



WaveStar[®] BandWidth Manager, Release 4.1

Alarm Messages and Trouble Clearing Guide

365-370-110 R4.1
Issue 7
October 2001

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WaveStar® BandWidth Manager, Release 4.1 Alarms, Messages, and Trouble Clearing Guide

365-370-110 R4.1

Date: October 2001

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About this Information Product

- Purpose** This Alarm Messages and Trouble-Clearing Guide (AMTCG) provides the following information about the Wavestar Bandwidth Manager System:
- Maintenance and trouble-clearing information and tasks
 - A central directory of alarm messages

Reason for reissue This WaveStar BandWidth Manager, Release 4.1 AMTCG contains two tasks that were missing from Release 4.0, and new tasks, 571-588. The “Loopbacks” section of Chapter 2 was also rewritten to include a description of *forced* versus *operating*.

The following tasks were missing in Release 4.0 and have been added:

- Task 533: Clear ‘Circuit Pack Unequipped/Missing’
- Task 535: Clear ‘Circuit Pack Invalid’

The following tasks are new:

- Task 571: Clear ‘Local Squelch Map Conflict’
- Task 580: Clear STM64, STM16, STM4, STM1 or STM1E Multiplex Section ‘Signal Degrade’ or ‘Excessive Error’
- Task 581: Clear STM64, STM16, STM4, STM1 or STM1E ‘Multiplex Section Remote Defect Indication’
- Task 582: Clear STM64, STM16, STM4, STM1 or STM1E ‘Multiplex Section Server Signal Failure’

- Task 583: Clear ‘HP Signal Degrade’
- Task 584: Clear ‘HP Unequipped’
- Task 585: Clear ‘HP Excessive Error’
- Task 586: Clear ‘HP Server Signal Failure’
- Task 587: Clear ‘DS3 Bit Error Rate’
- Task 588: Clear ‘System in Maintenance Condition’

The following section of Chapter 2 is new:

- Determining LocA and LocZ for Multi-Ring Traffic

Safety labels The following safety labels are used throughout this document:



DANGER

Indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.



WARNING

Indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.



CAUTION

Indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided. Caution is also used for property-damage-only accidents, including equipment damage, loss of software, or service interruption.

Intended audience	The WaveStar BandWidth Manager <i>Alarm Messages and Trouble-Clearing Guide</i> is written primarily for technicians in the field of telecommunications and communications network providers. Descriptive material in this document may be used by anyone desiring specific information or knowledge on the system's alarms and associated trouble-clearing tasks. Procedural material (tasks) in this document is written primarily for personnel responsible for maintenance of the WaveStar BandWidth Manager.
Conventions used	Each group of tasks is numbered. A task number does not represent a task's priority, the level of privilege required for the task, or the sequence in which tasks should be performed. The task numbering conventions for the respective task groups are as follows: • Acceptance (100-199) — these only exist in the UOG • Operation (200-299) — these only exist in the UOG • Circuit Order/Provisioning (300-399) — these only exist in the UOG • Trouble-Clearing (500-599) • Supporting (700-799) For example, a task numbered 502 is a Trouble-Clearing Task. A task numbered 708 is an Supporting Task.

Related documentation The following table lists the documents included in the WaveStar BandWidth Manager documentation set.

Table 1. WaveStar BandWidth Manager Documentation Set

Comcode	Document Number	Title
NA	365-370-100	<i>WaveStar BandWidth Manager Installation Manual</i>
109 128 090	365-370-101 R4.1	<i>WaveStar BandWidth Manager Applications and Planning Guide</i>
109 142 315	365-370-133	<i>WaveStar BandWidth Manager TL-1 Message Details (formerly the Operations System Engineering Guide)</i>
109 128 108	365-370-109 R4.1	<i>WaveStar BandWidth Manager User Operations Guide</i>
109 128 116	365-370-110 R4.1	<i>WaveStar BandWidth Manager Alarm Messages and Troubleclearing Guide</i>
109 153 866	CD-ROM	<i>WaveStar BandWidth Manager Release 4.1 Documents</i>

Lasers and eye damage The optical energy emitted by laser and high-radiance LEDs in the 400-1400 nm range may cause eye damage if absorbed by the retina. When a beam of light enters the eye, the eye magnifies and focuses the energy on the retina magnifying the irradiance. The irradiance of the energy that reaches the retina is approximately 105 or 100,000 times more than at the cornea and, if sufficiently intense, may cause a retinal burn.

The damage mechanism at the wavelengths used in telecommunications is thermal in origin, for example, damage caused by heating. Therefore, a specific amount of energy is required for a definite time to heat an area of retinal tissue. Damage to the retina occurs only when one looks at the light sufficiently long that the product of the retinal irradiance and the viewing time exceeds the damage threshold. Optical energies above 1400 nm cause surface and skin burns and do not affect the retina. The thresholds for injury at wavelengths greater than 1400 nm are significantly higher than for wavelengths in the retinal hazard region.

Classification of lasers

Manufacturers of lasers and laser products in the United States are regulated by the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) under 21 CFR 1040. These regulations require manufacturers to certify each laser or laser product as belonging to one of four major Classes: I, II, IIa, IIIa, IIIb, or IV. The International Electro-technical Commission (IEC) is an international standards body that writes laser safety standards. Classification schemes are similar with Classes divided into Classes 1, 2, 3A, 3B, and 4. Lasers are classified according to the accessible emission limits and their potential for causing injury. Lightwave systems are generally classified as Class I/1, because, under normal operating conditions, all energized laser transmitting circuit packs are terminated on optical fibers which enclose the laser energy with the fiber sheath forming a protective housing. Also, covers are in place over the circuit pack shelves. The circuit packs themselves, however, may be FDA/CDRH Class I or IIIb or IEC Class 1, 3A, or 3B.

Lightwave safety precautions

In its normal operating mode, a lightwave system is totally enclosed and presents no risk of eye injury. It is a Class I/1 system under the FDA/CDRH and IEC classifications.

The lightguide cables that interconnect various components of a lightwave system can disconnect or break, and may expose people to lightwave emission. Also, certain measures and maintenance procedures may expose the technician to emission from the semiconductor laser during installation and servicing. Unlike more familiar laser devices, such as solid-state and gas lasers, the emission pattern of a semiconductor laser results in a highly divergent beam. In a divergent beam, the irradiance (power density) decreases rapidly with distance. The greater the distance, the less energy will enter the eye and the less potential risk for eye injury. Inadvertently viewing an unterminated fiber or damaged fiber with the unaided eye at distances greater than 5 to 6 inches normally will not cause eye injury provided the power in the fiber is less than a few milliwatts at the shorter wavelengths and a few tens of milliwatts at the longer wavelengths. However, damage may occur if an optical instrument such as a microscope, magnifying glass, or eye loupe is used to stare at the energized fiber end.

Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

Safety precautions for enclosed systems

Under normal operating conditions, lightwave transmission systems are completely enclosed; nonetheless, the following precautions should be observed:

- Because of the potential for eye damage, technicians should not stare into optical connectors or broken fibers.
- Under no circumstance should lightwave/lightguide operations be performed by a technician before satisfactorily completing an approved training course.
- Since viewing lightwave emission directly in excess of Class I/1 limits with an optical instrument such as an eye loupe greatly increases the risk of eye damage, an appropriate label(s) must appear in plain view, in close proximity to the optical port, on the terminal equipment.

Figure 1-1 illustrates the FDA Class IIIb non-interlocked protective housing label.

Figure 1-1 Protective Housing Label



NC-USM-111

Safety precautions for unenclosed systems

During service, maintenance, or restoration, a lightwave transmission system is considered unenclosed. Under these conditions, follow these practices:

- Only authorized, trained personnel shall be permitted to do service, maintenance, and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Laser modules associated with the optical ports of laser circuit packs are typically recessed, which limits the exposure distance. Optical port shutters and automatic power reduction (APR) are engineering controls that are also used to limit the emissions. However, technicians removing or replacing laser circuit packs should not stare or look directly into the optical

port with optical instruments or magnifying lenses. (Normal eye wear or indirect viewing instruments, such as a Find-R-Scope, are not considered magnifying lenses or optical instruments.)

- Only authorized, trained personnel should use the lightwave test equipment during installation or servicing since this equipment contains semiconductor lasers. [Some examples of lightguide test equipment are Optical Time Domain Reflectometers (OTDRs), Hand-Held Loss Test Sets, and Feature Finders.]
- Under no circumstances shall any personnel scan a fiber with an optical test set without verifying that all lightwave sources on the fiber are turned off.
- All unauthorized personnel shall be excluded from the immediate area of lightwave transmission systems during installation and service.

Consult *ANSI Z136.1*, American National Standard for Safe Use of Lasers in the United States or outside the United States, IEC-60825, Part 2 for guidance on the safe use of optical fiber optic communication systems in the workplace.

Electrostatic Discharge (ESD) Considerations

This section describes the precautions required because of ESD.

Circuit pack/port unit handling precautions

Industry experience has shown that all integrated circuit packs can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.

Observe the following precautions when handling circuit packs/units to prevent damage by electrostatic discharge:

- Assume all circuit packs contain solid-state electronic components that can be damaged by ESD.
- When handling circuit packs/units (storing, installing, removing, etc.) or when working on the backplane, always wear a grounded wrist strap or wear a heel strap and stand on a grounded, static-dissipating floor mat.
- Handle all circuit packs/units by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.

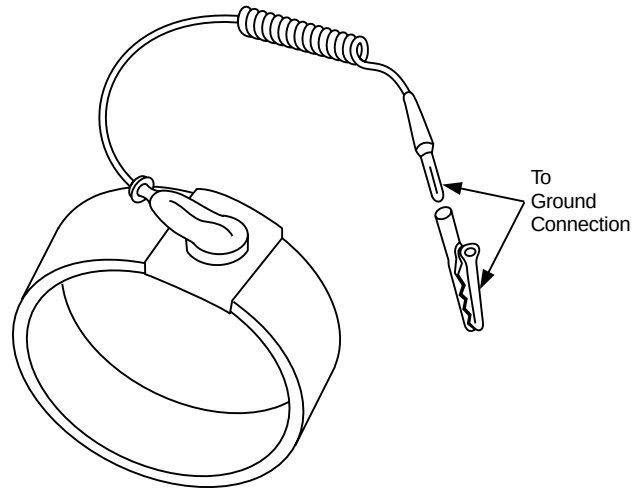
- Observe all warning labels on bags and cartons. Whenever possible, do not remove circuit packs/units from antistatic packaging until ready to insert them into slots.
- If possible, open all circuit packs/units at a static-safe work position, using properly grounded wrist straps and static-dissipating table mats.
- Always store and transport circuit packs/units in static-safe packaging. Shielding is not required unless specified.
- Keep all static-generating materials such as food wrappers, plastics, and *Styrofoam*® containers away from all circuit packs/units. When removing circuit packs/units from a cabinet, immediately place the circuit packs/units in static-safe packages.
- Whenever possible, maintain relative humidity above 20 percent.
- Always keep the electromagnetic interference (EMI)/ESD protective front covers on the shelves except during an upgrade or maintenance procedure. Once a circuit pack/unit is replaced in the shelf, immediately close the front cover.

Important! Any connectors on the shelf interconnection panel that are not cabled should be fitted with a plastic dust cap to provide ESD protection.

Static control wrist straps

To reduce the possibility of ESD damage, shelves are equipped with grounding jacks to enable personnel to ground themselves using wrist straps (Figure 1-2), while handling circuit packs/units or working on a shelf. The wrist straps should be checked periodically with a wrist strap tester to ensure that they are working properly.

Figure 1-2 Static Control Wrist Strap



NC-USM-110

Important! The grounding jacks for connection of wrist straps are located on each user panel and the rear of the equipment bay. These jacks are labeled.

Important safety instructions

READ AND UNDERSTAND ALL INSTRUCTIONS.

When using this telecommunication equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Follow all warnings and instructions marked on the product.
2. Slots and openings in this product at the back or bottom are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered.
3. Opening or removing rear covers or sheet-metal parts may present exposure to high current or electrical energy levels, or to other risks.
4. Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the product.
5. Refer servicing to qualified service personnel.
6. Use caution when installing and modifying telecommunications lines.
7. Never install telecommunication wiring during a lightning storm.
8. Never install telecommunication jacks in wet locations unless the jack is specifically designed for wet locations.
9. Never touch uninsulated telecommunication wires or terminals unless the telecommunication line has been disconnected at the network interface.
10. Installation must include an independent frame ground conductor to building ground. Grounding/bonding circuit continuity is vital for safe operation of this equipment. Never operate with grounding/bonding conductor disconnected.
11. This product has two -48 V DC input power feeders. Disconnecting one power feeder will not de-energize the product. To reduce the risk of injury, disconnect both power supply cables when removing power from the system.
12. Metallic telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as applicable.
13. For continued protection against risk of fire, replace only with same type and rating of fuse.

14. Use only Lucent Technologies manufactured, recognized circuit packs/units/modules.
15. This equipment is intended for installation in Restricted Access Locations where access is controlled or where access can only be gained by service personnel with a key or tool. Access to this equipment is restricted to qualified service personnel only.
16. Power the unit only from -48 V DC sources providing Safety Extra Low Voltage (SELV) outputs.
17. This equipment must be provided with a readily accessible input power disconnect device as part of the building installation (such as a main power disconnect switch or external circuit breaker).

SAVE THESE INSTRUCTIONS.

**Description of
documentation set**

This section briefly describes the documents that are included in the WaveStar BandWidth Manager documentation set.

Installation Manual

The *WaveStar BandWidth Manager Installation Manual* is a step-by-step guide to system installation and setup. It also includes information needed for pre-installation site planning and post-installation acceptance testing.

Applications and Planning Guide

The *WaveStar BandWidth Manager Applications and Planning Guide* (APG) is for use by network planners, analysts and managers. It is also for use by the Lucent Account Team. It presents a detailed overview of the system, describes its applications, gives planning requirements, engineering rules, ordering information, and technical specifications.

User Operations Guide

The *WaveStar BandWidth Manager User Operations Guide* provides step-by-step information for use in daily system operations. The manual demonstrates how to perform system provisioning, operations, and administrative tasks.

Alarm Messages and Trouble Clearing Guide

The *WaveStar BandWidth Manager Alarm Messages and Trouble Clearing Guide* provides detailed information on maintenance and trouble clearing, a list of the systems's alarm messages, and procedures for routine maintenance, troubleshooting, diagnostics, and component replacement.

TL-1 Messaging Guide

The *WaveStar BandWidth Manager TL-1 Messaging Guide* provides detailed information on TL1 commands, messages, and error codes.

Document assumptions	This document assumes that its readers have an understanding of the following: • Basic principles of telecommunication transmission • Common telecommunication and system terminology (a glossary is provided in this manual to assist you) • Test sets and tools used in the telecommunication industry • Local operations and functional procedures of your company • Personal computer (PC) operation, common PC terminology, and navigational procedures in a windows-style user interface
User interface to system	Users interact with the WaveStar BandWidth Manager system using a PC and a windows-like graphical user interface (GUI). The GUI is called the WaveStar Craft Interface Terminal (WaveStar CIT), which permits you to perform system operations such as administration, provisioning, fault management, and more.
Using the WaveStar CIT	Procedures or tasks presented in this document expect users to be familiar with operating the WaveStar CIT and navigating through the screens of information relating to a particular operation. The screens are designed to be straightforward and to contain all information relating to a particular operation. The tasks presented in this document rely heavily on the information provided in the screen displays. Therefore, it is imperative that a user read all the information provided in a particular screen before continuing an operational function.
Training	Prerequisite training that will allow you to become proficient in understanding and operating the WaveStar BandWidth Manager is described later in this preface under the heading “Training.” This document expects a user to be familiar with the basic functions of the system before performing tasks that could damage the system, affect system operations, or impede communication traffic within the system. Understanding the descriptive material provided in this manual and attending the suggested training courses should allow you to perform the tasks necessary to operate and maintain the WaveStar BandWidth Manager system.

Chapter descriptions Table 2. highlights the type of information found in each chapter.

Table 2. Chapter Descriptions

Chapter	Title	Description
Preface	About this Information Product	Describes the book's purpose, intended audience, and organization. References related documentation and explains how to comment on this document.
1	Alarms, Conditions, and Fault Messages	Provides a list of all alarm messages generate by the product, explaining what each message means.
2	Maintenance/Troubleclearing	Defines the maintenance philosophy and outlines the various features available to monitor and maintain the WaveStar BandWidth Manager
	Trouble Clearing Tasks	Provides procedures for clearing conditions that cause alarms.
	Supporting Tasks	Provides procedures for all supporting tasks you may perform using WaveStar BandWidth Manager
	Abbreviations and Acronyms	Explains common telecommunication abbreviations and acronyms.
	Glossary	Defines telecommunication terms.
	Index	Lists specific subjects and their corresponding page numbers.

Locating and Using the tasks

Search Chapter 1 (alphabetically) for the desired alarm. As necessary, read the accompanying alarm message and identify the appropriate trouble-clearing task.

Using task elements

All task elements in each task category are numbered and are listed in numerical order. However, you should never perform any of the tasks in numerical order unless directed by the main task you are performing.

Important! Perform all steps in a task in numeric order unless a step sends you to another task element, a supporting element (SE), or supporting task.

Unless otherwise instructed, if one task element sends you to another task element or supporting task, you must return to the first task element after you complete the second. After you have completed the first main task element, you have finished the task.

Using supporting elements

Supporting elements (SEs) contain details necessary to complete the step that referenced the SE in the main task. SEs allow new or infrequent users access to detailed information that may not be needed by experienced users. Supporting elements are used only within the main task that referenced the SE. Therefore, an SE is an integral part of the main task and has a similar numerical reference.

Using supporting tasks

Supporting tasks are not main task elements. Supporting tasks may be referenced from multiple main task elements. Thus, a supporting task may actually support multiple job (task) functions.

Go to a supporting task only when referred to by a main task element. Thus, a supporting task should only be accessed whenever it is referenced from a T or SE.

Important! Perform all steps in a supporting task in numeric order unless a step sends you to another task element, a supporting element (SE), or supporting task.

Unless otherwise instructed, if one task element sends you to another task element or supporting task, you must return to the first task element after you complete the second. After you have completed the first main task element, you have finished the task.

If/Then statements in a task or supporting element

If .../Then ... columns in a task element contain only one condition that is true in a table cell under the **If ...** column. You perform the action in the related table cell under the **Then ...** column. You then continue to the next sequential step or as directed by the action under the **Then ...** column.

Verifying actions

Sometimes you will be asked to verify that actions have occurred. This may take the form of a formal statement of the expected response. At other times, the instructions will merely state verify that...

Screen display and equipment designation fonts

The tasks in this manual use a MONOSPACE font to identify text on a screen or a response displayed from the network. A BOLD font identifies the lettering designations on panels, shelves, and circuit packs.

Documentation Ordering Information

This section describes how to order

- Additional copies of this document
- Electronic documentation (CD-ROMs)
- Product drawings from the Lucent Technologies Customer Information Center (CIC)

RBOC/BOC Customers

RBOC/BOC customers should process orders through your Company Documentation Coordinator.

Commercial Customers

Table 3, “Placing an Order” The following table provides the information necessary for commercial customers to order standard documentation or request placement on the standing order list (for reissues of any document) by mail, internet, telephone, or fax.

Table 3. Placing an Order

Mailing and Internet Addresses	Telephone Numbers	Fax Numbers
Mailing Address: Lucent Technologies Customer Information Center Attention: Order Entry 2855 N. Franklin Road P.O. Box 19901 Indianapolis, IN 46219 Internet Address: www.lucentdocs.com	From USA: 1-888-LUCENT-8 (1-888-582-3688)	1-800-566-9568
	From North American Region (NAR): +1-317-322-6619	+1-317-322-6359
	From Asia/Pacific Region and China; Caribbean/Latin America Region (CALA): +1-317-322-6411	+1-317-322-6699
	From Europe/Middle East/Africa (EMEA): +1-317-322-6416	+1-317-322-6699

Ordering CD-ROMs

Documentation for WaveStar BandWidth Manager is available on CD-ROM. The following table lists the contacts for specific information about CD-ROM documentation.

Table 4. Ordering CD-ROM Documentation

IF you wish to...	THEN contact...
order an annual subscription	Your Account Executive. Lucent Technologies Customer Information Center. Contact information is provided in previous table.
obtain pricing information	
obtain a list of documents available on CD-ROM	

Payment

One of the following methods of payment is required with orders from commercial customers:

- Credit card is required for orders totaling \$1000 or less. Visa, MasterCard, and American Express are accepted. Prepayment by check is also acceptable
- Orders totaling over \$1000 may be paid for using credit card, check, or invoice upon receipt of a purchase order. Purchase orders may be faxed or mailed using the information provided above.
- Lucent Associates - Orders placed by Lucent associates are billed using an FML organization number and location code.

Important! Lucent Technologies entities should use Form IND 1-80.80 FA, which is available through the Customer Information Center.

Training information

This section describes the WaveStar BandWidth Manager training courses.

Registering for a course

To enroll in a training class at one of the Lucent Technologies corporate training centers, please call 1-888-LUCENT8 (1-888-582-3688):

Prompt 2.

To arrange a suitcase session at your facility, call 1-800-432-6317.

To register for a course or obtain schedule information for outside the continental United States, please contact your in-country training representative or call +1-407-767-2798.

Overview Course This section describes TR3800 and TR3802.

Content

The WaveStar BandWidth Manager Overview Course (TR3800, SONET edition and TR3802, SDH edition) provides a detailed introduction to WaveStar BandWidth Manager, covering the features and benefits of the network solutions, equipment functions and requirements, and network planning.

Audience

Lucent marketing/sales personnel, customer network planners and engineers, product managers, technical consultants, and account representatives.

Course length

3 days

**Operations and
Maintenance Course**

This section describes TR3801 and TR3803.

Content

The WaveStar BandWidth Manager Operations and Maintenance Course (TR3801, SONET and TR3803, SDH edition) includes detailed descriptions of initial turn-up and day-to-day operations and maintenance tasks, as well as emphasis on developing skills using the WaveStar BandWidth Manager User Operations Guide, 365-370-109 R4.1 and the WaveStar BandWidth Manager Alarm Messages and Troubleclearing Guide, 365-370-110 R4.1. The course covers the physical equipment and using the new GUI-based WaveStar CIT to provision equipment, enter cross-connections, perform administrative functions, run diagnostic tests, and perform manual protection switching.

Audience

Technicians, installers, maintenance engineers, technical support personnel, product evaluators, and anyone desiring operations and maintenance information for WaveStar BandWidth Manager.

Course length

5 days

SDH Technical Support

This section describes the technical support available for SDH customers of WaveStar BandWidth Manager.

WaveStar BandWidth Manager is complemented by a full range of services available to support planning, maintaining, and operating your system. Applications testing, network integration, and upgrade/conversion support is also available.

Technical support

Lucent Technologies' Technical Support Services (TSS) organization is the first point of contact for SDH customers. Each segment of the TSS organization is committed to providing customers with quality product support services and regards the customer as its highest priority.

Important! TSS was formerly known as Customer Technical Support (CTS).

Contacting TSS

The TSS team maintains direct contact with Lucent Technologies' development and manufacturing organizations to assure prompt resolution of all assistance requests.

To contact TSS, please call +1-630-224-4672: Prompt 2.

SONET technical support

This section describes the technical support available for SONET customers of WaveStar BandWidth Manager.

WaveStar BandWidth Manager is complemented by a full range of services available to support planning, maintaining, and operating your system. Applications testing, network integration, and upgrade/conversion support is also available.

Technical support groups

Technical support is available through

- North American Regional Technical Assistance Center (NARTAC)
- Technical Support Services (TSS)

Lucent Technologies technical support groups are committed to providing customers with high quality product support services. The NARTAC and TSS organizations regard customers as their highest priority and understand the obligation of customers to maintain quality services.

Contacting your NARTAC

NARTAC is the first point of contact for technical support. NARTAC personnel troubleshoot field problems 24 hours a day over the phone and on site (if necessary).

For technical assistance, call 1-866-LUCENT8.

NARTAC services

NARTAC provides the following technical support services:

- Tracks and maintains visible ownership of all reported customer assistance requests, from inception through resolution
- Analyzes and diagnoses reported problems
- Communicates actions, plans, and problem status to the reporting customer
- Provides restoration and recovery services
- Provides preventative and/or circumvention measures
- Initiates action to establish modifications requests (MRs) for design issues
- Writes technical bulletins
- Provides technical assistance to installers

Important! NARTAC personnel are supported by the Lucent Technologies Technical Support Services (TSS) organization.

TSS services

The TSS organization provides quality product support services and regards the customer as its highest priority. The TSS organization maintains direct contact with development and manufacturing organizations of Lucent Technologies to assure prompt resolution of all customer assistance requests.

The TSS organization provides the following technical support services:

- Manages customer assistance requests
- Supports first service applications (FSAs), customer lab evaluations (CLEs), and initial customer applications (ICAs)
- Develops software release descriptions, installation manuals, engineering change procedures (ECPs), method of procedures (MOPs), modification implementation procedures (MIPs)
- Provides installation and NARTAC training

A technical support platform

The TSS organization provides an online system, the Customer Assistance Request Entry System (CARES), to track all customer assistance requests. The TSS CARES communicates details about assistance requests, product bulletins, and other critical information to customer sites. The TSS CARES web site is available at <http://ctscares.lucent.com/>.

To obtain a login to CARES, please call

- 866-LUCENT8 (SONET)
- +1-630-224-4672 (SDH)

Reference

For additional information about technical support, please contact your Lucent Customer Support Team.

How to comment

Because customer satisfaction is extremely important to Lucent Technologies, every attempt is made to encourage feedback from customers about our information products.

Customer comment form

A customer comment form is located immediately after the title page of this document. Please fill out the form and fax it to the number provided on the form.

Is the form missing?

If the customer comment form is missing, you may submit comments by fax, email, or on-line.

Fax: +1-407-767-2760

Email: ctiphotline@lucent.com

URL: <http://www.lucent-info.com/comments/>





1 Alarms, Conditions, and Error Messages

Overview

Purpose This overview serves to describe the format and content of an Alarm Message as well as the organization and presentation of the various types of Alarm Messages.

Format of alarm messages Each alarm message is described by an individual table with the following information items:

Alarm Data	What It Means
Probable Cause	This is the same “Probable Cause” as contained in the Alarm List report – which is visible from the WaveStar CIT <i>System View</i> screen. This field lists the acronym (as it appears in the <i>Probable Cause</i> column) and it’s expansion (as it appears in the <i>Description</i> column).
Definition	Two to three sentences or a paragraph that describes this alarm.
Nature of Alarm/Type	<i>Nature of Alarm</i> serves to indicate whether the alarm is: 1. Temporary/Transient — meaning that it appears for a brief time interval until cleared by the system (without external intervention), or 2. Persistent — meaning that it appears and remains (continuously) until cleared by the system or external intervention. Persistent give the following two types of notifications: - when it occurs, and - when it clears. <i>Type</i>, which is synonymous with the WaveStar CIT Alarm List column header <i>Alarm Type</i>, serves to indicate one of six different alarm notification categories. They are:

Alarm Data	What It Means
Nature of Alarm/Type <i>Continued</i>	- Communications – meaning that the identified probable cause (alarm) was generated by one or more of following interface standards (SONET - including EC1, SDH - including STM1E, or T3). Or, one or more of the following system anomalies (system timing/timing reference failure, protection switching protocol/switching failure). The exact type, or types, is listed with the <i>Interface Standard/Possible Signal Level Affected</i>. - Equipment – meaning that the identified probable cause (alarm) was generated internal to this node and not on one of the external communication interfaces. - Processing Error – meaning that the identified probable cause (alarm) was generated as the result of an abnormal activity with the system’s software. - Quality-of-Service – meaning that the identified probable cause (alarm) was generated as the result of bit-error rates that have exceeded a predetermined threshold. These are also referred to as TCA alarms. - Environmental – this category includes the external alarm sensors, which are referred to as miscellaneous discretes. - Security – meaning that the identified probable cause (alarm) was generated as the result of an excessive number of failed login attempts.
Type AID Affected	Indicates, by functional category (for example, shelf, circuit pack, port, logical tributary, and so forth) the type of AID that is affected by this alarm.
Interface Standard	Indicates whether the alarm is available only on SONET signals, SDH signals, or T3 signals.
Possible Signal Level Affected	The different optical and/or electrical signals that this alarm may have an association.
Affect on Service	This is the same “Affect on Service” as contained in the Alarm List report – which is visible from the WaveStar CIT System View screen. The two “Affect on Service” options are: Non-Service Affecting (NSA), and Service Affecting (SA).

Alarm Level	This is the same “Alarm Level” as contained in the Alarm List report – which is visible from the WaveStar CIT System View screen. For each Probable Cause there is an associated <i>Alarm Level</i>. Possible values are: • Critical (CR) • Major (MJ) • Minor (MN) • Not Alarmed • Not applicable, and • Not Reported (NR).
On-site Indications	User Panel LEDs – These are the visual indicators that are generated by the node whenever this <i>Probable Cause</i> is raised. Possible choices are: • CR LED • MJ LED • MN LED, and • NO User Panel LEDs illuminated. Circuit Pack Faceplate – These are the visual indicators that are generated by the node whenever this <i>Probable Cause</i> is raised. Possible choices are: • Continuous Red LED • Flashing Red LED • Flashing Green LED • NO Indication (no alarm indication – which is a continuous Green LED).

On-site Indications, <i>Continued</i>	Not Reported, for example an AIS, means that the alarms will only appear on the CIT. There will not be any indications on the User Panel or circuit pack faceplate LEDs. Furthermore, Not Reported alarm levels will not appear on the CIT's Alarm List. Other menus must be used to determine the condition type. For example, to display an AIS use <code>Fault-Analysis-Facility Failure States</code> and expand down the directory structure to the port/tributary level.
Can the Default Alarm Level be Reprovisioned via ASAP?	Note: The alarm level reported depends on the ASAP. In this document the default ASAP is used. <i>YES</i> , the Alarm Severity Assignment Profile (ASAP) can be used to change the alarm level. or <i>NO</i> , ASAP cannot be used to change the alarm level.
Trouble-Clearing Task ID	A specific 4-character identifier (for example, T 500) that contains the numbered steps, which are referred to as a procedure, for clearing this alarm. Alarms which are transient in nature and that do not require any external human intervention to clear – will not have a 4-character identifier (procedure) specified.

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Alarm Messages

Order of presentation	Alarm Messages are grouped by alarm type and listed alphabetically by Probable Cause. The order of presentation is as follows: • First, Communications • Second, Equipment • Third, Processing Error • Fourth, Quality-of-Service • Fifth, Environmental • Sixth, Security
Required login permissions	Any user whose login permissions include an M1 or higher can view (display) the Alarm List. However, any user whose job functions include performing Trouble-Clearing tasks must have an M4 or an M5. Refer to heading <i>NE Login Administration</i> , in the WaveStar BandWidth Manager User/Operations Guide, for further details.



Alarm Messages — Communications

AIS (Alarm Indication Signal - DS3)

Alarm Data	What it Means	
Probable Cause	AIS (Alarm Indication Signal – DS3)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LED		
- Circuit Pack faceplate	flashing Red	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DS3 port Incoming</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed on the receive (IN) port at the upstream node).	

AIS-L
(Alarm Indication Signal –
Line)

Alarm Data	What It Means	
Probable Cause	AIS-L (Alarm Indication Signal – Line)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1</i> port can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

AIS-P
(Alarm Indication Signal –
Path)

Alarm Data	What it Means	
Probable Cause	AIS-P (Alarm Indication Signal – Path)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR	NR
- T3	CR	Not Applicable
On-site Indications	CR	
- User Panel LEDs	Not Applicable	
- Circuit Pack faceplate LED	flashing Red	Not Applicable
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STS-N(c) Point-to-Point Tributary</i> can be used to change the STS-N alarm level. YES, ASAP type <i>DS3 Port Outgoing (SONET)</i> can be used to change the T3 alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

APSC **(BLSR Inconsistent APS** **Codes)**

Alarm Data	What It Means	
Probable Cause	APSC (BLSR Inconsistent APS Codes)	
Definition	For K-bytes to be considered consistent, in the first 12 frames since the K-bytes were found to be consistent, there must be 3 consecutive frames which have identical K-bytes. In other words, there is a rolling window of 12 frames in which 3 consecutive frames must have identical K-bytes. If this condition is violated, the INAPS Alarm will be raised.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 524	

APSFOP (APS Failure of Protocol)

Alarm Data	What It Means	
Probable Cause	APSFOP (APS Failure of Protocol)	
Definition	There are two modes of APS. They are referred to as: • With K-bytes, and • Without K-bytes. For the mode, <i>With K-bytes</i>, this alarm indicates that the receiver could not decode meaningful information from the K-byte. For the mode, <i>Without K-bytes</i>, this alarm indicates that the receiver is detecting a Signal Degrade or Signal Failure Condition.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
- SDH	STM64, STM16, STM4, STM1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>automatic protection switching</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

APSPROV (BLSR Improper APS Codes)

Alarm Data	What It Means	
Probable Cause	APSPROV (BLSR Improper APS Codes)	
Definition	A BLSR or MS-SPRing ring is detecting K-bytes with an invalid status.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 525	

AUAIS
(AU Alarm Indication
Signal)

Alarm Data	What it Means	
Probable Cause	AUAIS (AU Alarm Indication Signal)	
Definition	Alarm indication signals that notify downstream equipment that a failure has been detected and alarmed by some upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	Not Reported	Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LEDs	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

AULOP
(AU Loss of Pointer)

Alarm Data	What it Means	
Probable Cause	AULOP (Administrative Unit – Loss of Pointer)	
Definition	For an incoming AU-n (where n = 3 or 4) signal (for example a provisioned tributary) a corresponding valid pointer was not found in N consecutive frames (where $8 \Rightarrow N \leq 10$) or N consecutive New Data Flags (NDFs) were detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	CR	Not Reported
On-site Indications		
- User Panel LEDs	CR	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>VC-N(c) Point-to-Point tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 512	

AUSRM
(AU Signal Rate Mismatch)

Alarm Data		What it Means	
Probable Cause		AUSRM (AU Signal Rate Mismatch)	
Definition		This alarm is raised when one of the following conditions persists for 2.5 seconds: - An optical or electrical port is user-provisioned as unprotected (that is, not user-provisioned as part of a facility protection group) and the port is user-provisioned for adaptive rate operation (when supported), and the incoming signal rate is greater than the user-provisioned cross-connection rate. - An optical or electrical port is user-provisioned as part of a 1+1, 1xN, 2F BLSR, or 4F BLSR port protection group, and the working traffic is user-provisioned for adaptive rate operation (when supported), and the incoming signal rate (regardless of the protection switch state) is greater than the user-provisioned cross-connection rate. - An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; any of the associated working traffic is user-provisioned for fixed rate operation; a protection switch is active; and the incoming signal rate does not match the user-provisioned tributary rate of the associated working traffic. - An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; the protection access traffic is user-provisioned for fixed rate operation; no protection switch is active; and the incoming signal rate on the protection access signal does not match the user-provisioned protection access tributary rate.	
Nature of Alarm/Type		Persistent	Communications
Interface Standard	Possible Signal Level Affected		
- SDH	VC3, VC4, VC4-4c, VC4-16c		
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)	
- SDH Alarm Level	MJ	NR (Not Reported)	
On-site Indications	MJ		No indication
- User Panel LEDs			

Alarm Data	What it Means	
	No indication	No indication
- Circuit Pack faceplate LED		
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP VC-N(c) Point-to-Point Tributary can be used to change the alarm level.	
Trouble-Clearing Task ID		

BLSR-DKB
(Ring-Default K-bytes)

Alarm Data	What It Means	
Probable Cause	BLSR-DKB (Ring Default K-bytes)	
Definition	Default K-bytes were received; the received K-byte Source Node ID is the same as the Destination Node ID.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 526	

CKTAUDUD
(Ring Circuit Alarm
Suppressed)

Alarm Data/	What it Means	
Probable Cause	CKTAUDUD (Ring Circuit Alarm Suppressed)	
Definition	Normally, this is a transient condition which is raised during ring discovery.	
Nature of Alarm/Type	Transient	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	Not Applicable
- SDH Alarm Level	Not Allowed	Not Applicable
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. NO user action required.	

**DCCMSF (DCC MSect
Failure)**

Alarm Data	What it Means	
Probable Cause	DCCMSF (DCC MSect Failure)	
Definition	The <i>Multiplex Section</i> DCC channel has failed due to either DCC hardware/equipment failure or a failure of the transmission facility carrying the active DCC channel	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STMn Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 514	

DCCRS (DCC R Disabled-Unavailable)

Alarm Data	What it Means	
Probable Cause	DCCRS (DCC R Sct Disabled-Unavailable)	
Definition	For MS-SPRing ring DCCs provisioned to use <i>Regenerator Section</i> overhead, a provisioning activity has occurred which required allocation of LAPD channels and no channels were available in the working DCC circuit pack. Examples of such provisioning activity are: • A new optical port (pre)provisioning • A protection group is deleted and LAPD channels must be allocated for what was the standby DCC channels in the protection group.	
Nature of Alarm/Type	Transient	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 517	

DCCRSF
(DCC RSect Failure)

Alarm Data	What it Means	
Probable Cause	DCCRSF (DCC RSect Failure)	
Definition	The <i>Regenerator Section</i> DCC channel has failed due to either DCC hardware/equipment failure or a failure of the transmission facility carrying the active DCC channel.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	MN	MN
- Circuit Pack LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 514	

DUPL-RNG (Duplicate Ring Node)

Alarm Data	What It Means	
Probable Cause	DUPL-RNG (Duplicate Ring Node)	
Definition	Two nodes exist in a ring with either the same TID, system field ID in the NSAP, or there are more than 16 nodes in the ring.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 529	

EOC
**(DCC Sect Disabled-
 Unavailable)**

Alarm Data	What it Means	
Probable Cause	EOC (DCC Sect Disabled-Unavailable)	
Definition	For BLSR DCCs provisioned to use section overhead provisioning activity has occurred which required allocation of LAPD channels and no channels were available in the working DCC circuit pack. Examples of such provisioning activity are: • A new optical port (pre)provisioning • A protection group is deleted and LAPD channels must be allocated for what was the standby DCC channels in the protection group.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack LEDs	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 517	

EOC
(DCC Sect Failure)

Alarm Data	What It Means	
Probable Cause	EOC (DCC Sect Failure)	
Definition	The DCC channel has failed due to either: • DCC hardware/equipment failure, or • Failure of the transmission facility carrying the active DCC channel.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OC-n/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 514	

EOC (LinkID Sect Mismatch)

Alarm Data	What It Means	
Probable Cause	EOC (LinkID Sect Mismatch)	
Definition	Upon establishment of a DCC link with another node, the received LinkID has a LinkID protocol version number which is not supported by this nodes LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

EOC
(User-Network Side Sect
Failure)

Alarm Data	What It Means	
Probable Cause	EOC (User-Network Side Sect Failure)	
Definition	This is for BLSR. Both sides of the LAPD channel have been provisioned as user side or network side. This is a provisioning error.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OC-N/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

HLDOVRSYNC (System Clock Holdover)

Alarm Data	What It Means	
Probable Cause	HLDOVRSYNC (System Clock Holdover)	
Definition	Loss of the external reference signal has resulted in either a manual or automatic switch to internal synchronization.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	MN
On-site Indications		
- User Panel LEDs	NO Indication	MN
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Timing</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 519	

HPDEG (HP Signal Degrade)

Alarm Data	What it Means	
Probable Cause	HPDEG (HP Signal Degrade)	
Definition	The path (B3) Bit Error Rate exceeds the provisioned signal degrade value.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4, VC4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	Not Reported	Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

HPEXC (HP Excessive Error)

Alarm Data	What it Means	
Probable Cause	HPEXC (HP Excessive Error)	
Definition	Transmission bit errors on an SDH path (tributary) are occurring at a rate which exceeds the provisioned threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4, VC4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

HPLOP
(HP Loss of Pointer)

Alarm Data	What it Means	
Probable Cause	HPLOP (High Order Path – Loss of Pointer)	
Definition	For an incoming AU-n (where n = 3 or 4) signal (for example a provisioned tributary) a corresponding valid pointer was not found in N consecutive frames (where $8 \Rightarrow N \leq 10$) or N consecutive New Data Flags (NDFs) were detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	CR	Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 512	

HPPLM-P
(HP Payload Label
Mismatch)

Alarm Data		What it Means	
Probable Cause		HPPLM (High Order Path – Payload Label Mismatch)	
Definition		A Signal Label (at the monitoring point) other than one of the following: - Equipped, Non-Specific (0x01) - Asynchronous Mapping for DS3 (0x04)	
Nature of Alarm/Type		Persistent	Communications
Alarm Type/ Condition Type		PLM-P	
Interface Standard		Possible Signal Level Affected	
- SONET		T3 (DS3 port)	
- SDH		VC3, VC4	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level		CR	Not Applicable
On-site Indications		CR	No indication
- User Panel LEDs			
- Circuit Pack faceplate LED		Flashing Red	No indication
Can the Alarm Level be re-provisioned via ASAP?		YES, ASAP type <i>VC-N Path Terminated (SDH)</i> can be used to change the alarm level. YES, ASAP type <i>DS3 port Outgoing (SDH)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID			

HPRDI
(HP Remote Defect
Indication)

Alarm Data	What it Means	
Probable Cause	HPRDI (High Order Path – Remote Defect Indication)	
Definition	The path RDI bit is set in the G1 byte, indicating the far-end path terminating equipment is detecting a receive defect.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	Not Applicable
- SDH Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications		
- User Panel LEDs	CR	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level. YES, ASAP type <i>DS3 Outgoing SDH</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

HPUNEQ (HP Unequip)

Alarm Data	What it Means	
Probable Cause	HPUNEQ (HP Unequip)	
Definition	The path is unequipped. This is detected for 5 or more consecutive frames during which the C2 Byte has a value equal to 0x00.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	NR (Not Reported)
- SDH Alarm Level	CR	NR (Not Reported)
On-site Indications		
- User Panel LEDs	CR	No indication
- Circuit Pack faceplate LED	flashing Red	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>VC-N(c) Point-to-Point Tributary</i> can be used to change the alarm level. YES, ASAP type <i>DS3 port Outgoing (SDH)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

ISD (DS3 Idle Signal)

Alarm Data	What it Means	
Probable Cause	ISD (DS3 Idle Signal)	
Definition	The receiver port is detecting DS3 idle (Blue Signal) from upstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DS3 Port Incoming</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	No user action required at the local (detecting) NE. However, appropriate personnel at the upstream NE should be notified of this alarm - so that they can troubleshoot and take appropriate action.	

LIDMSM (LinkID MSect Mismatch)

Alarm Data	What it Means	
Probable Cause	LIDMSM (LinkID MSect Mismatch)	
Definition	Upon establishing a DCC Link with another node, the received LinkID has a LinkID protocol version number which is not supported by this node's LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	No indication	MN
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STMn Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

LIDRSM (LinkID Rsect Mismatch)

Alarm Data	What it Means	
Probable Cause	LIDRSM (Link ID Rsect Mismatch)	
Definition	Upon establishing a DCC link with another node, the received LinkID has a LinkID protocol version number which is not supported by this node's LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	No indication	MN
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

LIDSM (LinkID Sect Mismatch)

Alarm Data	What it Means	
Probable Cause	LIDSM (LinkID Sect Mismatch)	
Definition	Upon establishing a DCC Link with another node, the received LinkID has a LinkID protocol version number which is not supported by this node's LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	-	MN
On-site Indications	MN	
- User Panel LEDs		
- Circuit Pack faceplate LED	Flashing Red	
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>OC-N/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Escalate to the next level of technical support, might require an upgrade.	

LOF
(DS3 Loss of Frame)

Alarm Data	What it Means	
Probable Cause	LOF (DS3 Loss of Frame)	
Definition	The receive port is detecting DS3 loss of frame. DS3 AIS will be inserted towards downstream equipment to indicate trouble is alarmed there.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DS3 Port Incoming</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 545	

LOF
(Loss of Frame)

Alarm Data	What It Means	
Probable Cause	LOF (Loss of Frame)	
Definition	The node's receiver, where this alarm is active, is not detecting a valid signal frame. The node's transmitter, where the LOF is active, transmits an AIS-(L or P) toward the upstream receiver.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1 port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 545	

LOS (DS3 Loss of Signal)

Alarm Data	What it Means	
Probable Cause	LOS (DS3 Loss of Signal)	
Definition	The receive port is detecting DS3 loss of signal. DS3 AIS will be inserted towards downstream equipment to indicate trouble is alarmed here.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DS3 Port Incoming</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 543	

LOS (Loss of Signal)

Alarm Data	What It Means	
Probable Cause	LOS (Loss of Signal)	
Definition	The node's receiver, where this alarm is active, is not detecting a valid signal level. If the alarm is a CR, the system will insert a logical all-1's signal toward the downstream equipment. If the alarm is MN, the signal was protected.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR (not protected)	MN (protected)
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1 port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 543	

LOP-P
(Loss of Pointer – Path)

Alarm Data	What it Means	
Probable Cause	LOP-P (Loss of Pointer – Path)	
Definition	A valid pointer was not found in N consecutive frames (where $8 \leq N \leq 10$), or N consecutive <i>new data flags</i> (other than in a concatenation indicator) were detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Logical Tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STS-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 512	

**MAN (Constituent Signal
Rate Change)**

Alarm Data	What it Means	
Probable Cause	MAN (Constituent Signal Rate Change)	
Definition	Indication that the incoming signal tributary structure has changed.	
Nature of Alarm/Type	Temporary	Communications
Alarm Type/ Condition Type	STS3 Cross Connect, or STS12 Cross Connect, or STS48 Cross Connect	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- System Event	Not Allowed	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>System Event</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. NO user action required.	

MSAIS (MSect Alarm Indication Signal)

Alarm Data	What it Means	
Probable Cause	MSAIS (MSect Alarm Indication Signal)	
Definition	An SDH receiver (port) is detecting AIS which is all 1's in bits 6, 7 and 8 of the K2 Byte.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	(NR) Not Reported	(NR) Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. NO user action required.	

MSDEG
(MSect Signal Degrade)

Alarm Data	What it Means	
Probable Cause	MSDEG (MSect Signal Degrade)	
Definition	An SDH receiver (port) is detecting B2 Errors at a rate that exceeds the provisioned Signal Degrade Threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

MSEXC
(Multiplex Section
Excessive Error)

Alarm Data	What it Means	
Probable Cause	MSEXC (Multiplex Section Excessive Error)	
Definition	An SDH receiver is detecting line (B2) bit errors at a rate which exceeds the provisioned threshold. The provisioned threshold can range from 10E-3 to 10E-5 BER. If the SDH port is part of a protection group, a protection switch will occur.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	CR	MN
On-site Indication	CR	MN
- User Panel LEDs		
- Circuit Pack LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

MSRDI
(MSect Remote Failure
Indication)

Alarm Data	What it Means	
Probable Cause	MSRDI (MSect Remote Failure Indication)	
Definition	An SDH receiver (port) is detecting RDI, which is a 110 pattern in bits 6, 7 and 8 of the K2-byte. This indicates the Far-End is detecting a receiver failure.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	Not Reported	Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STMn Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

MSSSF
(MSect Server Signal
Failure)

Alarm Data	What it Means	
Probable Cause	MSSSF (MSect Server Signal Failure)	
Definition	This is an indication that an SDH <i>Multiplex Section</i> (Line) has failed and AIS is being inserted towards the downstream equipment. This alarm results from the detection of STMLOS or STMLOF.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	flashing Red LED	flashing Red LED
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-n Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

NID-CONFL
(Node ID Mismatch)

Alarm Data	What It Means	
Probable Cause	NID-CONFL (Node ID Mismatch)	
Definition	In a BLSR/MS-SPRing, the Source Node ID in the received K-bytes is not a valid Node ID in the ring map or the Source Node ID is not a valid neighbor of this Node.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 528	

OSILINKERR
**(DCC Line Disabled-
 Unavailable)**

Alarm Data	What It Means	
Probable Cause	OSILINKERR (DCC Line Disabled-Unavailable)	
Definition	For those BLSR DCCs that are provisioned to use Line rather than Section — an activity has occurred which required allocation of LAPD channels and no channels were available in the working DCC circuit pack. Examples of such provisioning activity are: • A new Optical Port (pre)provisioning • A Protection Group is deleted, and LAPD channels must be allocated for what were the standby DCC channels in the Protection Group.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	Not Alarmed
On-site Indication		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T517	

OSILINKERR
(DCC Line Failure)

Alarm Data		What It Means	
Probable Cause		OSILINKERR (DCC Line Failure)	
Definition		The DCC channel has failed due to either DCC hardware/equipment failure or a failure of the transmission facility carrying the active DCC channel.	
Nature of Alarm/Type		Persistent	Communications
Type AID Affected		Port	
Interface Standard		Possible Signal Level Affected	
- SONET		OC192, OC48, OC12, OC3, EC1	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level		MN	MN
On-site Indications		MN	MN
- User Panel LEDs			
- Circuit Pack LED		NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?		YES, ASAP type <i>OCn/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		T 515	

OSILINKERR
**(DCC MSect Disabled-
 Unavailable)**

Alarm Data	What it Means	
Probable Cause	OSILINKERR (DCC MSect Disabled-Unavailable)	
Definition	For MS-SPRing ring DCCs provisioned to use <i>Multiplex Section</i> overhead, a provisioning activity has occurred which required allocation of LAPD Channels and no Channels were available in the working DCC Circuit Pack. Examples of such provisioning activity are: • A new optical port (pre)provisioning • A protection group is deleted and LAPD channels must be allocated for what was the standby DCC channels in the protection group.	
Nature of Alarm/Type	Transient	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 517	

OSILINKERR
(LinkID Line Mismatch)

Alarm Data	What It Means	
Probable Cause	OSILINKERR (LinkID Line Mismatch)	
Definition	Upon establishing a DCC link with another node, the received LinkID has a LinkID protocol version number which is not supported by this node's LinkID software. Note: The condition will clear only when a LinkID protocol version number is received which is supported.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	Flashing RED
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OC-n/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

OSILINKERR
(User-Network Side Line
Failure)

Alarm Data	What It Means	
Probable Cause	OSILINKERR (User-Network Side Line Failure)	
Definition	Both ends of the LAPD channel have been provisioned as network-network or user-user.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	MN	MN
- Circuit Pack LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OC-N/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

OVRDSW
(Ring Prot Switching
Suspended)

Alarm Data	What It Means	
Probable Cause	OVRDSW (Ring Protection Switching Suspended)	
Definition	Ring protection switching has been disabled, while waiting for ring map discovery to build a valid ring map.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T520	

PAINTGRT
(Path Integrity Failure)

Alarm Data	What it Means	
Probable Cause	PAINTGRT (Path Integrity Failure)	
Definition	A circuit through a BLSR/MS-SPRing ring has not been provisioned in all nodes or has been mis-provisioned in one or more nodes.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	MJ
- SDH Alarm Level	Not Allowed	MJ
On-site Indications		
- User Panel LEDs	No indication	MJ
- Circuit Pack faceplate LED	No indication	No indication.
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 511	

PDI-P
(STS Payload Defect
Indicator)

Alarm Data	What it Means	
Probable Cause	PDI-P (STS Payload Defect Indicator)	
Definition	A Payload Defect Indication has been detected for the specified Tributary. This signal is used by the system to initiate DRI/Path Switch.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Reported	Not Reported
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STS-N(c) Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable (Trouble-Clearing actions should be performed beginning at the upstream node).	

PLM-P (STS Payload Label Mismatch)

Alarm Data	What it Means	
Probable Cause	PLM-P (STS Payload Label Mismatch)	
Definition	The value in signal label (C2 byte) in the drop direction has an unexpected value (a value other than 01 or 04).	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c	
- T3	DS3 Port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET	CR	Not Applicable
- T3 Alarm Level	CR	Not Applicable
On-site Indications		
- User Panel LEDs	Flashing Red	Flashing Red
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YSE, ASAP type <i>Path Terminated (SONET)</i> can be used to change the alarm level. YES, ASAP type <i>DS3 Port Outgoing (SONET)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 539	

PSA
(Path Switch Active)

Alarm Data	What it Means	
Probable Cause	PSA (Path Switch Active)	
Definition	Because of some anomaly there has been a switch from the Working path to the Protection path.	
Nature of Alarm/Type	Persistent	Communications
Alarm Type/ Condition Type	Path Protection Group OR Constituent Path Protection Group	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- SDH	VC3, VC4, VC4-4c, VC4-16c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Allowed	MN
- SDH Alarm Level	Not Allowed	MN
On-site Indications		
- User Panel LEDs	No indication	MN
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DRI-Path</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	If the switch was caused by an incoming signal defect then there should be an alarm associated with the defect. Follow the Task ID for the specified alarm.	

RFI-L **(Remote Failure Indication** **– Line)**

Alarm Data	What It Means	
Probable Cause	RFI-L (Remote Failure Indication – Line)	
Definition	A RFI-L is declared when an RDI-L persists for 2.5 seconds.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	(NR) Not Reported	(NR) Not Reported
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable at this node. The user action should be to investigate and clear the alarm/cause at the far-end node.	

RFI-P
(Remote Failure Indication -
Path)

Alarm Data		What it Means	
Probable Cause		RFI-P (Remote Failure Indication – Path)	
Definition		A RFI-P is declared when an RDI-P persists for 2.5 seconds.	
Nature of Alarm/Type		Persistent	Communications
Type AID affected		Port	
Interface Standard		Possible Signal Level Affected	
- SONET		STS1, STS3	
- T3		DS3 port	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level		(NR) Not Reported	(NR) Not Reported
On-site Indications		No indication	
- User Panel LEDs		No indication	
- Circuit Pack faceplate LED		flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?		YES, ASAP type <i>Path Terminating (SONET)</i> can be used to change the alarm level.	
		YES, ASAP type <i>DS3 Port Outgoing (SONET)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		Not Applicable. NO user action required.	

RNG-DSCVY
(Ring Discovery In Progress)

Alarm Data	What It Means	
Probable Cause	RNG-DSCVY (Ring Discovery In Progress)	
Definition	Indication that ring discovery is in progress. The alarm will clear once discovery is completed or ringmap is declared incomplete (ring discovery still continues).	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not Applicable. NO user action required.	

RNG-INC
(Ring Incomplete)

Alarm Data		What It Means	
Probable Cause		RNG-INC (Ring Incomplete)	
Definition		Ring discovery is declared to be incomplete due to one of the following reasons: • NO LinkID • LinkID Mismatch • ring discovery time-out (5 minutes) • NO OSI association to neighbor. Note: LinkID is a stack manager software entity which identifies an association between neighboring nodes.	
Nature of Alarm/Type		Persistent	Communications
Type AID Affected		Protection group	
Interface Standard		Possible Signal Level Affected	
- SONET		OC192, OC48	
- SDH		STM64, STM16	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level		Not Applicable	MJ
- SDH Alarm Level		Not Applicable	MJ
On-site Indications		NO Indication	
- User Panel LEDs		MJ	
- Circuit Pack Faceplate LED		NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?		YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		T 531	

RNG-INITC
(Ring Startup in Progress)

Alarm Data	What It Means	
Probable Cause	RNG-INITC (Ring Startup in Progress)	
Definition	Normally, this is a transient condition which indicates the ring network is starting up.	
Nature of Alarm/Type	Transient	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

RNG-IRPM
(Inconsistent Ring
Protection Mode)

Alarm Data	What It Means	
Probable Cause	RNG-IRPM (Inconsistent Ring Protection Mode)	
Definition	The ring discovery software has determined that all nodes in a ring are NOT provisioned for the same protection mode. Valid protection modes are: • Ring Loopback mode • Transoceanic Shortened Mode. All nodes in a ring must be provisioned to use the same mode.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 532	

RNG-PREEMPT (Extra Traffic Pre-empted)

Alarm Data	What It Means	
Probable Cause	RNG-PREEMPT (Extra Traffic Pre-empted)	
Definition	Traffic, which has been cross-connected directly onto protection channels (tributaries), commonly known as extra traffic, has been pre-empted (disconnected) due to an active protection switch. AIS will be inserted on this extra traffic.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not reported	
- SDH Alarm Level	Not reported	
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

RNG-SQUELCH (Ring Traffic Squelched)

Alarm Data	What It Means	
Probable Cause	RNG-SQUELCH (Ring Traffic Squelched)	
Definition	Multiple failures have isolated a node or nodes in a ring. Tributaries coming from the isolated node(s) which have drop cross-connections at this node are being squelched. AIS is inserted on any traffic sourced from or destined to the isolated node/nodes to protect against improperly connecting traffic.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group side	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications	NO Indication	
- User Panel LEDs	MJ	
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR /MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 527	

RNG-URT (Unknown Ring Type)

Alarm Data	What It Means	
Probable Cause	RNG-URT (Unknown Ring Type)	
Definition	The discovered ring type is invalid. Valid ring types are: • Mixed SONET • Mixed SDH • WaveStar SONET • WaveStar SDH. Note: Mixed means a ring contains a mixture of Lucent WaveStar and Non-WaveStar products.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications	NO Indication	
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

SQMAP-CONFL **(Local Squelch Map** **Conflict)**

Alarm Data	What It Means	
Probable Cause	SQMAP-CONFL (Local Squelch Map Conflict)	
Definition	A cross-connection to/from a BLSR/MS-SPRing ring has been provisioned with a locA/locZ that is not in the BLSR/MS-SPRing ring map. This is an error in provisioning of a cross-connection.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Protection group	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48	
- SDH	STM64, STM16	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MN
- SDH Alarm Level	Not Applicable	MN
On-site Indications	NO Indication	MN
	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>BLSR/MS-SPRing Protection Switch</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 573	

SRM-P (Signal Rate Mismatch – Path)

Alarm Data	What it Means	
Probable Cause	SRM-P (Signal Rate Mismatch - Path)	
Definition	SRM-P is declared when one of the following conditions persists for 2.5 seconds: - An optical port is user-provisioned as unprotected (that is, not user-provisioned as part of a facility protection group) and the port is user-provisioned for adaptive rate operation, and the incoming signal rate is greater than the user-provisioned cross-connection rate. - An optical port is user-provisioned as part of a 1+1, 1xN, 2F BLSR, or 4F BLSR port protection group; the working traffic is user-provisioned for adaptive rate operation; and the incoming signal rate (regardless of the protection switch state) is greater than the user-provisioned cross-connection rate. - An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; any of the associated working traffic is user-provisioned for fixed rate operation; a protection switch is active; and the incoming signal rate does not match the user-provisioned tributary rate of the associated working traffic. - An optical port is user-provisioned as part of a 1xN, 2F BLSR, or 4F BLSR port protection group; the protection access traffic is user-provisioned for fixed rate operation; no protection switch is active; and the incoming signal rate on the protection access signal does not match the user-provisioned protection access tributary rate.	
Nature of Alarm/Type	Persistent	Communications
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		

Alarm Data	What it Means	
	No indication	No indication
- Circuit Pack faceplate LED		
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type STS-N(c) Point-to-Point Tributary can be used to change the alarm level.	
Trouble-Clearing Task ID		

SSF (HP Server Signal Failure)

Alarm Data	What it Means	
Probable Cause	SSF (HP Server Signal Failure)	
Definition	A port or tributary level HPAIS has been detected, indicating this path is failed.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	VC3, VC4	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	Not Reported	Not Applicable
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>Path Terminating (SDH)</i> can be used to change the alarm level.	
	YES, ASAP type <i>DS3 Outgoing (SDH)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

STMLOF
(STM Loss of Frame)

Alarm Data	What it Means	
Probable Cause	STMLOF (STM Loss of Frame)	
Definition	An SDH receiver, where this alarm is active, is detecting an Out-Of-Frame (OOF) condition on all STM-N Tributaries. The node's transmitter, where the LOF is active, transmits an multiplex section AIS towards downstream equipment.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	CR	MN
On-site Indications		
- User Panel LEDs	CR	MN
- Circuit Pack faceplate LED	flashing RED	flashing RED
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-N port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 545	

STMLOS (STM Loss of Signal)

Alarm Data	What it Means	
Probable Cause	STMLOS (STM Loss of Signal)	
Definition	The SDH receiver, where this alarm is active, is detecting an all-zero's pattern. If unprotected, the alarm is CR and the node will insert a multiplex section AIS signal toward the downstream equipment. An RDI/RFI signal is also returned to the upstream equipment. If the alarm is MN, the signal was protected.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E.	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing RED	flashing RED
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STM-N port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 543	

SYNC **(Line Sync Reference** **Failure)**

Alarm Data	What It Means	
Probable Cause	SYNC (Line Sync Reference Failure)	
Definition	An OC48 line which has been provisioned as the synchronization reference for this NE has failed.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Timing Reference	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Reported
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Timing</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 570	

SYNC
(Sync Reference Failure)

Alarm Data	What It Means	
Probable Cause	SYNC (Sync Reference Failure)	
Definition	A failure of incoming line or DS1 synchronization reference has been detected.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Timing Reference	
Interface Standard	Possible Signal Level Affected	
- SONET	T1	
- SDH	E1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	MJ
- SDH Alarm Level	Not Applicable	MJ
On-site Indications		
- User Panel LEDs	NO Indication	MJ
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Timing</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 513	

STQLC (System Timing Quality Level Change)

Alarm Data	What it Means	
Probable Cause	STQLC (System Timing Quality Level Change) Change in NE level of quality due to local office timing (external) reference failure	
Definition		
Nature of Alarm/Type	Transient	Communications
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Allowed	Not Applicable
On-site Indications	No indication	No indication
	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

T-BERL
(DS3 Bit Error Rate)

Alarm Data	What it Means	
Probable Cause	T-BERL (DS3 Bit Error Rate)	
Definition	The receiver is detecting bit errors at a rate which exceeds the provisioned threshold value.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	flashing Red	flashing Red
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>DS3 Port Incoming</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

T-BERL
(Excessive Bit Error
Rate-Line)

Alarm Data	What It Means	
Probable Cause	T-BERL (Excessive Bit Error Rate – Line)	
Definition	The receiver is detecting bit errors at a rate which exceeds the provisioned threshold value.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>OCn/EC1 Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 521	

T-BERL
(Bit Error Rate – Signal
Degrade Line)

Alarm Data		What It Means	
Probable Cause		T-BERL (Bit Error Rate/Signal Degrade – Line)	
Definition		A SONET receiver is detecting bit errors at a rate which exceeds the provisioned threshold value.	
Nature of Alarm/Type		Persistent	Communications
Type AID Affected		Port	
Interface Standard		Possible Signal Level Affected	
- SONET		OC192, OC48, OC12, OC3, EC1	
-T3		DS3 port	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level		MJ	MN
- T3 Alarm Level		MJ	MN
On-site Indications		MJ for SONET, or NO Indication for DS3 ports	
- User Panel LEDs			
- Circuit Pack Faceplate LED		Flashing Red	Flashing Red for SONET optical NO Indication for DS3 ports
Can the Alarm Level be Reprovisioned via ASAP?		YES, ASAP type <i>automatic protection switching</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		T 521	

T-BERP
**(Bit Error/
Signal Degrade – Path)**

Alarm Data	What It Means	
Probable Cause	T-BERP (Bit Error/Signal Degrade – Path)	
Definition	The detected Bit Error Ratio for a SONET Tributary exceeds the provisioned threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	NR (Not Reported)	NR (Not Reported)
On-site Indications	NO Indication	NO Indication
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, STS-N(c) <i>Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

T-BERP
(Excessive Error – Path)

Alarm Data	What It Means	
Probable Cause	T-BERP (Excessive Error – Path)	
Definition	Bit Error Rate for a tributary is in excess of the provisioned threshold.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Reported	Not Reported
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type STS-N(c) <i>Point-to-Point Tributary</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

UNEQ-P
(STS Path Unequipped)

Alarm Data	What It Means	
Probable Cause	UNEQ-P (STS Path Unequipped)	
Definition	The receiver is detecting a <i>Path Unequipped</i> condition on a tributary.	
Nature of Alarm/Type	Persistent	Communications
Type AID Affected	Logical tributary (for SONET signals)	
Type AID Affected	Port (for T3 signals)	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- T3	DS3 port	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	CR (STSN)	MN
- T3 Alarm Level	Not Applicable	CR
On-site Indications - User Panel LEDs - Circuit Pack Faceplate LED	CR for SONET	MN for SONET
	NO Indication for T3	CR for T3
	NO Indication	NO Indication for SONET Flashing Red for DS3 Outgoing
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>STS-N(c) Point-to-Point Tributary</i> can be used to change the alarm level. YES, ASAP type <i>DS3 Port Outgoing (SONET)</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

UNSMSF
(User-Network Side MSect
Failure)

Alarm Data	What it Means	
Probable Cause	UNSMSF (User-Network Side MSect Failure)	
Definition	The MS-SPRing port protection group is provisioned to use line DCC and both sides of the LAPD channel are provisioned user side or network side. This is a provisioning error.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STS1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STMn Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

UNSRSF
(User-Network Side RSect
Failure)

Alarm Data	What it Means	
Probable Cause	UNSRSF (User-Network Side RSect Failure)	
Definition	The MS-SPRing port protection group is provisioned to use Section DCC and both sides of the LAPD channel are provisioned user side or network side. This is a provisioning error.	
Nature of Alarm/Type	Persistent	Communications
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SDH Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>STMn Port</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 516	

Alarm Messages — Equipment

BKUPMEMP (Non-Volatile Memory Wearout)

Alarm Data	What It Means	
Probable Cause	BKUPMEMP (Non-Volatile Memory Wearout)	
Definition	Whenever the maximum number of permitted bad sectors has been exceeded.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MN	MN
On-site Indications - User Panel LEDs - Circuit Pack Faceplate LED	MN	MN
	Continuous Red	Continuous Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 507	

DBMEMTRF
(Auto Database Backup
Failure

Alarm Data	What it Means	
Probable Cause	DBMEMTRF (Auto Database Backup Failure)	
Definition		
Nature of Alarm/Type	Transient	Equipment
Affect on Service	Non-Service Affecting (NSA)	
- Default Alarm Level	Not Alarmed	
On-site Indications		
- User Panel LEDs	No indication	
- Circuit Pack faceplate LED	No indication	
Can the Alarm Level be re-provisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		

EQPT (Circuit Pack Failure)

Alarm Data	What It Means	
Probable Cause	EQPT (Circuit Pack Failure)	
Definition	Internal Fault Algorithms have indicated this pack as defective.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Continuous Red	Continuous Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Refer to T 500.	

INIT-1
(Startup/
Initialization Complete)

Alarm Data	What It Means	
Probable Cause	INIT-1 (Startup/Initialization Complete)	
Definition	A controller has completed its initialization sequence.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Reprovisioned via ASAP?	NO	
Trouble-Clearing Task ID	Not Applicable. NO user action required.	

INT
(Fan Failure)

Alarm Data	What It Means	
Probable Cause	INT (Fan Failure)	
Definition	One fan (if the alarm is MN) has failed, or two fans (if the alarm is CR) have failed.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Shelf	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications		
- User Panel LEDs	CR	MN
- Circuit Pack Faceplate LED	Continuous Red	Continuous Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 501, T 502, T 503	

PRCDRERR
(Circuit Pack Invalid)

Alarm Data	What It Means	
Probable Cause	PRCDRERR (Circuit Pack Invalid)	
Definition	The circuit pack does not match the provisioning for its slot. For transmission slots, this can occur if a circuit pack is inserted with invalid circuit pack name or qualifier for the current provisioning of the slot. This alarm also occurs if the inventory information on the circuit pack can not be read and thus the system can not determine if the circuit pack is valid for the slot.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Slot	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MN	MN
On-site Indications		
- User Panel LEDs	MN	MN
- Circuit Pack Faceplate LED	NO Indication	Flashing Green
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 535	

PWR
(Power/Fuse Failure)

Alarm Data	What It Means	
Probable Cause	PWR (Power/Fuse Failure)	
Definition	One (or two) power feed to the subject shelf have failed.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Shelf	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	None Note: If both power feeds have failed - then the shelf will be power-down and there will not be any circuit pack LEDs lighted.	Continuous Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 505	

REPLUNITMISS **(Circuit Pack Unequipped/ Missing)**

Alarm Data	What It Means	
Probable Cause	REPLUNITMISS (Circuit Pack Unequipped/Missing)	
Definition	The Circuit Pack has been extracted from its slot.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	CR	MN
On-site Indications	CR	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 533	

REPLUNITMISS
(Mate Circuit Pack
Unequipped)

Alarm Data	What It Means	
Probable Cause	REPLUNITMISS (Mate Circuit Pack Unequipped)	
Definition	Either the OC-192 circuit pack or the associated Pointer Processor circuit pack is not provisioned or has been deleted.	
Nature of Alarm/Type	Persistent	Equipment
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MN	MN
On-site Indications	MN	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	T 534	

SCMMA
(System in Maintenance
Condition)

Alarm Data	What It Means	
Probable Cause	SCMMA (System in Maintenance Condition)	
Definition	System has been placed into maintenance condition either from a user command or autonomous condition such as extraction of the NVM.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	NO	
Trouble-Clearing Task ID		

SYSBOOT
(System Restart)

Alarm Data	What It Means	
Probable Cause	SYSBOOT (System Restart)	
Definition	The main controller is restarting.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	Not Applicable	Not Applicable
Can the Alarm Level be Reprovisioned via ASAP?	NO	
Trouble-Clearing Task ID	Will automatically clear when rebooting finishes.	

TSA
(Alarm Test)

Alarm Data	What It Means	
Probable Cause	TSA (Alarm Test)	
Definition	Indication that the test LED button or the remote test LED command has been executed.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Affect on Service	NO Reported Alarm Level	
On-site Indications - User Panel LEDs - Circuit Pack Faceplate LED	LEDs will cycle on and off.	
	LEDs will cycle on and off.	
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Will automatically clear when the test cycle completes.	

UPGRDF
(Upgrade Failed)

Alarm Data	What It Means	
Probable Cause	UPGRDF (Upgrade Failed)	
Definition	An upgrade to a new release of software failed.	
Nature of Alarm/Type	Transient	Equipment
Type AID Affected	System	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	NO	
Task ID	Try upgrade again. See <i>User Operations Guide</i> Task 202.	



Alarm Messages — Quality-of-Service

T-{modifiertype} (Threshold Crossing Alert – DS3 Incoming)

Alarm Data	What it Means	
Probable Cause	T-T3modifiertype (Threshold Crossing Alert – DS3 Incoming) Where <i>modifiertype</i> can be (one of several including CVL, ESL, and so forth). Refer to the WaveStar BandWidth Manager User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified incoming (receive) DS3 performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold.	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 Incoming	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	No. (To disable, set value to 0 TCA profile edit).	
Trouble-Clearing Task ID	There may be no user action required, depending on your maintenance strategy	

T-{modifier type}
(Threshold Crossing Alert –
DS3 Outgoing)

Alarm Data	What it Means	
Probable Cause	T-T3modifier type (Threshold Crossing Alert – DS3 Outgoing)	
	Where <i>modifier type</i> can be (one of several including CVL, ESL, LOSS-L and so forth). Refer to the WaveStar BandWidth Manager User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified outgoing (transmit) DS3 performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold.	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- T3	DS3 Outgoing	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- T3 Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	No	
Trouble-Clearing Task ID	There may be no user action required, depending on your maintenance strategy	

**T-{modifiertype}
(Threshold Crossing Alert –
Path Layer)**

Alarm Data	What it Means	
Probable Cause	T-STs1, T-STs3c, T-STs12c, T-OC3, T-OC12, T-OC48, T-OC48c, T-OC192 or T-VC3, T-VC4, T-VC4-4C (Threshold Crossing Alert – Path Layer) Where <i>modifiertype</i> can be (one of several including CVP, CV-PFE, ESP, and so forth). Refer to the WaveStar BandWidth Manager User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified path layer performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Port	
Interface Standard	Possible Signal Level Affected	
- SONET	STS1, STS3c, STS12c, STS48c	
- SDH	VC3, VC4, VC4-4c	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID	There may be no user action required, depending on your maintenance strategy	

T-{modifiertype}
(Threshold Crossing Alert –
Physical Layer)

Alarm Data		What it Means	
Probable Cause		T-LBCN, T-LPT, T-OPR (Threshold Crossing Alert – Physical Layer). Refer to the WaveStar BandWidth Manager User/Operations Guide — Performance Monitoring chapter for details.	
Definition		The specified Physical Layer Performance Monitoring Parameter has exceeded the Provisioned Quality-Of-Service Threshold	
Nature of Alarm/Type		Persistent	Quality-of-Service
Type AID affected		Port	
Interface Standard		Possible Signal Level Affected	
- SONET		OC192, OC48, OC12, OC3, EC1	
- SDH		STM64, STM16, STM4, STM1E, STM1	
Affect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level		Not Applicable	Not Alarmed
- SDH Alarm Level		Not Applicable	Not Alarmed
On-site Indications		No indication	
- User Panel LEDs		No indication	
- Circuit Pack faceplate LED		No indication	
Can the Alarm Level be re-provisioned via ASAP?		No. (Factory set values and can only be enabled or disabled).	
Trouble-Clearing Task ID		There may be no user action required, depending on your maintenance strategy	

T-{modifiertype}
(Threshold Crossing Alert –
Section/Line or RS/MS
layer)

Alarm Data	What it Means	
Probable Cause	T-modifiertype (Threshold Crossing Alert – Section/Line or RS/MS layer). Where <i>modifiertype</i> can be (one of several including CVS, ESS, SESS, and so forth). Refer to the WaveStar BandWidth Manager User/Operations Guide — Performance Monitoring chapter for details.	
Definition	The specified Regenerator Section/Multiplex Section performance monitoring parameter has exceeded the provisioned Quality-Of-Service threshold	
Nature of Alarm/Type	Transient	Quality-of-Service
Type AID affected	Logical tributary	
Interface Standard	Possible Signal Level Affected	
- SONET	OC192, OC48, OC12, OC3, EC1	
- SDH	STM64, STM16, STM4, STM1, STM1E	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- SONET Alarm Level	Not Applicable	Not Alarmed
- SDH Alarm Level	Not Applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	No indication	No indication
- Circuit Pack faceplate LED	No indication	No indication
Can the Alarm Level be re-provisioned via ASAP?	NO	
Trouble-Clearing Task ID		



Alarm Messages — Processing Error

AUTORESET (Autonomous Reset)

Alarm Data	What It Means	
Probable Cause	AUTORESET (Autonomous Reset)	
Definition	A higher level controller has detected that a lower Level controller has unexpectedly reset. An unexpected reset is one which was not initiated by the higher level controller or via a user command. Unexpected resets are sanity resets which are NOT preceded by a Software Error or Resource Usage - Out-Of-Memory Error. A Manual Button Push is also considered to be an unexpected reset.	
Nature of Alarm/Type	Persistent	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	NO Reported alarm level	NO Reported alarm level
On-site Indications	Various LEDs will flash during the reset cycle.	Various LEDs will flash during the reset cycle.
- User Panel LEDs		
- Circuit Pack Faceplate LED	Various LEDs will flash during the reset cycle.	Various LEDs will flash during the reset cycle.
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Will automatically clear when completed.	

BKUPMEMO
(Non-Volatile Memory
Usage)

Alarm Data	What It Means	
Probable Cause	BKUPMEMO (Non-Volatile Memory Usage)	
Definition	Note: There exists, in NVM, a high threshold mark. If this mark is exceeded – then the minimum amount of required space in the NVM has been exceeded. Whenever system usage of NVM is high and has exceeded the minimum amount required as spare.	
Nature of Alarm/Type	Persistent	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	Flashing Red	Flashing Red
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

DATAFLT
(Memory Mismatch)

Alarm Data	What It Means	
Probable Cause	DATAFLT (Memory Mismatch)	
Definition	The existence of corruption in the user-originated data and NE-originated data throughout all the images held in the NE (NVM, RAM, and hardware device settings).	
Nature of Alarm/Type	Persistent	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

PROGFLT
(File Error)

Alarm Data	What It Means	
Probable Cause	PROGFLT (File Error)	
Definition	An error occurred during an autonomous (initiated by software) file access to the PCMCIA NVM. This is a non-hardware-related error such as nonrecoverable data corruption or incompatibility errors.	
Nature of Alarm/Type	Transient	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not Reported	
On-site Indications	NO Indication	NO Indication
- User Panel LEDs		
- Circuit Pack Faceplate LED	Not applicable	Not applicable
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

PROCROVLD-1
(Resource Usage)

Alarm Data	What It Means	
Probable Cause	PROCROVLD-1 (Resource Usage)	
Definition	There exists a transient processing error related to usage of a finite resource such as cpu, buffers, and so forth. The “resource type” additional text in the alarm identifies the specific resource.	
Nature of Alarm/Type	Persistent	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	MJ	MN
On-site Indications	MJ	MN
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>Equipment</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

SFT
(Software Error)

Alarm Data	What It Means	
Probable Cause	SFT (Software Error)	
Definition	The controller software detected an unexpected result such as: • Unexpected case • Unknown/unexpected return value • Index or boundary violations • Bus cycle time-out, and • CPU exceptions (for example, Bus Error, Address Error, Illegal Instruction, Spurious Interrupt, Privilege Violation, Divide by Zero). Software errors are categorized as fatal and non-fatal. A fatal software error will result in an intentional sanity reset (service-preserving for transmission) after alarm processing is complete. A non-fatal software error will only result in an alarm; no reset is performed.	
Nature of Alarm/Type	Transient	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	Not Alarmed
On-site Indications		
- User Panel LEDs	NO Indication	NO Indication
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Timing</i> can be used to change the alarm level.	
Trouble-Clearing Task ID	Not applicable. NO user action required.	

WKGMEM
(Out of Memory Error)

Alarm Data	What It Means	
Probable Cause	WKGMEM (Out of Memory Error)	
Definition	A controller has detected that the High Level Watermark, for Memory Usage, has been reached.	
Nature of Alarm/Type	Transient	ProcErr
Type AID Affected	Circuit Pack	
Affect on Service	Service Affecting (SA)	Non-Service Affecting (NSA)
- Alarm Level	Not applicable	Not Alarmed
On-site Indications	NO Indication	
- User Panel LEDs		
- Circuit Pack Faceplate LED	NO Indication	NO Indication
Can the Alarm Level be Reprovisioned via ASAP?	YES, ASAP type <i>System Events</i> can be used to change the alarm level.	
Trouble-Clearing Task ID		



Alarm Messages — Security

MAN (Intruder Alert)

Alarm Data		What it Means	
Probable Cause		MAN (Intruder Alert)	
Definition		The number of invalid user authentication attempts has been exceeded. NOTE: For the identified login the provisioned parameter (User ID Lockout Threshold) has been exceeded. And, the user cannot login until the provisioned parameter (User ID Lockout Period) has expired.	
Nature of Alarm/Type		Information only! NOTE: This alarm will be stored in the NE Alarm Log and in the NE Security Log .	
Effect on Service		Service Affecting (SA)	Non-Service Affecting (NSA)
- User Id (login) Event		Not Allowed	Not Allowed
On-site Indications			
- User Panel LEDs	No indication	No indication	
- Circuit Pack faceplate LED	No indication	No indication	
Can the Alarm Level be re-provisioned via ASAP?		This alarm does not belong to a specific ASAP type, its alarm severity is not provisionable.	
Trouble-Clearing Task ID		This alarm cannot be cleared.	



Conditions — Protection Switching

1+1 Revertive optical protection change

Protection Switch Data	What It Means
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. The receiver monitors these two separate optical links and selects one as the “Working” and the other as the “Standby.” A change in switch selection state can be either the result of an external action (for example, a manual or forced command) or an internal action (for example, signal failed or signal degraded, and so forth). Once the switch request state is cleared the receiver will automatically switch back to the other (Working) optical link. Thus, this type of protection switching is referred to as <i>revertive</i>.
Switch Request State(s)	- Lockout - Forced - NO request - Signal failed - Signal degraded - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192
- SDH	- STM1, STM4, STM16, STM64
Type AID Affected	Port

**1+1 Revertive optical
protection change,
continued**

Protection Switch Data	What It Means (Continued)
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.
Can the Condition be Reprovisioned via ASAP?	YES, ASAP type <i>System Timing</i> can be used to change the alarm level.

1+1 Non-revertive optical protection change

Protection Switch Data	What It Means
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. The receiver monitors these two separate optical links and selects one as the “Working” and the other as the “Standby”. A change in switch selection state can be either the result an external action (for example, a manual or forced command) or an internal action (for example, signal failed or signal degraded, and so forth). Since there is no switch back, once the switch request state is cleared, this type of switch is referred to as non-revertive.
Switch Request State(s)	- Lockout - Forced - NO request - Signal failed - Signal degraded - Do not revert - Manual
Condition Type(s)	Description of condition types:
- PS (Protection Switch)	- The change of switch selection state from: (a) Working to Protection, or (b) Protection to Working.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192
- SDH	- STM1, STM4, STM16, STM64

**1+1 Non-revertive optical
protection change,
continued**

Protection Switch Data	What It Means (continued)
Type AID Affected	Port
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

**1+1 Optical (optimum)
protection change**

Protection Switch Data	What it Means
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Do not revert - Failure of protocol
Condition Type(s)	Description of condition types:
- PS (Protection Switch)	- The change of switch selection state from: (a) Working to Protection, or (b) Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC3, OC12, OC48, OC192
- SDH	- STM1, STM4, STM16, STM64
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

1xN Electrical protection change

Protection Switch Data	What it Means
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Equipment failed - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-N	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
- INHSWPR	- No protection switch - the switch request state equals Lockout.
Applicable Type(s)	Subtype(s)
- Circuit pack	- DS3
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	If the circuit pack is active, then the circuit pack's Green LED will be lighted continuously.

**1+1 Equipment protection
change, no change in
active units**

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Forced - NO request
Condition Type(s)	Description of condition types:
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- Circuit Pack	- Timing, Switch, Control
Type AID Affected	Equipment
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	If at least one port of the circuit pack is an active port of a 1+1 protection group, then the circuit pack's Green LED will be lighted continuously.

**PATHDRI/
CONSTITUENT PATH
protection change**

Protection Switch Data	What it Means
Definition	
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Wait to restore - Manual
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- STS1, STS3c, STS12c, STS48c
- SDH	- VC3, VC4, VC4-4c, VC4-16c
Type AID affected	Protection Group
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	No indication

2-Fiber ring protection change

Protection Switch Data	What it Means
Definition	The transmit node simultaneously transmits a single signal on two separate optical links. These links are referred to as the <i>Working line</i> and the <i>Protection line</i> . The receivers, at each node, monitors the <i>Working</i> and <i>Standby lines</i> . A change in switch selection state can be either the result an external action (for example, a manual or forced command) or an internal action (for
Switch Request State(s)	- Lockout - Forced - No request - Signal failed - Signal degraded - Wait to restore - Manual - Exercise - Reverse request
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- No change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC48, OC192
- SDH	- STM16, STM64
Type AID affected	Port
On-site Indications	
- User Panel LEDs	No indication
- Circuit Pack faceplate LED	No indication

4-Fiber ring protection change

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Lockout - Forced - NO request - Signal failed - Signal degraded - Wait to restore - Manual - Exercise - Reverse request
Condition Type(s)	Description of condition types:
- WKSWPR-2	- The change of switch selection state was from Working to Protection.
- WKSWBK	- The change of switch selection state was from Protection to Working.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC48, OC192
- SDH	- STM16, STM64
Type AID Affected	Port
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	NO Indication

Timing reference protection change

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Lockout - NO lockout - Forced - NO request - Wait to restore - Manual - Reference failed
Condition Type(s)	Description of condition types:
- INHSWPR	- NO protection switch - the switch request state equals Lockout.
- PS (Protection Switch)	- The change of switch selection state from: (a) Sync reference 0 to sync reference 1, or (b) Sync reference 1 to sync reference 0.
- GP (General Purpose)	- NO change in switch selection state - just a change in the state of the switching algorithm.
Applicable Type(s)	Subtype(s)
- SONET	- OC48, OC192
- SDH	- STM16, STM64
Type AID Affected	Timing reference
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	NO Indication

Clock mode protection change

Protection Switch Data	What It Means
Definition	
Switch Request State(s)	- Free running - Holdover (via forced switch) - Holdover (via all references failed) - Locked
Condition Type(s)	Description of condition types:
- FRNGSYNC	- Protection switch, clock mode, free running
- HLDOVRSYNC	- Protection switch, clock mode, forced holdover
- HLDOVRSYNC	- Protection switch, clock mode, holdover
- SYNCCLK	- Protection switch, clock mode, locked
Type AID Affected	System
On-site Indications	
- User Panel LEDs	NO Indication
- Circuit Pack Faceplate LED	Not applicable



Error Messages

AID

Error Message Data	Meaning
Definition	The command was partially successful (completion code = PRTL) on an AID range. Meaning, this command was successful for some of the AIDs but not all. Or, if the command did not execute for any of the range of AIDs then (completion code = DENY).
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully “aid” <error code> Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which specified an incorrect range of AIDs.
Corrective Action	Determine the correct AID and AID range. Then, re-try the command.

EATN

Error Message Data	Meaning
Definition	The command failed due to incorrect equipage.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, not valid for Access Type, incorrect equipage Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, that the node's equipment configuration did not support
Corrective Action	Determine the current equipment configuration for the subject node. Either change the command to match the current equipment configuration or else change the equipment to match the command.

EATN

Error Message Data	Meaning
Definition	The command failed due to a TID mismatch in a retrieved file.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Valid for Access Type, retrieved file TID mismatch Click on OK. Correct the entered data.
Problem/Cause	The node's equipage was not correct for the specified TID.
Corrective Action	Verify that you are logged in to the desired TID. As applicable, check office records and verify the equipage records.

ENEQ

Error Message Data	Meaning
Definition	The command failed due to equipage that is missing.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Equipped Click on OK. Correct the entered data.
Problem/Cause	User entered a command which required equipment that is not currently configured in the node.
Corrective Action	Check office records and verify the equipage records.

ENEQ

Error Message Data	Meaning
Definition	The command was denied because there was not enough space to store/record the output file data.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Equipped, insufficient file space Click on OK. Correct the entered data.
Problem/Cause	Node's NVM is currently removed. Or, the WaveStar CIT does not have sufficient space to receive the backup data file.
Corrective Action	Make sure that the device/location that is to receive the output is equipped and has sufficient room. For example, is the NVM equipped? Or, does the WaveStar CIT's harddisk have sufficient space to receive the node's backup data?

ENSG

Error Message Data	Meaning
Definition	The command was denied because the generic was not available.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Equipage, Not Software Generic, generic not available Click on OK. Correct the entered data.
Problem/Cause	The command referred to a particular release of software (generic) that is not currently configured on this node's NVM.
Corrective Action	Only refer to those generic's that are on the NVM.

ICNV

Error Message Data	Meaning
Definition	Input Command Not Valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid Click on OK. Correct the entered data.
Problem/Cause	Command could not be executed. The exact cause could not be determined.
Corrective Action	User must identify the input failure and enter the appropriate input parameter/value.

ICNV

Error Message Data	Meaning
Definition	Input Command Not Valid, missing TID.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, missing TID Click on OK. Correct the entered data.
Problem/Cause	The command requires a tid value.
Corrective Action	User enters the appropriate tid value.

ICNV

Error Message Data	Meaning
Definition	The command was denied because a required TID was omitted.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, missing TID Click on OK. Correct the entered data.
Problem/Cause	Execution of this command requires a valid TID.
Corrective Action	Determine the correct TID. Enter the command again with the correct TID.

ICNV

Error Message Data	Meaning
Definition	The command was denied because of an extra AID parameter.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, extra AID Click on OK. Correct the entered data.
Problem/Cause	User entered too many AID parameters in the AID block than are allowed for this command.
Corrective Action	Determine the correct syntax, or punctuation, and enter the command correctly.

ICNV

Error Message Data	Meaning
Definition	The command was denied because fewer AID parameters were entered than required.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Command Not Valid, required AID missing Click on OK. Correct the entered data.
Problem/Cause	User did not enter the proper number of AID parameters.
Corrective Action	Determine the correct number of AID parameters for this command.

IDNC

Error Message Data	Meaning
Definition	The command was denied because the combination of input parameters was not valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data, Not Consistent Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid set of parameters.
Corrective Action	Determine the correct combination of input parameters and enter the command correctly.

IDNV

Error Message Data	Meaning
Definition	The command was denied because one or more of the input parameter values was not valid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data Not Valid Click on OK. Correct the entered data.
Problem/Cause	User entered a command with incorrect input parameters.
Corrective Action	Determine the correct input parameters and re-enter the command correctly.

IDNV

Error Message Data	Meaning
Definition	The command was denied because an incorrect parameter value was entered.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data Not Valid, invalid <parameter name> Click on OK. Correct the entered data.
Problem/Cause	User entered a command with <name of the input parameter>, which is incorrect for this command.
Corrective Action	Determine the correct parameter, and re-enter the command correctly.

IDRG

Error Message Data	Meaning
Definition	The input parameter range was incorrect.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Data, Range Error Click on OK. Correct the entered data.
Problem/Cause	User entered a command that accepts a range but the given range was incorrect.
Corrective Action	Determine the correct input parameter range and enter the command correctly.

IEAE

Error Message Data	Meaning
Definition	The command was denied because an entity already exists.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Entity Already Exists Click on OK. Correct the entered data.
Problem/Cause	An existing entity (for example, bay-1 or shelf-1) cannot be added since it already exists.
Corrective Action	Verify the current configuration of the node. Most likely you will have attempted to create an entity that already exists. Most likely, changing to an entity that does not exist will be sufficient.

IENE

Error Message Data	Meaning
Definition	The command was denied because of an invalid entry.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Entity Not Exists Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid entity.
Corrective Action	Verify the current configuration of the node and only enter a correct entity.

IIAC

Error Message Data	Meaning
Definition	Illegal syntax in the AID block of the command.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Access identifier, incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	User entered a command which contains an AID block and for which the entered AID was syntactically incorrect.
Corrective Action	Determine the correct syntax and enter the command correctly.

IIAC

Error Message Data	Meaning
Definition	Entered command has correct syntax but contains an unknown value.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Access identifier, unknown AID Click on OK. Correct the entered data.
Problem/Cause	User entered a command which contains an AID block and for which the entered AID is an unknown value.
Corrective Action	Determine the correct value for this command and re-enter the command.

IICT

Error Message Data	Meaning
Definition	The CTAG value was non-NULL but still invalid.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Correlation Tag (CTAG), incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	The CTAG value, that was entered, is invalid.
Corrective Action	Determine the correct/appropriate CTAG values and re-enter the command.

IISP

Error Message Data	Meaning
Definition	The command is not recognized for this product.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Syntax or Punctuation Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained either a syntax or punctuation error.
Corrective Action	Determine the correct syntax, or punctuation, and re-enter the command.

IISP

Error Message Data	Meaning
Definition	The command was denied because it exceeded the maximum number of characters.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Syntax or Punctuation, command too long Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained more than 488 characters.
Corrective Action	Determine the correct syntax, or punctuation, and enter the command correctly.

IITA

Error Message Data	Meaning
Definition	The command was denied because it has a syntactically incorrect TID.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid Target identifier, incorrect syntax Click on OK. Correct the entered data.
Problem/Cause	User entered improper command.
Corrective Action	Determine the correct syntax for the TID and re-enter the command.

IITA

Error Message Data	Meaning
Definition	The command was denied because an unknown TID was entered.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Invalid TID, Unknown TID Click on OK. Correct the entered data.
Problem/Cause	User entered a command that specified a TID which is unknown to this network.
Corrective Action	View the ring map in order to determine the appropriate TIDs. Re-enter the command with the desired/appropriate TID.

INUP

Error Message Data	Meaning
Definition	The input command failed because of an incorrect parameter type.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Non-null Un-implemented Parameter Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained an incorrect parameter type.
Corrective Action	Determine the correct parameter type, and enter the command correctly.

IPNC

Error Message Data	Meaning
Definition	The command was denied because of an invalid command qualifier.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Input, Parameter Not Consistent Click on OK. Correct the entered data.
Problem/Cause	User entered a command which did not parse because of an incorrect command qualifier.
Corrective Action	Determine the correct command qualifier, and enter the command correctly.

PICC

Error Message Data	Meaning
Definition	The command was denied because the user did not have sufficient privileges to execute this command.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Privilege, Illegal Command Code Click on OK. Correct the entered data.
Problem/Cause	This command did not execute because it requires a privilege higher than that of the user issuing the command, or for other security reasons.
Corrective Action	Contact the system administrator.

PLNA

Error Message Data	Meaning
Definition	The login session was not fully initialized whenever this command was issued.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Privilege, Login Not Active Click on OK. Correct the entered data.
Problem/Cause	The command was denied because it was entered before a session had been initiated with ACT-USER.
Corrective Action	Try the command again.

SABT

Error Message Data	Meaning
Definition	The command was denied because it was aborted.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Aborted Click on OK. Correct the entered data.
Problem/Cause	User or administrator aborted this command before it completed.
Corrective Action	NONE

SARB

Error Message Data	Meaning
Definition	The command was denied because it is experiencing temporary exhaust of allocated resources.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, All Resources Busy, system limit exceeded Click on OK. Correct the entered data.
Problem/Cause	Currently not enough system processing resources to properly execute this command.
Corrective Action	Try the command at a later time.

SCNA

Error Message Data	Meaning
Definition	The command was denied because the system could not abort it.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Command Not Able to be aborted Click on OK. Correct the entered data.
Problem/Cause	User attempted to abort a command but the system could not abort - thus this error message.
Corrective Action	NONE.

SCNF

Error Message Data	Meaning
Definition	The command is not recognized for this product.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Command Not Found, command not recognized Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which was not found in the system's command parse tree.
Corrective Action	Only enter commands that apply to this product.

SDNC

Error Message Data	Meaning
Definition	The command was denied because of an invalid entry.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Data Not Consistent, invalid instance of entity Click on OK. Correct the entered data.
Problem/Cause	User entered an invalid entity for this node or command.
Corrective Action	Determine the correct entity and enter the command correctly.

SNVS

Error Message Data	Meaning
Definition	The command was denied because of mode, state, or status.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State Click on OK. Correct the entered data.
Problem/Cause	User entered a command for which the status was not valid for this node.
Corrective Action	.

SNVS

Error Message Data	Meaning
Definition	The command was denied because it cannot be executed while in Maintenance Condition.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, maintenance condition Click on OK. Correct the entered data.
Problem/Cause	User entered a command that can only be executed while the node is NOT in Maintenance Condition.
Corrective Action	Exit Maintenance Condition and re-enter the command.

SNVS

Error Message Data	Meaning
Definition	The command was denied because the node is currently in Restoration Mode.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, restoration mode Click on OK. Correct the entered data.
Problem/Cause	User entered a command that cannot be executed while the node is in Restoration Mode.
Corrective Action	Re-enter the command whenever the node is out of Restoration Mode.

SNVS

Error Message Data	Meaning
Definition	The command was denied because it cannot be executed until the node has successfully completed its initialization.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Not in Valid State, system initializing Click on OK. Correct the entered data.
Problem/Cause	User entered a command while the node was still in the process of re-initializing.
Corrective Action	Wait until the node has completed initializing and then re-enter the command.

SRAC

Error Message Data	Meaning
Definition	The command was denied because it was issued to the wrong product/NE.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Access Configuration is invalid, retrieved file NE mismatch Click on OK. Correct the entered data.
Problem/Cause	User issued a command that either contained an incorrect product name or user was logged in to the wrong node.
Corrective Action	User should verify that they are logged into the desired and appropriate NE. Re-issue the command again when logged in to the desired node. Ensure that only the correct and desired product name is used

SROF

Error Message Data	Meaning
Definition	The command was denied because of a failure to communicate with the external node.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Operation Failed, external communications failure Click on OK. Correct the entered data.
Problem/Cause	User entered a TL1 command, via the Cut-Through window, which contained more than 488 characters.
Corrective Action	Identify and correct any path related alarms (for example, LOS, or DCC Section failure) exist on this ring.

SROF

Error Message Data	Meaning
Definition	The command was denied because of non-hardware issues.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Requested Operation Failed Click on OK. Correct the entered data.
Problem/Cause	Most likely cause is improper provisioning.
Corrective Action	Identify and correctly provision the related system parameters.

SSRE

Error Message Data	Meaning
Definition	The command was denied because it attempted to exceed an internal resource limit.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, System Resources Exceeded, allowed limit exceeded Click on OK. Correct the entered data.
Problem/Cause	The system is busy processing higher priority commands.
Corrective Action	Retry the command later whenever the node is not as busy.

SSTP

Error Message Data	Meaning
Definition	The command was denied because of a problem with the target hardware.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Stopped, failed target hardware Click on OK. Correct the entered data.
Problem/Cause	The node, which is the target of this command, has a hardware problem that prohibited successful execution of this command.
Corrective Action	Identify and fix the failed target hardware.

SWFA

Error Message Data	Meaning
Definition	The command was denied because the control hardware is failed, missing, or initializing.
WaveStar CIT Error Message	WaveStar CIT Error Command did not execute successfully Status, Working unit Failed, control hardware failed, missing or initializing Click on OK. Correct the entered data.
Problem/Cause	Hardware related failure.
Corrective Action	Wait for any currently initializing hardware to complete those activities, or replace any missing or failed hardware.





2 Maintenance and Trouble-Clearing

Overview

Purpose This chapter defines the maintenance philosophy and describes the features available to monitor and maintain the WaveStar BandWidth Manager system.

Objectives This chapter provides information to perform the following:

- Define the maintenance philosophy for the WaveStar BandWidth Manager system
- Recognize the types of protection switching performed by the WaveStar BandWidth Manager system
- Describe the features that are available to monitor and maintain the WaveStar BandWidth Manager system

Related tasks For related trouble-clearing tasks, see Part I, Trouble-Clearing Tasks in this manual.

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Maintenance Philosophy

Introduction The WaveStar BandWidth Manager system allows operation and maintenance of network elements in a network from a centralized location. The WaveStar BandWidth Manager system continuously monitors the equipment and incoming signals, and reports any current or potential troubles. This enables the user to take the appropriate corrective action.

Proactive maintenance The WaveStar BandWidth Manager system supports proactive and reactive maintenance. Proactive maintenance refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending failure.

Proactive maintenance consists of monitoring performance parameters associated with the following:

- SONET sections, lines, and paths
- SDH regenerator sections, multiplex sections, and high order paths

For more information about performance monitoring refer to *Chapter 8, Performance Monitoring* in 365-370-109, *WaveStar BandWidth Manager User Operations Guide*.

Reactive maintenance Reactive maintenance occurs after an equipment (circuit pack) or transport (signal) failure. The LEDs on the user panel and circuit pack faceplates report internal troubles. Most troubles can be detected and corrected at this level. The WaveStar Craft Interface Terminal (WaveStar CIT) may be used to retrieve detailed reports about performance monitoring, alarm and status, and configurations for network elements in a network.

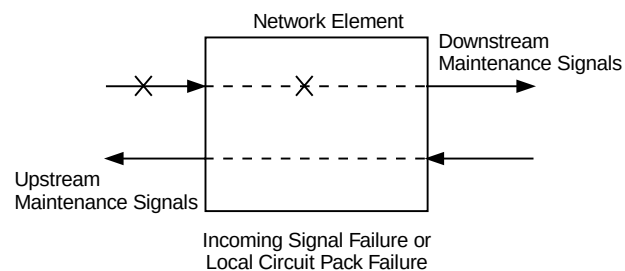


Generating Maintenance Signals

Introduction When the WaveStar BandWidth Manager system detects failure conditions on transmission signals, maintenance signals are inserted into the transmission signals in the upstream or downstream direction to notify other network elements. The following figure shows the relationship between failures and upstream/downstream maintenance signals.

Upstream/downstream maintenance signals

The following figure shows the relationship between failures and upstream/downstream maintenance signals.



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Supported maintenance signals

The WaveStar BandWidth Manager system supports the following maintenance signals:

- Alarm indication signals (AIS)
- Remote defect indication (RDI) signals
- Remote error indication (REI) signals
- Path trace signals
- Path unequipped signals
- DS3 idle signals
- Payload defect indicator signals

Alarm indication signals (AIS)

Alarm indication signals (AIS) notify downstream equipment that a failure has been detected and alarmed by some upstream equipment. The WaveStar BandWidth Manager system generates the following alarm indication signals:

- SONET path AIS: A SONET path AIS signal is generated downstream after a loss of signal (LOS), loss of frame (LOF), alarm indication signal, or loss of pointer (LOP) is detected on the incoming SONET signal, or local equipment failure is detected.

- SDH high order path AIS: An SDH high order path AIS signal is generated downstream after an LOS, LOF, alarm indication signal, trace identifier mismatch, or LOP is detected on the incoming SDH signal, or local equipment failure is detected.
- DS3 AIS: A DS3 AIS signal is generated downstream after an LOS, LOF, alarm indication signal, payload label mismatch, LOP, excessive bit error rate (BER) is detected on the incoming DS3 signal or STS-1 path, or local equipment failure is detected.

**Remote defect indication
(RDI) signals**

Remote defect indication (RDI) signals notify upstream equipment that a downstream failure has been detected. The WaveStar BandWidth Manager system generates the following remote defect indication signals:

- SONET line RDI signal: A SONET line RDI signal is generated upstream after a loss of signal (LOS), loss of frame (LOF), or line alarm indication signal is detected on the incoming SONET signal.
- SONET path RDI signal: A SONET path RDI signal is generated upstream after a loss of pointer (LOP) or path alarm indication signal is detected on the incoming SONET signal.
- SDH multiplex section RDI signal: An SDH multiplex section RDI signal is generated upstream after an LOS, LOF, trace identifier mismatch, or multiplex section alarm indication signal is detected on the incoming SDH signal.
- SDH high order path RDI signal: An SDH high order path RDI signal is generated upstream after an LOS, LOF, trace identifier mismatch, alarm indication signal, or LOP is detected on the incoming SDH signal.

**Remote error indication
(REI) signals**

Remote error indication (REI) signals notify upstream equipment about the number of incoming interleaved-bit block errors it has detected. The WaveStar BandWidth Manager system generates the following remote error indication signals:

- SONET line REI signal: A SONET line REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming line B2 byte.
- SONET path REI signal: A SONET path REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming STS path B3 byte.

- SDH multiplex section REI signal: An SDH multiplex section REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming multiplex section B2 byte.
- SDH high order path REI signal: An SDH high order path REI signal is generated upstream to indicate the interleaved-bit block error count based on the incoming high order path B3 byte.

Path trace signals

Path trace signals are transmitted repetitively to verify path continuity. The DS3EC1/8 port unit generates and terminates the path overhead. Thus, the OC3/STM1, OC12/STM4, OC48/STM16, and OC192/STM64 port units pass through any path trace signals. The value of the transmit path trace signals is provisionable for DS3 ports only. However, the WaveStar BandWidth Manager system can retrieve the value of the path trace signal for any SONET or SDH port.

The WaveStar BandWidth Manager system supports:

- SONET STS-1, STS-3c, STS-12c, and STS-48c path trace
- SDH VC-3, VC-4, VC-4-4c, and VC-4-16c high order path trace signals

Path unequipped signals

Path unequipped signals are transmitted to notify downstream equipment that the path is incomplete (for example, a port in the AUTO state or the absence of a valid cross-connection).

The WaveStar BandWidth Manager system supports the following path unequipped signals:

- SONET STS-1 path unequipped
- SONET STS-3c path unequipped
- SONET STS-12c path unequipped
- SONET STS-48c path unequipped
- SDH VC-3 path unequipped
- SDH VC-4 path unequipped
- SDH VC-4-4C path unequipped
- SDH VC-4-16C path unequipped

DS3 idle signals

The DS3 idle signal is transmitted repetitively on an outgoing DS3 line. The WaveStar BandWidth Manager system generates a DS3 idle signal on an outgoing DS3 line after the following:

- The DS3 line has its output mode set to Terminated with DS3 Idle selected.
- The Path Termination Monitoring Point was provisioned as SONET, the “TF FM - XC dependency” of the Path Termination Monitoring Point is set to “yes,” and no cross-connection is provisioned in the DS3 output direction.
- The Path Termination Monitoring Point was provisioned as SDH, the “TF FM - XC dependency” of the Path Termination Monitoring point is set to Yes, and no cross-connection is provisioned in the DS3 output direction.

Path payload defect indicator signals

Path payload defect indicator signals are embedded in STS-1 signals to notify downstream equipment about incoming DS3 signal defects. The WaveStar BandWidth Manager system generates path payload defect indicator signals when DS3 AIS or loss of signal (LOS) defects are detected on the incoming DS3 line.



Transport Fault Detection and Isolation

Fault detection The WaveStar BandWidth Manager system continuously monitors incoming signals according to the state of the tributaries and ports. (For information about tributary and port states and transitions, refer 365-370-109, *WaveStar BandWidth Manager, User Operations Guide*.) If a port or tributary is in the MON (Monitored) state, the WaveStar BandWidth Manager system monitors the port/tributary and activates the appropriate indicators when a failure occurs.

Monitored/detected transport failures The following table shows the incoming signals and the associated failures the WaveStar BandWidth Manager system monitors and detects.

Incoming Signals	Monitored/Detected Failures
OC-192/OC-48/OC-12 /OC-3	Loss of Signal Loss of Frame Alarm Indication Signal-Line Remote Failure Indication Excessive Error Bit Error/Signal Degrade DCC Sect Failure DCC Line Failure LinkID Sect Mismatch LinkID Line Mismatch User-Network Side Sect Failure User-Network Side Line Failure DCC Sect Disabled-Unavailable DCC Line Disabled-Unavailable

Incoming Signals	Monitored/Detected Failures
STM-64/STM-16/ STM-4/STM-1	STM Loss of Signal STM Loss of Frame MSect Alarm Indication Signal MSect Remote Failure Indication RSect Trace Identifier Mismatch MSect Excessive Error MSect Signal Degrade MSect Server Signal Failure DCC RSect Failure DCC MSect Failure LinkID RSect Mismatch LinkID MSect Mismatch User-Network Side RSect Failure User-Network Side MSect Failure DCC RSect Disabled-Unavailable DCC MSect Disabled-Unavailable
DS3	DS3 Loss of Signal DS3 Loss of Frame Alarm Indication Signal- DS3 DS3 Bit Error DS3 Idle Signal

Fault isolation When a failure is detected, the WaveStar BandWidth Manager system employs automatic diagnostics to isolate the failure. Most failures are isolated to an incoming line, section, path, terminated path, or incoming DS3. Failures are reported to the local technician and operations systems so that repair decisions can be made. If desired, operations system personnel and the local technician can use the WaveStar CIT to gain more detailed information on the trouble condition.



Equipment Fault Detection and Isolation

Fault detection The WaveStar BandWidth Manager system continuously monitors its internal condition according to the state of the circuit pack slots. (For information about circuit pack states and transitions, refer 365-370-109, *WaveStar BandWidth Manager, User Operations Guide*.) If a circuit pack is in the MON (Monitored) state, the WaveStar BandWidth Manager system monitors the circuit pack and activates the appropriate indicators when a failure occurs.

Monitored/detected equipment failures The WaveStar BandWidth Manager system monitors and detects the following equipment failures:

- Circuit Pack Failure - Circuit Pack
- Circuit Pack Unequipped/Missing - Circuit Pack
- Mate Circuit Pack Unequipped - Circuit Pack
- Circuit Pack Invalid - Slot
- Non-Volatile Memory Wearout - Circuit Pack
- Power/Fuse Failure - Shelf
- Fan Failure - Shelf
- Automatic Laser Shutdown - Circuit Pack
- Alarm Test - System

Fault isolation When a failure is detected, the WaveStar BandWidth Manager system employs automatic diagnostics to isolate the failed equipment. Most failures are isolated to a maximum of two circuit packs, but some failures may be isolated to more than two circuit packs. Failures are reported to the local technician and operations systems so that repair decisions can be made. If desired, operations system personnel and the local technician can use the WaveStar CIT to gain more detailed information on the trouble condition.



Fault Reporting

Introduction All failures detected and isolated by the WaveStar BandWidth Manager system are stored and made available to be reported, on demand, through the WaveStar CIT. In addition, a history of the past 1024 alarm notifications is maintained and available for on-demand reporting. Each alarm notification is date and time stamped.

Fault reporting indicators The WaveStar BandWidth Manager system also automatically reports all failures through indicators that are subject to the provisionable parameters:

- Facility alarm generate delay interval: The alarm generate delay interval is the amount of time (0 to 60 seconds) that the system waits, after it detects a facility failure, before reporting the failure using all indicators.
- Facility alarm clear delay interval: The alarm clear delay interval is the amount of time (0 to 60 seconds) that the system waits, after a facility failure clears, before reporting that the failure has cleared using all indicators.
- Equipment alarm generate delay interval: The alarm generate delay interval is the amount of time (0 to 60 seconds) that the system waits, after it detects an equipment failure, before reporting the failure using all indicators.
- Equipment alarm clear delay interval: The alarm clear delay interval is the amount of time (0 to 60 seconds) that the system waits, after an equipment failure clears, before reporting that the failure has cleared using all indicators.

Alarm severity assignment profiles The alarm severity assignment profiles (ASAP) allow users to provision the severity of failures. For more information about alarm severity assignment profiles, refer to 365-370-109, *WaveStar BandWidth Manager User Operations Guide*.



Maintenance Condition State

Introduction The maintenance condition state is a state that the WaveStar BandWidth Manager system enters to protect the system cross-connection and provisioning data during:

- CTL/MEM circuit pack failures
- Software installations and upgrades
- Manual database restorals

During the maintenance condition state the system maintains transmission and external interfaces (for example, WaveStar CIT), and performs automatic protection switching within the shelves (outside of the system control complex).

Entering the maintenance condition state

The WaveStar BandWidth Manager system enters the maintenance condition state automatically or manually. The WaveStar BandWidth Manager system automatically enters the maintenance condition state when:

- The system is started and the switch size is provisioned NULL
- The primary CTL/MEM circuit packs are corrupted or unavailable
- An established shelf is unavailable during system controller start-up
- An automatic system control complex side protection switch is unsuccessful

The WaveStar BandWidth Manager system must be manually entered in the maintenance condition state before:

- Installing or upgrading software
- Manually restoring the database from a previously backed-up version

The **Fault > Enter/Exit Maintenance Condition** command is used to manually enter the maintenance condition state. For more information about the **Fault > Enter/Exit Maintenance Condition** command, refer to the online help available with the WaveStar CIT.

System behavior during the maintenance condition state

During the maintenance condition state, the WaveStar BandWidth Manager system allows commands that support the following functions:

- Back up and restore database
- Download and install software
- Exit maintenance condition
- Log in and log out of the system
- Modify circuit packs for system controller entities only
- Modify node - TID, switch size
- Operate system reset
- Operate circuit pack tests for system controller entities only
- Remove CTL/MEM circuit packs
- Retrieve system software and database information
- Retrieve system provisioning information
- Retrieve shelf data for Control Shelf only
- Update generic control information

During the maintenance condition state, the WaveStar BandWidth Manager system also disables the auto discovery of circuit packs. The auto discovery mechanism is re-enabled when the system exits the maintenance condition state. Any new circuit packs inserted while the system is in maintenance condition state are discovered when the system exits the maintenance condition. The removal of circuit packs is detected and processed while the system is in maintenance condition state.

Autonomous processing performed by the system during the maintenance condition state is restricted to switch, and fault and alarm processing. Any change to network element originated data during the maintenance condition state is uploaded into CTL/MEM circuit packs when the system exits the maintenance condition state.

The WaveStar BandWidth Manager system also continues to generate notifications and autonomous messages during the maintenance condition state. However, these notifications and messages are restricted based on the available entities.

Exiting the maintenance condition state

The WaveStar BandWidth Manager system exits the maintenance condition state automatically or manually. The WaveStar BandWidth Manager system automatically exits the maintenance condition state when:

- The system is restarted after installing/upgrading software
- The active system controller is restarted

The **Fault > Enter/Exit Maintenance Condition** command is used to manually exit the maintenance condition state. For more information about the **Fault > Enter/Exit Maintenance Condition** command, refer to the online help available with the WaveStar CIT.

The WaveStar BandWidth Manager system performs the following in sequence when exiting the maintenance condition state:

- Uploads all network element originated data (which is limited to protection switch data) from all shelf controllers and the system controller and freezes changes to those values. The system issues any appropriate protection switch change reports at this time.
- Updates any applicable alarm logs.
- Executes a service preserving restart of all controllers to download the executable code and database (user and network element originated data) to the entire system.
- Issues the appropriate alarm reports and state change reports.



1+1 Control Complex Protection Switching

Introduction The WaveStar BandWidth Manager system provides 1+1 control complex protection switching for the side 0 control complex circuit packs (CTL/SYS50D 0, CTL/EI 0, and CSIEX 0) and side 1 control complex circuit packs (CTL/SYS50D 1, CTL/EI 1, and CSIEX 1) on the Control Shelf. The 1+1 control complex protection switching also includes the SWIEX 0 and SWIEX 1 circuit packs on the Switch Shelves.

Control complex protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 1+1 control complex protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Circuit Pack Failure/Removal	Automatic
Manual Switch	WaveStar CIT/OS

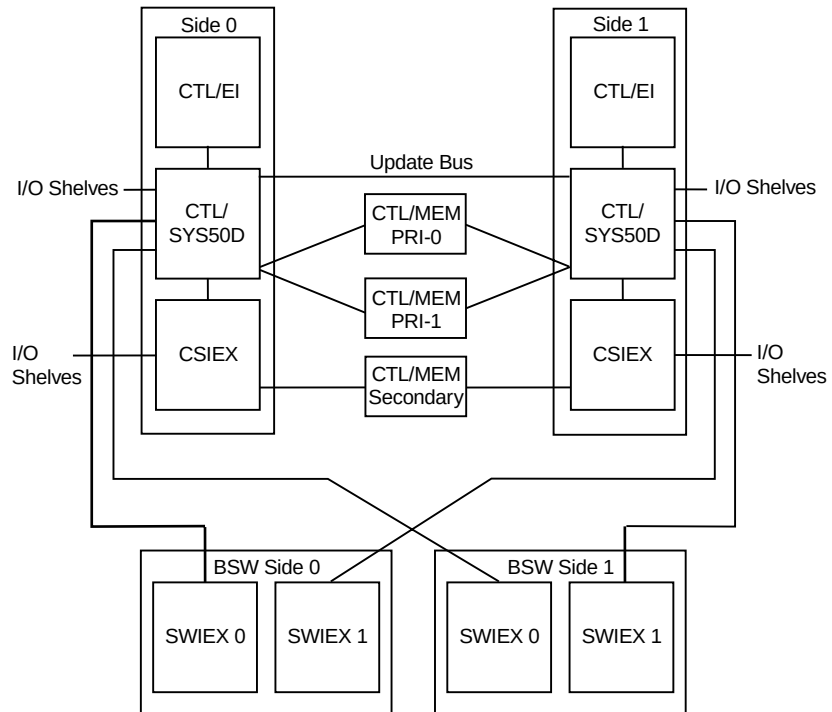
If a higher or equal priority switch request exists, a new switch request is denied.

1+1 nonrevertive protection switching The control complex uses 1+1 nonrevertive protection switching. The side 0 control complex circuit packs and side 1 control complex circuit packs interface with the circuit packs on the Control, Switch, and I/O shelves. One control complex side is active (working) and the other control complex side is standby.

When a protection switch occurs, the standby control complex side becomes the new active (working) control complex side. The original active (working) side becomes the standby side. The status remains the same (nonrevertive) after the fault clears.

Control complex protection switch architecture

The following figure shows the 1+1 control complex protection switching architecture.



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Control complex protection switch architecture

The control complex protection switching architecture consists of the following circuit packs:

- **CTL/SYS50D:** The CTL/SYS50D 0 and CTL/SYS50D 1 circuit packs operate as an active/standby pair. Each CTL/SYS50D circuit pack contains its own processor and memory. The active CTL/SYS50D circuit pack has access to the standby CTL/SYS50D circuit pack via the update bus.
- **CSIEX:** The CSIEX circuit pack expands the operations network (ON) capability of the associated CTL/SYS50D circuit pack to handle up to 48 shelf controllers.
- **CTL/EI:** The CTL/EI circuit pack contains the line drivers and receivers for the WaveStar CIT, office alarm relays, user panel interface, and the 10BaseT interface.

- **SWIEX:** The SWIEX packs provide the interface between the CTL/SYS50D and the BSW circuit packs. Two SWIEX circuit packs are equipped in each Switch Shelf. Each CTL/SYS50D circuit pack accesses one SWIEX circuit pack on each Switch Shelf. The SWIEX circuit pack connected to the active CTL/SYS50D circuit pack is the active SWIEX circuit pack on the shelf.
- **CTL/MEM:** The primary CTL/MEM circuit packs (PRI-0 and PRI-1) serve as the duplicated non-volatile memory for the system.

The CTL/SYS50D, CTL/EI, CSIEX, and SWIEX circuit packs act as a single unit and are protected as a single unit. The CTL/SYS50D circuit pack monitors the health of the associated CSIEX, SWIEX, CTL/EI circuit packs, and the other CTL/SYS50D circuit pack. Any failures detected cause a control complex protection switch.

The active CTL/SYS50D circuit pack also monitors the CTL/MEM circuit packs. If a CTL/MEM circuit pack failure is detected, no protection switching occurs. The primary CTL/MEM circuit packs operate as an active/active pair.



4-Fiber Bidirectional Line-Switched Ring/Multiplex Section Shared Protection Ring Switching

Introduction The WaveStar BandWidth Manager system performs 4-fiber bidirectional line-switched ring (BLSR)/multiplex section shared protection ring (MS-SPRing) switching in response to automatically detected faults in OC-48/STM-16 and OC-192/STM-64 optical lines and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 4-fiber BLSR/MS-SPRing protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection - Span	WaveStar CIT/OS
Signal Fail - Protection	Automatic
Forced of Service to Protection - Span	WaveStar CIT/OS
Forced of Service to Protection - Ring	WaveStar CIT/OS
Signal Fail - Span	Automatic
Signal Fail - Ring	Automatic
Signal Degrade - Protection	Automatic
Signal Degrade - Span	Automatic
Signal Degrade - Ring	Automatic
Manual Switch to Protection - Span	WaveStar CIT/OS
Manual Switch to Protection - Ring	WaveStar CIT/OS
Wait to Restore	Automatic
Reverse Request - Span	Automatic
Reverse Request - Ring	Automatic

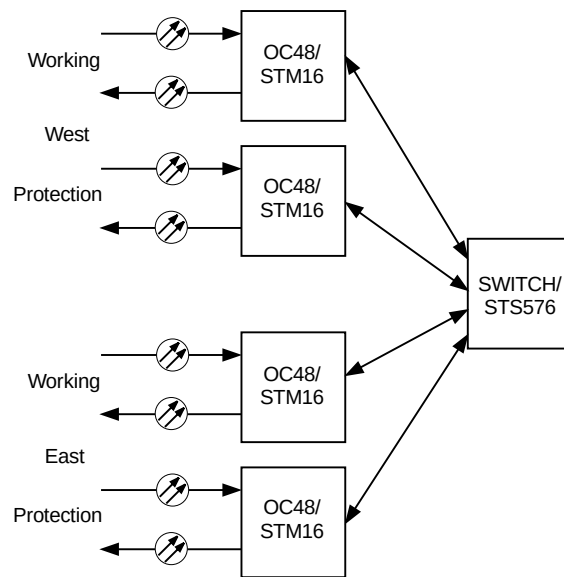
If a higher or equal priority switch request exists, a new switch request is denied.

Bidirectional revertive protection switching

The 4-fiber BLSR/MS-SPRing uses bidirectional, revertive protection switching for both span requests (open and closed ring applications) and ring requests (closed ring applications only). Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working line to the protection line when a fault is detected in one or both directions of transmission. In revertive switching, when the fault clears and the wait-to-restore interval expires, the traffic switches back (reverts) to the working line.

4-fiber OC-48 BLSR/STM-16 MS-SPRing architecture

The following figure shows the 4-fiber OC-48/STM-16 BLSR/MS-SPRing protection switching architecture.



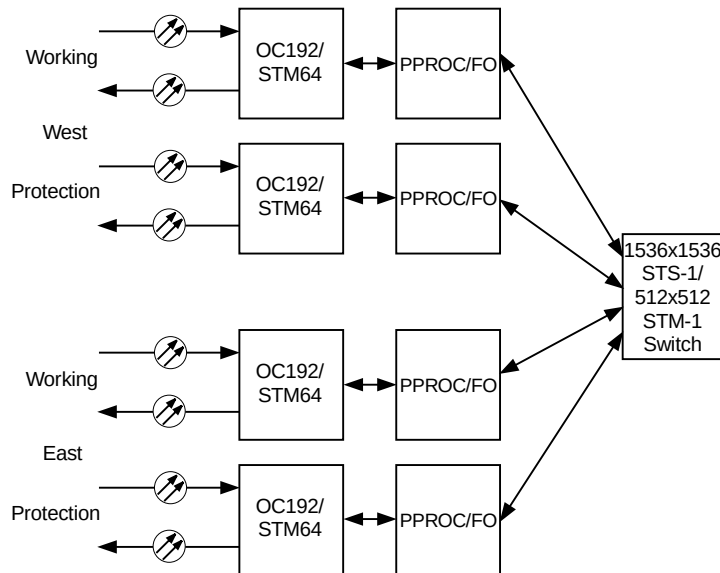
NC-USM-161

There is one working OC-48/STM-16 line carrying service in the east direction and one working OC-48/STM-16 line carrying service in the west direction. The east protection line is used to protect the east working line, and the west protection line is used to protect the west working line. The protection switching is performed by the SWITCH/STS576 circuit pack.

Important! In open ring applications, the end nodes are equipped with a working line and protection line in one direction only (east or west).

4-fiber OC-192 BLSR/STM-64 MS-SPRing architecture

The following figure shows the 4-fiber OC-192/STM-64 BLSR/MS-SPRing protection switching architecture.



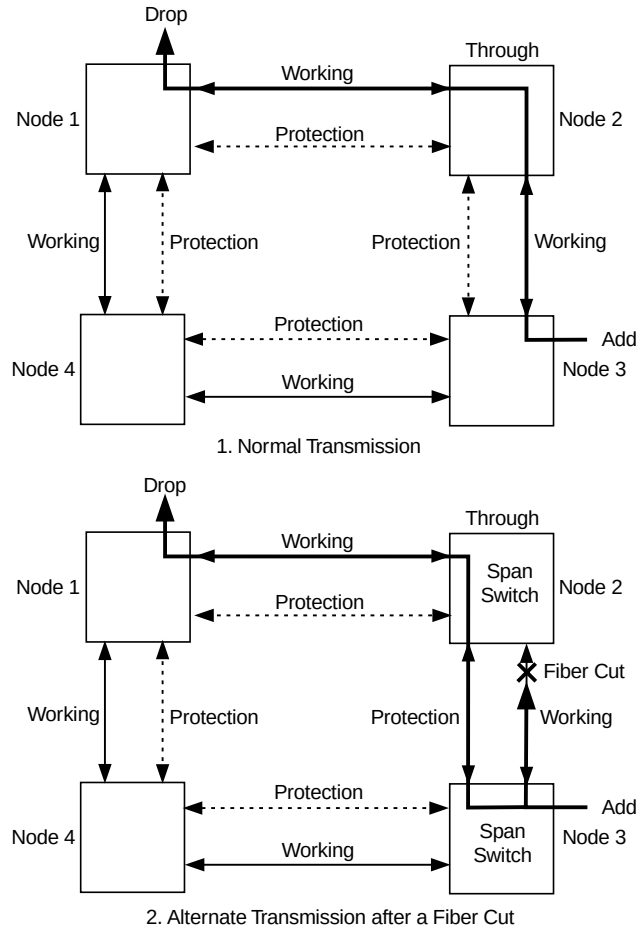
NC-USM-203

There is one working OC-192/STM-64 line carrying service in the east direction and one working OC-192/STM-64 line carrying service in the west direction. The east protection line is used to protect the east working line, and the west protection line is used to protect the west working line. The protection switching is performed by the 1536x1536 STS-1/512x512 STM-1 switch on the shelf. The 1536x1536 STS-1/512x512 STM-1 switch consists of five working SWITCH/STS768 circuit packs and five protection SWITCH/STS768 circuit pack.

Important! In open ring applications, the end nodes are equipped with a working line and protection line in one direction only (east or west).

4-fiber BLSR/MS-SPRing span switching example

The following figure shows an example of 4-fiber BLSR/MS-SPRing span switching in a closed ring application. Only one direction of transmission is shown. (4-fiber BLSR span switching is bidirectional.) Node 1 also bridges traffic to the protection line, and Node 3 also selects traffic from the protection line.



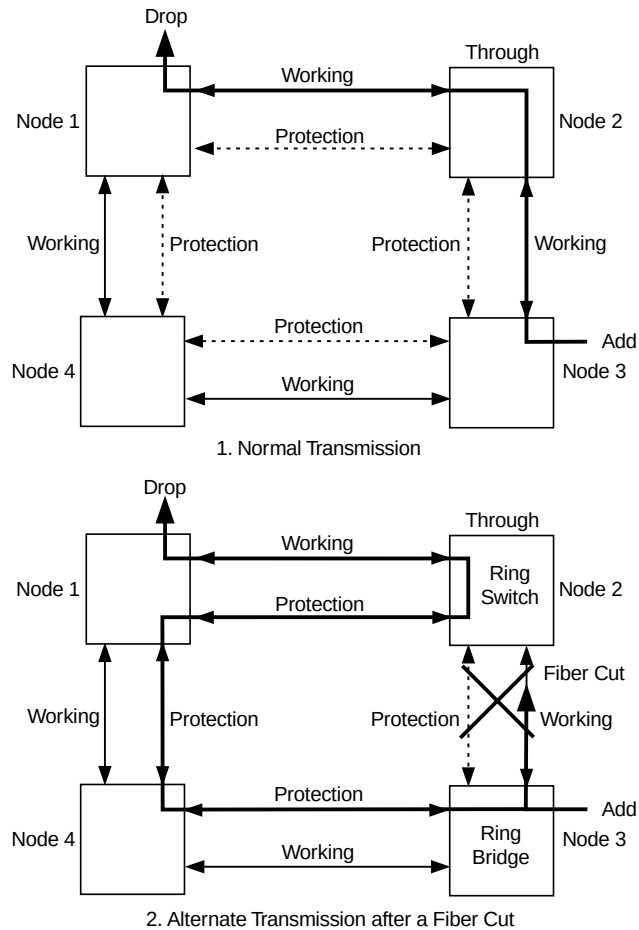
NC-USM-164

For span protection switching, the nodes adjacent to the failure make connections to bridge the add and through traffic to the protection line in the same span. All drop and through traffic is selected from the protection line in the same span.

Important! The WaveStar BandWidth Manager supports 4-fiber BLSR/MS-SPRing span switching in closed ring and open ring applications.

4-fiber BLSR/MS-SPRing ring switching example

The following figure shows an example of 4-fiber BLSR/MS-SPRing ring switching in a closed ring application. Only one direction of transmission is shown. (4-fiber BLSR ring switching is bidirectional.) Node 1 also bridges traffic to the protection line, and Node 3 also selects traffic from the protection line.



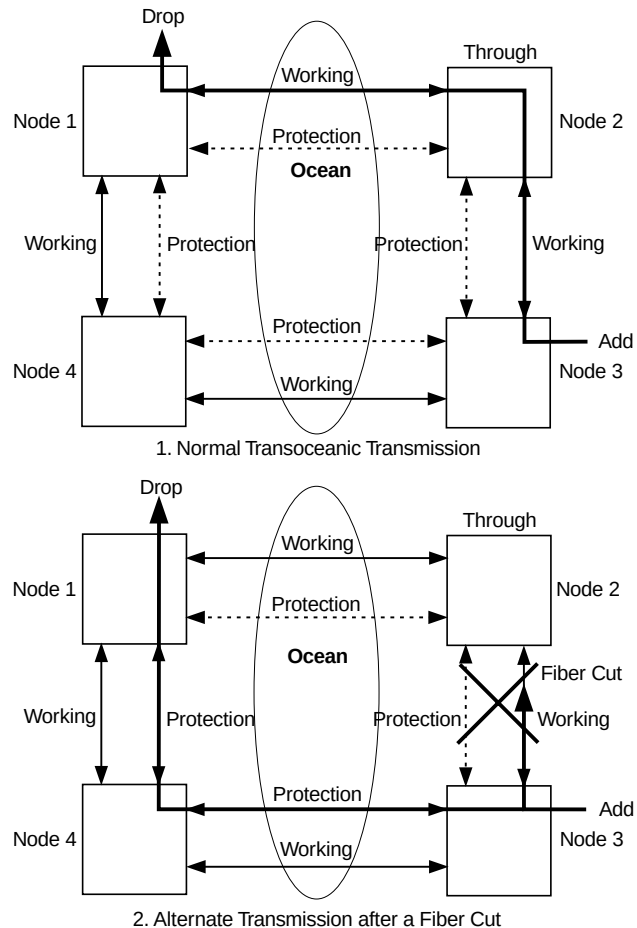
NC-USM-163

For ring protection switching, the nodes adjacent to the failure make connections to bridge the add and through traffic to the protection line in the other direction. All drop and through traffic is selected from the protection line in the other direction.

Important! The WaveStar BandWidth Manager supports 4-fiber BLSR/MS-SPRing ring switching in closed ring applications only.

4-fiber MS-SPRing with transoceanic protocol example

The following figure shows an example of a 4-fiber MS-SPRing provisioned to use transoceanic protocol (TOP). Only one direction of transmission is shown. (4-fiber MS-SPRing switching is bidirectional.) Node 1 also bridges traffic to the protection line, and Node 3 also selects traffic from the protection line.



NC-USM-165

The transoceanic protocol minimizes the protection route used during a ring switch in large ring applications (circumference greater than 1200 kilometers). If a failure occurs between nodes 2 and 3, the nodes adjacent to the failure (nodes 2 and 3) detect the failure and initiate protection switching. Any nodes that add/drop traffic impacted by the failure, bridge and switch to restore the traffic on the protection line away from the failure. Intermediate nodes pass through signals on the protection lines that are not added/dropped.

□

2-Fiber Bidirectional Line-Switched Ring/Multiplex Section Shared Protection Ring Switching

Introduction The WaveStar BandWidth Manager system performs 2-fiber bidirectional line-switched ring (BLSR)/multiplex section shared protection ring (MS-SPRing) switching in response to automatically detected faults in OC-48/STM-16 and OC-192/STM-64 lines and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 2-fiber BLSR/MS-SPRing protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

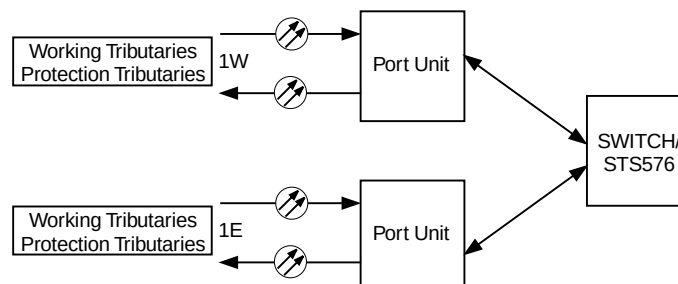
Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection - Span	WaveStar CIT/OS
Forced of Service to Protection, Ring	WaveStar CIT/OS
Signal Fail - Ring	Automatic
Signal Degrade - Ring	Automatic
Manual Switch to Protection - Ring	WaveStar CIT/OS
Wait to Restore	Automatic
Reverse Request - Ring	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Bidirectional revertive protection switching The optical line uses bidirectional revertive 2-fiber ring protection switching. Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working tributaries of one line to the protection tributaries of the line in the opposite direction when a fault is detected. In revertive switching when the fault and wait-to-restore interval clear, the traffic switches back (reverts) to the working tributaries.

2-fiber OC-48/STM-16 BLSR/MS-SPRing architecture

The following figure shows the 2-fiber OC-48/STM-16 BLSR/MS-SPRing protection switching architecture.



NC-USM-160

There are working tributaries carrying service on Line 1W and Line 1E. The tributaries not carrying service on each line are the protection tributaries. The protection tributaries on Line 1W are used to protect the working tributaries on Line 1E, and the protection tributaries on Line 1E are used to protect the working tributaries on Line 1W. The protection switching is performed by the SWITCH/STS576 circuit pack.

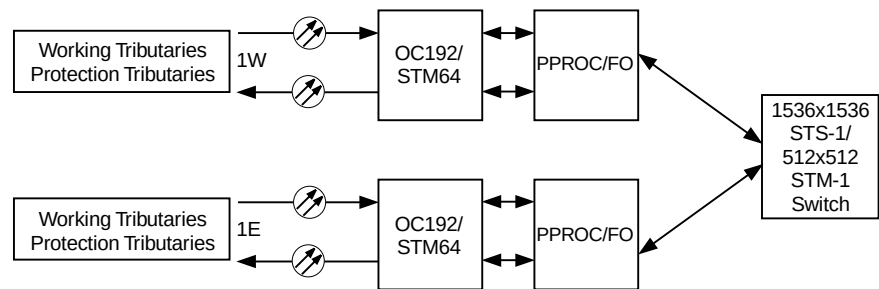
OC-48/STM-16 2-fiber ring tributary mapping

The following table shows the mapping between the service STS-1/VC-3 tributaries and their protection STS-1/VC-3 tributaries on the other optical line in 2-fiber BLSR/MS-SPRing applications.

Service STS-1/VC-3 Tributary	Protection STS-1/VC-3 Tributary on other OC-48 Line
1 through 24	25 through 48, respectively

2-fiber OC-192/STM-64
BLSR/MS-SPRing
architecture

The following figure shows the 2-fiber OC-192/STM-64 MS-SPRing protection switching architecture.



NC-USM-229

There are working tributaries carrying service on Line 1W and Line 1E. The tributaries not carrying service on each line are the protection tributaries. The protection tributaries on Line 1W are used to protect the working tributaries on Line 1E, and the protection tributaries on Line 1E are used to protect the working tributaries on Line 1W. The protection switching is performed by the 1536x1536 STS-1/512x512 STM-1 switch on the shelf. The 1536x1536 STS-1/512x512 STM-1 switch consists of five working SWITCH/STS768 circuit packs and five protection SWITCH/STS768 circuit packs.

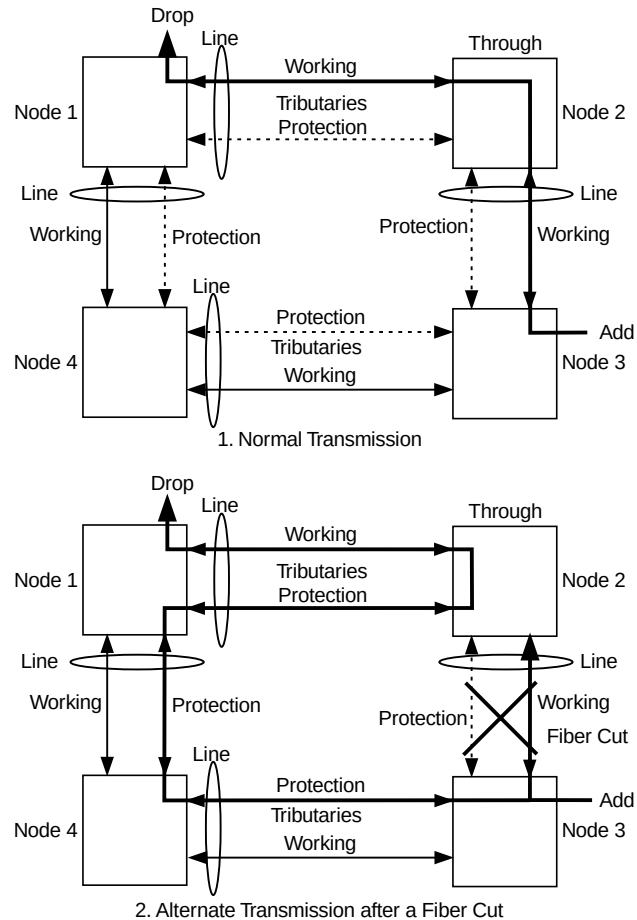
OC-192/STM-64 2-fiber ring
tributary mapping

The following table shows the mapping between the service STS-1/VC-3 tributaries and their protection STS-1/VC-3 tributaries on the other optical line in OC-192/STM-64 2-fiber BLSR/MS-SPRing applications.

Service STS-1/VC-3 Tributary	Protection STS-1/VC-3 Tributary on other OC-192/STM-64 Line
1 through 96	97 through 192, respectively

2-fiber BLSR/MS-SPRing example

The following figure shows an example of 2-fiber BLSR/MS-SPRing protection switching. Only one direction of transmission is shown. (2-fiber BLSR/MS-SPRing switching is bidirectional.) Node 1 also bridges traffic to the protection line, and Node 3 also selects traffic from the protection line.



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For 2-fiber ring protection switching, the nodes adjacent to the failure make connections to bridge the add and through traffic to the protection tributaries of the line in the other direction. All drop and through traffic is selected from the protection tributaries of the line in the other direction.

□

Determining LocA and LocZ for Multi-Ring Traffic

Overview Multi-ring traffic here means that the traffic traverses several BLSRs or MS-SPRings.

LocA and locZ When provisioning cross-connections involving BLSR/MS-SPRing ports the user is required to specify the locA and locZ information. If the input AID of a cross-connection is a BLSR/MS-SPRing port, the locA must be specified. If the output AID of a cross-connection is a BLSR/MS-SPRing port, the locZ must be specified. In general, the locA specifies the TID of the network element (NE) where the traffic carried by the cross-connection enters the ring. The locZ specifies the TID of the NE where the traffic leaves the ring. The locA/locZ fields are used by BLSR/MS-SPRing to determine transoceanic mode protection switching, and to eliminate (squenching) the chance of misconnecting traffic if a ring becomes segmented.

Source/destination NEs When using the Craft Interface Terminal (CIT), locA corresponds to **Source NE Name** and locZ corresponds to **Destination NE Name**.

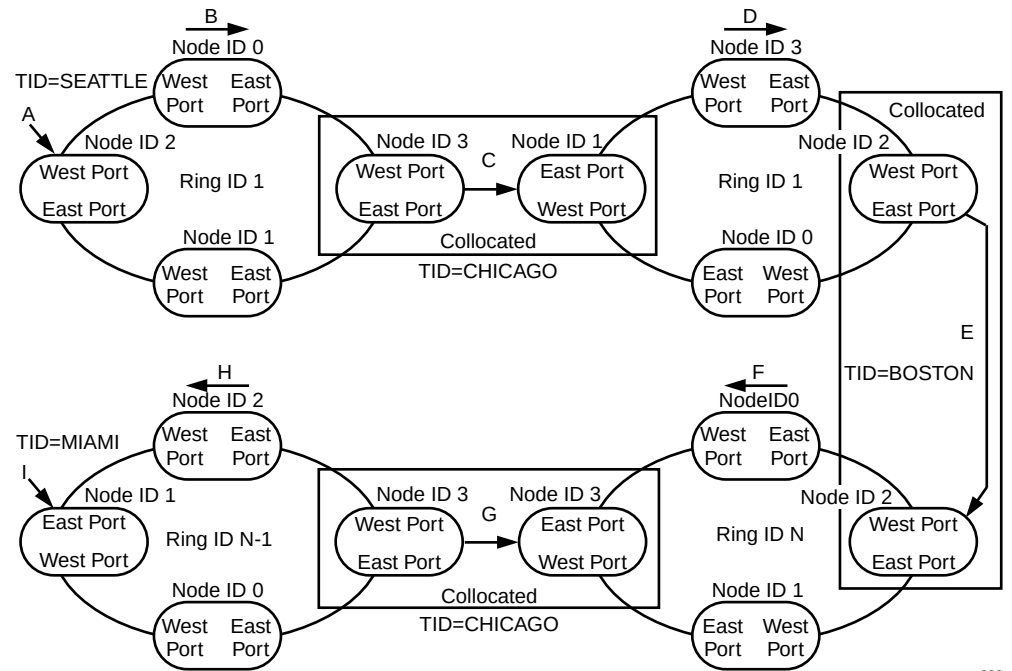
General rule Normally, for a cross-connection involving adding traffic to a ring, only the locZ is required. For cross-connections where traffic is dropped from a ring, only the locA is required. Where the traffic passes through a node (from the east port to the west port or the converse) both locA and locZ must be specified. When traffic drops from one ring and enters another ring on the same NE, both locA and locZ must also be specified. This type of cross-connection between two different rings is called a ring-to-ring cross-connection. (Sometimes it is called “inter-BLSR” but it could actually be connecting two MS-SPRings.)

Ring-to-ring rule (no TSI) The following two steps must be used to determine the locA and locZ fields for a ring-to-ring cross-connection:

1. The locA is determined from the ring where the traffic is being dropped. In other words, the ring containing the “in” AID of the cross-connection. The locA is the TID of the node where the traffic entered that ring.
2. The locZ is determined from the ring where the traffic is being added. That is the ring containing the “out” AID of the cross-connection. The locZ is the TID of the node where the traffic exits that ring.

Example The following figure shows traffic that traverses several BLSRs or MS-SPRings.

Figure 2-1 Multiple BLSR or MS-SPRing Traffic



nc-usm-338

The following table shows the appropriate values for locA and locZ for this multi-ring example.

Table 2-1 LocA and LocZ Values (multi-ring example)

XConn	Type	LocA	LocZ
A	Add	none	CHICAGO
B	Through	SEATTLE	CHICAGO
C	Ring-to-Ring	SEATTLE	BOSTON
D	Through	CHICAGO	BOSTON
E	Ring-to-Ring	CHICAGO	NEWYORK
F	Through	BOSTON	NEWYORK
G	Ring-to-Ring	BOSTON	MIAMI
H	Through	NEWYORK	MIAMI
I	Drop	NEWYORK	none



Determining LocA and LocZ for TSI Traffic

Overview Normally traffic in a BLSR or MS-SPRing stays on the same tributary, or time slot. Although it is not recommended, sometimes traffic does switch tributaries, or time slots. This is called time slot interchange (TSI).

LocA and locZ When provisioning cross-connections involving BLSR/MS-SPRing ports the user is required to specify the locA and locZ information. If the input AID of a cross-connection is a BLSR/MS-SPRing port, the locA must be specified. If the output AID of a cross-connection is a BLSR/MS-SPRing port, the locZ must be specified. In general, the locA specifies the TID of the network element (NE) where the traffic carried by the cross-connection enters the ring or where it switches tributaries. The locZ specifies the TID of the NE where the traffic leaves the ring or switches tributaries. The locA/locZ fields are used by BLSR/MS-SPRing to determine transoceanic mode protection switching, and to eliminate (squelching) the chance of misconnecting traffic if a ring becomes segmented.

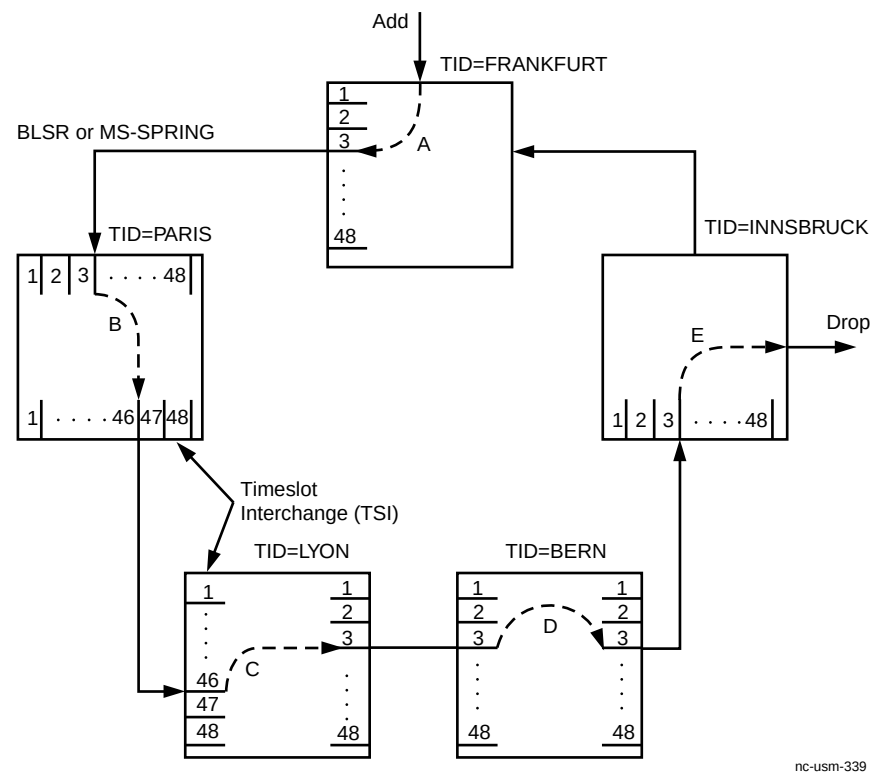
TSI and through cross-connections Where the traffic passes through a node (from the east port to the west port or the converse) both locA and locZ must be specified. When the traffic passes through a node without TSI (without switching tributaries) it is called a “through” cross-connection. When traffic passes through a node with TSI (it does switch tributaries) it is called a “TSI” cross-connection.

TSI rule Consider “upstream” to mean the direction toward the source tributary of a cross-connection and “downstream” to mean toward the destination tributary. The following two steps must be used to determine the locA and locZ fields for any cross-connection in traffic using TSI:

1. Determine locA by going upstream until you get to an NE that has a TSI cross-connection or an NE that has the add cross-connection. That NE is locA.
2. Determine locZ by going downstream until you get to an NE that has a TSI cross-connection or an NE that has the drop cross-connection. That NE is locZ.

Example The following figure shows traffic that uses time slot interchange.

Figure 2-2 TSI Traffic



The following table shows the appropriate values for locA and locZ for this TSI example.

Table 2-2 LocA and LocZ Values (TSI example)

XConn	Type	LocA	LocZ
A	Add	none	LYON
B	Through	FRANKFURT	LYON
C	TSI	FRANKFURT	INNSBRUCK
D	Through	LYON	INNSBRUCK
E	Drop	LYON	none

□

Unidirectional Path-Switched Ring/SubNetwork Connection Protection Switching

Introduction In Release 3.1, the WaveStar BandWidth Manager system performs unidirectional path-switched ring (UPSR)/subnetwork connection protection (SNCP) switching in response to automatically detected faults in paths and external commands from a WaveStar CIT or operations system (OS).

The WaveStar BandWidth Manager system supports UPSR/SNCP switching for

- STS-1, STS-3c (Release 4 and later), and STS-12c (Release 4 and later) paths in OC-12 UPSR rings.
- STS-1, STS-3c (Release 4 and later), STS-12c (Release 4 and later), and STS-48c (Release 4 and later) paths in OC-48 UPSR rings
- VC-4, VC-4-4c (Release 4 and later), and VC-4-16c (Release 4 and later) paths in STM-16 SNCP rings

For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the UPSR/SNCP protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection - Span	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Automatic Path Selector Criteria	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore (revertive mode)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Automatic path selector criteria

The WaveStar BandWidth Manager system performs automatic UPSR/SNCP switching based on the automatic path selector criteria. The automatic path selector criteria uses the following hierarchy of signal impairments (ordered from top to bottom in increasing signal quality):

- LOP-P, AIS-P, UNEQ-P, and signal rate mismatch (SRM) (most impaired - worst signal quality)
- Excessive STS Path BER
- STS PDI-P
- STS signal degrade (least impaired)
- Path-level signal with no impairments.

The WaveStar BandWidth Manager system selects the path-level signal with the best quality.

Unidirectional switching

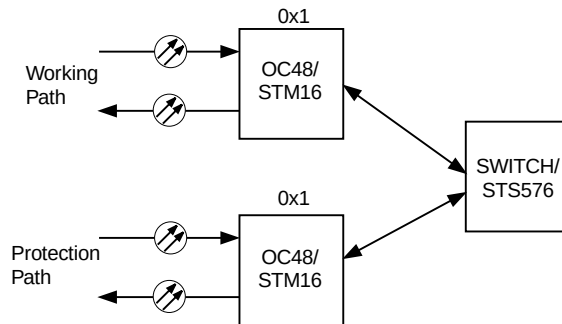
The UPSR/SNCP switching is unidirectional. Unidirectional refers to protection switching that is performed in the receive direction only. The transmitting terminal transmits the same path-level signal on two lines. The receiving terminal monitors the two path-level signals independently and chooses one path-level signal as the working (active) path and the other path-level signal as the protection path. The WaveStar BandWidth Manager system selects the incoming path-level signal with the best quality (based on the automatic path selector criteria).

Revertive/nonrevertive switching

The UPSR/SNCP switching may be provisioned as revertive or nonrevertive. When a protection switch occurs, the receiving terminal selects the signal from the protection path. In revertive switching when the fault clears, the receiving terminal automatically switches back (reverts) to the original working path. In nonrevertive switching when the fault clears, the receiving terminal does *not* switch back to the original working path.

UPSR/SNCP architecture

The following figure shows an example of the UPSR/SNCP protection switching architecture with OC48/STM16 port units.



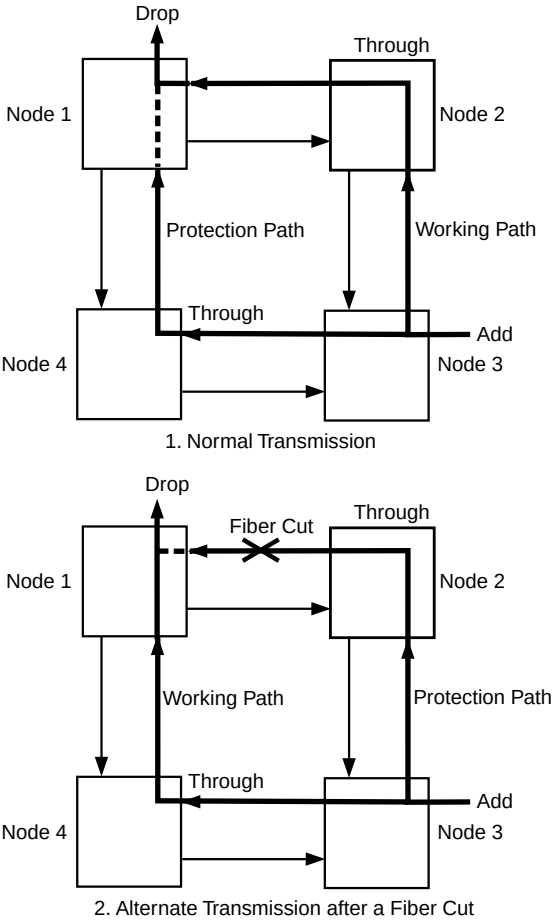
NC-USM-263

The UPSR/SNCP switching is performed in the receive (toward the SWITCH/STS576 circuit pack) direction. If the active incoming path-level signal fails, the working SWITCH/STS576 circuit pack chooses the protection path-level signal.

In the transmit (toward the optical line) direction, the working SWITCH/STS576 circuit pack bridges the same path-level signal to the working and protection paths.

UPSR/SNCP switching example

The following figure shows an example of UPSR/SNCP switching.



NC-USM-264



1+1 Optical Port Protection Switching

Introduction The WaveStar BandWidth Manager system performs 1+1 optical port protection switching for OC-192/STM-64 (Release 3.1 and later), OC-48/STM-16, OC-12/STM-4, OC-3/STM-1 ports. Optical port protection switching takes place in response to automatically detected faults and external commands from a CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities (unidirectional 1+1 protection switching)

The following table shows the unidirectional 1+1 optical port protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Forced Switch (to Working or Protection)	WaveStar CIT/OS
Signal Fail (Working or Protection)	Automatic
Signal Degrade (Working or Protection)	Automatic
Manual Switch (to Working or Protection)	WaveStar CIT/OS
Wait to Restore	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Switch request priorities (bidirectional 1+1 protection switching)

The following table shows the bidirectional 1+1 optical port protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection or Forced Switch to Working	WaveStar CIT/OS
Signal Fail on Protection	Automatic
Forced Switch to Protection	WaveStar CIT/OS
Signal Fail on Working	Automatic

Switch Priorities (Descending Order)	Source of Request
Signal Degrade on Working or Protection	Automatic
Manual Switch to Working or Protection	WaveStar CIT/OS
Wait to Restore or Do Not Revert	Automatic

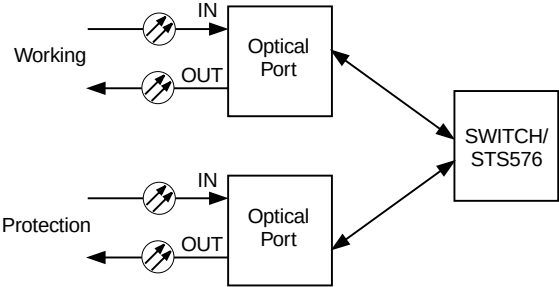
If a higher or equal priority switch request exists, a new switch request is denied.

Operation In 1+1 optical port protection switching, the transmitting terminal transmits the same signal on two lines. The receiving terminal monitors the two lines independently and chooses one line as the working (active) line and the other line as the protection line. When a protection switch occurs, the receiving terminal selects the signal from the protection line.

Unidirectional/bidirectional switching The WaveStar BandWidth Manager system uses provisionable unidirectional or bidirectional (Release 3 and later) 1+1 port protection switching. Unidirectional refers to protection switching that is performed in one direction (transmit or receive) only. Bidirectional refers to protection switching that is performed in both directions of transmission simultaneously.

Revertive/nonrevertive switching The 1+1 port protection switching may be provisioned as revertive or nonrevertive. When a protection switch occurs, the receiving terminal selects the signal from the protection path. In revertive switching when the fault clears, the receiving terminal automatically switches back (reverts) to the original working path. In nonrevertive switching when the fault clears, the receiving terminal does *not* switch back to the original working path.

OC-48/STM-16, OC-12/STM-4, and OC-3/STM-1 1+1 port protection architecture The following figure shows the OC-48/STM-16, OC-12/STM-4, and OC-3/STM-1 1+1 port protection switching architecture.



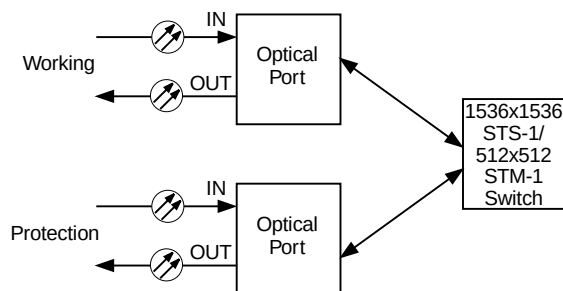
NC-USM-152

The 1+1 optical port protection switching is performed in the receive (toward the SWITCH/STS576 circuit pack) direction. If the active incoming line fails, the working SWITCH/STS576 circuit pack chooses the line signal from the protection optical port.

In the transmit (toward the optical line) direction, the working SWITCH/STS576 circuit pack bridges the same line signal to the working and protection optical ports.

OC-192/STM-64 1+1 port protection architecture

The following figure show the OC-192/STM-64 1+1 port protection switching architecture.



NCATM004

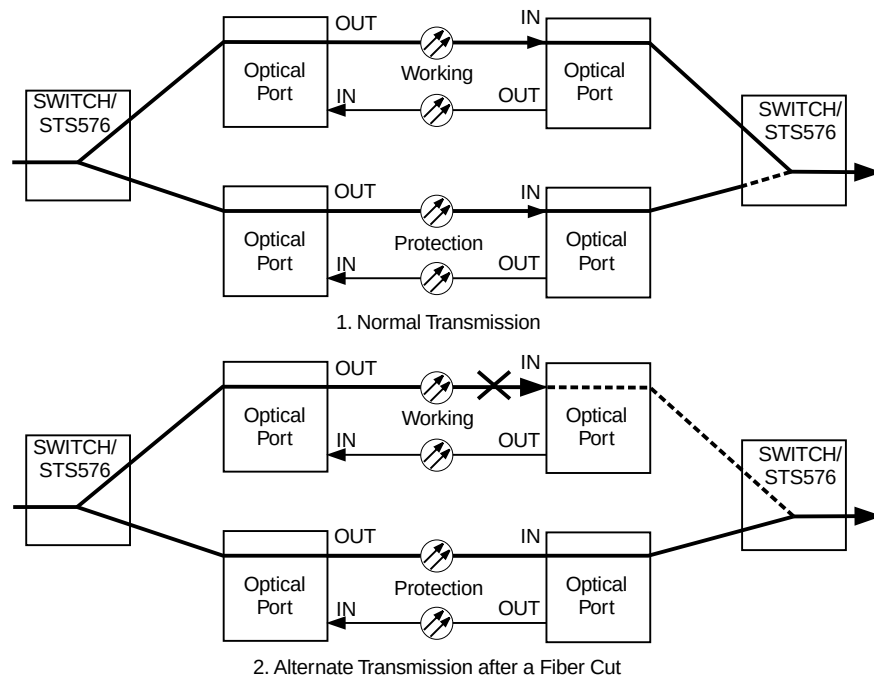
The 1+1 optical port protection switching is performed by the 1536x1536 STS-1/512x512 STM-1 switch on the shelf. The 1536x1536 STS-1/512x512 STM-1 switch consists of five working SWITCH/STS768 circuit packs and five protection SWITCH/STS768 circuit pack.

The 1+1 optical port protection switching is only performed in the receive direction (toward the 1536x1536 STS-1/512x512 STM-1 switch). If the active incoming line fails, the working 1536x1536 STS-1/512x512 STM-1 switch chooses the line signal from the protection optical port.

In the transmit (toward the optical line) direction, the working 1536x1536 STS-1/512x512 STM-1 switch bridges the same line signal to the working and protection optical ports.

Optical port protection switching example

The following figure shows an example of unidirectional 1+1 optical port protection switching.



NC-USM-151

Important! In bidirectional 1+1 optical port protection, protection switching is performed in both directions of transmission simultaneously.



1xN DS3EC1/8 Port Unit Protection Switching

Introduction The WaveStar BandWidth Manager system provides protection for all DS3EC1/8 port units. The DS3EC1/8 port units can be 1xN ($N \leq 12$) protected and use bidirectional revertive switching. The 1xN DS3EC1/8 port unit protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 1xN DS3EC1/8 port unit protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Lockout of Working	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Circuit Pack Failure/Removal	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

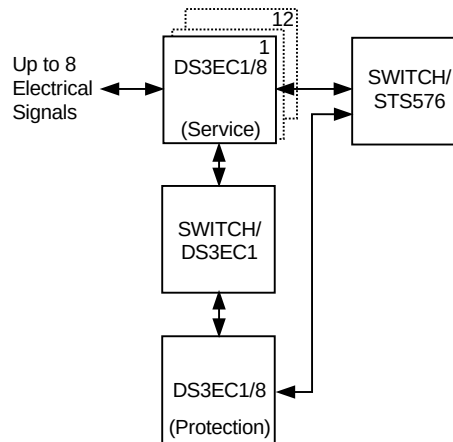
Port unit priority Each I/O Shelf can be equipped with up to 12 service DS3EC1/8 port units and one protection DS3EC1/8 port unit. Each service DS3EC1/8 port unit can be assigned a high or low protection priority. This allows a high priority port unit to preempt any previous switch to protection by a lower priority port unit. Switch requests of equal priority will be met in the order in which they are received. If two requests occur simultaneously, the one with the lower slot address will take priority.

Bidirectional revertive protection switching

Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working DS3EC1/8 port unit to the protection DS3EC1/8 port unit when a port unit fault occurs. In revertive switching, when the fault and the wait-to-restore interval clear, the traffic switches back (reverts) to the working DS3EC1/8 port unit.

1xN DS3EC1/8 port unit protection architecture

The following figure shows the 1xN DS3EC1/8 port unit protection switching architecture.



NC-USM-159

Operation

If a service DS3EC1/8 port unit fails, the input protection switching relays on the failed DS3EC1/8 port unit route the eight incoming electrical (DS3 and/or EC-1) signals to the SWITCH/DS3EC1 circuit pack. The SWITCH/DS3EC1 circuit pack switches the eight DS3 and/or EC-1 signals to the protection DS3EC1/8 port unit. The working SWITCH/STS576 circuit pack chooses the electrical signals from the protection DS3EC1/8 port unit.

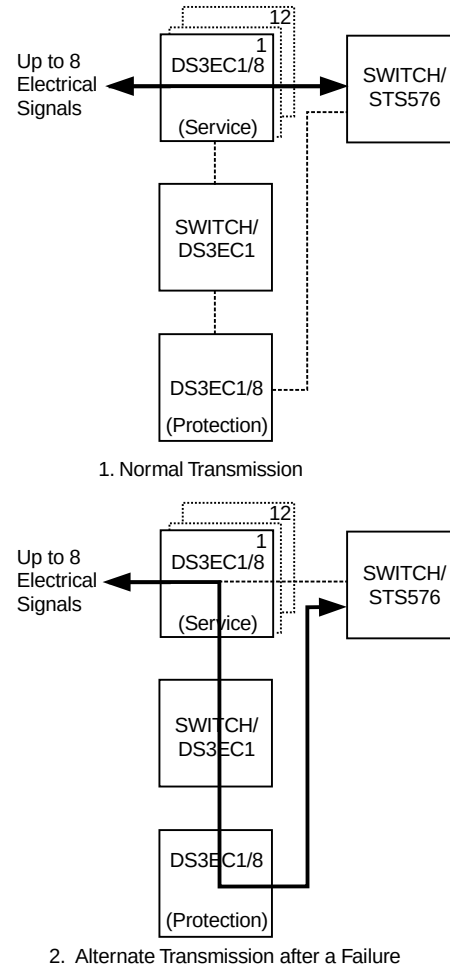
Shorting contacts are provided in the DS3EC1/8 port unit backplane connector so that when the port unit is removed, the cables short through to the SWITCH/DS3EC1 circuit pack for routing to the protection DS3EC1/8 port unit.

In the outgoing direction, the working SWITCH/STS576 circuit pack routes the electrical signals to the protection DS3EC1/8 port unit instead of the failed service DS3EC1/8 port unit. The SWITCH/DS3EC1 circuit pack accepts the eight electrical signals from the protection DS3EC1/8 port unit and routes them to the output protection switching relays on the failed port unit and on to the local cross-connect panel (or equivalent).

The WaveStar BandWidth Manager system also supports unprotected DS3EC1/8 port unit operation. The WaveStar BandWidth Manager system may be equipped without a protection DS3EC1/8 port unit.

1xN DS3EC1/8 port unit protection switching example

The following figure shows an example of 1xN DS3EC1/8 port unit protection switching.



NC-USM-158



1XN STM1E/4 Port Unit Protection Switching

Introduction In Release 3.1, the WaveStar BandWidth Manager system provides protection for all STM1E/4 port units. The STM1E/4 port units can be 1xN ($N \leq 8$) protected and use bidirectional revertive switching. The 1xN STM1E/4 port unit protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 1xN STM1E/4 port unit protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Lockout of Working	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Circuit Pack Failure/Removal	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

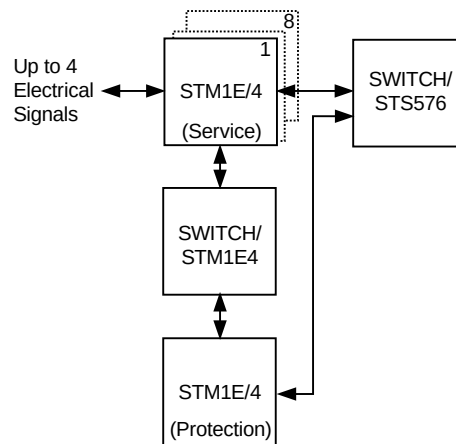
Port unit priority Each SDH Universal I/O Shelf can be equipped with up to 8 service STM1E/4 port units and one protection STM1E/4 port unit. Each service STM1E/4 port unit can be assigned a high or low protection priority. This allows a high priority port unit to preempt any previous switch to protection by a lower priority port unit. Switch requests of equal priority will be met in the order in which they are received. If two requests occur simultaneously, the one with the lower slot address will take priority.

Bidirectional revertive protection switching

Bidirectional refers to protection switching that is performed in the transmit and receive directions simultaneously. The traffic switches from the working STM1E/4 port unit to the protection STM1E/4 port unit when a port unit fault occurs. In revertive switching, when the fault and the wait-to-restore interval clear, the traffic switches back (reverts) to the working STM1E/4 port unit.

1xN STM1E/4 port unit protection architecture

The following figure shows the 1xN STM1E/4 port unit protection switching architecture.



NC-USM-256

Operation

If a service STM1E/4 port unit fails, the input protection switching relays on the failed STM1E/4 port unit route the four incoming electrical (STM1e) signals to the SWITCH/STM1E4 circuit pack. The SWITCH/STM1E4 circuit pack switches the four STM1e signals to the protection STM1E/4 port unit. The working SWITCH/STS576 circuit pack chooses the electrical signals from the protection STM1E/4 port unit.

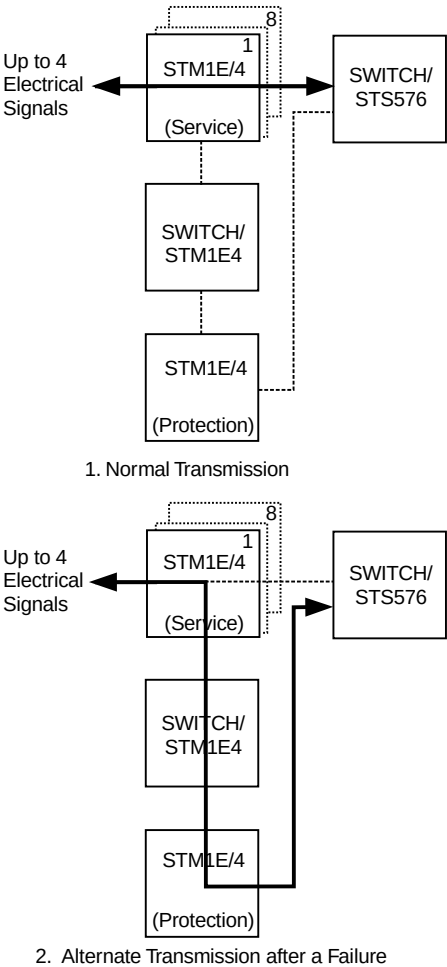
Shorting contacts are provided in the STM1E/4 port unit backplane connector so that when the port unit is removed, the cables short through to the SWITCH/STM1E4 circuit pack for routing to the protection STM1E/4 port unit.

In the outgoing direction, the working SWITCH/STS576 circuit pack routes the electrical signals to the protection STM1E/4 port unit instead of the failed service STM1E/4 port unit. The SWITCH/STM1E4 circuit pack accepts the 4 electrical signals from the protection STM1E/4 port unit and routes them to the output protection switching relays on the failed port unit and on to the local cross-connect panel (or equivalent).

The WaveStar BandWidth Manager system also supports unprotected STM1E/4 port unit operation. The WaveStar BandWidth Manager system may be equipped without a protection STM1E/4 port unit.

**1xN STM1E/4 port unit
protection switching
example**

The following figure shows an example of 1xN STM1E/4 port unit protection switching.



NC-USM-257



Dual Ring Interworking Protection Switching

Introduction In Release 4 and later releases, The WaveStar BandWidth Manager system supports dual ring interworking (DRI) protection switching. DRI protection switching protects a circuit with a termination in one ring and the other termination in another ring when an interconnecting node or line fails. DRI protection switching takes place in response to automatically detected failures or external commands from a WaveStar CIT or operations system (OS). For information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the DRI protection switching priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

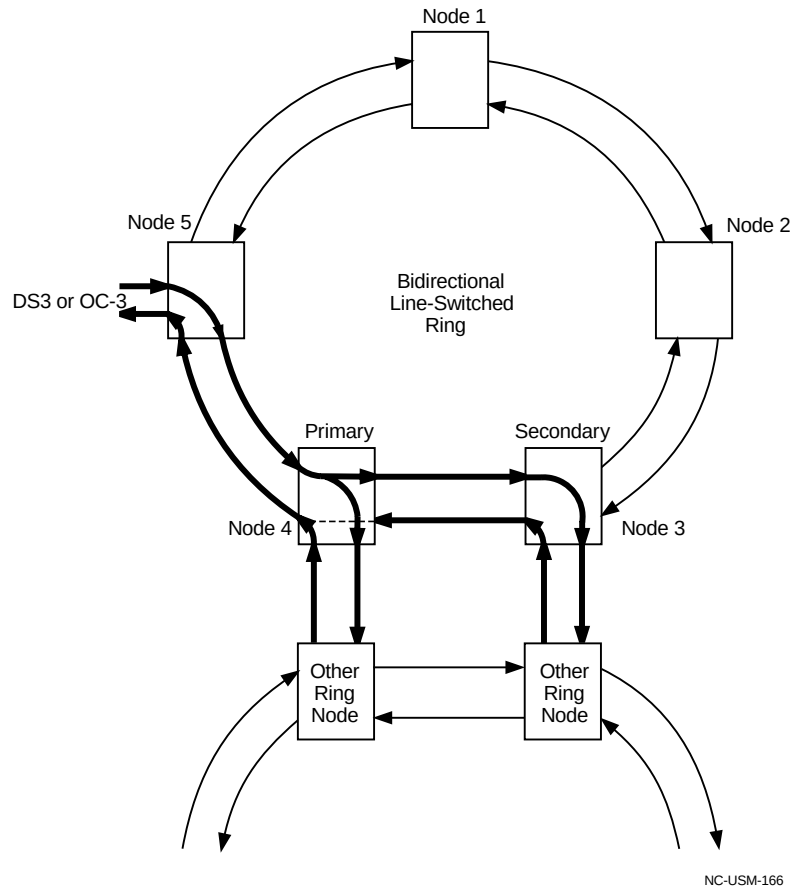
Switch Priorities (Descending Order)	Source of Request
Clear	WaveStar CIT/OS
Lockout of Protection	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Automatic Path Selector Criteria	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Unidirectional revertive/nonrevertive switching

DRI protection switching is unidirectional and revertive or nonrevertive. Unidirectional refers to protection switching that is performed in one direction only. For a given 1-way circuit, DRI protection switching is only performed in the add direction. When a fault occurs, traffic switches from the primary to secondary node. DRI protection switching may be provisioned as revertive or nonrevertive. In nonrevertive switching when the fault clears, traffic does *not* automatically switch back (revert) to the primary node. In revertive switching when the fault clears, traffic does automatically switch back (reverts) to the primary node.

DRI architecture The following figure shows a DRI application with two rings. One ring is a bidirectional line-switched ring equipped with the WaveStar BandWidth Manager system. The other ring could be another line-switched ring equipped with the WaveStar BandWidth Manager system or a path-switched ring.



The figure also shows a 2-way DRI circuit. The 2-way DRI circuit is routed to/from the termination node (node 5) in the bidirectional line-switched ring through the primary node (node 4) and secondary node (node 3) to the other ring. (The primary and secondary nodes are not required to be adjacent nodes.)



1+1 Equipment Protection Switching

Introduction The WaveStar BandWidth Manager system provides 1+1 equipment protection for the following circuit packs:

- CTL/SYS50DM
- CTL/SR50DC
- SWITCH/STS576 and SWIF
- SWITCH/STS768 and SWIF
- BSW
- TMG/STRAT3

The 1+1 equipment protection switching takes place in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Protection Switch...** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the 1+1 equipment protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear Forced	WaveStar CIT/OS
Forced Switch (to Side 0 or Side 1)	WaveStar CIT/OS
Circuit Pack Failure/Removal	Automatic
Manual Switch (to Side 0 or Side 1)	WaveStar CIT/OS

If a higher or equal priority switch request exists, a new switch request is denied.

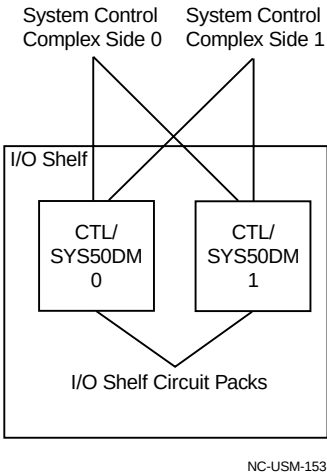
1+1 nonrevertive protection switching

In 1+1 nonrevertive protection switching, the side 0 circuit pack and the side 1 circuit pack interface with the same circuit packs. One side is active (working) and the other side is standby.

When a protection switch occurs, the standby side becomes the new active (working) side. The original active (working) side becomes the standby side. The status remains the same (nonrevertive) after the fault clears.

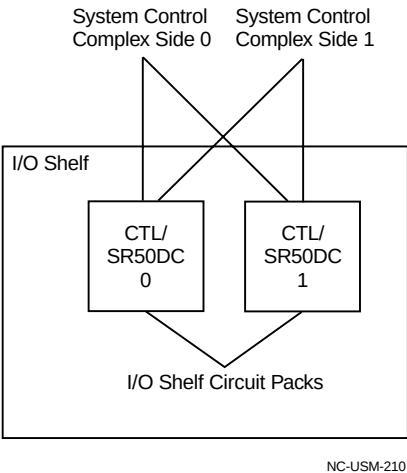
**CTL/SYS50DM circuit pack
protection switching
architecture**

The following figure shows the 1+1 CTL/SYS50DM circuit pack protection switching architecture.



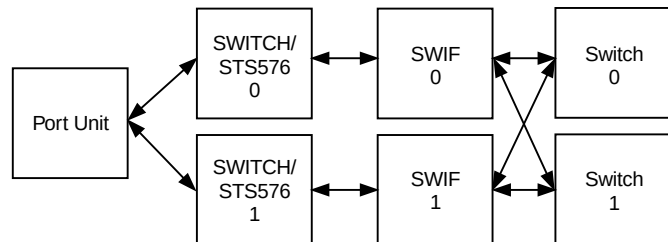
**CTL/SR50DC circuit pack
protection switching
architecture**

The following figure shows the 1+1 CTL/SR50DC circuit pack protection switching architecture.



SWITCH/STS576 and SWIF circuit pack protection switching architecture

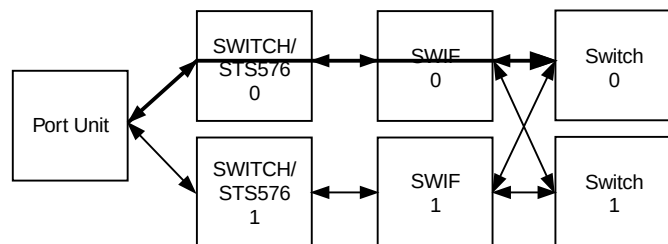
The following figure shows the SWITCH/STS576 and SWIF circuit pack protection switching architecture. The SWITCH/STS576 and SWIF circuit packs on the same side switch as a single unit. For example, if the SWITCH/STS576 0 or SWIF 0 circuit pack fails, traffic switches to the SWITCH/STS576 1 and SWIF 1 circuit packs.



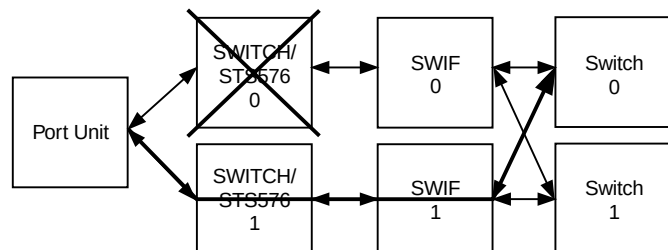
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SWITCH/STS576 and SWIF circuit pack protection switching example

The following figure shows an example of SWITCH/STS576 and SWIF circuit pack protection.



1. Typical Transmission

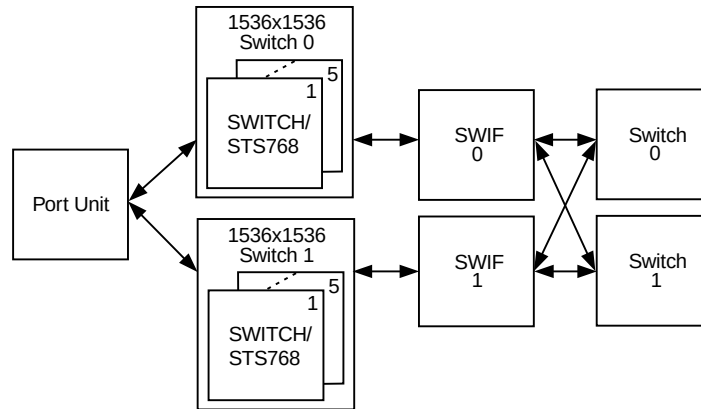


2. Alternate Transmission After a Failure

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SWITCH/STS768 and SWIF circuit pack protection switching architecture

The following figure shows the SWITCH/STS768 and SWIF circuit pack protection switching architecture.

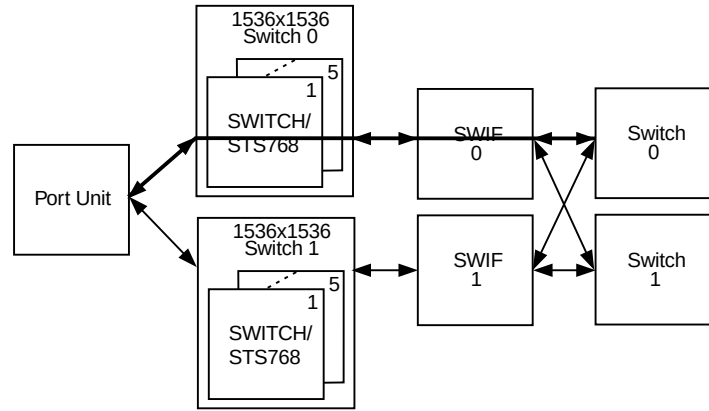


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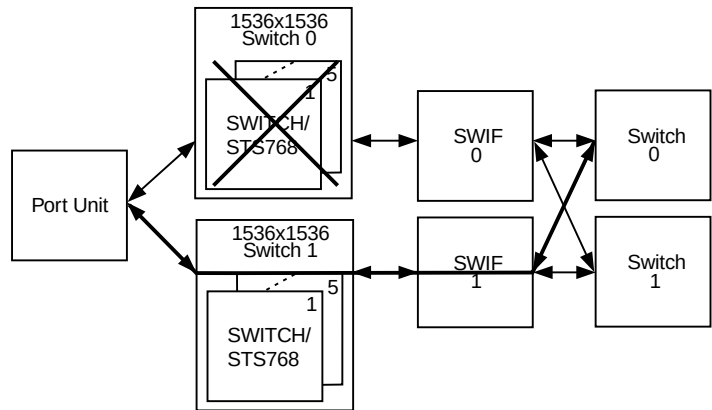
Five SWITCH/STS768 circuit packs form the 1536x1536 Switch 0 and five SWITCH/STS768 circuit packs form the 1536x1536 Switch 1 on the shelf. The 1536x1536 Switch and SWIF circuit packs on the same side switch as a single unit. For example, if a SWITCH/STS768 circuit pack in the 1536x1536 Switch 0 or SWIF 0 circuit pack fails, traffic switches to the 1536x1536 Switch 1 and SWIF 1 circuit packs.

**SWITCH/STS768 and SWIF
circuit pack protection
switching example**

The following figure shows an example of SWITCH/STS768 and SWIF circuit pack protection switching example.



1. Typical Transmission

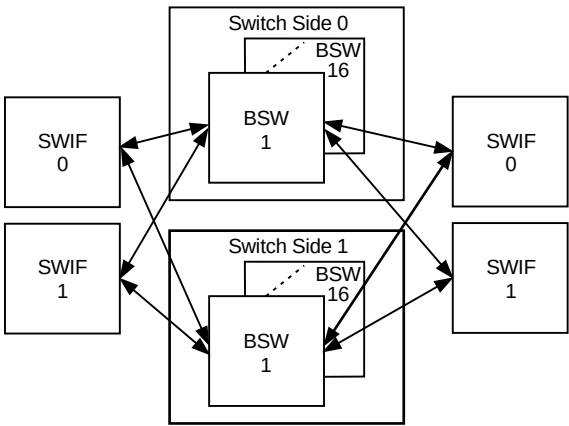


2. Alternate Transmission After a Failure

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BSW circuit pack protection switching architecture

The following figure shows the BSW circuit pack protection switching architecture.

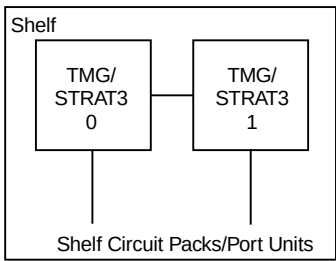


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The BSW circuit packs are protected on an individual circuit pack basis. For example, if the side 0 BSW 1 circuit pack is active and then fails, the system switches to the side 1 BSW 1 circuit pack. In the WaveStar BandWidth Manager 4608/1536 system, sixteen BSW circuit packs are required to carry an STS-1/VC-3 cross-connection. The active BSW circuit packs may individually reside in side 0 or side 1.

TMG/STRAT3 circuit pack protection switching architecture

The following figure shows the TMG/STRAT3 circuit pack protection switching architecture.



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Synchronization Reference Protection Switching

Introduction The WaveStar BandWidth Manager system provides protection for all system synchronization references. Synchronization reference protection switching occurs in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For more information about the **Fault > Timing/Sync Protection Switch > System Timing Reference Switch** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the synchronization reference protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear Reference Switch	WaveStar CIT/OS
Lockout	WaveStar CIT/OS
Forced Switch	WaveStar CIT/OS
Reference Failure	Automatic
Manual Switch	WaveStar CIT/OS
Wait to Restore (Revertive only)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Timing References In the locked timing mode, the WaveStar BandWidth Manager system derives timing from up to two external DS1 references (EXTREF1 and EXTREF2) and one OC-48 line reference (LINE1). In Release 4 and later releases, the WaveStar BandWidth Manager system derives timing from up to two external DS1 or E1 references (EXTREF1 and EXTREF2) and two OC-48/STM-16 or OC-192/STM-64 line references (LINE1 and LINE2).

In Release 4 and later releases, each timing reference is assigned a:

- System Timing Reference Priority (for example, 1, 2, 3, or 4)
- Quality level (for example PRS, STU, ST2, ST3), (if the System SSM Mode parameter is Enabled)

In releases prior to Release 4, each timing reference is assigned a System Timing Reference Priority only.

Revertive/nonrevertive switching (releases prior to Release 4)

In releases prior to Release 4, the system supports revertive or nonrevertive synchronization reference protection switching based on the System Timing Reference Priority parameter. If the System Timing Reference Priority parameter is provisioned with the same value for each timing reference, timing reference protection is nonrevertive. For example, the System Timing Reference Priority parameter of each timing reference is provisioned as 1 for nonrevertive operation. (See the following example.)

If the System Timing Reference Priority parameter is provisioned with different values, timing reference protection is revertive. For example, the System Timing Reference Priority parameters for the timing references are provisioned 1, 2 and 3, respectively, for revertive operation. The value 1 is the highest priority and 3 is the lowest priority. (See the following example.)

Example of timing reference priorities and switching operation

Important! In Release 4 and later releases, up to 2 lines reference are supported.

The following table shows an example of timing reference priorities and switching operation.

Type of Switching	System Timing Reference Priority		
	EXTREF1	EXTREF2	LINE1
Nonrevertive	1	1	1
Revertive (Recommended Priorities)	1 (highest)	2	3

Revertive/nonrevertive switching (Release 4 and later)

In Release 4 and later releases, the system supports revertive or nonrevertive synchronization reference protection switching based on the System SSM (Synchronization Status Message) Mode parameter, Quality Levels, and the System Timing Reference Priority parameter.

System SSM Mode Enabled

If the System SSM Mode parameter is Enabled, the system uses the Quality Levels associated with each timing reference (for example, PRS, STU, ST2, ST3) to determine the active timing reference. If the Quality Level is the same value for each timing reference, timing reference protection is nonrevertive. For example, the Quality Level of each timing reference is STU.

If the Quality Level of the timing references have different values, timing reference protection is revertive. For example, the Quality Levels associated with the timing references are PRS, STU, ST2, ST3, respectively.

See the following table for a list of Synchronization Status Messages and Quality Levels.

Synchronization Status Message	Description	Quality Level
SONET Synchronization Status Messages		
PRS	Primary Reference Source - Stratum 1 Traceable	1 (highest)
STU	Synchronized - Traceability Unknown	2
ST2	Stratum 2 Traceable	3
ST3	Stratum 3 Traceable	4
SIC	SONET Internal Clock - Minimum Clock Traceable	5
ST4	Stratum 4 Traceable	6
DUS	Don't Use for Synchronization	7 (lowest)
SDH Synchronization Status Messages		
PRC	Primary Reference Clock - Stratum 1 Traceable	1 (highest)
SSU T	Synchronization Supply Unit - Transmit	2
SSU L	Synchronization Supply Unit - Local	3
SEC	SDH Equipment Clock	4
DNU	Do Not Use for Synchronization	5 (lowest)

Important! The WaveStar BandWidth Manager system does not accept provisioning Quality Levels lower than ST3 (SONET) or SEC (SDH).

If the WaveStar BandWidth Manager system derives timing from an incoming OC-48/STM-16 or OC-192/STM-64 signal, the Quality Level of the outgoing OC-48/STM-16 or OC-192/STM-64 signal is DUS (SONET) or DNU (SDH).

System SSM Mode Disabled

If the System SSM Mode is Disabled, the system uses the System Timing Reference Priority parameter associated with each timing reference (for example 1, 2, 3, 4) to determine the active timing reference. Refer to the “Revertive/nonrevertive switching (releases prior to Release 4)” for a description of revertive/nonrevertive switching using the System Timing Reference Priority parameter.

Operation (releases prior to Release 4)

If the active timing reference fails, the system selects the available timing reference with the highest provisioned System Timing Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System Timing Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (Priority 1 - highest)
- EXTREF2 (Priority 2)
- LINE1 (Priority 3)

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.

Operation (Release 4 and later)

In Release 4 and later releases, synchronization reference protection switching is affected by the provisioned value (Enabled or Disabled) of the System SSM Mode parameter.

System SSM Mode Enabled

If the active timing reference fails and the System SSM Mode is Enabled, the system selects the available timing reference with the highest Quality Level as the active timing reference.

If more than one available timing reference has the same Quality Level, the system selects the available timing reference with the highest provisioned System Timing Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System Timing Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (highest priority)
- EXTREF2
- LINE1
- LINE2 (lowest priority)

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.

System SSM Mode Disabled

If the active timing reference fails and the System SSM Mode is Disabled, the system selects the available timing reference with the highest provisioned System Timing Reference Priority as the active timing reference.

If more than one available timing reference has the same provisioned System Timing Reference Priority, the system selects the active timing reference according to the following (in descending order):

- EXTREF1 (highest priority)
- EXTREF2
- LINE1
- LINE2 (lowest priority)

If there are no available timing references, the system performs a synchronization mode switch and enters the holdover mode.



Synchronization Mode Protection Switching

Introduction The WaveStar BandWidth Manager system provides synchronization mode protection. Synchronization mode protection switching occurs in response to automatically detected faults and external commands from a WaveStar CIT or operations system (OS). For information about the **Fault > Timing/Sync Protection Switch > Clock Mode Switch** command, refer to the online help available with the WaveStar CIT.

Switch request priorities The following table shows the synchronization mode protection switch priorities (in descending order of priority) used by the WaveStar BandWidth Manager system.

Switch Priorities (Descending Order)	Source of Request
Clear Mode Switch	WaveStar CIT/OS
Force Switch to Holdover	WaveStar CIT/OS
Synchronization Reference Failure (Automatic Switch to Holdover)	Automatic

If a higher or equal priority switch request exists, a new switch request is denied.

Operation If the WaveStar BandWidth Manager system is provisioned to operate in the locked timing mode and all timing reference signals fail or unavailable, the TMG/STRAT3 circuit packs switch to the holdover mode. The holdover mode is entered when the integrity of the reference signal is considered unacceptable, or by manual command. In the holdover mode, the on-board oscillator frequency will not degrade below the stratum 3 level. When the fault clears, the TMG/STRAT3 circuit packs switch back (revert) to the locked mode.

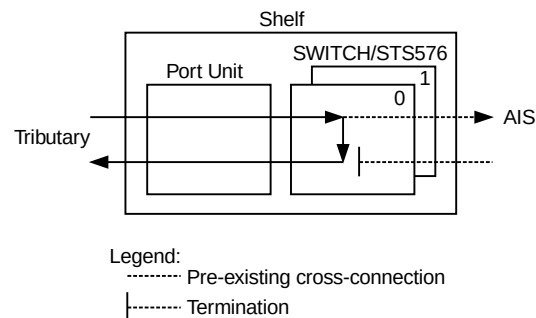


Loopbacks

- Introduction** The WaveStar BandWidth Manager system provides the following types of loopbacks:
- Cross-connect loopbacks
 - Nearside facility loopbacks (Release 4 and later)
 - Optical loopbacks

Cross-connect loopbacks Cross-connect loopbacks allow an input tributary to be looped back in the shelf SWITCH/STS576 or SWITCH/STS768 circuit packs to the output of the same tributary.

The following figure shows an example of a cross-connect loopback.



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Activating/Releasing

Cross-connect loopbacks are activated and released in response to the **Fault > Analysis > Cross Connect Loopback** command entered at the WaveStar CIT or operations system. For more information about the **Fault > Analysis > Cross Connect Loopback** command, refer to the online help available with WaveStar CIT.

Not Allowed

Cross-connect loopbacks are not allowed on tributaries used for test access.

“Forced” versus “Operating”

Cross-connect loopbacks are allowed on any tributary that is not being used for test access, regardless of whether there is an existing cross-connection to the selected tributary. If there is a cross-connection, then the cross-connect loopback is called “forced” and the button in the WaveStar CIT to activate it says **Force**. If there is no cross-connection,

then the cross-connect loopback is called “operating” and the button to activate it says **Operate**.

Alarms

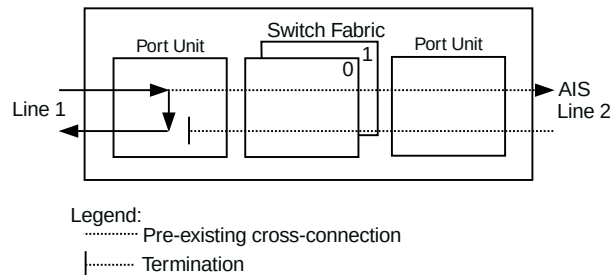
If a cross-connection exists on the selected tributary, an alarm indication signal (AIS) is inserted downstream during the loopback. If a cross-connection exists in the opposite direction, the signal is terminated during the loopback. When the cross-connect loopback is released, any pre-existing cross-connections are automatically reestablished.

Active cross-connect loopbacks are noted by the abnormal (ABN) LED on the user panel and the WaveStar CIT.

Nearside facility loopbacks

Nearside facility loopbacks allow an incoming DS3, EC1, STM-1e, OC-3/STM-1, OC-12/STM-4, or OC-48/STM-16 line to be looped back in the port unit to the output of the same line.

The following figure shows an example of a nearside facility loopback.



NC10G072

Activating/Releasing

Nearside facility loopbacks are established and released in response to the **Fault > Analysis > Facility Loopback** command entered at the WaveStar CIT or operations system. For more information about the **Fault > Analysis > Facility Loopback** command, refer to the online help available with WaveStar CIT.

“Forced”

Nearside facility loopbacks are allowed on any incoming DS3, EC1, STM-1e, OC-3/STM-1, OC-12/STM-4, or OC-48/STM-16 line regardless of whether there is an existing cross-connection(s) established to tributaries associated with the port. Every nearside facility loopback is called “forced” and the WaveStar CIT button to activate it says **Force**.

Alarms

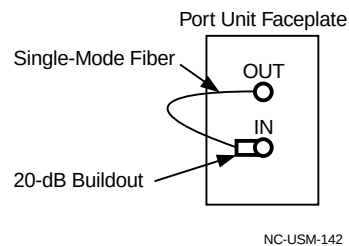
If a cross-connection exists on a tributary associated with the port, an alarm indication signal (AIS) is inserted downstream during the loopback. If a cross-connection exists in the opposite direction, the signal is terminated during the loopback. When the nearside facility loopback is released, any pre-existing cross-connections are automatically reestablished.

Active nearside facility loopbacks are reported by the abnormal (ABN) LED on the user panel and the WaveStar CIT.

Optical loopbacks

The WaveStar BandWidth Manager system allows manual loopbacks to be performed on all optical interfaces. Front access to the optical connectors on the port unit faceplates allows manual optical loopbacks. This loopback is performed by connecting the OUT optical connector on the faceplate of a port unit to the IN optical connector on the same port unit with a single-mode fiber jumper and lightguide buildouts.

The following figure shows the optical loopback connections.



Tests

Introduction The WaveStar BandWidth Manager system provides the following self tests:

- LED test
- Office alarms test

LED test The LED test verifies that the user panel and circuit pack faceplate LEDs are operating properly in a shelf. The test consists of one or more test iterations (cycles) repeated as many times as specified.

In each test iteration (cycle) the user panel LEDs and circuit pack faceplate LEDs are lighted for 2 seconds and turned off for 2 seconds. This repeats three times for each test iteration (cycle) specified. The PWR ON LED is always on if the shelf is powered and cannot be tested.

The LEDs revert to normal operation after the LED test is completed.

The LED test is performed using the LED test push button on the user panel or the **Fault > Test > LED...** command. For more information about the user panel and the LED test push button, refer to 365-370-109, *WaveStar BandWidth Manager User Operations Guide*. For more information about the **Fault > Test > LED...** command, refer to the online help available with the WaveStar CIT.

Office alarms test The office alarms test verifies that the shelf audible/visible office alarm outputs and the corresponding LEDs on the user panel are operating properly. The test consists of one or more test iterations (cycles) repeated as many times as specified.

In each test iteration (cycle) the office audible/visible office alarm outputs and the corresponding user panel LEDs turn on for 5 seconds each in the following order:

- Critical
- Major
- Minor

The office alarms revert to normal operation after the test is completed. The office alarms test is performed using the **Fault > Test-Office Alarm...** command. For more information about the **Fault > Test > Office**

Alarm... command, refer to the online help available with the WaveStar CIT.



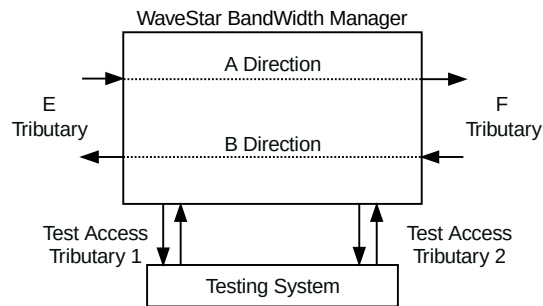
Test Access

Introduction The WaveStar BandWidth Manager system provides test access cross-connections that allow circuits to be monitored and split by external testing systems. This aids in turning up facilities and in sectionalizing faults in existing service circuits. Test access allows circuit quality to be tested at a single network element or over all of an end-to-end circuit that is routed through multiple network elements.

In Release 3.1 and later releases, test access cross-connections can be established at the STS-1/VC-3, STS-3/VC-4, STS-12/VC-4-4c, and STS-48/VC-4-16c rates. DS3, EC-1, OC-3/STM-1, OC-12/STM-4, or OC-48/STM-16 ports support test access tributaries for connection to an external testing system.

In Release 3 and earlier releases, test access cross-connections can be established between STS-1 tributaries and DS3 ports that are connected to an external testing system. The DS3 ports are designated as test access tributaries.

Conventions The following figure shows the test access conventions.



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The test access conventions are:

- **E Tributary:** The first tributary to be monitored or split. There is always an E Tributary. If a tributary without a cross-connection is to be tested, it is always an E Tributary.
- **F Tributary:** The second tributary to be monitored or split. The F Tributary is not required for all test access modes.
- **A Direction:** The signal path from the E Tributary to the F Tributary. If there is only a one-way cross-connection, the signal travels in the A direction.
- **B Direction:** The signal path from the F Tributary to the E Tributary.

- Test Access Tributary 1: The first tributary that is connected to the external testing system.
- Test Access Tributary 2: The second tributary that is connected to the external testing system. This tributary is only used in dual-test modes.

Test access rates The WaveStar BandWidth Manager system supports the following test access rates:

- STS-1/VC-3
- STS-3/VC-4 (Release 3.1 and later)
- STS-12/VC4-4c (Release 3.1 and later)
- STS-48/VC4-16c (Release 3.1 and later)

Ports and supported test access tributaries The following types of ports can be connected to an external testing system:

- DS3
- EC-1 (Release 3.1 and later)
- OC-3/STM-1 (Release 3.1 and later)
- OC-12/STM-4 (Release 3.1 and later)
- OC-48/STM-16 (Release 3.1 and later)
- OC-192/STM-64 (Release 4 and later)

A single OC-n/STM-n port connected to an external testing system can support multiple test access sessions. For example, an OC-12 port connected to an external testing system supports up to 12 test access sessions at the STS-1 rate.

The following table shows the port types and the supported test access tributaries.

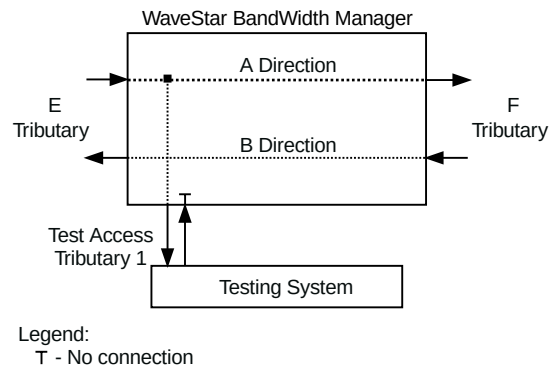
Port Types	Supported Test Access Tributaries							
	STS-1	STS-3	STS-12	STS-48	VC-3	VC-4	VC-4-4c	VC-4-16c
DS3	X							
EC-1	X							
OC-3	X	X						
OC-12	X	X	X					
OC-48	X	X	X	X				
OC-192	X	X	X	X				
STM-1					X	X		
STM-4					X	X	X	
STM-16					X	X	X	X
STM-64					X	X	X	X

Test access modes The WaveStar BandWidth Manager system supports the following test access modes:

- MONE (monitor E tributary) mode
- MONF (monitor F tributary) mode (Release 3.1 and later)
- SPLTA (split A direction) mode (Release 3.1 and later)
- SPLTB (split B direction) mode (Release 3.1 and later)
- SPLTE (split E tributary) mode
- SPLTF (split F tributary) mode (Release 3.1 and later)
- MONEF (monitor E tributary and F tributary) mode
- SPLTAB (split A direction and B direction) mode (Release 3.1 and later)
- SPLTEF (split E tributary and F tributary) mode

MONE mode The MONE mode is used to monitor the E Tributary input signal of a one-way cross-connection or an idle E Tributary input signal (no cross-connection).

The following figure shows an example of the MONE mode used to monitor the E Tributary input signal of a two-way cross-connection.

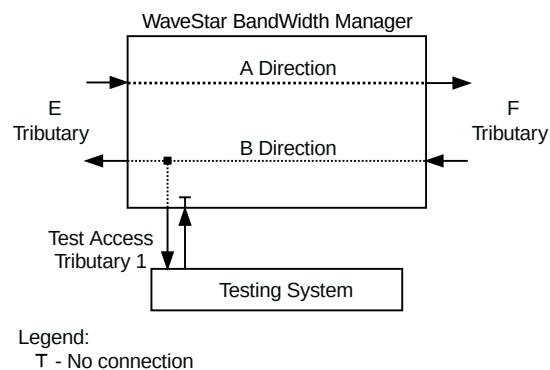


NC-USM-147

If the F Tributary is entered, the F Tributary must be the destination of a one-way cross-connection that has the E Tributary as the source, or the F Tributary must be part of a two-way cross-connection that does not have any other test access sessions on it.

MONF mode The MONF mode (Release 3.1 and later) is used to monitor the F Tributary input signal.

The following figure shows an example of the MONF mode used to monitor the F Tributary input signal of a two-way cross-connection.

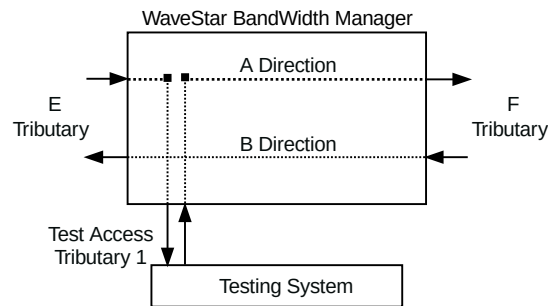


NC-USM-258

The F Tributary and E Tributary must be part of a two-way cross-connection. The MONF mode is not supported for tributaries with one-way cross-connections or idle F Tributary input signals (no cross-connection).

SPLTA Mode The SPLTA mode (Release 3.1 and later) is used to test a tributary in the A direction.

The following figure shows an example of the SPLTA mode used to test the A direction of a tributary used in a two-way cross-connection.

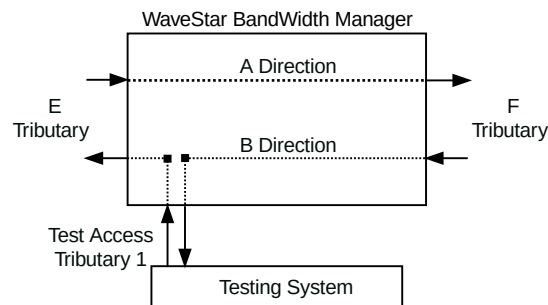


NC-USM-259

The connection is split in the A direction to allow testing. Any bridges to the E or F tributaries are unaffected. The SPLTA mode is also used to test the A direction of a tributary in one-way cross-connections. The SPLTA mode is not supported for idle tributary input signals (no cross-connection).

SPLTB Mode The SPLTB mode (Release 3.1 and later) is used to test a tributary in the B direction.

The following figure shows an example of the SPLTB mode used to test the B direction of a tributary used in a two-way cross-connection.

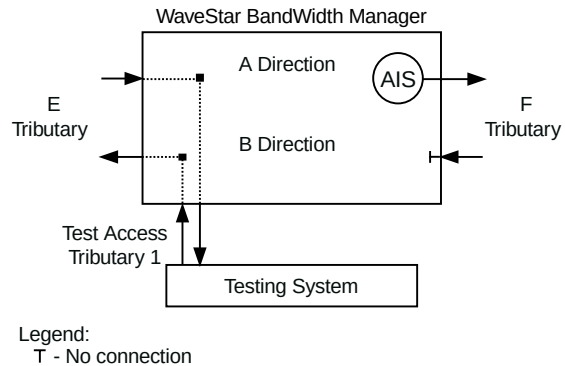


NC-USM-260

The connection is split in the B direction to allow testing. Any bridges to the E or F tributaries are unaffected. The E Tributary and F Tributary must be part of a two-way cross-connection. The SPLTB mode is not supported for tributaries with one-way cross-connections or idle tributary input signals (no cross-connection).

SPLTE mode The SPLTE mode is used to test the E Tributary signal.

The following figure shows an example of the SPLTE mode used to test the E Tributary signal of a two-way cross-connection.

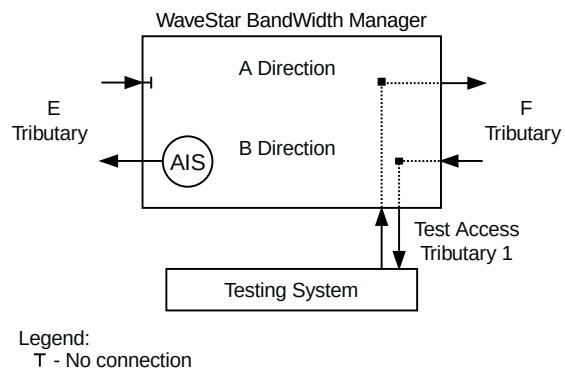


NC-USM-146

The E Tributary signal is split from the F Tributary signal. DS3 or Path AIS is transmitted on the outgoing F Tributary signal and the incoming F Tributary signal is terminated. If a one-way cross-connection from the E Tributary to F Tributary, AIS is transmitted on the outgoing F Tributary signal. If the E Tributary is idle (no cross-connection), the F Tributary signal is unaffected.

SPLTF mode The SPLTF mode is used to test the F Tributary signal.

The following figure shows an example of the SPLTF mode used to test the F Tributary signal of a two-way cross-connection.

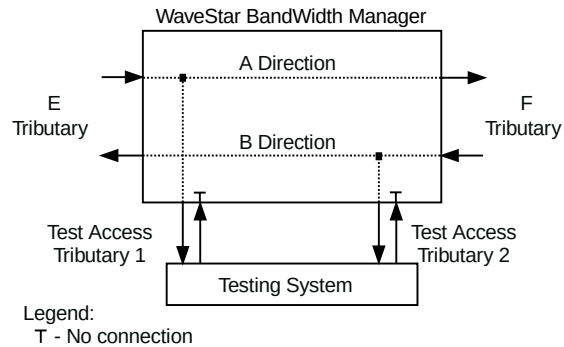


NC-USM-261

The F Tributary signal is split from the E Tributary signal. DS3 or Path AIS is transmitted on the outgoing E Tributary signal and the incoming E Tributary signal is terminated. The SPLTF mode is not supported for tributaries with one-way cross-connections or idle tributary input signals (no cross-connection).

MONEF mode The MONEF mode is used to monitor the E Tributary input signal and the F Tributary input signal of a two-way cross-connection.

The following figure shows an example of the MONEF mode used to monitor two tributaries.

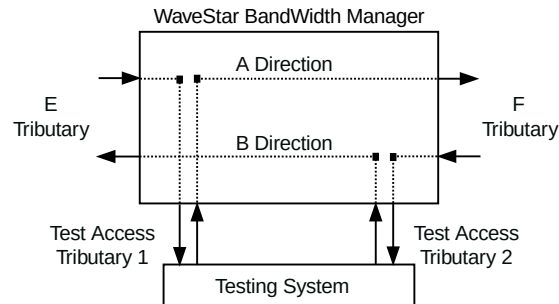


NC-USM-144

The E Tributary, F Tributary, and two test access tributaries are required. The F Tributary must be the destination of the two-way cross-connection, and the E Tributary must be the source. The MONEF mode is not supported for tributaries that have one-way cross-connections or idle tributaries (no cross-connections).

SPLTAB mode The SPLTAB mode is used to test the A direction and B direction.

The following figure shows an example of the SPLTAB mode used to split the A and B directions of a two-way cross-connection.

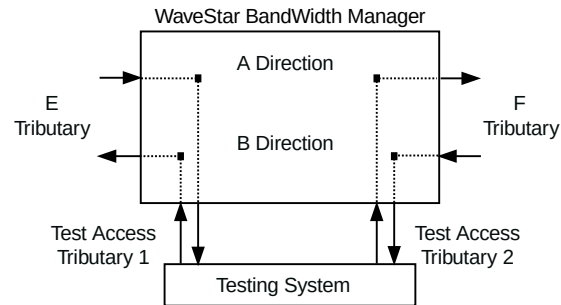


NC-USM-262

Two test access tributaries are required. The E Tributary and F Tributary must be part of a two-way cross-connection. The SPLTAB mode is not supported for tributaries with one-way cross-connections or idle tributary input signals (no cross-connection).

SPLTEF mode The SPLTEF mode is used to test the E Tributary signal and F Tributary signal.

The following figure shows an example of the SPLTEF mode used to test the E Tributary signal and F Tributary signal of a two-way cross-connection.



NC-USM-145

Two test access tributaries are required. The SPLTEF mode is not supported for tributaries that have one-way cross-connections or idle tributaries (no cross-connections).

Restrictions The following restrictions apply to test access:

- Test Access Tributary 1 and E Tributary are always required.
- Test Access Tributary 1, E Tributary, Test Access Tributary 2 (if entered), and F Tributary (if entered) must not be already in use as a test tributary.
- Test Access Tributary 1, E Tributary, Test Access Tributary 2 (if entered), and F Tributary (if entered) must not be looped back.
- Test Access Tributary 1 and Test Access Tributary 2 must not be part of a cross-connection.
- Test Access Tributary 1 must be different from E Tributary.
- Test Access Tributary 1 must be different from Test Access Tributary 2.
- Tributaries must be on physically-present circuit packs (pre-provisioned circuit packs can not be used)
- Test access is not supported on the protection DS3EC1/8 or STM1E/4 port units.
- Test access is not supported on protection ports of 1+1 optical protection groups.

- Test access must be established initially in the MONE, MONF (Release 3.1 and later), or MONEF mode. This is referred to as “monitor before split” and is a safety precaution that prevents possible service interruptions.
- Test access cross-connections must be made in the main switch fabric (Releases 3.1 and earlier). Therefore, test access for bidirectional line-switched rings (BLSR)/multiplex section shared protection rings (MS-SPRing) through tributaries is not supported in Release 3.1 and earlier releases. In Release 4 and later releases, test access supports on-shelf cross-connections.
- Test access for unidirectional path-switched ring (UPSR)/sub-network connection protection (SNCP) through tributaries is not supported.
- Test access is not supported on tributaries that are part of a path-protected cross-connections.

Commands Test access cross-connections must be specified and administered using the **Fault > Analysis > Test Access** command. A test access wizard is available to help with the following:

- **Create a New Test Access Session:** This enters tributaries for test access and establishes a test access session in the MONE, MONF (Release 3.1 and later) MONEF mode. Multiple test access sessions are supported.
- **Modify a Test Access Session:** This modifies the test access mode of an existing test access session. In Release 3.1 and later releases, this changes the test access mode between MONE, MONF, SPLTA, SPLTB, SPLTE, and SPLTF; and between MONEF, SPLTAB, and SPLTEF. In Release 3 and earlier releases, this changes the test access mode between MONE and SPLTE, and between MONEF and SPLTEF.
- **Delete a Test Access Session:** This deletes an existing test access session. Any pre-existing cross-connections that were affected by the test access session are restored.
- **View Existing Test Access Sessions:** This reports on one or more existing test access sessions.

For more information about the **Fault > Analysis > Test Access** command and test access wizard, refer to the online help available with WaveStar CIT.



Reports

- Introduction** The WaveStar BandWidth Manager system provides the following reports:
- Equipment Lists
 - Status Lists
 - Cross-Connection List
 - Reservation List
 - NE Alarm List
 - BLSR Protection Switch List
 - System Bandwidth Utilization (Release 3.1 and later)
- Reports provide information about parameters for a range of equipment. For example, a report may show the parameters for all the transmission ports on a shelf.
- Equipment Lists** The Equipment Lists reports show the current state of provisionable parameters for shelves, circuit packs, ports, and tributaries. The following commands are used to obtain Equipment Lists reports:
- **Reports > Equipment Lists > Shelf...**
 - **Reports > Equipment Lists > Pack...**
 - **Reports > Equipment Lists > Port...**
 - **Reports > Equipment Lists > Trib...**
- For more information about these reports, refer to the online help available with the WaveStar CIT.
- Status Lists** The Status Lists reports show status information (for example, alarms, states, and fault information) for shelves, circuit packs, and ports. The following commands are used to obtain Status Lists reports:
- **Reports > Status Lists > Shelf...**
 - **Reports > Status Lists > Pack...**
 - **Reports > Status Lists > Port...**
- For more information about these reports, refer to the online help available with the WaveStar CIT.

- Cross-Connection List** The Cross-Connection List report shows the cross-connections on a shelf, circuit pack, port, port protection group, or ring. The **Reports > Cross > Connection List...** command is used to obtain a Cross-Connection List report. For more information, refer to the online help available with the WaveStar CIT.
- NE Alarm List** The NE Alarm List report shows detailed information about the current alarms on the network element. The **Reports > NE Alarm List...** command is used to obtain an NE Alarm List report. For more information, refer to the online help available with the WaveStar CIT.
- BLSR Protection Switch List** The BLSR Protection Switch List report shows the BLSR protection switches on a shelf. The **Reports > BLSR Protection Switch List** command is used to obtain a BLSR Protection Switch List report. For more information, refer to the online help available with the WaveStar CIT.
- System Bandwidth Utilization** The System Bandwidth Utilization report shows how the SWIF circuit pack capacity is used for each shelf and the remaining available bandwidth. The **Reports > System Bandwidth Utilization...** command is used to obtain a System Bandwidth Utilization report. For more information, refer to the online help available with the WaveStar CIT.



Logs

Introduction The WaveStar BandWidth Manager system maintains the following activity logs:

- NE Alarm Log
- NE Protection Switch Activity Log
- NE User Log
- NE Security Log (Release 3.1 and later)
- NE Notification Log

Logs are used to display history data that is maintained in the network element (NE) database.

NE Alarm Log The NE Alarm Log shows the last 1024 alarm notifications at the network element. The **Reports > NE Alarm Log...** command is used to obtain an NE Alarm Log. For more information, refer to the online help available with the WaveStar CIT.

NE Protection Switch Activity Log The NE Protection Switch Activity Log shows a list of the previous manual and automatic protection switches. The **Reports > NE Protection Switch Activity Log...** command is used to obtain an NE Protection Switch Activity Log. For more information, refer to the online help available with the WaveStar CIT.

NE User Log The NE User Log shows a list of the previous executed commands. The **Reports > NE User Log...** command is used to obtain an NE User Log. For more information, refer to the online help available with the WaveStar CIT.

NE Security Log The NE Security Log shows a list of all logins and logouts. The **Reports > NE Security Log...** command is used to obtain an NE Security Log. For more information, refer to the online help available with the WaveStar CIT.

NE Notification Log The NE Notification Log shows a list of all changes (manual and automatic) to the database. The **Reports > NE Notification Log...** command is used to obtain an NE Notification Log. For more information, refer to the online help available with the WaveStar CIT.



Summary

Introduction	This chapter defines the maintenance philosophy and describes the features available to monitor and maintain the WaveStar BandWidth Manager system.
Maintenance philosophy	The WaveStar BandWidth Manager system allows operation and maintenance of network elements in a network from a centralized location. The WaveStar BandWidth Manager system continuously monitors equipment and incoming signals, and reports any current or potential troubles. This enables the user to take the appropriate corrective action. The WaveStar BandWidth Manager system supports proactive and reactive system maintenance.
Maintenance signals	When the WaveStar BandWidth Manager system detects failure conditions on transmission signals, maintenance signals are inserted into the transmission signals in the upstream or downstream direction to notify other network elements. The WaveStar BandWidth Manager system supports the following maintenance signals: • Alarm indication signals (AIS) • Remote defect indication (RDI) signals • Remote error indication (REI) signals • Path trace signals • Path unequipped signals • DS3 idle signals • Payload defect indicator signals
Fault detection, isolation, and reporting	The WaveStar BandWidth Manager system continuously monitors its internal condition and incoming signals according to the state of the tributaries and ports. When a failure is detected, the WaveStar BandWidth Manager system employs automatic diagnostics to isolate the failed circuit pack or signal. All failures detected and isolated by the WaveStar BandWidth Manager system are stored and made available to be reported, on demand, through the WaveStar CIT.

Protection switching	The WaveStar BandWidth Manager system supports the following types of protection switching: • 1+1 control complex protection switching • 4-fiber bidirectional line-switched ring/multiplex section shared protection ring protection switching (open and closed rings) • 2-fiber bidirectional line-switched ring/multiplex section shared protection ring protection switching • Unidirectional path-switched ring/Sub-network connection protection switching (Release 3.1 and later) • 1+1 optical port protection switching • 1xN DS3EC1/8 port unit protection switching • 1xN STM1E/4 port unit protection switching (Release 3.1 and later) • Dual ring interworking (DRI) protection switching (Release 4 and later) • 1+1 equipment protection switching • Synchronization reference protection switching • Synchronization mode protection switching
Loopbacks	The WaveStar BandWidth Manager system provides the following types of loopbacks: • Cross-connect loopbacks • Nearside facility loopbacks (Release 4 and later) • Optical loopbacks
Tests	The WaveStar BandWidth Manager system provides the following self tests: • LED test • Office alarms test
Test access	The WaveStar BandWidth Manager system provides test access cross-connections that allow circuits to be monitored and split by external testing systems. This aids in turning up facilities and in sectionalizing faults in existing service circuits. Test access allows circuit quality to be tested at a single network element or over all of an end-to-end circuit that is routed through multiple network elements.

In Release 3.1 and later releases, test access cross-connections can be established at the STS-1/VC-3, STS-3/VC-4, STS-12/VC-4-4c, and STS-48/VC-4-16c rates. DS3, EC-1, OC-3/STM-1, OC-12/STM-4, or OC-48/STM-16 ports support test access tributaries for connection to an external testing system.

In Release 3 and earlier releases, test access cross-connections can be established between STS-1 tributaries and DS3 ports that are connected to an external testing system. The DS3 ports are designated as test access tributaries.

Reports The WaveStar BandWidth Manager system provides the following reports:

- Equipment Lists
- Status Lists
- Cross-Connection List
- Reservation List
- NE Alarm List
- BLSR Protection Switch List
- System Bandwidth Utilization

Reports provide information about parameters for a range of equipment. For example, a report may show the parameters for all the transmission ports on a shelf.

Logs The WaveStar BandWidth Manager system maintains the following activity logs:

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- NE Protection Switch Activity Log
- NE User Log
- NE Security Log (Release 3.1 and later)
- NE Notification Log

Logs are used to display history data that is maintained in the network element database.



Part III

Trouble-Clearing Tasks

Task 500: Alarms and Applicable Trouble-Clearing Task(s)

Probable Cause	Description	Trouble Clearing Task ID
AIS	Alarm Indication Signal – DS3	Not Applicable
AIS-L	Alarm Indication Signal – Line	Not Applicable
AIS-P	Alarm Indication Signal – Path	
ALS	Automatic Laser Shutdown	T 572
APSB	Protection Switch Byte Failure	
APSC	BLSR Inconsistent APS Codes	T 524
APSCM	APS Channel mismatch	
APSFOP	APS Failure of Protocol	Not Applicable
APSPROV	BLSR Improper APS Codes	T 525
CKTAUDSNP	Ring Ckt Validation Suspended	
CKTAUDUD	Ring Circuit Audit Suspended	
DUPL-RNG	Duplicate Ring Node	T 529
EOC	DCC Sect Disabled- Unavailable	T 517
EOC	DCC Sect Failure	T 514
EOC	DCC Type Mismatch	
EOC	LinkID Sect Mismatch	
EOC	User-Network Side Sect Failure	T 516
FEPLF	Far-End Protection Line Failure	
GFPLOF	VCG - Loss of Frame Delineation	
HLDOVRSYNC	System Clock Holdover	T 519
ISD	DS3 Idle Signal	
LANANM	Ethernet Port - Auto Negotiation Mismatch	
LANLOS	Ethernet Port - Loss of Signal	
LOA	VCG - Loss of Alignment	

Probable Cause	Description	Trouble Clearing Task ID
LOF	DS3 Loss of Frame	T 545
LOF	Loss of Frame	T545
LOM	VCG - Loss of Multiframe	
LOP-P	Loss of Pointer – Path	T512
LOS	DS3 Loss of Signal	T 543
LOS	Loss of Signal	T543
MAN	Constituent Signal Rate Change	
NID-CONFL	Node ID Mismatch	T 528
OSILINKERR	DCC Line Disabled- Unavailable	T 517
OSILINKERR	DCC Line Failure	T 515
OSILINKERR	LinkID Line Mismatch	
OSILINKERR	User-Network Side Line Failure	T 516
OVRDSW	Ring Prot Switching Suspended	
PAINTGRT	Path Integrity Failure	T 511
PDI-P	STS Payload Defect Indicator	
PSA	Path Switch Active	
PSF	Path Switch Failure	
PLM-P	STS Payload Label Mismatch	T 539
RFI-L	Remote Failure Indication – Line	Not Applicable
RFI-P	Remote Failure Indication – Path	
RNG-CERR	East/West - Cable Error	
RNG-DSCVY	Ring Discovery In Progress	Not Applicable
RNG-INITC	Ring Startup in Progress	
RNG-OPEN	Ring Open	
RNG-PREEMPT	Extra Traffic Pre-empted	
RNG-SQUELCH	Ring Traffic Squelched	T 527
RNG-UR	Unknown Ring Type	
RINC-INC	Ring Incomplete	T 531

Probable Cause	Description	Trouble Clearing Task ID
BLSR-DKB	Ring-Default K-bytes	T 526
SQMAP-CONFL	Local Squelch Map Conflict	
SQMAP-INCST	Ring Squelch Map Inconsistent	
SRM-P	Signal Rate Mismatch – Path	
SYNC	Line Sync Reference Failure	T 570
SYNC	Sync Reference Failure	T 513
STQLC	System Timing Quality Level Change	
T-BERL	DS3 Bit Error Rate	
T-BERL	Excessive Bit Error Rate-Line	
T-BERL	Bit Error Rate – Signal Degrade Line	T 521
T-BERP	Bit Error Rate/ Signal Degrade – Path	
T-BERP	Excessive Bit Error Rate – Path	
UNEQ-P	STS Path Unequipped	
VCGSF	VCG - Signal Fail	
ALS	Automatic Laser Shutdown	T 572
EQPT	Circuit Pack Failure	
	ADJCTL/DCC	T 546
	CTLEI	T 554
	CTLMEM	T 553
	DS3EC1/8	T 547
	OC3STM1	T 550
	OC12STM4	T 549
	OC48STM64	T 548
	OC192STM64	T 564
	Pointer Processor	T 567
	SWITCH576	T 559
	SWITCH768	T 563
	SWITCHDS3EC1/8	T 562

Probable Cause	Description	Trouble Clearing Task ID
	SYS50DM	T 552
	TMGSTRAT3	T 560
INIT-1	Startup/ Initialization Complete	
INT	Fan Failure	T 504
PRCDRERR	Circuit Pack Invalid	T 535
PWR	Power/Fuse Failure	T 506
RCVRY	System in Restoration Mode	
REPLUNITMISS	Circuit Pack Unequipped/ Missing	T 533
REPLUNITMISS	Mate Circuit Pack Unequipped	T 534
SCMMA	System in Maintenance Condition	
SYSBOOT	System Restart	
TSA	Alarm Test	Not Applicable
UPGRDF	Upgrade Failed	
T-{modifiertype}	Threshold Crossing Alert – DS3 Incoming	
T-{modifier type}	Threshold Crossing Alert – DS3 Outgoing	
T-{modifiertype}	Threshold Crossing Alert – Path Layer	
T-{modifiertype}	Threshold Crossing Alert – Physical Layer	
T-{modifiertype}	Threshold Crossing Alert –Section/Line or RS/MS layer	
AUTORESET	Autonomous Reset	Not Applicable
BKUPMEMO	Non-Volatile Memory Usage	Not Applicable
DATAFLT	Memory Mismatch	Not Applicable
PROGFLT	File Error	Not Applicable
PROCROVLD-1	Resource Usage	Not Applicable
SFT	Software Error	Not Applicable

Probable Cause	Description	Trouble Clearing Task ID
WKGMEM	Out of Memory Error	
MISC	Miscellaneous Discretes	T 507

Task 501: Clear ‘Fan Failure’ in a WaveStar BandWidth Manager Switch Shelf

Purpose The *Fan Failure* alarm can occur as the result of several factors. Use this procedure to determine the exact cause, replace the failed hardware component, and thus clear this alarm.

Required equipment The following items are required before beginning this procedure.

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Phillips head screwdriver (medium size).

Related information For related information, see Operations Task 207: *Replace Fan Filter Every Six Months* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1 and the following sections in this manual:

- *Chapter 2, Maintenance and Trouble-Clearing*
- *Task 505: Clear ‘Power/Fuse Failure’ for a WaveStar Bandwidth Manager Shelf*
- *Task 709: Replace Fan Unit*

Before you begin Prior to beginning this task, you must:

1. Have access to a new (uninstalled) fan unit.
2. Have quick access to a new (uninstalled) fan filter.
3. Have access to a new umbilical cable.
4. Have access to a new (uninstalled) User Panel.
5. Have a WaveStar CIT that is connected to the subject network element (NE).
6. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

1. Remove the front shelf cover.
2. When activated, turn-off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel.

Task Complete the following steps to clear a ‘*Fan Failure*’ alarm.

-
- 1** From the WaveStar CIT *System View*, left-click on the **Alarm List** button.

Important! Under the column header that is labeled *Description*, you will see the names for each active alarm, their associated Alarm Level, Affect on Service, and so forth. Some alarms have multiple probable causes and may have more than one Alarm Level; for example, either an MJ or an MN.

- 2** Under the column header *Description* and for the item *Fan Failure*, “Is the Alarm Level = MJ?”

If...	Then...
YES,	go to Step 7. <i>When the Alarm Level = MJ, either: (a) the fan unit internal controller has failed, or (b) multiple fans have failed – resulting in the remaining fans operating in high-speed mode.</i>
NO,	the Alarm Level must = MN. Continue with Step 3.

- 3** Under the column header *Description*, “Is the alarm *Power/Fuse Failure* included in the list?”

If...	Then...
YES,	refer to the Task <i>Clear Power/Fuse Failure for a WaveStar Bandwidth Manager Switch Shelf</i> . Reference: Task 505: Clear Power/Fuse Failure
NO,	continue.

-
- 4 On the subject NE Fan Unit, visually determine whether the LED *Filter Alarm* is lighted.

If...	Then...
YES,	go to Step 17.
NO,	the LED <i>Fail</i> must be lighted. Continue with the next step. Important! The probable causes are: (a) single fan failure – with other fans operating in high-speed mode, or (b) the control circuit that is located within the fan unit.

-
- 5 On the faceplate of the fan unit, “Is the fan unit circuit breaker -48 V (A) or -48 V (B) tripped?”

If...	Then...
YES,	reset the tripped circuit breaker.
NO,	go to Step 7.

-
- 6 Did the 3-amp circuit breaker, which is located on the fan unit, trip again?

If...	Then...
YES,	go to Step 7.
NO,	<i>STOP! End of Task.</i>

-
- 7 Replace the fan unit.

Reference: Task 709: Replace Fan Unit

-
- 8 Wait 30 seconds and then, at the WaveStar CIT, left-click on the **Update Alarms** button.

-
- 9** Under the column header *Description* and for the item *Fan Failure*, “Did the Alarm Level = MJ/MN reoccur?”

If...	Then...
YES,	continue with Step 10.
NO,	<i>STOP! End of Task.</i>

-
- 10** Remove the new fan unit, and insert the original fan unit.

Reference: Task 709: Replace Fan Unit

-
- 11** Disconnect and replace the umbilical cable that connects to the rear of the User Panel.

-
- 12** Wait 30 seconds and then, at the WaveStar CIT, left-click on the **Update Alarms** button.

-
- 13** Under the column header *Description* and for the item *Fan Failure*, “Did the Alarm Level = MJ/MN reoccur?”

If...	Then...
YES,	continue with Step 14.
NO,	<i>STOP! End of Task.</i>

-
- 14** Disconnect and remove the newly installed umbilical cable and replace with the original cable.

-
- 15** Disconnect and replace the User Panel.

Reference: Remove an Existing User Panel and Replace with a New User Panel

-
- 16** *STOP! End of Task.*

-
- 17** Remove the existing filter, and insert a new filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 18** Press the **Filter Alarm Reset** button (which is located on the front of the fan unit).
-

- 19** Wait 6 minutes and then, at the WaveStar CIT, left-click on the **Update Alarms** button.
-

- 20** Under the column header *Description*, “Did the alarm *Fan Failure* reoccur?”

If...	Then...
YES,	continue with Step 21.
NO,	<i>STOP! End of Task.</i>

- 21** If the original filter is relatively clean, then remove the new filter, and reinsert the original filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 22** Go to Step 7.

END OF STEPS



SE 501-1: Remove an Existing User Panel and Replace with a New User Panel

Task Perform the following steps to replace a defective User Panel in a WaveStar BandWidth Manager *Switch Shelf*.

- 1 Take the Phillips head screwdriver and loosen the two screws that function to attach the User Panel to the shelf faceplate.
- 2 Gently, pull the User Panel forward until the umbilical cable is accessible and can be disconnected manually from the User Panel.
- 3 While being careful to maintain the correct orientation (top side as up), partially insert the new User Panel into the shelf opening.
- 4 Reconnect the umbilical cable.
- 5 Visually observe the guide pins while completely, but gently, inserting the User Panel.
- 6 Take the Phillips head screwdriver and tighten the two screws that function to reattach the User Panel to the shelf faceplate.
- 7 *STOP! End of Task.*

END OF STEPS



Task 502: Clear ‘Fan Failure’ in a WaveStar BandWidth Manager System Controller Shelf

Purpose The Fan Failure alarm can occur as the result of several factors. Use this procedure to determine the exact cause, replace the failed hardware component, and thus clear this alarm.

Required equipment The following equipment is required to perform this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap.

Related information For related information, see Operations Task 207: *Replace Fan Filter Every Six Months* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1 and the following sections in this manual:

- *Chapter 2, Maintenance and Trouble Clearing*
- *Task 505: Clear ‘Power/Fuse Failure’ for a WaveStar BandWidth Manager*
- *Task 709: Replace Fan Unit*

Before you begin Prior to beginning this task, you must:

1. Have access to a new (uninstalled) fan unit.
2. Have access to a new (uninstalled) fan filter.
3. Have access to a new SWITCH/STS576 circuit pack.
4. Have a WaveStar CIT that is connected to the subject NE.
5. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

1. Remove the front shelf cover.
2. When activated, turn off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel.

Task Complete the following steps to clear a 'Fan Failure' alarm.

- 1 From the WaveStar CIT *System View*, left-click on the **Alarm List** button.

Important! Under the column header that is labeled *Description*, you will see the names for each active alarm, their associated Alarm Level, Affect on Service, and so forth. Some alarms have multiple probable causes and may have more than one Alarm Level; for example, either an MJ or an MN.

- 2 Under the column header *Description* and for the item *Fan Failure*, "Is the Alarm Level = MJ?"

If...	Then...
YES,	go to Step 7. <i>When the Alarm Level = MJ, either: (a) the fan unit internal controller has failed, or (b) multiple fans have failed – resulting in the remaining fans operating in high-speed mode.</i>
NO,	the Alarm Level must = MN; continue with Step 3.

- 3 Under the column header *Description*, "Is the alarm *Power/Fuse Failure* included in the list?"

If...	Then...
YES,	refer to the Task <i>Clear Power/Fuse Failure for a WaveStar BandWidth Manager Shelf</i> . Reference: Task 505: Clear Power/Fuse Failure
NO,	continue.

-
- 4** On the subject NE Fan Unit, visually determine whether the LED *Filter Alarm* is lighted.

If...	Then...
YES,	go to Step 13.
NO,	the LED <i>Fail</i> must be lit. Continue with the next step. Important! The probable causes are: (a) single fan failure – with other fans operating in high-speed mode, or (b) the control circuit that is located within the fan unit.

-
- 5** On the faceplate of the fan unit, “Is the fan unit circuit breaker -48 V (A) or -48 V (B) tripped?”

If...	Then...
YES,	reset the tripped circuit breaker.
NO,	go to Step 7.

-
- 6** Did the circuit breaker trip again?

If...	Then...
YES,	go to Step 7.
NO,	<i>STOP! End of Task.</i>

-
- 7** Replace the fan unit.

Reference: Task 709: Replace Fan Unit

-
- 8** Wait 30 seconds and then, at the WaveStar CIT, left-click on the **Update Alarms** button.

-
- 9 Under the column header *Description* and for the item *Fan Failure*, “Did the Alarm Level = MJ/MN reoccur?”

If...	Then...
YES,	continue with Step 10.
NO,	<i>STOP! End of Task.</i>

-
- 10 Remove the new fan unit, and insert the original fan unit.

Reference: Task 709: Replace Fan Unit

-
- 11 Disconnect and replace the User Panel.

Reference: Remove an Existing User Panel and Replace with a New User Panel

-
- 12 *STOP! End of Task.*

-
- 13 Remove the existing filter, and insert a new filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

-
- 14 Press the **Filter Alarm Reset** button (which is located on the front of the fan unit).

-
- 15 Wait 6 minutes and then, at the WaveStar CIT, left-click on the **Update Alarms** button.

-
- 16 Under the column header *Description*, “Did the alarm *Fan Failure* reoccur?”

If...	Then...
YES,	continue with Step 17.
NO	<i>STOP! End of Task.</i>

-
- 17** If the original filter is relatively clean, then remove the new filter, and reinsert the original filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 18** Go to Step 7.

END OF STEPS



SE 502-1: Remove an Existing User Panel and Replace with a New User Panel

Task Perform the following steps to replace a defective User Panel in a WaveStar BandWidth Manager *System Controller Shelf*.

- 1 Take the Phillips head screwdriver, and loosen the two screws that function to attach the User Panel to the shelf faceplate.
- 2 Gently, pull the User Panel forward until it is completely out of the shelf.
- 3 While being careful to maintain the correct orientation (top side as up), partially insert the new User Panel into the shelf opening.
- 4 Visually observe the guide pins while completely, but gently, inserting the User Panel.
- 5 Take the Phillips head screwdriver and tighten the two screws that function to reattach the User Panel to the shelf faceplate.
- 6 *STOP! End of Task.*

END OF STEPS



Task 503: Clear 'Fan Failure' in a WaveStar BandWidth Manager I/O Shelf

Purpose The Fan Failure alarm can occur as the result of several factors. Use this procedure to determine the exact cause, replace the failed hardware component, and thus clear this alarm.

Required equipment The following equipment is required to perform this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand these warnings and precautions prior to performing this task.



CAUTION

Removal of the active SWITCH/STS576 circuit pack will result in a service interruption.

Related information For related information, see Operations Task 207: *Replace Fan Filter Every Six Months* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1 and the following sections in this manual:

- *Chapter 2, Maintenance and Trouble-Clearing*
- *Task 505: Clear 'Power/Fuse Failure' for a WaveStar Bandwidth Manager Shelf*
- *Task 709: Replace Fan Unit*

Before you begin Prior to beginning this task, you must:

1. Have quick access to a new (uninstalled) fan unit.
2. Have quick access to a new (uninstalled) fan filter.
3. Have quick access to a new SWITCH/STS576 circuit pack.
4. Have a WaveStar CIT that is connected to the subject NE.
5. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

1. Remove the front shelf cover.
2. When activated, turn off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel.

Task Complete the following steps to clear a 'Fan Failure' alarm.

- 1 From the WaveStar CIT *System View*, left-click on the **Alarm List** button.

Important! Under the column header that is labeled *Description*, you will see the names for each active alarm, their associated Alarm Level, Affect on Service, and so forth. Some alarms have multiple probable causes and may have more than one Alarm Level; for example, either an MJ or MN.

- 2 Under the column header *Description* and for the item *Fan Failure*, "Is the Alarm Level = MJ?"

If...	Then...
YES,	go to Step 7. Important! When the Alarm Level = MJ, either: (a) the fan unit internal controller has failed, or (b) multiple fans have failed – resulting in the remaining fans operating in high-speed mode.
NO,	the Alarm Level must = MN. Continue with Step 3.

- 3 Under the column header *Description*, "Is the alarm *Power/Fuse Failure* included in the list?"

If...	Then...
YES,	refer to the Task <i>Clear Power/Fuse Failure for a WaveStar BandWidth Manager Shelf</i> . Reference: Task 505: Clear Power/Fuse Failure

If...	Then...
NO,	continue with Step 4.

- 4 On the subject NE Fan Unit, visually determine whether the LED *Filter Alarm* is lighted.

If...	Then...
YES,	go to Step 14.
NO,	the LED <i>Fail</i> must be lit. Continue with Step 5. Important! The probable causes are: (a) single fan failure – with other fans operating in high-speed mode, or (b) the control circuit that is located within the fan unit.

- 5 On the faceplate of the fan unit, “Is the fan unit circuit breaker -48 V (A) or -48 V (B) tripped?”

If...	Then...
YES,	reset the tripped circuit breaker.
NO,	go to Step 7.

- 6 Did the circuit breaker trip again?

If...	Then...
YES,	go to Step 7.
NO,	<i>STOP! End of Task.</i>

- 7 Is this alarm for the upper Fan Unit?

If...	Then...
YES,	go to Step 9.
NO,	continue.

-
- 8** Replace the lower Fan Unit, and continue with Step 10.

Reference: Task 709: Replace Fan Unit

- 9** Replace the upper Fan Unit, and continue with Step 10.

Reference: Task 709: Replace Fan Unit

- 10** Wait 30 seconds and then, at the WaveStar CIT, left-click on the **Update Alarms** button.
-

- 11** Under the column header *Description* and for the item *Fan Failure*, “Did the Alarm Level = MJ/MN reoccur?”

If...	Then...
YES,	continue with Step 12.
NO,	<i>STOP! End of Task.</i>

- 12** Remove the new fan unit, and insert the original fan unit.

Reference: Task 709: Replace Fan Unit

- 13** Determine which of the two SWITCH/STS576 circuit packs is active and which is in hot-standby.

Important! The on-site craft can visually determine status (active versus hot-standby) by checking the state of the green LED on the circuit pack faceplate. The circuit pack that is currently handling traffic (active) will have a steady-green lighted LED. The alternate circuit pack’s LED (the one in hot-standby) will not be lighted.

Alternately, and at the WaveStar CIT, status of the SWITCH/ STS576 circuit packs can be determined by displaying the shelf and right-clicking on the drop-down *view details* for the subject circuit pack.

14 Unlatch, and only partially pull from the slot, the SWITCH/STS576 circuit pack whose LED is NOT lighted steady-green.

15 Wait 30 seconds and after that lapse of time, at the WaveStar CIT, left-click on the button **Update Alarms**.

16 Under the column header *Description* and for the item *Fan Failure*, “Did the Alarm Level = MJ/MN clear?”

If...	Then...
YES,	continue with Step 24.
NO,	continue with Step 17.

17 Reinsert the SWITCH/STS576 circuit pack that is partially removed. Wait 30 seconds for the circuit pack to reinitialize.

18 At the WaveStar CIT, and from the System View, select *Fault-Protection Switching*.

19 Left-click on the tab labeled *Protection*.

20 In the root directory, scroll down and left-click on the item that is labeled *1+1 Equipment ests576grp*.

21

1. For the box that is labeled *Switch Type*, left-click on the drop-down arrow and (as appropriate) select the entry *Force to Side 0* or *Force to Side 1*.
2. Then, left-click on the button that is labeled **Apply**.

Important! *In the Protection Group window, you want to cause the side whose status is hot-standby to become the active side.*

22

1. The on-site craft should verify that the switch occurred by observing the status of the green LED on each of the two SWITCH/STS576 circuit packs.
 2. Unlatch and fully remove the alternate SWITCH/STS576 circuit pack (whose LED is NOT lighted steady-green).
 3. Insert a new SWITCH/STS576 circuit pack, and fully close its latch.
-

23 *STOP! End of Task.*

24 For the SWITCH/STS576 circuit pack that is partially removed, finish removing it and replace it with a new SWITCH/STS576 circuit pack.

25 *STOP! End of Task.*

26 Remove the existing filter, and insert a new filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

27 Press the **Filter Alarm Reset** button (which is located on the front of the lower fan unit).

28 Wait 6 minutes and then, at the WaveStar CIT, left-click on the **Update Alarms** button.

29 Under the column header *Description*, “Did the alarm *Fan Failure* reoccur?”

If...	Then...
YES,	continue with Step 30.
NO,	<i>STOP! End of Task.</i>

-
- 30** If the original filter is relatively clean, then remove the new filter, and reinsert the original filter.

Reference: Task 207 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 31** Go to Step 8.

Task 505: Clear Power/Fuse Failure

Purpose The Power/Fuse Failure alarm can occur as the result of several factors. Use this procedure to determine the exact cause, reset circuit breakers, replace the failed hardware component, and thus clear this alarm.

Required equipment The following equipment is required to perform this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Digital volt meter (DVM) or equivalent.

Related information For related information, see the following sections in this manual:

- *Chapter 2, Maintenance and Trouble-Clearing*
- *Task 706: Replace Power Filter*
- *Task 710: Replace the Low Voltage Protection Unit*

Before you begin Before you begin this task, you must:

1. If equipped with a low-voltage protection unit (LVPU), then have access to a new LVPU
2. Have a WaveStar CIT that is connected to the subject NE
3. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.

Do the following as appropriate:

1. Remove the front shelf cover
2. When activated, turn-off the audible alarm by pressing the **ACO** button, which is located on the front of the user panel

Task Complete the following steps to clear a Power/Fuse Failure for a WaveStar BandWidth Manager shelf.

-
- 1 From the WaveStar CIT *System View*, left-click on **Alarm List** button.

Important! Under the column header that is labeled *Description*, you will see the names for each active alarm, the associated alarm level, affect on service, and so forth. Some

alarms have multiple probable causes and may have more than one alarm level; for example, either an MJ or an MN.

2

If...	Then...
<i>Power/Fuse Alarm</i> indicates CR and CR LED on user panel is red,	both power feeds (A and B) of the shelf have been lost. Proceed to Step 3.
<i>Power/Fuse Alarm</i> indicates MN and MN LED on user panel is yellow,	a single power feed (A or B) of the shelf has been lost. Proceed to Step 6.

3 Visually examine both the A and B feed circuit breakers.

4

If...	Then...
Both the A and B feed circuit breakers have tripped,	proceed to Step 5.
The A and B feed circuit breakers have not tripped,	both the LVPUs have activated. Refer this issue to your next higher level of technical support. <i>STOP! End of Task.</i>

5

If...	Then...
Just prior to this alarm, the local craft manually inserted a circuit pack,	the on-site craft should use a light and check for bent pins on the metral connector. <i>STOP! End of Task</i> Reference: Metral Press-Fit Repair Kit

If...	Then...
Just prior to this alarm, the local craft did not manually insert a circuit pack,	escalate to the next higher level of technical support. <i>STOP! End of Task.</i>

6

If...	Then...
Alarm list description field indicates a failure on the A feed,	examine the circuit breaker for the A feed and determine if it has tripped.
Alarm list description field indicates a failure on the B feed,	examine the circuit breaker for the B feed and determine if it has tripped.

7

If...	Then...
Circuit breaker A has tripped,	execute Step 8 and Step 9 for circuit breaker A.
Circuit breaker B has tripped, Neither the A or B circuit breaker has tripped,	execute Step 8 and Step 9 for circuit breaker B. a problem exists with the physical connection at either the input or output of the power filter. Proceed to Step 10 and execute the remaining steps for the A or B feed as appropriate.

8 Reset the circuit breaker (A or B as appropriate).

9

If...	Then...
The circuit breaker trips a second time,	replace the appropriate power filter (A or B). <i>STOP! End of Task.</i> Reference: Task 706
The circuit breaker does not trip a second time,	<i>STOP! End of Task.</i>

10 Observe the LED of the appropriate (A or B) LVPU.

11

If...	Then...
The LED of the LVPU is off,	proceed to Step 12.
The LED of the LVPU is on (illuminated),	proceed to Step 14.

12 Using a DVM, measure the input feed of the appropriate (A or B) LVPU.

13

If...	Then...
The input feed of the LVPU is less than -43 V DC,	The LVPU for the appropriate feed (A or B) is functioning normally. <i>STOP! End of Task</i>
The input feed of the LVPU is greater than -43 V DC,	proceed to Step 17.

14 Check for problems with the physical connection at either the input or output of the appropriate (A or B) power filter. As necessary, tighten all loose connections.

15 From the WaveStar CIT, left-click on the **Update Alarms** button.

16

If...	Then...
The Alarm List description field indicates a failure on the appropriate (A or B) feed,	proceed to Step 17.
The Alarm List description field does not indicate a failure on the appropriate (A or B) feed,	<i>STOP! End of Task.</i>

17 Replace the defective LVPU for the appropriate (A of B) feed.

Reference:

18 *STOP! End of Task.*

END OF STEPS



Task 509: Address ‘Alarm Test,’
‘Auto Disconnected Cross-Connect,’
‘Autonomous Reset,’
‘BLSR Traffic Squelched,’
‘Extra Traffic Preempted,’
‘File Error HP Unequipped,’
‘Memory Mismatch,’
‘Non-Volatile Memory Usage,’
‘Out of Memory,’
‘Path Switch Active,’
‘Path Switch Inhibited,’
‘Resource Usage,’
‘Ring Discovery in Progress,’
‘Ring Start-up in Progress,’
‘Software Error,’
‘System in Restoration Mode,’
‘System Restart,’
‘System Start-up Complete,’

Purpose Use this procedure to determine the correct action to take in order to address the listed alarms:

No user action required

Complete the following steps to address the identified alarms.

1

If the NE Alarm is...	Then the Craft Response is...
— Alarm Test — Auto Disconnected Cross-Connect — Autonomous Reset — BLSR Traffic Squelched — Extra Traffic Preempted — File error — HO Unequipped — Memory Mismatch — Non-Volatile Memory Usage — Out of Memory — Path Switch Active — Path Switch Inhibited — Resource Usage — Ring Discovery in Progress — Ring Traffic Preempted — Software Error — System in Restoration Mode — System Startup Complete — System Restart	Take NO action! Important! The system will automatically correct for this error condition and will, after a brief time interval, restore itself to normal processing activities. If this does not occur, contact your next level of technical support.

END OF STEPS

Task 510: Investigate Cause When 'ABN' LED is Lighted

Purpose	The ABN LED serves to visually indicate, to the on-site craft person, any manually caused abnormal condition. These conditions could include any maintenance or provisioning activity that could affect service or potentially mask the reporting of service affecting failures. <i>No user/craft initiated activities are required to clear a lighted ABN LED.</i> This LED will extinguish whenever the activity which resulted in lighting it is finished.
Required privilege code(s)	The user must have a privilege code of M1 and P3 (or higher) to perform this task.
Required equipment	The following list is the minimum set of required equipment: • WaveStar Craft Interface Terminal (CIT) • Wrist strap
Safety precautions	To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager product, it is imperative to review and understand these warnings and precautions prior to performing this task.
	CAUTION <i>Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar CIT to prevent electrostatic discharge damage to sensitive components.</i>
Related information	For related information, see Chapter 2, <i>Maintenance and Trouble-Clearing</i> in this manual.
Assumptions	This task starts with the assumption that you are already physically located at a node that displays a lighted ABN LED.
Before you begin	Prior to performing this task, the user must: 1. Connect the WaveStar CIT to the local area network (LAN) of the subject NE/ring. 2. Have a valid login on both the WaveStar CIT and all subject NE(s) within the ring.

3. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.

Task If desired, you may complete the following steps to investigate which user-initiated activity is responsible for lighting the ABN LED.

Important! The conditions that result in lighting the ABN LED are completely independent from the generation of alarms (CR, MJ, or MN). If an alarm exists simultaneously when the ABN LED is lighted, then the alarm should be treated independently of the ABN.

1 Any of the following conditions will result in lighting the ABN LED:

- During any lock-out (for example, *Fault-Timing/Sync Protection Switch-System Timing Reference Switch-Lockout*)
 - During any forced switch (for example, *Fault-Timing/Sync Protection Switch-System Timing Reference Switch-Forced Switch*)
 - During any manual switch that is revertive
 - While the “Protection Line” is being accessed
 - While a *Fault-Analysis-Cross-Connect Loopback* is in place (both hardware loopbacks and software loopbacks)
 - While a Fault-CP: Remove From Service command is active.
-

2 At the WaveStar CIT and from the *System View* window select:

Reports-NE Protection Switching Activity Log

or

Reports-NE User Log

or

Reports-NE Notification Log

until one of the items listed in Step 1 is identified.

END OF STEPS



Task 513: Clear ‘T1 Synchronization Reference Failure’ or ‘E1 Synchronization Reference Failure’

Purpose Use this procedure to clear the alarm *T1 Synchronization Reference Failure* or *E1 Synchronization Reference Failure*.

Before you begin Before you begin this task you must:

1. Have a WaveStar CIT that is connected to the subject network element (NE).
2. Log in to the WaveStar CIT application.
3. Log in to the subject WaveStar NE.

Required equipment The following list contains the minimum equipment requirements in order to successfully complete this procedure:

- WaveStar CIT
- Wrist strap

Task Complete the following steps to clear the alarm *T1 Synchronization Reference Failure* or *E1 Synchronization Reference Failure*.

1 From the **System View** screen, select/click on the button labeled **Alarm List**.

2 Does the Alarm List include *T1 Synchronization Reference Failure* or *E1 Synchronization Failure*?

If...	Then...
NO,	STOP! End of Task.
YES,	continue.

3

If the BITS clock is...	Then the problem exists within the...
alarmed,	external synchronization reference. Reference: SE 513-1: External Synchronization Reference is Showing an Alarm
NOT alarmed,	cabling/connectors, and is located somewhere between the external synchronization reference and the NE. Reference: SE 513-2: Locate and Correct the Problem Dealing with the Cable That Connects the NE to It's External Synchronization Reference

4 Wait 2 minutes for the alarm to clear.

5 Click on the button **Update Alarms**, and continue with Step 2.

END OF STEPS

SE 513-1: External Synchronization Reference is Showing an Alarm

Perform the steps below to correct the problem within the synchronization reference and/or clear the *Synchronization Reference Failure* alarm.

- 1 Replace the defective (and alarmed) circuit pack within the external synchronization reference.

Important! Refer to the appropriate vendor documentation for that particular product.

2

If the external synchronization reference was...	Then...
repaired,	the NE's alarm should clear. <i>STOP! End of Supporting Element.</i>
NOT immediately repaired,	as an option, the craft may choose to provision the NE as "not connected." What this means is that the NE will ignore this input and clear this alarm. From the CIT <i>System View</i> screen, select Configuration-Timing/Sync-System Timing . And, under the box labeled Cable-1 Timing Collection Source : select the option Not Connected . Important! Whenever the defective circuit pack (within the external synchronization reference) is replaced, the craft should remember to provision the shelf (by removing the Not Connected selection) to again receive the external synchronization reference.

END OF STEPS

SE 513-2: Locate and Correct the Problem Dealing with the Cable That Connects the NE to It's External Synchronization Reference

Perform the steps below to (a) locate and correct the external synchronization reference cable problem and (b) re-establish the signal from the external synchronization reference to the NE.

-
1 Go to the rear of the NE and identify the connector that receives, as its input, the external synchronization reference.
.....
- 2** Verify that the cable is properly mated with its connector.
.....
- 3** Trace the cable all of the way back to the external synchronization reference and verify that the cable and all intermediate connections are correct and in good condition. If the cable has been disconnected (anywhere along the route), then reconnect. If the cable (or any connector) is damaged, then replace as necessary.

.....
E N D O F S T E P S
.....



Task 514: Clear ‘DCC Section Failure,’ or Clear ‘DCCRSeCT Failure, or Clear ‘DCCMSeCTion Failure’

Purpose Use this task whenever the NE Alarm List displays either:

- *DCC Section Failure* (SONET alarm), or
- *DCC RSeCTion Failure* (SDH alarm).
- *DCC MSeCTion Failure* (SDH alarm)

Before you begin For 1+1 applications that are currently using a DCC channel, if the decision is made to enable/disable that DCC channel, then this alarm will appear (momentarily) while one NE has the DCC channel disabled and the other is pending that provisioning change. Once the DCC channel is disabled, at both NEs, this alarm will automatically clear. Failure of an incoming DCC channel is usually associated with provisioning or hardware failures at the source of the incoming signal or with other troubles involving the incoming signal.

Important! Alarms should (normally) be resolved preceding from the higher level to the lower level. Thus when solving alarms with this strategy, a *DCC Section Failure*, *DCC RSeCTion Failure*, or *DCC MSeCTion Failure* may be cleared as the result of clearing a higher level alarm.

Required equipment The WaveStar CIT Interface Terminal (CIT) is the minimum equipment required to complete this task.

Important considerations This alarm can occur on any of the following types of facilities:

- 1+1
- MS-SPRing
- MS-SPRing with transoceanic protocol
- BLSR.

Trouble-shooting and alarm clearing strategy The craft need only perform one or two primary activities in order to clear a *DCC Section Failure* alarm. These are as follows:

1. Clear all higher level alarms that are associated with the identified AID.

2. If there were not any higher level alarms, or if the *DCC Section Failure* alarm continues, either enable the DCC channel at the neighbor NE or disable the DCC channel at the current NE.

Important! Numbers 1 and 2 (above) will usually result in clearing this alarm. A third option is to reset/replace the near-end and far-end ADJCTL/DCCEI circuit packs.

Task Complete the following steps to clear a *DCC Section/DCC RSection/DCC MSection Failure* alarm.

- 1 From the **Alarm List** identify the AID for the circuit pack/port that is producing this alarm.

- 2 Does the identified AID have other (near-end) accompanying higher level alarms?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 6.

3

If the higher level alarm is...	Then clear the ...
Loss of Signal,	LOS alarm. Reference: Task 543: Clear 'OC192/STM64, OC48/STM16, OC12/STM4, OC3/STM1, STM1E/4, or T3 DS3EC1/8 Loss of Signal'
Loss of Frame,	LOF alarm. Reference: T 545
Excessive Bit Error Rate	EBER alarm. Reference: T 521

- 4 On the *System View* screen, click on the **Update Alarms** button.

-
- 5** Is the *DCC Section/DCC RSection/DCC MSection Failure* still included in the list?

If...	Then...
YES,	continue with Step 6.
NO,	<i>STOP! End of Task</i>

-
- 6** For this near-end NE, verify that the DCC channel provisioning is appropriate for this AID (from Step 1).

Reference: T 305 in the UOG 365-370-109

-
- 7** On the *System View* screen, click on the **Update Alarms** button.

-
- 8** Is the *DCC Section/DCC RSection/DCC MSection Failure* still included in the list?

If...	Then...
YES,	continue with Step 9.
NO,	<i>STOP! End of Task.</i>

-
- 9** From the *System View* screen select:

Administration>OSI Neighbor

-
- 10** From the **OSI Neighbor Map**:

1. Scroll down the directory structure and select the appropriate bay and shelf.
2. Click/highlight the appropriate **CP dccei (ADJCTL/DCCEI)**
3. Click on the **Select** button.

-
- 11** In the **Neighbor Map for _____** (AID) the three main columns that are of interest here are (a) Local Port, (b) Nbr Port, and (c) Nbr NE

Name. In the Local Port column, locate the occurrence of the subject AID (from Step 1).

1. Scan across this same row to the Nbr Port and Nbr NE Name columns.
2. Identify the AID of the Nbr Port.
3. Click on the **Close** button to close this **Neighbor Map** for the -_-#-#-dccei-cp screen.

-
- 12** Click on the **WaveStar CIT View** and attempt to establish a login session by entering the Nbr NE Name in the field labeled *TID*. Were you able to log in to the Nbr Name NE?

If...	Then...
YES,	continue with Step 13.
NO,	refer to the task <i>Attempted Login to NE Failed...</i> Reference: Task 518: Attempted Login to NE Failed — WaveStar CIT Screen Displays 'Communication to NE Failed' or 'Communication Error'

-
- 13** Verify that the far-end NE has correct DCC channel provisioning for this AID (Nbr Port from Step 11).

Reference: T 305 in the UOG 365-370-109

-
- 14** Return to the original NE where this alarm was reported.

Important! This may be accomplished by establishing a new login session to that NE, or (if that NE session was saved to an icon) just click on the icon for the near-end NE.

-
- 15** On the *System View* screen, click on the **Update Alarms** button.

-
- 16** Is the *DCC Section/DCC RSection/DCC MSection Failure* still included in the list?

If...	Then...
YES,	continue with Step 17.
NO,	<i>STOP! End of Task.</i>

-
- 17** Verify that the near-end NE's ADJCTL/DCCEI circuit pack is functioning properly.

Reference: SE 514-1: Verify correct operation of the ADJCTL/DCCEI circuit pack

-
- 18** On the *System View* screen, click on the **Update Alarms** button.

-
- 19** Is the *DCC Section/DCC RSection/DCC MSection Failure* still included in the list?

If...	Then...
YES,	continue with Step 20.
NO,	<i>STOP! End of Task.</i>

-
- 20** Log in to the (far-end) Nbr Name NE.

-
- 21** Verify that the NE's ADJCTL/DCCEI circuit pack is functioning properly.

Reference: SE 514-1: Verify correct operation of the ADJCTL/DCCEI circuit pack

-
- 22** On the *System View* screen, left-click on the **Update Alarms** button.

-
- 23** Is the *DCC Section/DCC RSection/DCC MSection Failure* still included in the list?

If...	Then...
YES,	continue with Step 24.
NO,	<i>STOP! End of Task.</i>

-
- 24** Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....



SE 514-1: Verify correct operation of the ADJCTL/DCCEI circuit pack

Task Perform the following steps to verify that the ADJCTL/DCCEI circuit pack is functioning properly.

1 Instruct the on-site craft to go to the subject NE and determine whether:

1. The ADJCTL/DCCEI circuit pack's FAULT LED is lighted (Red), or
 2. The EI FAULT LED is lighted (Red), or
 3. The ACTIVE LED is blinking green, or
 4. The EI ACTIVE LED is blinking green.
-

2

If...	Then...
the answer to either (1.1, 1.2, 1.3, or 1.4) is <i>YES</i> ,	continue with Step 3.
the answer to either (1.1, 1.2, 1.3, or 1.4) is <i>NO</i> ,	<i>STOP! End of Task.</i>

3 Instruct the on-site craft to:

1. Go to the subject ADJCTL/DCCEI.
 2. And, press the RESET switch, which is accessible from the front of the ADJCTL/DCCEI circuit pack.
-

4 Instruct the on-site craft to wait a minimum of 2 minutes for this circuit pack to reinitialize.

-
- 5 Instruct the on-site craft to visually determine the condition of the ACTIVE, EI ACTIVE, FAULT, and EI FAULT LEDs.

If...	Then...
the ACTIVE and EI ACTIVE LEDs are lighted continuously,	go to Step 12.
the FAULT is lighted	continue.

-
- 6 Instruct the on-site craft to:
1. Physically unlatch and remove the alarmed circuit pack.
 2. Insert a known good replacement circuit pack.

Important! The newly installed ADJCTL/DCCEI should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 7 Wait 2 minutes for this circuit pack to reinitialize.

-
- 8 Click on the **Update Alarms** button.

-
- 9 Does the list include this same *DCC Sect/DCC RSect Failure* alarm?

If...	Then...
YES,	continue with Step 10.
NO,	Stop! End of Task.

-
- 10 Instruct the on-site craft to remove the newly installed ADJCTL/DCCEI circuit pack and reinsert the original ADJCTL/DCCEI.

-
- 11** Wait 2 minutes for this circuit pack to reinitialize.

END OF STEPS



Task 516: Clear ‘User-Network Side Sect Failure’ or ‘User-Network Side Line Failure’ or ‘User-Network Side RSect Failure’ ‘User-Network Side MSect

- Purpose** Use this procedure to clear:
- The SONET alarm *User-Network Side Sect Failure*, or
 - The SONET alarm *User-Network Side Line Failure*, or
 - The SDH alarm *User-Network Side MSect Failure*, or
 - The SDH alarm *User-Network Side RSect Failure*.

Description These alarms can occur only as the result of improper provisioning. The solution to clearing this alarm is to provision the DCC channel correctly.

Important! Each DCC channel has two ends. One end must be provisioned as *User-Side* while the other must be provisioned as *Network-Side*. It does not matter which is *User-Side* nor which is *Network-Side*. And, for BLSR/MS-SPRing applications, the provisioning of one link does not have any impact on the provisioning of adjacent links.

Related information For related information see *Chapter 7, Provisioning, Security, and Administration* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1.

- Before you begin** Prior to performing this task, you must:
1. Connect the WaveStar CIT to the LAN of the subject NE/ring.
 2. Have a valid login on both the CIT and all subject NE(s) within the ring.
 3. Log in to the CIT.

Task Complete the following steps to clear the *User-Network Side.....Failure* alarm.

Important! If you are logged in to one node, be that node part of a ring or part of a linear chain, then from your WaveStar CIT/ local node you cannot determine whether a far-end node is in the

process of rebooting. Similarly, you cannot tell whether a far-end DCC/EI circuit pack is in the process of resetting.

The time that it would take an NE to reboot (from start to finish) is approximately 20 minutes. The time that it would take a DCC/EI circuit pack to reset is about 2 minutes.

- 1 From the *System View* screen, click on the **Alarm List** button.

- 2 Is there one or more LOS alarms also included in the list?

If...	Then...
YES,	you should clear all LOS alarms before continuing with step 3. Reference: Task 543: Clear 'OC192/STM64, OC48/STM16, OC12/STM4, OC3/STM1, STM1E/4, or T3 DS3EC1/8 Loss of Signal'
NO,	continue.

- 3 Does the list include an entry of *User-Network Side Sect Failure*, or *User-Network Side Line Failure*, or *User-Network Side MSect Failure*, or *User-Network Side RSect Failure*?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Task.</i>

- 4 Assume that one of the DCC/EI circuit packs is currently performing a reset. Wait 2 minutes, and then continue with Step 5.

- 5 Click on the **Update Alarms** button.

6 Does the alarm list still include *User-Network.....Failure*?

If...	Then...
YES,	make a note of the corresponding/Local Port AID, and continue with Step 7.
NO,	<i>Stop! End of Task.</i>

7 Were you able to confirm that someone has taken action to manually reboot the far-end node?

If...	Then...
YES,	wait 20 minutes for the reboot to complete and go to Step 5. Determine if the far-end is being rebooted by contacting the appropriate far-end personnel.
NO,	continue.

8 From the *System View* screen:

1. Select **Configuration-DCC Terminations**.
2. From the **Configure DCC Terminations** window, expand down the directory structure until the appropriate ADJCTL/DCCEI is displayed.
3. Highlight the desired ADJCTL/DCCEI.
4. Click on the **Select** button.
5. On the right-hand side of the window, select the desired *Port AID*: (from the drop-down arrow).
6. For the field labeled **LAPD Role:**, switch from the current selection to the alternate.
7. Click on the **Apply** button.
8. Click on the **Close** button.

9 Click on the **Update Alarms** button.

-
- 10** Does the alarm list still include *User-Network.....Failure?*

If...	Then...
YES,	make a note of the corresponding/Local Port AID, and continue with Step 11.
NO,	<i>STOP! End of Task.</i>

-
- 11** Measure the received optical power level and compare the measurement to the specification.

Reference: Task 712: Measure Received Optical Power

.....

- 12** Verify that the appropriate LBO is installed on the *IN* port.

Reference: Task 711: Select Lightguide Buildout (LBO)

.....

- 13** Click on the **Update Alarms** button.
-

- 14** Does the alarm list still include *User-Network.....Failure?*

If...	Then...
YES,	make a note of the corresponding/Local Port AID, and continue with Step 15
NO,	STOP! End of Task.

.....

- 15** Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Task 517: Clear ‘DCC Sect Disabled-Unavailable’ or ‘DCC MSect Disabled - Unavailable’ or ‘DCC RSect Disabled - Unavailable’ or ‘DCC Line Disabled - Unavailable’

Purpose Use this task whenever the NE Alarm List displays:

- *DCC Section Disabled - Unavailable*, or
- *DCC MSection Disabled - Unavailable*, or
- *DCC RSection Disabled - Unavailable*, or
- *DCC Line Disabled - Unavailable*.

Required equipment Use the WaveStar CIT Interface Terminal (CIT) to complete this task.

- Important considerations**
1. Each I/O shelf can support up to a maximum of 32 DCC channels.
 2. Any attempt to provision an additional DCC channel that would exceed this maximum limit of 32 per I/O shelf will result in generating a *DCC...Unavailable* alarm.
 3. Each protection group (be it a 1+1, 1x1, or 0x1 protection group) uses one DCC channel.
 4. If all 32 DCC channels are currently being used and the user were to split an existing 1+1 port protection group, then this would result in generating a *DCC...Unavailable* alarm.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE/ring.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE/ring.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Complete the following steps to clear a ‘DCC _____ Disabled-Unavailable’ alarm.

Important! The solution to clearing this alarm is (a) to review the list of port AIDs that already have a DCC channel assigned to

them, (b) to identify one or more AIDs that no longer need/require a DCC channel, (c) to free-up (delete) those DCC channels that are no longer needed/required—thus making them available.

- 1 From the Alarm List, identify the AID for the shelf that is producing this alarm.

-
- 2 From the *System View* screen:

1. Click on **View-DCC Terminations**.
2. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ Shelf _ until the desired CP dccei is displayed. Then, highlight line item *CP dccei (ADJCTL/DCCEI)*.
3. Click on the **Select DCC Pack** button.

Important! The *View DCC Terminations* screen lists the number of **Remaining Channels**. While this alarm is active, the **Remaining Channels** field will always show the number 0.

If you do not identify at least one DCC channel to free-up, then it will not be possible to clear this alarm.

- 3 Review the list of port AIDs and identify one or more that are no longer needed/required.

-
- 4 Disable the identified DCC channel.

Reference: T 305

-
- 5 Click on the **Update Alarms** button.

-
- 6 Is the 'DCC Sect Disabled-Unavailable' or 'DCC RSect Disabled-Unavailable' or 'DCC MSect Disabled - Unavailable' or 'DCC Line Disabled - Unavailable' alarm still listed?

If...	Then...
YES,	continue with Step 7.
NO,	<i>STOP! End of Task.</i>

-
- 7** Escalate to your next higher level of technical support.

END OF STEPS



Task 518: Attempted Login to NE Failed — WaveStar CIT Screen Displays ‘Communication to NE Failed’ or ‘Communication Error’

Purpose Use this procedure when the WaveStar Craft Interface Terminal (CIT) screen displays one of the following messages:

- Attempted Login to NE Failed
- The OSI Association request has failed!

Required equipment The following equipment is required in order to complete this task:

- WaveStar CIT
- Wrist strap

Related information For related information, see *Appendix A, WaveStar CIT Tutorial* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1.

Task Complete the following steps to reestablish communication and log in to the NE:

1 Given that the WaveStar CIT screen currently displays:

- Attempted Login to NE Failed, or
- The OSI Association request has failed!

Quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar and then clicking on the **YES** button.

2 Restart the WaveStar CIT applications software, and then retry to:

- Connect to the NE, and if that is successful, then
 - Log in to the NE.
-

3 Were the connect and log-in sessions successful?

If...	Then...
YES,	<i>STOP! End of Task.</i>

If...	Then...
NO,	continue.

-
- 4 Verify that the LAN cable which connects the PC to the NE is not damaged and that all connections are proper and secure. Replace any damaged cable, and repair any connection problems.

Important! The WaveStar CIT will again display one of the two failed connection messages.

-
- 5 You should quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar and clicking on the **YES** button.

-
- 6 Restart the WaveStar CIT applications software, and then retry to:
1. Connect to the NE, and if that is successful, then
 2. Log in to the NE.

-
- 7 Were the connect and log-in sessions successful?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	continue. Important! The ADJCTL/DCC circuit pack is unavailable whenever this circuit pack is: (a) performing a reboot, or (b) failed (fail LED is lighted red). Determining the status of this circuit pack will require an on-site visual inspection of the circuit pack LEDs.

-
- 8 Is the ADJCTL/DCC circuit pack's fail LED lighted red?

If...	Then...
YES,	replace this circuit pack, and then go to Step 5.

If...	Then...
NO,	continue. Important! The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. Reference: Task 546: Clear 'ADJCTL/DCC Circuit Pack Failure'

9 Is the ADJCTL/DCC circuit pack performing a reboot?

If...	Then...
YES,	wait 2 minutes, and then go to Step 5.
NO,	continue. Important! If the CTL/SYS50D circuit pack is rebooting you cannot log in until that process completes.

10 Is the SYS50D rebooting?

If...	Then...
YES,	wait 2 minutes, and then go to Step 5.
NO,	continue. Important! If the NE is performing a system reboot you cannot log in to the NE until the process has completed.

11 Is the NE performing a reboot?

If...	Then...
YES,	wait (approximately 20 minutes) for this process to complete.
NO,	continue.

12 Instruct the on-site craft to take the following actions:

1. Locate the ADJCTL/DCC circuit pack.
2. While using the wrist strap, unlatch and physically pull out this circuit pack (only a short distance).
3. Reseat this circuit pack.

13 Wait 2 minutes, and then continue with the next step.

Important! The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. A reboot is indicated by a flashing green LED on the circuit pack faceplate.

14 Quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar, and then clicking on the **YES** button.

15 Restart the WaveStar CIT applications software, and try again to:

1. Connect to the NE, and if that is successful, then
2. Log in to the NE.

16 Were the connect and log-in sessions successful?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	continue.

17 Instruct the on-site craft to:

1. Locate the SYS50D circuit pack.
2. While using the wrist strap, unlatch and physically pull out this circuit pack (only a short distance), then
3. Reseat this circuit pack.

18 Wait 2 minutes and then continue.

Important! The total time required for the ADJCTL/DCC circuit pack to reboot should be less than 2 minutes. A reboot is indicated by a flashing green LED on the circuit pack faceplate. While the circuit pack is rebooting, you cannot log in until that process completes.

19 You should quit the WaveStar CIT applications software by selecting **File-Exit** from the menu bar, and then clicking on the **YES** button.

20 Restart the WaveStar CIT applications software, and then try again to:

1. Connect to the NE, and if that is successful, then
2. Log in to the NE.

21 Were the connect and log-in sessions successful?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	Continue with step 22.

22 Have you tried to log in using a default user ID and password (LUC01/LUC+01 or LUC02/LUC+02)?

If...	Then...
YES,	Escalate this problem to your next higher level of technical support.
NO,	Continue with step 23.

-
- 23** Attempt to log in to the “cut-through” or TL1 view using a default user ID and password.

If...	Then...
the attempt fails,	Escalate this problem to your next higher level of technical support.
the attempt succeeds,	Continue with step 24.

-
- 24** Retrieve the equipment state using the following command:

RTRV - STATE - EQPT : \$t i d : SYSTEM : \$c t a g ;
with appropriate values for \$tid and \$ctag.

.....

- 25** Record the state of the system with respect to maintenance condition (MCOND=Y or MCOND=N).

If...	Then...
MCOND=Y,	The database may be corrupt. Contact Lucent Technical Support for assistance in recovering the database.
MCOND=N,	You somehow lost the user ID and/or password that you tried the first time, but the system still works and you can add any new users you want.

.....

E N D O F S T E P S

.....



Task 519: Clear System Clock Holdover

Purpose Use this procedure to clear the alarm *System Clock Holdover*.

Before you begin Before you begin this task you should have access to the following items from the local office:

- Records for all external synchronization cable connections to this network element (NE)
- Synchronization related provisioning records for this NE.

Required privilege code You must have at least an M1 in order to complete this task.

Related information For related information, see Chapter 6, *Control, Transmission and Synchronization* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1.

Task **Important!** Each NE always expects to receive one, two, three, or a maximum of four different external timing references. When no external reference is present, this alarm is active.

Whenever this alarm is active, ALL external references have failed. The external references could be: (a) one or two BITS clock inputs and/or, (b) one or two line reference inputs. The BITS reference failures could be: (a) in the DB9 terminated external timing cables, which connect the shelf to the BITS clock, or (b) in the BITS clock circuit packs. The failure of a line reference could be either: (a) improper/incomplete provisioning, or (b) LOS on the line that is being used for the reference.

Complete the following steps to clear the alarm *System Clock Holdover*....

1 Is the subject NE served by one or two BITS clock inputs?

If...	Then...
YES,	continue with Step 2.
NO,	go to Step 13.

-
- 2** *Check status of BITS clock sources.* Instruct the on-site craft to verify that the external timing cable/cables is/are properly connected to the rear of the System Controller shelf.
-

- 3** Was/were DB9 connector/connectors J165 and/or J166 properly connected to the shelf?

If...	Then...
YES,	go to Step 6.
NO,	reconnect and continue.

.....

Important! The system default for the Wait to Restore counter is 20 seconds.

- 4** Wait for the Wait to Restore counter to expire, and then, from the *System View* screen, click on the **Update Alarms** button.
-

- 5** Has this alarm cleared?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	continue.

-
- 6** Refer to records at the local office, and identify the two circuit packs, from within the BITS clock, that feed this shelf.
-

- 7** Instruct the on-site craft to physically go to the BITS clock and visually determine the status of the one (or two) identified circuit packs.
-

- 8** Were one or both of the two identified circuit packs alarmed?

9 As appropriate, replace any failed circuit pack/packs within the BITS clock.

10 Use local procedures to verify continuity of the one (or two) external reference cables. Replace any damaged cable.

11 Wait for the Wait to Restore counter to expire, and then from the *System View* screen, click on the **Update Alarms** button.

12 Has this alarm cleared?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	escalate to your next higher level of technical support.

13 *Check Status of Line Reference Sources.* Does the *Alarm List* include the alarm *Line Sync Reference Failure*?

If...	Then...
YES,	clear the <i>Line Sync Reference Failure</i> alarm, and go to Step 18.
NO,	continue.

14 *Provision the NE for one or two Line References.* Check office records and determine the AID/AIDs for the OC-xx line/lines that serve to provide LINE1 and/or LINE2 timing.

15 From the *System View* screen:

1. Select *View-Timing/Sync*.
2. Select the tab labeled *Timing Reference*.
3. Identify the AID for LINE1 and/or LINE2.

.....

Important! The AIDs that are specified in the office records should be listed with the *Timing Reference* tab.

- 16** Compare the identified AID/AIDs to those from office records.
-

- 17** Are there discrepancies between office records and NE provisioning?

If...	Then...
YES,	correct the provisioning.
NO,	continue.

.....

- 18** From the *System View* screen, click on the **Update Alarms** button. Does the *Alarm List* still include *System Clock Holdover*?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

.....

END OF STEPS

.....



Task 524: BLSR Inconsistent APS Codes

Purpose	Use this procedure to address a <i>BLSR Inconsistent APS Codes</i> alarm.
Required Equipment	Use the WaveStar Craft Interface Terminal (CIT) to complete this task.
BLSR Inconsistent APS Codes Alarm Occurrence	This alarm is issued if, in the 12 frames starting with the last frame containing a previously inconsistent APS code, there are not 3 consecutive frames containing identical K-bytes.
Common reasons for occurrence	This alarm may occur during normal ring maintenance or when there is an OC-48/OC-192 protection circuit pack failure or CTL/SYS50DM circuit pack failure.
Most common solutions	This alarm should clear itself after a few minutes.
Related information	For related information, see Chapter 2, <i>Maintenance and Trouble-Clearing</i> in this manual,

Task **Important!** A ‘BLSR Inconsistent APS Codes’ alarm cannot be cleared by itself. It is usually associated with one or more other failures at the local node or a remote node.

Use the procedure below to determine the associated failure which is causing the ‘BLSR Inconsistent APS Codes’ alarm.

-
- 1 Contact Issue 7or, if possible, log in to the node that is reporting the ‘BLSR Inconsistent APS Codes’ alarm.
-
- 2 Determine whether that node is detecting/reporting an OC-48/OC-192 Port SD.

If...	Then...
YES,	clear the OC-48/OC-192 Port SD alarm and continue. Reference: T 521
NO,	continue.

-
- 3** Determine whether that node is detecting/reporting a SYS50DM circuit pack failure.

If...	Then...
YES,	clear the SYS50DM circuit pack failure and continue. In some situations, problems with the SYS50DM circuit pack can cause a BLSR Inconsistent APS Codes alarm. Reference: Task 552: Clear 'SYS50DM Circuit Pack Failure'
NO,	continue.

-
- 4** Click on the **Update Alarms** button.

-
- 5** Is the same 'BLSR Inconsistent APS Codes alarm' still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

Task 525: BLSR Improper APS Codes

Purpose	Use this procedure to address a <i>BLSR Improper APS Codes</i> alarm.
Required Equipment	Use the WaveStar Craft Interface Terminal (CIT) to complete this task.
Related information	For related information, see Chapter 2, <i>Maintenance and Trouble-Clearing</i> in this manual.
Improper APS Code alarm occurrence	This alarm occurs when a manually initiated or automatic switch request does not complete properly.
Common reasons for occurrence	This alarm may occur when there is an OC48/STM16 or OC192/STM64 protection circuit pack failure, CTL/SYS50DM circuit pack failure, or other problems associated with these circuit packs.
Most common solutions	Perform the following steps to clear this alarm: • Isolate the problem to the OC48/STM16 or OC192/STM64 protection circuit pack and replace it.

Task Complete the following steps to address a *BLSR Improper APS Codes* alarm.

-
- 1** Contact or, if possible, log in to the node that is reporting the *BLSR Improper APS Codes* alarm.
-
- 2** Determine whether that node is detecting/reporting an OC48/STM16 Signal Degrade or OC192/STM64 Signal Degrade.

If...	Then...
YES,	clear the Signal Degrade alarm and continue with next step.
NO,	continue with next step.

-
- 3** Determine whether the node is detecting/reporting a CTL/SYS50DM circuit pack failure.

If...	Then...
YES,	clear the CTL/SYS50DM circuit pack failure and continue. In some situations, problems with the CTL/SYS50DM circuit pack can cause a <i>BLSR Inconsistent APS Codes</i> alarms. Reference: Task 552: Clear 'CTL/SYS50DM Circuit Pack Failure'
NO,	continue with next step.

-
- 4** Click on the **Update Alarms** button.
-

- 5** Is the same *BLSR Improper APS Codes* alarm still displayed in the Alarm List?

If...	Then...
YES	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

Task 526: Clear Default K-bytes Alarm

Purpose	Use this procedure to address a <i>Default K-bytes</i> alarm.
Required equipment	Use the WaveStar Craft Interface Terminal (CIT) to complete this task:
Related information	For related information, see Chapter 2, <i>Maintenance and Trouble-Clearing</i> in this manual.
	Important! This alarm (when present) indicates that protection switching is unavailable.
Default k-bytes alarm occurrence	This alarm is issued when the received K-bytes source node ID is equal to the destination node ID.
Common reasons for occurrence	This alarm may occur more frequently when: • Adding or deleting nodes from a ring • Power sequencing a node • Ring Protection modes are not provisioned the same at all nodes. This alarm may also occur when performing certain ring maintenance tasks.
Most common solutions	This alarm should clear itself after all of the node's ring maps have been updated to reflect the most recent addition/removal of node(s) within the ring and after all nodes in the ring have been powered up.
Task	Use the following steps to address a 'Default K-bytes' alarm.

1 Check and clear accompanying alarms.

Important! The system may automatically correct for this error condition and will, after a brief time interval, restore itself to normal processing activities. If this does not occur, contact your next level of technical support.

Reference: Task 516: Clear 'User-Network Side Sect Failure' or 'User-Network Side Line Failure' or 'User-Network Side RSect Failure' 'User-Network Side MSect'
Task 531: Clear 'Ring Incomplete'

END OF STEPS

Task 529: Clear ‘Duplicate Ring Node’

Purpose	Use this task to clear a <i>Duplicate Ring Node</i> alarm.
Required equipment/ personnel	The following equipment is required in order to complete this task: • Wavestar Craft Interface Terminal (CIT) • On-site assistance at the node (or nodes)
Before you begin	Attention to details and conscientious efforts should prevent this alarm from ever occurring. However, instances when this alarm may occur include: • Whenever a new node is added to an existing ring, or • When changing the TID of an existing node, after combining two open rings. Prior to beginning this task, make sure: • You either have in-hand a copy of the office records for this ring, or • You have access to office records and can determine the correct TID for every node of the ring.
Task	Complete the following steps in order to (a) identify the node that has the correct TID, and (b) change the node’s TID to the correct value.

Important! While this alarm is active, the ring cannot determine if it’s a ring map. Therefore, all ring switching is inhibited. The user should understand the severity of these issues and attach a high priority to getting this alarm cleared quickly!

- 1** Obtain a copy of the office records for this ring, and verify that the records are not the cause of this problem. For example, verify that a duplication of TIDs is not specified. Correct the office records as necessary.

Important! If you attempt to remotely login to one of the nodes with the duplicate TID, you generally will not know which of the two you are really communicating with. Therefore, a local/direct

connection (by an on-site craft) is generally required to change/correct the node with the incorrect TID.

-
- 2 Use local means to determine what activities have recently occurred with this ring.

Important! The source of this alarm will most likely be associated with these recent activities.

3

If...	Then...
the recent activity was to add a new node,	instruct the on-site craft to: 1. physically connect their WaveStar CIT to the new node. 2. log in to their local node using the identified TID. 3. verify that this node's TID is correct per office records. 4. as appropriate, change this TID to make it unique. Reference: T329 5. as appropriate, update office records.

4

If...	Then...
the recent activity was to change the TID of an existing node,	instruct the craft to: 1. physically connect their WaveStar CIT to the new node. 2. login to their local node using the identified TID. 3. verify that this node's TID is correct per office records. 4. as appropriate, change this TID to make it unique. Reference: T329 5. as appropriate, update office records.

5

If...	Then...
the recent activity was to combine two open rings,	instruct the craft to: 1. use local means to identify which node has the duplicate/incorrect TID. 2. send the on-site craft to the identified node. 3. login to this node (using the duplicate TID). 4. change its TID to the correct (specified) value. Reference: T329 Important! Two nodes will be indicating Duplicate Ring Node, while all other nodes will be indicating Ring Protection Switching Suspended. Subsequent logins to this node must be the corrected TID and <i>not</i> with the duplicate.

-
- 6** Log in (either remotely or locally) to the node with the TID that you just changed.
-

- 7** While still logged in to the just-changed TID node, wait 2 to 10 minutes for Ring Discovery to complete, and clear the active alarms. Then verify that a new and correct ring-map has been established.

From the *System View* screen, select the following:

- **View>Rings>Ring Map**
- In the *View Ring Map* window, expand down the directory structure until the subject *RingID* is displayed
- Select (click) on the subject *RingID*
- Click on the **Select** button.
- Click on the button labeled **Display Ring Map Graph**

- Verify (visually) that the new ring-map:
 - lists the corrected TID, and
 - is a complete ring-map.

.....

8 Click on the **Update Alarms** button. Is the alarm *Duplicate Ring Node* still listed?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	continue.

.....

END OF STEPS



Task 531: Clear ‘Ring Incomplete’

Purpose This condition indicates that the designated network element (NE) is unable to create a complete ring map because of a controller or transmission failure in the ring network.

Required privilege code(s) The user must have a privilege code of M1 and P3 (or higher) to perform this task.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap

Related information For related information, see:

- Office records at the network provider
- *Chapter 7, Provisioning, Security, and Administration* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

Task Complete the following steps to clear the *Ring Incomplete* alarm:

1 From the WaveStar CIT **System View** screen, click on the **Alarm List** button.

2 Is the alarm *Ring Incomplete* displayed in the alarm list?

If...	Then...
YES,	continue with Step 3. Important! When the network is in the <i>Ring Incomplete</i> state, you may not be able to perform a remote login. In this case, local assistance will be required at those nodes.
NO,	<i>STOP! End of Task.</i>

-
- 3** Is there an ADJCTL/DCC circuit pack at one of the NEs within this ring that is currently performing a reset?

If...	Then...
YES,	continue.
NO,	go to Step 6.

-
- 4** Wait two minutes for the ADJCTL/DCC to complete its reset.
-

- 5** Click on the **Alarm List** button, and go to Step 2.
-

- 6** Within this ring, is there at least one NE that is performing a system reboot?

If...	Then...
YES,	continue.
NO,	go to Step 8.

-
- 7** Wait approximately 20 minutes for the identified NE to complete its system reboot. Go to Step 5.
-

- 8** Does the updated alarm list also contain an incoming OC48/STM16 or OC192/STM64 signal failure?

If...	Then...
YES,	identify the appropriate trouble-clearing task for the incoming OC48/STM16 or OC192/STM64 signal failure, and perform that task so as to clear the OC48/STM16 or OC192/STM64 signal failure alarm. Reference: Task 500: Alarms and Applicable Trouble-Clearing Task(s)
NO,	continue.

9 Was a provisioning problem identified and corrected?

If...	Then...
YES,	go to Step 5. Important! At least one NE within the ring may have incorrect provisioning. Check the Protection Group ID, Ring ID, East and West ports, and so forth. Also, verify that the fibers are not reversed. Refer to the office records for details on this ring and to <i>Chapter 7, Provisioning, Security, and Administration</i> in the <i>WaveStar BandWidth Manager User Operations Guide</i> , 365-370-109 R4.1 for details on how to implement provisioning.
NO,	continue.

10 Consult with your next higher level of technical support.

END OF STEPS

Task 532: Clear ‘Inconsistent Ring Protection Switch Mode’

- Purpose** Use this task to:
- Identify which network element (NE) has its *Protection Switch Mode* parameter provisioned incorrectly for this ring.
 - Clear this alarm by reprovisioning the *Protection Switch Mode* to the correct value for this ring.

Important! The parameter *Protection Switch Mode* must be set to the same value for every NE in a particular ring/subnetwork. The two options are (a) Shortened Path or (b) Ring Loopback.

Required privilege code(s) The user must have a privilege code of M1 and P3 (or higher) to perform this task.

- Required equipment** Use the following equipment to complete this task:
- WaveStar Craft Interface Terminal (CIT)
 - Wrist strap

- Related information** For more information, see the following sections of the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1:
- Chapter 7, *Provisioning, Security, and Administration*
 - Task 309: *Modify Existing Optical Port Protection Group*

- Before you begin** Prior to performing this task, you must:
1. Connect the WaveStar CIT to the LAN of the subject NE/ring.
 2. Have a valid login on both the CIT and all subject NE(s) within the ring.
 3. Log in to the CIT.

Task Complete the following steps to clear the ‘*Inconsistent Ring Protection Switch Mode*’ alarm.

-
- 1 Determine, from office records, what is the correct *protection switch mode* for this ring.

-
- 2 At the WaveStar CIT, connect to the desired NE by selecting the NE's icon from the domain/view screen, then select menu options **Network Element-Connect NE** and execute.

Important! As an alternative, just double-click on the icon of the desired NE.

- 3 In the *System View* screen, click on the **Alarm List** button.
-

- 4 Does the alarm list include an entry for *Inconsistent Ring Protection Switch Mode*?

If...	Then...
YES,	continue with Step 6.
NO,	<i>STOP! End of Task.</i>

- 5 Make a note of the corresponding AID from the **AID** column label.
-

- 6 Determine whether or not the problem is with the current NE. From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab that is labeled **Prot Grp**.
3. Click on the appropriate I/O shelf.
4. Click on the appropriate 4F BLSR/4F MS-SPRing (AID from Step 5 or Step 11).
5. Click on the tab that is labeled **Provisionable Parameters**.
6. Mode (*Shortened Path* or *Ring Loopback*) should be displayed to the right of the label **Protection Switch Mode**.

-
- 7** Is the mode correct for this particular 4F BLSR/4F MS-SPRing?

If...	Then...
YES,	click on the Close button and go to Step 13.
NO,	click on the Close button and continue with the next step.

-
- 8** It will be necessary to modify (change/correct) the current provisioned values for this 4F BLSR/4F MS-SPRing port protection group. Refer to task *Modify Existing Optical Port Protection Group*.

Reference: Task 532

.....

- 9** In the *System View* screen, click on the **Update Alarms** button.
-

- 10** In the *System View* screen, click on the **Alarm List** button.
-

- 11** Make a note of the corresponding AID from the **Alarm Issue Point** column.
-

- 12** Does the alarm list include an entry for *Inconsistent Ring Protection Switch Mode*?

If...	Then...
YES,	continue with Step 13
NO,	<i>STOP! End of Task.</i>

-
- 13** From the WaveStar CIT *System View* screen, select **View-Rings-Ring Map**.
-

- 14** Click on the tab that is labeled **Ring ID**.

-
- 15** As appropriate, in the Windows-like Explorer screen, click on the [+] symbol to expand the directory structure until the desired ring is displayed.

From the right-half of the screen, identify (and make a note of) the **Node Neighbor NE Name** and its **Node Neighbor Port**.

Important! The idea is to pick a direction based on the AID from Step 11 and go sequentially around the ring, from neighbor-to-neighbor, until the NE with this provisioning problem is identified and subsequently reprovisioned correctly.

-
- 16** At the WaveStar CIT, connect to the desired network element (Node Neighbor NE Name) by selecting the NE's icon from the domain/view screen, then select menu options **Network Element-Connect NE** and execute.

Important! As an alternative, just double-click on the icon of the desired NE, or enter the TID and click on the **Connect** button.

-
- 17** Go to Step 6.

END OF STEPS



Task 533: Clear ‘Circuit Pack Unequipped/Missing’

Purpose Use this procedure to clear a *Circuit Pack Unequipped/Missing* alarm. The exact alarm description includes the circuit pack type, for example it could be *OC48/STM16 Circuit Pack Unequipped/Missing*. The procedure is the same for most circuit pack types. One type that has special considerations is ADJCTL/DCC and those considerations are included in this task.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Appropriate type of circuit pack (it may be in the slot already, but not engaged)

ADJCTL/DCC Beginning with WaveStar BandWidth Manager, R4.0, the System Controller Shelf may be equipped with one or two ADJCTL/DCC circuit packs. Their AIDs are “sc-1-#-#-dcc1” and “sc-1-#-#-dcc2”. The BandWidth Manager allows simplex and duplex modes of operation. On system startup, if there is a single ADJCTL/DCC inserted in the System Controller Shelf then the BandWidth Manager operates in simplex mode. As soon as a second ADJCTL/DCC is inserted the system automatically switches to duplex mode. With R4.0 and later releases, use this task whenever the Alarm List displays the *ADJCTL/DCC Circuit Pack Unequipped/Missing* alarm.

Task Complete the following steps to clear a *Circuit Pack Unequipped/Missing* alarm.

-
- 1** From the **Alarm List** determine the AID of the slot for the unequipped circuit pack.
-
- 2** Press firmly on both latches on the circuit pack to make sure they are fully closed.
-

-
- 3** Wait two minutes, click on the **Update Alarms** button, then click on the **Alarm List** button.
-

- 4** Does the *Circuit Pack Unequipped/Missing* alarm still appear?

If...	Then...
NO	<i>STOP! End of Task.</i>
YES	go to Step 5.

-
- 5** Is this an ADJCTL/DCC circuit pack?

If...	Then...
NO	escalate to the next higher level of technical support.
YES	refer to Task 546.

-
- 6** Based on the information obtained in Step 1, obtain the needed/missing circuit pack and to insert that circuit pack into appropriate slot.

END OF STEPS



Task 534: Clear ‘Mate Circuit Pack Unequipped Failure’

Purpose Use this procedure to clear a *Mate Circuit Pack Unequipped Failure* alarm.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Pointer Processor circuit pack (PPROC/STS192)
- Spare/replacement SWIF circuit pack)
- OC192/STM64 circuit pack.

Before you begin This alarm only applies to those port units which are implemented across more than one (two) circuit packs. Currently, the two circuit packs (OC192/STM64 and PPROC/STS192) are the only ones for which this alarm may apply. This alarm may occur (normally and briefly) while either of these two circuit packs is being provisioned. However, once these circuit packs are provisioned, any subsequent circuit pack removal will result in generating a different alarm—which is known as *Circuit Pack Unequipped Failure*.

Task Complete the following steps to clear a *Mate Circuit Pack Unequipped Failure* alarm.

Important! This alarm is raised against one of the circuit packs when only one is provisioned (correct pack is equipped) and the other is not yet provisioned (not yet equipped). As soon as both packs have been simultaneously equipped/provisioned for the first time, then the alarm is no longer produced. Subsequently, and for an in-service system, the only way to generate this alarm is to de-provision one circuit pack and not the paired circuit pack.

- 1** From the **Alarm List** determine the AID of the slot for the unequipped circuit pack.

Important! If, for example, the AID indicates that PPROC1 does not have its mate circuit pack equipped, then the alarm-clearing solution is to have the craft insert an OC192/STM64

circuit pack in the slot labeled *TR1*. On the converse, if the AID were to indicate that *TR1* did not have its mate circuit pack equipped, the alarm-clearing solution would be to have the craft insert a Pointer Processor into the slot labeled PPROC1.

-
- 2** Based on the information obtained in Step 1, instruct the on-site craft to obtain the needed/missing circuit pack and to insert that circuit pack into appropriate slot.
-

- 3** Instruct the on-site craft to inform you whenever the newly installed circuit pack has successfully rebooted.

Important! A successful reboot should normally complete in less than 2 minutes.

- 4** Click on the **Update Alarms** button.
-

- 5** Does the alarm list still include this same alarm?

If...	Then...
YES,	go to Step 6.
NO,	<i>STOP! End of Task.</i>

- 6** Escalate to the next higher level of technical support.

Task 535: Clear ‘Circuit Pack Invalid’

Purpose Use this procedure to clear a *Circuit Pack Invalid* alarm. The exact alarm description includes the circuit pack type, for example it could be *OC48/STM16 Circuit Pack Invalid*. The procedure is the same for all circuit pack types. This alarm is probably caused by one of the following:

- the slot is provisioned for a different type of circuit pack than the one that is inserted
- the system is unable to read the identity of the circuit pack

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Appropriate type of circuit pack

Task summary The remedy you want to use to clear this alarm is probably one of the following:

- change the circuit pack so that it matches the provisioning
- try inserting a different circuit pack of the same type

Task details Complete the following steps to clear a *Circuit Pack Invalid* alarm.

-
- 1** From the **Alarm List** determine the AID of the slot for the invalid circuit pack.
 - 2** Determine whether the circuit pack that is inserted is the correct type.
 - 3** Contact your next level of technical support with the information from Step 2.
-

END OF STEPS



Task 537: Clear ‘STM1E/4 Circuit Pack Failure’

- Purpose** Use this task to:
- Obtain the identity of an alarmed STM1E/4 circuit pack.
 - Replace the alarmed circuit pack.
 - Verify that the alarm has been cleared.

- Before you begin** Prior to beginning this task, you must:
1. Have a WaveStar CIT that is connected to the subject NE.
 2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
 3. From the *System View* screen of the subject NE, click on the button labeled **Alarm List**.

- Required equipment** The following equipment is required in order to successfully complete this procedure:
- WaveStar Craft Interface Terminal (WaveStar CIT)
 - Wrist strap
 - Spare/replacement STM1E/4 circuit pack

- Alarm clearing strategy**
1. Determine whether the alarm is on the protection circuit pack (*eprn*) or on one of the working circuit packs (slots *1 through 4* and *13 through 16*).
 2. If the alarm is an *eprn*, the task will instruct you to replace that circuit pack without further considerations.
 3. If, simultaneously, there also exists an alarm on one or more of the working circuit packs, then after replacing the failed *eprn* there should be a protection switch to *eprn*.
 4. If the alarm is only on one of the working circuit packs, then you should verify that a protection switch is in effect.
 - If the auto protection switch is in effect, then it is okay to replace the failed circuit pack.
 - If the auto protection switch is not in effect, then craft should do a manual protection switch.

Task Complete the following steps to clear an *STM1E/4 Circuit Pack Failure* alarm.

- 1** From the **Alarm List**, determine the AID of the failed circuit pack/packs.

Important! If the STM1E/4 circuit pack is part of a 1XN equipment protection group, then the alarmed circuit pack will have its FAULT LED lighted continuous Red, while the ACTIVE LED will not be lighted. However, if the STM1E/4 circuit pack is part of a 0X1 nonprotected group, then both the ACTIVE LED (Green) and FAULT LED (Red) will be lighted simultaneously.

- 2** Is the failed circuit pack part of a 1XN protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 15.

- 3** From the **Alarm List**, determine whether or not there also exists an *eprn Circuit Pack Failure*. Is the AID that of the *eprn* slot?

If...	Then...
YES,	go to Step 14.
NO,	continue.

- 4** From the **System View**:

- Click on **View-Protection**.
- Click on the tab that is labeled **Prot Grp**.
- In the Windows-like Explorer, expand down the directory until *1XN Equipment estm 1ee4grp* is displayed. Then, highlight that protection group.
- Click on the **Select** button.

Important! A manual switch or a forced switch can be used if replacement of a circuit pack is necessary. These will only be required if something abnormal occurred. Under the normal operations, an automatic switch with proper indications is enough to replace a defective circuit pack (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Failed*).

-
- 5** From the **View Protection** screen (within System View) and for the field that is labeled **Switch Request State**: “Is *Equipment Failed* listed?”, what is the response?

If...	Then...
YES,	a protection switch is in effect. Continue with Step 6.
NO,	perform a Manual Protection Switch . Reference: SE 537-1: Perform a Manual Protection Switch on an STM1E/4

-
- 6** Instruct the on-site craft to go to the identified AID (which is the circuit pack that is being protected), and physically unlatch and remove that circuit pack and inset a known good replacement circuit pack.

7

Important! The newly installed STM1E/4-cp should reinitialize (Green LED blinks and clears, and then no Red LED) in less than 2 minutes.

Wait 2 minutes for this circuit pack to reinitialize.

-
- 8** Click on the **Update Alarms** Buttons.

.....

9 Does the **Alarm List** include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 13.
NO,	continue.

.....

10 Does the list include other STM1E/4 circuit pack failure alarms?

If...	Then...
YES,	go to Step 4.
NO,	continue.

.....

11 Did you perform a **Manual Protection Switch** in Step 4?

If...	Then...
YES,	perform a Clear Protection Switch.
NO,	continue. Reference: SE 537-2: Clear Protection Switch on an STM1E/4

.....

12 **Stop! End of Task.**

.....

13 Escalate to the next higher level of technical support.

.....

14 Instruct the on-site craft to go to the AID of the eprn slot and:

- Physically unlatch and remove that circuit pack.
- Insert a known good replacement circuit pack.
- Continue with Step 7.

15

Important! For the 0X1 STM1E/4 applications, the failure will typically be just one port while the remaining seven will be functioning normally. With this scenario, the failed port will result in a loss of service to that single port. However, during the time interval that this circuit pack is removed from the shelf and until its replacement is rebooted, all eight ports will experience a loss of service.

The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this AMTCG. You should refer to your Local Operating Procedures to determine the steps required to roll any unprotected traffic.

16 Instruct the on-site craft to go to the identified AID and:

- Physically unlatch and remove that circuit pack.
- Insert a known good replacement circuit pack.
- Continue with Step 17.

17

Important! The newly installed STM1E/4-cp should reinitialize (Green LED blinks and clears, or Green LED blinks and remains lighted, and then no Red LED) in less than 2 minutes.

Wait 2 minutes for this circuit pack to reinitialize.

18 Click on the **Alarm List** button.

19 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 13.
NO,	continue.

20 As appropriate, use your Local Operating Procedures to determine the steps required to roll any unprotected traffic back to the newly replaced STM1E/4 circuit pack.

21 Stop! End of Task.

SE 537-1: Perform a Manual Protection Switch on an STM1E/4

Task Perform the following steps to manually switch an alarmed STM1E/4 circuit pack to the eprn protection circuit pack.

1 From the **System View** screen:

- Click on **Fault-Protection Switch**.
- Click on the tab labeled **Prot Grp**.
- In the Windows-like Explorer screen, expand/scroll down the directory until *1XN Equipment estm 1ee4grp* is displayed. Then, highlight that protection group.
- Click on the **Select** button.

Important! The right-hand part of the screen will display the selected **Protection Pack AID**: (for example, 1-1-##-eprn-cp). Also, this display shows a drop-down box for the **Working Pack AIDs**:

- Click on the drop-down arrow for the field **Working Pack AIDs**: and highlight the AID of the alarmed circuit pack.
 - In the field labeled **Switch Type**: click on the drop-down arrow and highlight Manual.
 - Click on the **Apply** button.
 - Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the **System View** screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual Protection Switch* command was successful.

Important! Any currently existing higher priority protection switch command would cause the command to fail. If the command was successful, then the list will display *Protection Switch (appropriate AID) Successful*.

3 Was the Manual Protection Switch Successful?

If...	Then...
YES,	Stop! End of Supporting Task.
NO,	continue.

4 Escalate to the next higher level of technical support

SE 537-2: Clear Protection Switch on an STM1E/4

Task Perform the following steps to **Clear** an existing Manual Protection Switch.

1 From the **System View** screen:

- Select **Fault-Protection Switch**.
- In the Windows-like Explorer, expand/scroll down the directory until the AID *1XN Equipment estm 1ee4grp* is shown. Then, highlight that protection group AID.

Important! The **Clear** command does NOT require the craft to input (select) either Working or Protection AIDs.

- Click on the **Select** button.
 - On the right-hand side of the screen, click on the drop down arrow beside the field labeled **Switch Type**:
 - Click on **Clear**.
 - Click on the **Apply** button.
 - Read the information in the Caution box, and then click on the **YES** button.
 - Click on the **Close** button.
-

2 **Stop! End of Supporting Element.**

Task 543: Clear ‘OC192/STM64, OC48/STM16, OC12/STM4, OC3/STM1, STM1E/4, or T3 DS3EC1/8 Loss of Signal’

Purpose	Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing this alarm.
Required equipment	The following is a list of required equipment for completing this procedure: • WaveStar Craft Interface Terminal (CIT) • Wrist strap • Spare/replacement circuit pack (OC3/STM1 or OC12/STM4 or OC48/STM16, or STM1E/4, or as applicable OC192/STM64, or DS3EC1/8). • Optical power meter (to measure the received power level) • Fiber cleaning supplies.
Optional equipment	The following is a list of equipment that the craft may need occasionally: • Optical transmitter/receiver test set • Optical Time Domain Reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut) • Set of buildout pads (5, 10, 15 and 20); type depends on fiber connector being used • DS3 transmitter/receiver set (to test “electrical” signal and cable troubles) • SDH transmitter/receiver set (to test “electrical” signal and cable troubles)
Safety precautions	To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand this precaution prior to performing this task.

**CAUTION**

The OBA has a maximum power output level of +17 dBm. If the far-end fiber is being fed by an OBA – then a 20-dB pad must be inserted between the OBA and the power meter. A pad is not required in order to measure the output power level of an OC192/STM64 OUT port.

**CAUTION**

The OC12/STM4 circuit pack contains two ports. Most likely, only one port will be indicating an LOS, while the other port may be providing normal transmission. Care must be exercised to NOT disconnect the port that is not alarmed – else, service will be disrupted.

**CAUTION**

The OC3/STM1 circuit pack contains 4 ports. Most likely, only one port will be indicating an LOS, while the other ports may be providing normal transmission, Care must be exercised to NOT disconnect the ports that is not alarmed – else, service will be disrupted.

Before you begin

Before you begin this task, it is important to understand that:

- An OC-3/STM-1 or OC-12/STM-4 or OC-48/STM-16 or OC-192/STM-64 LOS condition has been detected on the identified incoming (receiver) line, or

NOTE: Likely causes, in terms of priority, are:

1. Failure of the upstream transmitter circuit pack
2. Failure of the local receiver circuit pack
3. Failure on the incoming fiber line
4. Dirty/contaminated optical connector(s).
5. Defective LBO at either the receiver or transmitter.

- A T3 DS3 LOS condition has been detected on one or more of the DS3 signals from the office low-speed source (such as a DSX panel).

NOTE: Likely causes, in terms of priority, are:

6. Failure of the DS3 or EC1 office source
 7. Failure of the DS3 or EC1 port unit circuit pack
 8. Loose coaxial connector on the (shelf DS3EC1 connector panel or DSX panel)
 9. Failure (breakage) of the “electrical” coaxial cable
- An STM1E/4 LOS condition has been detected on one or more of the STM-1e signals from the office low-speed source (such as an STM1E panel).

NOTE: Likely causes, in terms of priority, are:

10. Failure of the STM-1e office source
11. Failure of the STM1E/4 port unit circuit pack
12. Loose coaxial connector on the shelf STM1E connector panel
13. Failure (breakage) of the “electrical” coaxial cable

Task Complete the following steps to clear an *LOS* alarm.

-
- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the Loss of Signal.

An LOS alarm may or may not have one or more associated alarms. An associated alarm could be either “equipment” or “facilities.” An example of an associated equipment alarm is *Circuit Pack Failure*. Examples of associated facilities alarms include: (a) LOS in both directions, (b) LOS on other fibers, (c) DCC Section Failure, or (d) DCC Line Failure.

-
- 2 Refer to the Alarm List and determine whether there are associated alarms (either equipment or facilities) at the local NE?

If...	Then...
YES,	go to Step 8.
NO,	continue.

Important! Before you can determine whether associated alarms exist on the neighbor NE, it will be necessary to: (a) determine the identity of the neighbor NE, (b) determine the neighbor port's identity, (c) log in to the neighbor NE, and, (d) display that NE's alarm list.

- 3 From the local NE and on the CIT **System View** screen, select **Administration-OSI Neighbor Map**.

-
- 4 In the **Administration-OSI Neighbor Map** screen:

1. Select (highlight and click on) the **ADJCTL/DCCEI** circuit pack.
2. Click on the **Select** button.

-
- 5 In the **Neighbor Map for subject dccei-cp**,

- Locate the column that is labeled *Local Port* and identify the row that lists the AID from Step 1.
- Identify the corresponding neighbor port—which is the same row but in the *Nbr Port* column.
- Identify the corresponding neighbor name—which is the same row but in the *Nbr NE Name* column.

-
- 6 Log in to the neighbor NE.

Important! If a problem exists that prevents you from logging in to the neighbor NE, then you should: (a) have an on-site craft physically connect to the subject NE, (b) have the craft log in to that NE, and (c) display the **Alarm List**.

7 Are there associated alarms with the remote/neighbor NE?

If...	Then...
YES,	continue.
NO,	go to Step 12.

8 Is the alarm equipment related?

If...	Then...
YES,	continue.
NO,	the alarm must be facilities-related. Continue with Step 10.

9

If the equipment alarm is...	Then continue with...
OC192/STM64, Circuit Pack Failure	Task Reference: Task 564: Clear 'OC192/STM64 Circuit Pack Failure'
OC48/STM16, Circuit Pack Failure	Task Reference: Task 548: Clear 'OC48/STM16 Circuit Pack Failure'
OC12/STM4, Circuit Pack Failure	Task Reference: Task 549: Clear 'OC12/STM4 Circuit Pack Failure'
OC3/STM1, Circuit Pack Failure	Task Reference: Task 550: Clear 'OC3/STM1 Circuit Pack Failure'
DS3EC1/8, Circuit Pack Failure	Task Reference: Task 547: Clear 'DS3EC1/8 Circuit Pack Failure'
STM1E/4, Circuit Pack Failure	Task Reference: Task 537: Clear 'STM1E/4 Circuit Pack Failure'

10 Does the Alarm List include multiple LOS/STMLOS alarms?

If...	Then...
YES,	refer to your local procedures for reporting and repairing fiber troubles. <i>STOP! End of Task.</i>
NO, just the single LOS/STMLOS alarm,	continue with Step (12).

Important! At this point you have determined that there is an LOS/STMLOS in both directions. This condition is indicative of a fiber break.

11 Refer to your local procedures for reporting and repairing fiber troubles.

12

If the local NE Alarm List display includes...	Then continue with...
OC192/STM64, Loss of Signal	Supporting Element Reference: SE 543-1: Clear 'OC192/STM64, Loss of Signal'
OC48/STM16, Loss of Signal	Supporting Element Reference: SE 543-2: Clear 'OC48/STM16, Loss of Signal'
OC12/STM4, Loss of Signal	Supporting Element Reference: SE 543-3: Clear 'OC12/STM4, Loss of Signal'
OC3/STM1, Loss of Signal	Supporting Element Reference: SE 543-4: Clear 'OC3/STM1, Loss of Signal'
T3 DS3, Loss of Signal	Supporting Element Reference: SE 543-5: Clear 'T3 DS3EC1/8 Loss of Signal'
STM1e, Loss of Signal	Supporting Element Reference: SE 543-6: Clear 'STM1E/4 Loss of Signal'

13 *STOP! End of Task.*

Important! Select one of the above tables to document this task.

END OF STEPS

SE 543-1: Clear ‘OC192/STM64, Loss of Signal’

Perform the steps below to clear an *OC192/STM64 LOS/STMLOS* alarm.

-
- 1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

-
- 2 Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 9.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

- 3 Instruct the on-site craft to re-connect the fiber to the circuit pack’s IN connector.

-
- 4 At the near-end node, click on the **Update Alarms** button.

-
- 5 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element.</i>

-
- 6** Instruct the on-site craft to replace the receiver (OC192/STM64 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned, whether the connector is known to be causing a problem or not, before re-connection

- 7** At the near-end node, click on the **Update Alarms** button.
-

- 8** Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	<i>STOP! End of Supporting Element.</i>

- 9** From the *System View* screen:

1. Select *File-NE Disconnect*.
 2. Click on the **YES** button in order to disconnect from the near-end NE.
-

- 10** Log in to the far-end NE.
-

- 11** From the *System View* screen click on the *Alarm List* button.
-

- 12** For the subject AID, does the Alarm List include a Probable Cause listing for the ALS alarm?

If...	Then...
YES,	clear that alarm (now).
NO,	continue.

-
- 13** From the *System View* screen, select *View-View Equipment Details* and then expand down the directory structure so as to determine whether the facility (AID) is powered by an OBA.
-

- 14** Does the far-end link include an OBA?

If...	Then...
YES,	go to Step 23.
NO,	continue.

-
- 15** Instruct the far-end on-site craft to measure the transmit (OUT) power level for the OC192/STM64.
-

- 16** Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. <i>STOP! End of Supporting Element.</i>
NO,	continue.

-
- 17** Instruct the far-end on-site craft to replace the transmitter (OC192/STM64 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

- 18** From the *System View* screen:

1. Select *File-NE Disconnect*.
 2. Click on the **YES** button in order to disconnect from the far-end NE.
-

- 19** Login to the near-end NE.
-

.....

20 From the *System View* screen, click on the **Alarm List** button.

.....

21 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element</i>

.....

22 Escalate to the next higher level of technical support.

.....

23 Instruct the far-end on-site craft to measure the output power level at the transmit port of the OBA.

.....

24 Is the power level within proper limits for this OBA?

If...	Then...
YES,	If YES, then there exists a problem with the fiber. Escalate to your facilities repair group. Stop! End of Supporting Element.
NO,	continue.

.....

25 Instruct the far-end on-site craft to measure the power level at the OUT port of the OC192/STM64.

.....

26 Is the power level within proper limits for this particular type of OC192/STM64 circuit pack?

If...	Then...
YES,	replace the OBA and afterwards go to Step 18.
NO,	go to Step 17.

.....

END OF STEPS

.....

SE 543-2: Clear ‘OC48/STM16, Loss of Signal’

Perform the steps below to clear an *OC48/STM16 LOS/STMLOS* alarm.

- 1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

- 2 Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 9.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

- 3 Instruct the on-site craft to reconnect the fiber to the circuit pack’s IN connector.

- 4 At the near-end node, click on the **Update Alarms** button.

- 5 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element.</i>

- 6 Instruct the on-site craft to replace the receiver (OC48/STM16 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

7 At the near-end node, click on the **Update Alarms** button.

8 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	<i>STOP! End of Supporting Element.</i>

9 From the *System View* screen:

1. Select **File-NE Disconnect**.
2. Click on the **YES** button in order to disconnect from the near-end NE.

10 Log in to the far-end NE.

11 From the *System View* screen, click on the **Alarm List** button.

12 For the subject AID, does the Alarm List include a Probable Cause listing for the ALS alarm?

If...	Then...
YES,	clear that alarm (now). Reference: Task 572
NO,	continue.

13 From the *System View* screen, select **View-View Equipment Details** and then expand down the directory structure so as to determine whether the facility (AID) is powered by an OBA.

14 Does the far-end link include an OBA?

If...	Then...
YES,	go to Step 23.
NO,	continue.

15 Instruct the far-end on-site craft to measure the transmit (OUT) power level for the OC48/STM16.

Reference: Task 712: Measure Received Optical Power

16 Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. <i>STOP! End of Supporting Element.</i>
NO,	continue.

17 Instruct the far-end on-site craft to replace the transmitter (OC48/STM16 circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

Reference: Task 703

18 From the *System View* screen:

1. Select **File-NE Disconnect**.
2. Click on the **YES** button in order to disconnect from the far-end NE.

19 Log in to the near-end NE.

.....

20 From the *System View* screen, click on the **Alarm List** button.

.....

21 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element</i>

.....

22 Escalate to the next higher level of technical support.

.....

23 Instruct the far-end on-site craft to measure the output power level at the transmit port of the OBA.

Reference: Task 712: Measure Received Optical Power

.....

24 Is the power level within proper limits for this OBA?

If...	Then...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. <i>STOP! End of Supporting Element.</i>
NO,	continue.

.....

25 Instruct the far-end on-site craft to measure the power level at the OUT port of the OC48/STM16.

.....

26 Is the power level within proper limits for this particular type of OC48/STM16 circuit pack?

If...	Then...
YES,	replace the OBA, and afterwards go to Step 18.
NO,	go to Step 17.

.....

END OF STEPS

.....

SE 543-3: Clear ‘OC12/STM4, Loss of Signal’

Perform the steps below to clear an *OC12/STM4 LOS/STMLOS* alarm.

- 1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

- 2 Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 11.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

- 3 Instruct the on-site craft to reconnect the fiber to the circuit pack’s IN connector.

- 4 At the near-end node, click on the **Update Alarms** button.

- 5 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element.</i>

Important! Before the OC12/STM4 circuit pack can be replaced it will first be necessary to “Bridge & Roll” traffic from the port that is still providing service.

- 6** Use local procedures in order to identify ports that are to be used in this Bridge & Roll task. Bridge & Roll service from the port that is still providing service.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 7** At the near-end node, instruct the on-site craft to replace the receiver (OC12/STM4 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

Reference: Task 703: Clean Optical Fibers and Connectors

- 8** At the near-end node, click on the **Update Alarms** button.
-

- 9** Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	continue.

-
- 10** Return the service that was rolled in Step 6 to it’s original port on this newly installed circuit pack. Use local procedures in order to identify ports that are to be used in this Bridge & Roll task.

STOP! End of Task.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

-
- 11** Determine whether the far-end is transmitting the proper signal level. Instruct the far-end on-site craft to measure the transmit (OUT) power level.
-

- 12** Is the power level within proper limits for this particular type of circuit pack.

If...	Then...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. <i>Stop! End of Supporting Element.</i>
NO,	continue.

Important! Before the OC12/STM4 circuit pack can be replaced, it will first be necessary to “Bridge & Roll” traffic from the port that is still providing service.

- 13** Use local procedures in order to identify ports that are to be used in this Bridge & Roll task. Bridge & Roll service from the port that is still providing service.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 14** At the far-end node, instruct the on-site craft to replace the transmitter (OC12/STM4 circuit pack).

Important! As necessary, refer to vendor supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

.....

15 At the near-end node, click on the **Update Alarms** button.

.....

16 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

.....

E N D O F S T E P S

.....

SE 543-4: Clear ‘OC3/STM1, Loss of Signal’

Perform the steps below to clear an *OC3/STM1 LOS/STMLOS* alarm.

- 1 Determine whether the near-end node is receiving the proper signal level. Instruct the on-site craft to measure the receive (IN) power level.

Reference: Task 712: Measure Received Optical Power

- 2 Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	continue.
NO,	reconnect the IN fiber connector and then go to Step 11.

Important! Then the problem was either a dirty fiber connector (which has just now been cleaned) or continues to be a defective near-end circuit pack. First, determine that the problem was NOT the fiber connector. Second, and only as necessary, replace the near-end circuit pack.

- 3 Instruct the on-site craft to reconnect the fiber to the circuit pack’s IN connector.

- 4 At the near-end node, click on the **Update Alarms** button.

- 5 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	continue.
NO,	<i>STOP! End of Supporting Element.</i>

Important! Before the OC3/STM1 circuit pack can be replaced, it will first be necessary to “Bridge & Roll” traffic from the port that is still providing service.

- 6** Use local procedures in order to identify ports that are to be used in this Bridge & Roll task. Bridge & Roll service from the port that is still providing service.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 7** At the near-end node, instruct the on-site craft to replace the receiver (OC3/STM1 circuit pack).

Important! As necessary, refer to vendor-supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

Reference: Task 703: Clean Optical Fibers and Connectors

- 8** At the near-end node, click on the **Update Alarms** button.
-

- 9** Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	continue.

-
- 10** Return the service that was rolled in Step 6 to its original port on this newly installed circuit pack. Use local procedures in order to identify ports that are to be used in this Bridge & Roll task.

STOP! End of Task.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

-
- 11** Determine whether the far-end is transmitting the proper signal level. Instruct the far-end on-site craft to measure the transmit (OUT) power level.
-

- 12** Is the power level within proper limits for this particular type of circuit pack?

If...	Then...
YES,	a problem exists with the fiber. Escalate to your facilities repair group. <i>Stop! End of Supporting Element.</i>
NO,	continue.

Important! Before the OC3/STM1 circuit pack can be replaced, it will first be necessary to “Bridge & Roll” traffic from the port that is still providing service.

- 13** Use local procedures in order to identify ports that are to be used in this Bridge & Roll task. Bridge & Roll service from the port that is still providing service.

Reference: Task 304 in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1

- 14** At the far-end node, instruct the on-site craft to replace the transmitter (OC3/STM1 circuit pack).

Important! As necessary, refer to vendor-supplied documentation pertaining to that NE.

Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

- 15** At the near-end node, click on the **Update Alarms** button.

16 Does the Alarm List still display the same LOS/STMLOS?

If...	Then...
YES,	escalate to your next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

E N D O F S T E P S

SE 543-5: Clear 'T3 DS3EC1/8 Loss of Signal'

Perform the steps below to clear a 'T3 DS3EC1/8 LOS' alarm.

Important! During port provisioning if a port's alarm monitoring state is MON, then it is not unusual for it to generate a T3 DS3EC1/8 LOS alarm. Generally, whenever all NE-to-NE provisioning is completed and correct, the LOS alarm will automatically clear.

During normal operations the occurrence of a T3 DS3EC1/8 LOS alarm will usually indicate that your receive port on the DS3EC1/8 circuit pack detected an incoming failure from the DSX connector panel.

- 1 Instruct the on-site craft to visually inspect the incoming coaxial cable(s) and their associated connector(s) and to correct any (or all) identified problems.

- 2 On the near-end NE, click on the **Update Alarms** button.

- 3 Is the same LOS still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

Important! DS3/EC-1 electrical signals can be tested using a DS3 transmitter/receiver test set.

- 4 Instruct the on-site craft to:
 1. Disconnect the subject coaxial cable from the NE's DS3 connector panel.
 2. Connect the DS3EC1/8 transmitter/receiver test set to the subject connector on the NE's DS3EC1 connector panel.
 3. Program the test set to insert (transmit) a good DS3 signal.

.....

5 On the near-end NE, click on the **Update Alarms** button.

.....

6 Is the same LOS still included in the list?

If...	Then...
YES,	continue with Step 7.
NO,	go to Step 11.

.....

7 Instruct the near-end NE's on-site craft to replace the receiver (DS3EC1/8 circuit pack).

.....

8 On the near-end NE, left-click on the **Update Alarms** button.

.....

9 Is the same LOS still included in the list?

If...	Then...
YES,	continue with Step 10.
NO,	<i>STOP! End of Task.</i>

.....

10 Escalate to the next higher level of technical support.

.....

Important! The problem has been determined to be external to the NE. Thus, it is (a) within the cabling that runs from the DS3EC1 connector panel to the DSX panel, or (b) between the DSX panel and the upstream office.

11 Instruct the on-site craft to:

1. Disconnect the DS3EC1/8 transmitter/receiver from the DS3EC1 connector panel (LOS will again appear).
2. Reconnect the original coaxial cable back to the subject connector on the DS3EC1 connector panel.
3. Disconnect the subject cable at the DSX panel.

4. Reconnect the subject to the DS3EC1/8 transmitter/receiver test set.
 5. Program the test set to insert (transmit) a good DS3/EC-1 signal.
-

12 On the near-end NE, click on the **Update Alarms** button.

.....

13 Is the same LOS still included in the list?

If...	Then...
YES,	continue with Step 14.
NO,	the problem is external to the office. Refer to the office records and consult with the far-end NE crafts person as necessary. <i>STOP! End of Task.</i>

.....

14 Instruct the on-site craft to disconnect the subject coaxial cable between the DS3EC1 connector panel and the test set/DSX panel and to replace it with a known good cable.

.....
E N D O F S T E P S
.....

SE 543-6: Clear ‘STM1E/4 Loss of Signal’

Perform the steps below to clear an ‘STM1E/4 STMLOS’ alarm.

Important! During port provisioning if a port’s alarm monitoring state is MON, then it is not unusual for it to generate an STM1E/4 STMLOS alarm. Generally, whenever all NE-to-NE provisioning is completed and correct, the LOS alarm will automatically clear.

During normal operations the occurrence of an STM1E/4 STMLOS alarm will usually indicate that your receive port on the STM1E/4 circuit pack detected an incoming failure from the STM1E connector panel.

- 1 Instruct the on-site craft to visually inspect the incoming coaxial cable(s) and their associated connector(s) and to correct any (or all) identified problems.

- 2 On the near-end NE, click on the **Update Alarms** button.

- 3 Is the same STMLOS still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

Important! STM1E/4 electrical signals can be tested using an SDH transmitter/receiver test set.

- 4 Instruct the on-site craft to:
 1. Disconnect the subject coaxial cable from the NE’s STM1E connector panel.
 2. Connect the SDH transmitter/receiver test set to the subject connector on the NE’s STM1E connector panel.
 3. Program the test set to insert (transmit) a good STM1E signal.

.....

5 On the near-end NE, click on the Update Alarms button.

.....

6 Is the same STMLOS still included in the list?

If...	Then...
YES,	continue with Step 7.
NO,	go to Step 11.

.....

7 Instruct the near-end NE's on-site craft to replace the receiver (STM1E/4 circuit pack).

.....

8 On the near-end NE, click on the **Update Alarms** button.

.....

9 Is the same STMLOS still included in the list?

If...	Then...
YES,	continue with Step 10.
NO,	<i>STOP! End of Task.</i>

.....

10 Escalate to the next higher level of technical support.

.....

Important! The problem has been determine to be external to the NE. Thus, it is (a) within the cabling that runs from the STM1E connector panel to the STM1E panel, or (b) between the STM1E panel and the upstream office.

11 Instruct the on-site craft to:

1. Disconnect the SDH transmitter/receiver from the STM1E connector panel (STMLOS will again appear).
2. Reconnect the original coaxial cable back to the subject connector on the STM1E connector panel.
3. Disconnect the subject cable at the STM1E panel.
4. Reconnect the subject to the SDH transmitter/receiver test set.

5. Program the test set to insert (transmit) a good STM1E signal.

12 On the near-end NE, click on the **Update Alarms** button.

13 Is the same STMLOS still included in the list?

If...	Then...
YES,	continue with Step 14
NO,	the problem is external to the office. Refer to the office records and consult with the far-end NE crafts person as necessary. STOP! End of Task.

14 Instruct the on-site craft to disconnect the subject coaxial cable between the STM1E connector panel and the test set/STM1E panel and replace it with a known good cable.

END OF STEPS



Task 544: How to Eject an NVM Card from an Out-of-Service Circuit Pack

Purpose Use this procedure ONLY for those circumstances where (a) the CTL/SYS50DM circuit pack WILL NOT boot up, or (b) the NVM will not eject using the software eject routine!

Required equipment Use the following equipment to complete this task:

- Wrist strap
- Nonconductive sturdy plastic (or wood) pointed stick/object.

Admonishments To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand these warnings and precautions prior to performing this task.



CAUTION

Excessive force can result in damage to the mechanical eject mechanism.

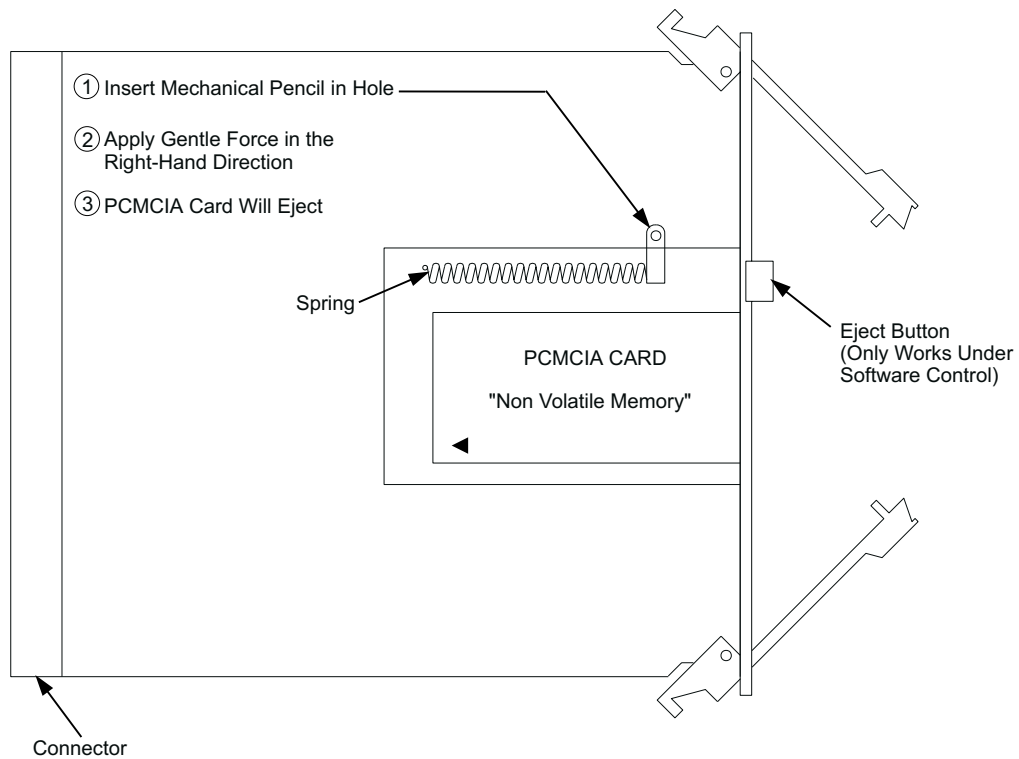
Task Complete the following steps to remove an NVM card from a defective circuit pack.

-
- 1** Physically remove the defective circuit pack (CTL/SYS50DM) from the shelf.
 - 2** Insert a sturdy object, such as the tip of a mechanical pencil, into the small tab (which has an eyelet). Refer to Figure 544-1.
 - 3** As appropriate, if the desire is to insert the previously removed PCMCIA card into another powered-up and already booted circuit pack, then refer to the task *Insert an NVM Card*.
-

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

CTL/SYS50DM with PCMCIA Card Inserted

Figure 544-1 CTL/SYS50DM with PCMCIA Card Inserted



NC-USM-135

Task 545: Clear ‘OC192/STM64, OC48/STM16, OC12/STM4, OC3/STM1, STM1E/4, or T3 DS3EC1/8 Loss of Frame’

Purpose Use this task to localize the problem, identify its cause, and implement the correction which results in clearing this alarm.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- DS3 transmitter/receiver set (to test “electrical” signal and cable troubles)
- Spare/replacement circuit pack (OC3/STM1, OC12/STM4, OC48/STM16, or as applicable OC192/STM64, or STM1E/4, or DS3EC1/8).
- Fiber cleaning supplies.

Optional equipment The following is a list of optional equipment required to complete this task:

- Optical power meter (to measure the received power level)
- OC3/STM1, OC12/STM4, OC48/STM16, or OC192/STM64 SONET/SDH transmitter/receiver test set
- Optical Time Domain Reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut)

Figures Figure 545-1 Near-End and Far-End NEs with Intermediate Transport Equipment

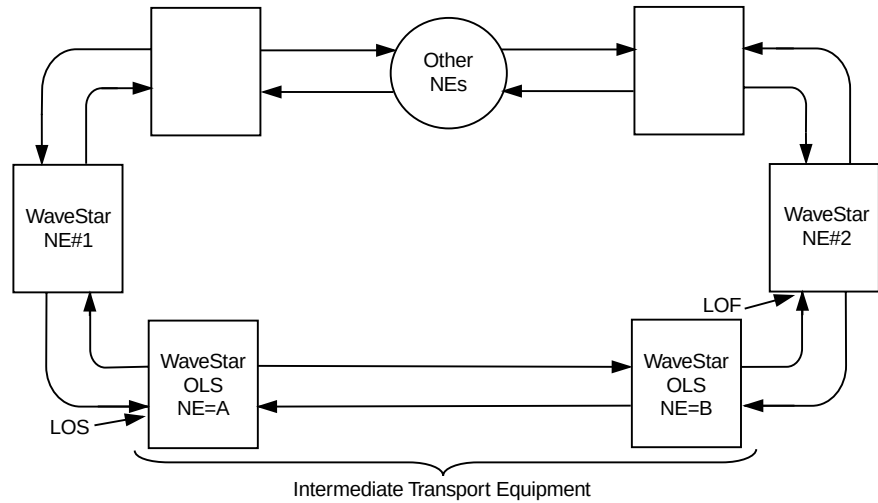
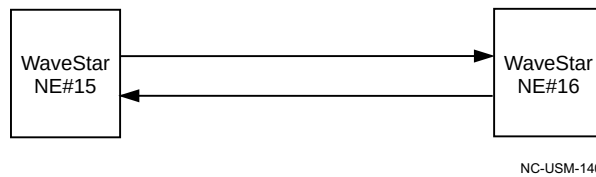


Figure 545-2 Near-End and Far-End NEs without Intermediate Transport Equipment



Before you begin Before you begin this task, it is important to understand that an LOF, in its pure and simple form, is the result of either: (a) a bad transmitter on the far-end NE, or (b) a bad receiver on the near-end NE. If intermediate transport equipment is involved, then the analysis and considerations are somewhat more complex.

Task Complete the following steps to clear an LOF alarm.

-
- 1** From the WaveStar CIT *System View*, click on the **Alarm List** button.

Important! Observe the column *Alarm Issue Point* and make a note of the AID that corresponds to the entry for the Loss of Frame.

2

If the Alarm List display includes...	Then continue with...
OC192/STM64, Loss of Frame	Supporting Element Reference: SE 545-1: Clear 'OC192/STM64 Loss of Frame'
OC48/STM16, Loss of Frame	Supporting Element Reference: SE 545-2: Clear 'OC48/STM16 Loss of Frame'
OC12/STM4, Loss of Frame	Supporting Element Reference: SE 545-3: Clear 'OC12/STM4 Loss of Frame'
OC3/STM1, Loss of Frame	Supporting Element Reference: SE 545-4: Clear 'OC3/STM1 Loss of Frame'
T3 DS3EC1/8, Loss of Frame	Supporting Element Reference: SE 545-5: Clear 'T3 DS3EC1/8 Loss of Frame'
STM1E/4, Loss of Frame	Supporting Element Reference: SE 545-6: Clear 'STM1E/4 Loss of Frame'

END OF STEPS

Important! Select one of the above tables to document this task.

SE 545-1: Clear ‘OC192/STM64 Loss of Frame’

Important! Before beginning this task it is important to know whether an intermediate transport system exists between the transmit NE and its corresponding receive NE. An intermediate transport system will complicate the issue of identifying exactly where the fault exists.

The topology of your ring may look somewhat like that depicted in Figure 545-1. For analysis purposes, let us assume that you are logged in at NE #2 and that this is where the LOF is being reported in the Alarm List.

Perform the steps below to clear an *OC192/STM64 LOF* alarm.

- 1 Refer to the office records and determine what components make up the transport system. For example, is there intermediate equipment (such as an Optical Line System) between the two NEs?

If...	Then...
YES,	continue with Step 2
NO,	go to Step 26

- 2 Contact or, if possible, log in to the node that is figuratively represented by NE=A. Determine whether that node is detecting/reporting an LOS alarm.

Is the far-end node (which is represented as NE=A) detecting an LOS?

If...	Then...
YES,	the recommendation is to replace the transmitter circuit pack in that span (which in Figure 545-1 is represented as NE #1). Continue with Step 19. Reference: Figure 545-1
NO,	continue.

Important! Step 4 through Step 9 are optional. They require the use of a SONET/SDH test set. If you do not have access to a test set, then you can continue with Step 31.

3 When using the test set:

1. Disconnect the receive fiber (from NE#1) at node NE=A, or at a cross-connect bay that is located near that NE.
2. Verify that the fiber connector is clean, and then connect the disconnected fiber to the test set.
3. Check and determine whether or not you are detecting a framed signal at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

4 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must be at the near-end node (NE #2). Go to Step 16. Reference: Figure 545-1
NO,	continue.

Important! The problem is either a contaminated fiber connector at node NE#1 or the transmitter at node NE#1.

5 Contact the on-site craft at node (NE #1) and instruct term to:

1. Disconnect the suspected fiber connection at the transmitter.
2. Clean and reconnect the fiber to the OUT connector.

Reference: Task 703: Clean Optical Fibers and Connectors

6 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must have been a contaminated connector. Continue with Step 9.
NO,	continue with the next step.

7 Contact the on-site craft at node (NE #1) and instruct them to replace the transmit circuit pack and reconnect the fiber.

8 Is a framed signal detected by the test set?

If...	Then...
YES,	continue.
NO,	escalate to next higher level of technical support.

9 Instruct the on-site craft, at node NE =A to:

1. Disconnect the fiber from the test set.
2. Clean the fiber connector.
3. Reconnect the fiber connector to node NE=A.

Reference: Task 703: Clean Optical Fibers and Connectors

10 At node NE#2 and from the *System View* screen, click on the **Update Alarms** button.

11 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

12 Clean the optical fiber and connector at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

13 Is a framed signal detected by the test set?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	continue.

14 Escalate to the next higher level of technical support.

15 Instruct the on-site craft at node NE=A to:

1. disconnect the fiber from their test set
2. Clean that fiber.
3. reconnect to the fiber to receiver of NW=A.

Reference: Task 703: Clean Optical Fibers and Connectors.

16 Instruct the on-site craft, at the near-end node (NE #2), to replace the receiver circuit pack.

Reference: Figure 545-1

17 Click on the **Update Alarms** button.

18 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

19 Click on the **Update Alarms** button.

-
- 20** Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 21.
NO,	<i>STOP! End of Task.</i>

-
- 21** Instruct the on-site craft to remove the newly installed circuit pack and replace it with the original circuit pack.

Reference: Figure 545-1

-
- 22** Click on the **Update Alarms** button.

-
- 23** Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

Important! The topology of your ring may look somewhat like that depicted in Figure 545-2. For analysis purposes, let us assume that you are at NE = 2.

-
- 24** Contact the on-site craft at the far-end node (NE = 1) and instruct them to replace the transmitter (circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

-
- 25** Click on the **Update Alarms** button.

.....

26 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 27.
NO,	<i>STOP! End of Task.</i>

.....

27 Instruct the on-site craft at the far-end NE (NE = 1) to replace the newly installed transmitter circuit pack with the original circuit pack.

.....

28 Instruct the on-site craft at the near-end NE (NE = 2) to replace the receiver circuit pack.

.....

29 Click on the **Update Alarms** button.

.....

30 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

.....

31 Contact the on-site craft at the far-end node and instruct them to replace the transmitter (circuit pack). Continue with Step 23.**20

.....

END OF STEPS

.....

SE 545-2: Clear 'OC48/STM16 Loss of Frame'

Important! Before beginning this task, it is important to know whether an intermediate transport system exists between the transmit NE and its corresponding receive NE. An intermediate transport system will complicate the issue of identifying exactly where the fault exists.

Perform the steps below to clear an *OC48/STM16 LOF* alarm.

.....

- 1 Refer to the office records and determine what components make up the transport system. For example, is there intermediate equipment (such as an Optical Line System) between the two NEs?

If...	Then...
YES,	continue with Step 2.
NO,	go to Step 27

.....

Important! The topology of your ring may look somewhat like that depicted in Figure 545-1. For analysis purposes, let us assume that you are logged in at NE #2 and that this is where the LOF is being reported in the Alarm List.

- 2 Contact or, if possible, log in to the node that is figuratively represented by NE=A. Determine whether that node is detecting/reporting an LOS alarm.
-

- 3 Is the far-end node (which is represented as NE=A) detecting an LOS?

If...	Then...
YES,	the recommendation is to replace the transmitter circuit pack in that span (which in Figure 545-1 is represented as NE #1). Continue with Step 20. Reference: Figure 545-1
NO,	continue with next step.

Important! Step 4 through Step 15 are optional. They require the use of a SONET/SDH test set. If you do not have access to a test set, then you can continue with Step 32.

4 When using the test set:

1. Disconnect the receive fiber at node NE=A, or at a cross-connect bay that is located near that NE
2. Verify that the fiber connector is clean and then connect the disconnected fiber to the test set
3. Check and determine whether or not you are detecting a framed signal at the test set.

5 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must be at the near-end node (NE #2). Go to Step 17. Reference: Figure 545-1
NO,	continue with next step.

Important! The problem is either a contaminated fiber connector at node NE#1 or the transmitter at node NE#1.

6 Contact the on-site craft at node (NE #1) and instruct them to:

1. Disconnect the suspected fiber connection at the transmitter.
2. Clean and reconnect the fiber to the OUT connector.

Reference: Task 703: Clean Optical Fibers and Connectors

7 Is a framed signal detected by the test set?

If...	Then...
YES,	the problem must have been a contaminated connector. Continue with Step 10.
NO,	continue with next step.

-
- 8** Contact the on-site craft at node (NE #1) and instruct them to replace the transmit circuit pack and reconnect the fiber.
-

- 9** Is a framed signal detected by the test set?

If...	Then...
YES,	continue.
NO,	escalate to the next higher level of technical support.

- 10** Instruct the on-site craft at node NE = A to:

1. Disconnect the fiber from the test set.
2. Clean the fiber connector.
3. Reconnect the fiber connector to node NE=A.

Reference: Task 703: Clean Optical Fibers and Connectors

- 11** At node NE#2 and from the *System View* screen, click on the **Update Alarms** button.
-

- 12** Is the same LOF still displayed in the Alarm List?

If...	Then...
YES	escalate to the next higher level of technical support.
NO,	STOP! End of Task.

- 13** Clean the optical fiber and connector at the test set.

Reference: Task 703: Clean Optical Fibers and Connectors

.....

14 Is a framed signal detected by the test set?

If...	Then...
YES	STOP! End of Task.
NO,	continue.

.....

15 Escalate to the next higher level of technical support.

.....

16 Instruct the on-site craft at node NE=A to:

1. Disconnect the fiber from their test set.
 2. Clean that fiber.
 3. Reconnect to the fiber to receiver of NW=A.
-

17 Instruct the on-site craft at the near-end node (NE #2) to replace the receiver circuit pack.

Reference: Figure 545-1

.....

18 Click on the **Update Alarms** button.

.....

19 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

.....

20 Click on the **Update Alarms** button.

.....

21 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 22.

If...	Then...
NO,	<i>STOP! End of Task.</i>

-
- 22** Instruct the on-site craft to remove the newly installed circuit pack and replace it with the original circuit pack.

Important! Each fiber connection/fiber connector should always be cleaned before re-connection, whether or not the connector is known to be causing a problem.

Reference: Figure 545-1

Task 703: Clean Optical Fibers and Connectors

-
- 23** Click on the **Update Alarms** button.

-
- 24** Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

Important! The topology of your ring may look somewhat like that depicted in Figure 545-2 For analysis purposes, let us assume that you are at NE = 2.

- 25** Contact the on-site craft at the far-end node (NE = 1) and instruct them to replace the transmitter (circuit pack).

Important! Each fiber connection/fiber connector should always be cleaned before reconnection, whether or not the connector is known to be causing a problem.

Reference: Figure 545-2

Task 703: Clean Optical Fibers and Connectors

-
- 26** Click on the **Update Alarms** button.

.....

27 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	continue with Step 28.
NO,	<i>STOP! End of Task.</i>

.....

28 Instruct the on-site craft at the far-end NE (NE = 1) to replace the newly installed transmitter circuit pack with the original circuit pack.

.....

29 Instruct the on-site craft at the near-end NE (NE = 2) to replace the receiver circuit pack.

.....

30 Click on the **Update Alarms** button.

.....

31 Is the same LOF still displayed in the Alarm List?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	<i>STOP! End of Task.</i>

.....

32 Contact the on-site craft at the far-end node and instruct them to replace the transmitter (circuit pack). Continue with Step 24.

.....

END OF STEPS

.....

SE 545-3: Clear ‘OC12/STM4 Loss of Frame’

Important! Regardless of whether or not the OC12/STM4 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

Perform the steps below to clear an *OC12/STM4 LOF* alarm.

Important! The first step is to replace the transmitter at the far-end NE.

- 1 Instruct the on-site craft at the far-end NE to replace the transmitter (OC12/STM4 circuit pack).

Important! Refer to the appropriate vendor-supplied documentation.

-
- 2 On the near-end NE, click on the **Update Alarms** button.

-
- 3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

-
- 4 Instruct the far-end craft to replace the newly installed OC12/STM4 circuit pack with the original circuit pack.

-
- 5 Instruct the near-end craft to replace the receiver (OC12/STM4 circuit pack).

Reference: Figure 545-2

-
- 6 On the near-end NE, click on the **Update Alarms** button.

-
- 7** Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	<i>STOP! End of Task.</i>

-
- 8** Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

SE 545-4: Clear ‘OC3/STM1 Loss of Frame’

Perform the steps below to clear an *OC3/STM1 LOF* alarm’

Important! Regardless of whether or not the OC3/STM1 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

The first step is to replace the transmitter at the far-end NE.

- 1 Instruct the on-site craft, at the far-end NE, to replace the transmitter (OC3/STM1 circuit pack).

Important! Refer to the appropriate vendor-provided documentation.

- 2 On the near-end NE, click on the **Update Alarms** button.

- 3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

- 4 Instruct the far-end craft to replace the newly installed OC3/STM1 circuit pack with the original circuit pack.

- 5 Instruct the near-end craft to replace the receiver (OC3/STM1 circuit pack).

Reference: Figure 545-2

- 6 On the near-end NE, click on the **Update Alarms** button.

-
- 7** Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	<i>STOP! End of Task.</i>

-
- 8** Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

SE 545-5: Clear ‘T3 DS3EC1/8 Loss of Frame’

Perform the steps below to clear a *T3 DS3EC1/8 LOF* alarm.

Important! This alarm indicates that the DS3EC1/8 signal at the INPUT jack has failed.

Regardless of whether or not the DS3EC1/8 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

The first step is to replace the transmitter at the far-end NE.

- 1 Instruct the on-site craft at the far-end NE to replace the transmitter (DS3EC1/8 circuit pack).

Important! Refer to the appropriate vendor-supplied documentation.

- 2 On the near-end NE, click on the **Update Alarms** button.

- 3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

- 4 Instruct the far-end craft to replace the newly installed DS3EC1/8 circuit pack with the original circuit pack.

- 5 Instruct the near-end craft to replace the receiver (DS3EC1/8 circuit pack).

Reference: Figure 545-2

- 6 On the near-end NE, click on the **Update Alarms** button.

-
- 7** Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8.
NO,	<i>STOP! End of Task.</i>

-
- 8** Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....



SE 545-6: Clear ‘STM1E/4 Loss of Frame’

Important! This alarm indicates that the STM1E/4 signal at the INPUT jack has failed.

Regardless of whether or not the STM1E/4 circuit pack is a member of a protection group, the circuit pack replacement considerations are the same.

The first step is to replace the transmitter at the far-end NE.

Perform the steps below to clear an *STM1E/4 LOF* alarm

-
- 1 Instruct the on-site craft, at the far-end NE, to replace the transmitter (STM1E/4 circuit pack).

Important! Refer to the appropriate vendor-supplied documentation.

-
- 2 On the near-end NE, click on the **Update Alarms** button.

-
- 3 Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 4.
NO,	<i>STOP! End of Task.</i>

-
- 4 Instruct the far-end craft to replace the newly installed STM1E/4 circuit pack with the original circuit pack.

-
- 5 Instruct the near-end craft to replace the receiver (STM1E/4 circuit pack).

Reference: Figure 545-2

-
- 6 On the near-end NE, click on the **Update Alarms** button.

-
- 7** Is the same LOF still included in the list?

If...	Then...
YES,	continue with Step 8
NO,	<i>STOP! End of Task.</i>

-
- 8** Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

Task 546: Clear ‘ADJCTL/DCC Circuit Pack Failure’

Overview Beginning with WaveStar BandWidth Manager, R4.0, the System Controller Shelf may be equipped with one or two ADJCTL/DCC circuit packs. Their AIDs are “sc-1-#-#-dcc1” and “sc-1-#-#-dcc2”. The BandWidth Manager allows simplex and duplex modes of operation. On system startup, if there is a single ADJCTL/DCC inserted in the System Controller Shelf then the BandWidth Manager operates in simplex mode. As soon as a second ADJCTL/DCC is inserted the system automatically switches to duplex mode. With R4.0 and later releases, use this task whenever the Alarm List displays the *ADJCTL/DCC Circuit Pack Failure* alarm.

Purpose Use this procedure in the following situations:

- You cannot establish communication with the subject network element (NE) via this ADJCTL/DCC circuit pack.
- You cannot obtain a response to a login session from the NE.
- The active LED on the ADJCTL/DCC circuit pack blinks continuously.
- The failed LED on the ADJCTL/DCC circuit pack lights red continuously.

Before you begin this task verify the following:

- The ADJCTL/DCC circuit pack is not in the process of reinitializing (a 2-minute wait should be sufficient).
- The subject NE is not rebooting.

Required equipment The following hardware/equipment items are required:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement ADJCTL/DCC circuit pack

Task Complete the following steps to clear an *ADJCTL/DCC Circuit Pack Failure* alarm.

-
- 1** Determine from the alarm message whether the AID for the alarmed circuit pack is “sc-1-#-#-dcc1” or “sc-1-#-#-dcc2”.

.....

2 Instruct the on-site craft to go to the subject NE and determine whether the subject ADJCTL/DCC circuit pack's:

1. FAULT LED is lighted (red), or
2. The ACTIVE LED is blinking green.

If the answer to either (1 or 2) is *YES*, continue with Step 2.

If *NO*, go to Step 7.

.....

3 Instruct the on-site craft to:

1. Go to the subject AID.
 2. Unseat the ADJCTL/DCC circuit pack from its connector but leave it in the slot.
 3. Wait 20 seconds.
 4. Reseat the ADJCTL/DCC circuit pack.
-

4 Instruct the on-site craft to wait a minimum of 2 minutes for this circuit pack to reinitialize.

.....

5 Instruct the on-site craft to visually determine the condition of the ACTIVE and FAULT LEDs.

If...	Then...
the ACTIVE LED is lighted continuously,	go to Step 7.
the FAULT is lighted,	continue with the next step.

.....

6 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
 2. Insert a known good replacement circuit pack.
-

7 Wait 2 minutes for this circuit pack to reinitialize.

.....

Important! The newly installed ADJCTL/DCC circuit pack should reinitialize (the green LED blinks, no red LED) in approximately 2 minutes.

-
- 8** From the *System View* screen, click on the **Update Alarms** button.
-

- 9** Has this alarm cleared?

If...	Then...
YES,	<i>STOP! End of Task.</i>
NO,	escalate to your next higher level of technical support.

-
- 10** *STOP! End of Task.*

END OF STEPS

Task 547: Clear ‘DS3EC1/8 Circuit Pack Failure’

- Purpose** Use this task to:
- Obtain the identity of an alarmed DS3EC1/8 circuit pack.
 - Replace the alarmed circuit pack.
 - Verify that the alarm has been cleared.

- Required equipment** The following list of equipment is required in order to successfully complete this procedure:
- WaveStar Craft Interface Terminal (CIT)
 - Wrist strap
 - Spare/replacement DS3EC1/8 circuit pack.

- Alarm clearing strategy** Use the following alarm-clearing strategy when trying to clear a *DS3EC1/8 Circuit Pack Failure* alarm.
1. Determine whether the alarm is on the protection circuit pack (*eprn*) or on one of the working circuit packs (slots *1 through 6* and slots *11 through 16*).
 2. If the alarm is an *eprn*, the task will instruct you to replace that circuit pack without further considerations.
 3. If, simultaneously, an alarm also exists on one or more of the working circuit packs, then after replacing the failed *eprn* there should be a protection switch to *eprn*.
 4. If the alarm is on only one of the working circuit packs, then you should verify that a protection switch is in effect.
 - If the auto protection switch is in effect, then it is okay to replace the failed circuit pack.
 - If the auto protection switch is not in effect, then the craft should do a manual protection switch.

- Before you begin** Prior to beginning this task, you must:
1. Have a WaveStar CIT that is connected to the subject network element (NE).
 2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
 3. From the *System View* screen of the subject NE, click on the button labeled **Alarm List**.

Task Complete the following steps to clear a *DS3EC1/8 Circuit Pack Failure* alarm

-
- 1** From the *Alarm List*, determine the AID of the failed circuit pack/packs.

Important! If the DS3EC1/8 circuit pack is part of a 1xN equipment protection group, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if the DS3EC1/8 circuit pack is part of a 0x1 unprotected group, both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

-
- 2** Is the failed circuit pack part of a 1xN protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 15.

-
- 3** From the Alarm List, determine whether or not an *eprn Circuit Pack Failure* also exists. Is the AID that of the eprn slot?

If...	Then...
YES,	go to Step 14.
NO,	continue.

-
- 4** From the *System View*:

1. Click on *View-Protection*.
2. Click on the tab that is labeled *Prot Grp*.
3. In the Windows-like explorer, expand down the directory until *1xN Equipment eds3ec1grp* is displayed; then highlight that protection group.
4. Click on the **Select** button.

Important! A manual switch or a forced switch can be used if replacement of a circuit pack is necessary. These will be required only if something abnormal occurred. Under normal operations an

automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Fail*) is enough to replace a defective circuit pack.

- 5 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Equipment Fail* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 547-1: Perform a Manual Protection Switch on a DS3EC1/8

- 6 Instruct the on-site craft to go to the identified AID and physically unlatch and remove that circuit pack and insert a known good replacement circuit pack.

Important! The newly installed DS3EC1/8-cp should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

- 7 Wait 2 minutes for this circuit pack to reinitialize.

- 8 Click on the **Update Alarms** button.

- 9 Does the list include this same circuit pack failure alarm?

If...	Then...
YES	go to Step 13.
NO,	continue.

.....

10 Does the list include other DS3EC1/8 circuit pack failure alarms?

If...	Then...
YES,	go to Step 4.
NO,	continue.

.....

11 Did you perform a *Manual Protection Switch* in Step 4?

If...	Then...
YES,	you should perform a Clear Protection Switch. Reference: SE 547-2: Clear Protection Switch on a DS3EC1/8
NO,	continue.

.....

12 *STOP! End of Task.*

.....

13 Escalate to the next higher level of technical support.

.....

14 Instruct the on-site craft to go to the AID of the eprn slot and:

1. Physically unlatch and remove that circuit pack.
2. Insert a known good replacement circuit pack.
3. Continue with Step 7.

.....

Important! For the 0x1 DS3EC1/8 applications, the failure will typically be just one port while the remaining seven will be functioning normally. With this scenario, the failed port will result in a loss of service to that single port. However, during the time interval that this circuit pack is removed from the shelf and until its replacement is rebooted, all eight ports will experience a loss of service.

- 15** The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this AMTCG. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.
-

- 16** Instruct the on-site craft to go to the identified AID and:

1. Physically unlatch and remove that circuit pack.
 2. Insert a known good replacement circuit pack.
 3. Continue with Step 17.
-

Important! The newly installed DS3EC1/8-cp should reinitialize (green LED blinks and clears, or green LED blinks and remains lighted, and then no red LED) in less than 2 minutes.

- 17** Wait 2 minutes for this circuit pack to reinitialize.
-

- 18** Click on the **Alarm List** button.
-

- 19** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 13.
NO,	continue.

- 20** As appropriate, use your local operating procedures to determine the steps required to roll any unprotected traffic back to the newly replaced DS3EC1/8 circuit pack.

END OF STEPS

SE 547-1: Perform a Manual Protection Switch on a DS3EC1/8

Perform the following steps to manually switch an alarmed DS3EC1/8 circuit pack to the eprn protection circuit pack.

1 From the *System View* screen:

1. Click on *Fault-Protection Switch*.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory until *1xN Equipment ds3ec1grp* is displayed; then highlight that protection group.
4. Click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, 1-1-##-eprn-cp). Also, this display shows a drop-down box for the *Working Pack AIDs*:

5. Click on the drop-down arrow for the field *Working Pack AIDs*: and highlight the AID of the alarmed circuit pack.
 6. In the field labeled *Switch Type*: left-click on the drop-down arrow and highlight **Manual**.
 7. Click on the **Apply** button.
 8. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual Protection Switch* command was successful.

Important! Any currently existing higher priority protection switch command would cause the command to fail. If the command was successful, the list will display **Protection Switch (appropriate AID) Successful**.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

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Issue 7, October 2001

- END OF STEPS

Task 548: Clear ‘OC48/STM16 Circuit Pack Failure’

Purpose Use this task to:

- Obtain the identity of an alarmed OC48/STM16 circuit pack
- Replace the alarmed circuit pack
- Verify that the alarm has been cleared.

Required equipment The following items are required before beginning this procedure:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC48/STM16 circuit pack

- Important considerations**
1. An OC48/STM16 circuit pack can only be used in a 0x1 (unprotected) equipment configuration. However, the unprotected circuit pack may be used to support facilities that are:
 - 1+1 protected
 - BLSR protected
 - MS-SPRing protected
 - 0x1 unprotected
 2. Regarding revertive and nonrevertive switching:
 - For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
 - For 1+1 facilities the defaults are:
 - Nonrevertive (but can be provisioned as revertive)
 - At initial start-up of an NE, service is provided by the *working line*
 - At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin

Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject network element (NE).
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the **Alarm List** button.

Task

Perform the following steps to clear an *OC48/STM16, Circuit Pack Failure* alarm.

-
- 1 From the *Alarm List*, determine the AID of the failed circuit pack.

Important! The OC48/STM16 circuit pack may be: (a) part of a BLSR facilities protection group (b) part of an MS-SPRing facilities protection group (c) part of a 1+1 facilities protection group, or (d) part of a 0x1 unprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

- 2 Is the failed circuit pack part of a BLSR/MS-SPRing or 1+1 facilities protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 12.

-
- 3 From the *System View* screen:
 1. Click on *View-Protection*.
 2. Click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand down the directory until the desired protection group (for example, *_F BLSR...* or *1+1 Optical...*) is displayed. Then highlight the protection group.
 4. Click on the **Select** button.

5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State*: equals *Signal Failure*) is enough to replace a defective circuit pack.

-
- 4 For the *View Protection* screen and for the field that is labeled *Switch Request State*: "Is *Signal Failure* listed?"

If...	Then...
YES,	a protection switch is in effect. Continue with Step 5.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 548-1: Perform a Manual Protection Switch

Important! The OC48/STM16 is a single port type circuit pack. Therefore, for the application where it is supporting a BLSR/MS-SPRing facility protection group or a 1+1 facility protection group, all traffic will be automatically switched to the other circuit pack upon declaring an OC48/STM16 circuit pack failure.

- 5 Instruct the on-site craft to:
 1. Disconnect the two fibers from the subject circuit pack.
 2. Physically unlatch and remove the alarmed circuit pack.
 3. Insert a known good replacement circuit pack.
 4. Clean and carefully reconnect the two fibers (OUT to OUT) and (IN to IN).

Reference: Task 700: How to Properly Remove a Circuit Pack
Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC48/STM16 circuit pack should reinitialize (green LED blinks and clears, and then no red

LED) in approximately 2 minutes—depending on other ongoing system activities.

- 6 Wait for this circuit pack to reinitialize.

- 7 Click on the **Alarm List** button.

- 8 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

- 9 Did you perform a *Manual Protection Switch* in Step 3?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 548-2: Clear Protection Switch
NO,	continue.

- 10 **STOP! End of Task.**

- 11 Escalate to the next higher level of technical support.

Important! For the 0x1 OC48/STM16 applications, a circuit pack failure means a complete loss of service on this particular facility.

- 12 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack (the AID from Step 1).
2. Physically unlatch and remove the failed circuit pack.

3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the two fibers (OUT to OUT) and (IN to IN).

Reference: Task 700: How to Properly Remove a Circuit Pack

Important! The newly installed OC48/STM16 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes, depending on other ongoing system activities.

- 13** Wait for this circuit pack to reinitialize.

-
- 14** Click on the **Alarm List** button.

-
- 15** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	go to Step 10.

END OF STEPS

SE 548-1: Perform a Manual Protection Switch

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

1 From the *System View* screen:

1. Click on *Fault-Protection Switch*.
 2. Click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2F BLSR...*) is displayed. Then, highlight the appropriate protection group.
 4. Click on the **Select** button.
 5. If ... *East Port AID...* is alarmed, then
 - for the field that is labeled *Direction*: select
West
 - for the field that is labeled *Switch Type*: select
Manual to Protection, Ring
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the Command List (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display *Protection Switch (appropriate AID) Successful*.

3 Was the *Manual Protection Switch* command successful?

If...	Then...
YES,	<i>Stop! End of Supporting Task.</i>

If...	Then...
NO,	continue.

-
- 4** Escalate to the next higher level of technical support.

END OF STEPS

SE 548-2: Clear Protection Switch

Perform the following steps to *Clear* an existing manual protection switch.

- 1** From the *System View* screen:
 1. Select *Fault-Protection Switch*.
 2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
 3. Click to highlight the desired AID.
 4. Click on the **Select** button.
 5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
 6. Click on *Clear*.
 7. Click on the **Apply** button.
 8. Read the information in the Caution box and then click on the **YES** button.
 9. Click on the **Close** button.

END OF STEPS



Task 549: Clear ‘OC12/STM4 Circuit Pack Failure’

Purpose Use this task whenever the NE Alarm List displays an *OC12/STM4 Circuit Pack Failure*.

Required equipment The following items are the minimum equipment requirements for completing this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC12/STM4 circuit pack.

- Important considerations**
1. An OC12/STM4 circuit pack can be used only in a 0x1 (unprotected) equipment configuration. However, the unprotected circuit pack may be used to support facilities that are:
 - a. 1+1 protected, or
 - b. 0x1 unprotected.
 2. Regarding revertive and nonrevertive switching:
 - a. For 1+1 facilities, upon failure of the working circuit pack, service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
 - b. For 1+1 facilities the defaults are:
 - Nonrevertive (but can be provisioned as revertive)
 - At initial start-up of an NE, service is provided by the *working line*
 - At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.

2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the System View screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear an *OC12/STM4 Circuit Pack Failure* alarm.

-
- 1 From the *Alarm List*, determine the AID of the failed circuit pack.

Important! The OC12/STM4 is a two port type of circuit pack. If both ports provide service to 1+1 facility protection groups, then the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if at least one of the two ports is part of a 0x1 unprotected group, then both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

- 2 Does the failed circuit pack provide service to a 1+1 facilities protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 12.

Important! If the circuit pack is being used to provide service to a 1+1 facility protection group, then at least one port (and perhaps two) will be automatically protected upon circuit pack failure.

- 3 From the *System View* screen:
 - a. Click on *View-Protection*.
 - b. Click on the tab labeled *Prot Grp*.
 - c. In the Windows-like explorer screen, expand/scroll down the directory until the desired protection group (for example, 1+1 Optical...) is displayed. Then highlight the protection group.
 - d. Click on the **Select** button

- e. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State*: equals *Signal Failure*) is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Signal Failure* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a <i>Manual Protection Switch</i> Reference: SE 549-1: Perform a Manual Protection Switch on an OC12/STM4

5 Instruct the on-site craft to:

- a. Disconnect the two fibers from the subject circuit pack
- b. Physically unlatch and remove the alarmed circuit pack
- c. Insert a known good replacement circuit pack
- d. Clean and carefully reconnect the fibers.

Reference: Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC12/STM4 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

6 Wait for this circuit pack to reinitialize.

7 Click on the **Update Alarms** button.

8 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

9

If, in Step 3, you...	Then...
performed a <i>Manual Protection Switch</i> ,	you may, as an option, chose to return service to the original side with a <i>Clear Protection Switch</i> command. Reference: SE 549-2: Clear Protection Switch on an OC12/STM4
did not perform a <i>Manual Protection Switch</i> ,	continue with Step 10.

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

Important! At this point you should have determined which port or ports are listed as unprotected. Depending on what part of the circuit pack failed, either one or both ports could still be providing service. In order to not interrupt this service, it will be necessary to roll it off to other facilities before removing this circuit pack.

12 The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this user/service manual. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.

13 Instruct the on-site craft to:

- a. Disconnect the two fibers from the subject circuit pack
- b. Physically unlatch and remove the alarmed circuit pack
- c. Insert a known good replacement circuit pack
- d. Clean and carefully reconnect the fibers.

Reference: Task 700: How to Properly Remove a Circuit Pack
Task 703: Clean Optical Fibers and Connectors

Important! The newly installed OC12/STM4 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

14 Wait for this circuit pack to reinitialize.

15 Click on the **Update Alarms** button.

16 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

17 If you chose to roll the 0x1 service in Step 12, then you can now restore the service to the newly installed circuit pack.

STOP! End of Task

END OF STEPS

SE 549-1: Perform a Manual Protection Switch on an OC12/STM4

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

- 1 From the *System View* screen:
 - a. Click on *Fault-Protection Switch*.
 - b. Click on the tab labeled *Prot Grp*.
 - c. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, ...1+1 *Optical o...*) is displayed. Then, highlight the appropriate protection group.
 - d. Click on the *Select* button.
 - e. In the field labeled *Switch Type*: click on the drop-down arrow and:
 - if....*Wkg...* is alarmed, then select *Manual to Protection*
 - OR
 - if....*Ptn...* is alarmed, then select *Manual to Working*.
 - f. Click on the **Apply** button.
 - g. Read the information message and, as appropriate, click on the **YES** button.
-
- 2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the Manual to _____ command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the *manual to* _____, would cause the command to fail. If the command was successful, then the list will display Protection Switch (appropriate AID) Successful.

- 3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

-
- 4** Escalate to the next higher level of technical support.

END OF STEPS



SE 549-2: Clear Protection Switch on an OC12/STM4

Perform the following steps to *Clear* an existing manual protection switch.

- 1 From the *System View* screen:
 - a. Select *Fault-Protection Switch*.
 - b. In the Windows-like explorer, expand/scroll down the directory until the desired AID is shown.
 - c. Click to highlight the desired AID.
 - d. Click on the **Select** button.
 - e. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
 - f. Click on *Clear*.
 - g. Click on the **Apply** button.
 - h. Read the information in the Caution box and then click on the **YES** button.
 - i. Click on the **Close** button.
-

- 2 *STOP! End of Supporting Element.*

END OF STEPS

Task 550: Clear ‘OC3/STM1 Circuit Pack Failure’

Purpose Use this task whenever the NE Alarm List displays an *OC3/STM1 Circuit Pack Failure*.

Required equipment The following items are the minimum equipment requirements for completing this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement OC3/STM1 circuit pack

- Important considerations**
1. An OC3/STM1 circuit pack can be used only in a 0x1 (unprotected) equipment configuration. However, the unprotected circuit pack may be used to support facilities that are:
 - a. 1+1 protected
 - b. 0x1 unprotected
 2. Regarding revertive and nonrevertive switching:
 - a. For 1+1 facilities, upon failure of the working circuit pack, service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the Issue 7 protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
 - b. For 1+1 facilities the defaults are:
 - Nonrevertive (but can be provisioned as revertive)
 - At initial start-up of an NE, service is provided by the *working line*
 - At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.

2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the System View screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear an *OC3/STM1 Circuit Pack Failure* alarm.

- 1 From the *Alarm List*, determine the AID of the failed circuit pack.

Important! The OC3/STM1 is a four port type of circuit pack. If all four ports provide service to 1+1 facility protection groups, then the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted. However, if at least one of the four ports is part of a 0x1 unprotected group, then both the ACTIVE LED (green) and FAULT LED (red) will be lighted simultaneously.

- 2 Does the failed circuit pack provide service to a 1+1 facilities protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 12.

Important! If the circuit pack is being used to provide service to a 1+1 facility protection group, then at least one port (and perhaps all four) will be automatically protected upon circuit pack failure.

- 3 From the *System View* screen:
 - a. Click on *View-Protection*.
 - b. Click on the tab labeled *Prot Grp*.
 - c. In the Windows-like explorer screen, expand/scroll down the directory on Bay __ and I/O Shelf __ until the desired protection group (for example, *1+1 Optical o...*) is displayed. Then highlight the protection group.

- d. Click on the **Select** button
- e. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State*: equals *Signal Failure*) is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Signal Failure* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 6.
NO,	you should perform a <i>Manual Protection Switch</i> Reference: SE 550-1: Perform a Manual Protection Switch on an OC3/STM1

5 Instruct the on-site craft to:

- a. Physically open the upper latch.
- b. Wait 5 seconds.
- c. Physically open the lower latch. While using both upper and lower latches, pull this circuit pack from the shelf.
- d. Insert a known good replacement circuit pack

Important! The newly installed OC3/STM1 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

6 Wait for this circuit pack to reinitialize.

7 Click on the **Update Alarms** button.

-
- 8** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

-
- 9** Did you perform a *Manual Protection Switch* in Step 3?

If...	Then...
YES,	you should perform a a <i>Clear Protection Switch</i> . Reference: SE 550-2: Clear Protection Switch on an OC3/STM1
NO,	continue.

-
- 10** *STOP! End of Task.*

-
- 11** Escalate to the next higher level of technical support.

Important! At this point you should have determined which port or ports are listed as unprotected. Depending on what part of the circuit pack failed, either one, two, three, or four ports could still be providing service. In order to not interrupt this service, it will be necessary to roll it off to other facilities before removing this circuit pack.

- 12** The rolling of traffic from 0x1 ports and the subsequent restoration of service are topics deemed outside the scope of this user/service manual. You should refer to your local operating procedures to determine the steps required to roll any unprotected traffic.

-
- 13** Instruct the on-site craft to:

- a. Physically unlatch and remove the alarmed circuit pack.

- b. Insert a known good replacement circuit pack.

.....

Important! The newly installed OC3/STM1 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in less than 2 minutes.

- 14** Wait for this circuit pack to reinitialize.

-
- 15** Click on the **Update Alarms** button.

-
- 16** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

-
- 17** If you chose to roll the 0x1 service in Step 12, then you can now restore the service to the newly installed circuit pack.

STOP! End of Task

.....

E N D O F S T E P S

.....

SE 550-1: Perform a Manual Protection Switch on an OC3/STM1

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

- 1 From the *System View* screen:
 - a. Click on *Fault-Protection Switch*.
 - b. Click on the tab labeled *Prot Grp*.
 - c. In the Windows-like explorer screen, expand/scroll down the directory until the desired protection group (for example, ...1+1 *Optical o...*) is displayed. Then, highlight the appropriate protection group.
 - d. Click on the *Select* button.
 - e. In the field labeled *Switch Type*: click on the drop-down arrow and:
 - if....*Wkg...* is alarmed, then select *Manual to Protection*
 - OR
 - if....*Ptn...* is alarmed, then select *Manual to Working*.
 - f. Click on the **Apply** button.
 - g. Read the information message and, as appropriate, click on the **YES** button.
-

- 2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the Manual to _____ command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the *manual to* _____, would cause the command to fail. If the command was successful, then the list will display Protection Switch (appropriate AID) Successful.

- 3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

-
- 4** Escalate to the next higher level of technical support.

END OF STEPS



SE 550-2: Clear Protection Switch on an OC3/STM1

Perform the following steps to *Clear* an existing manual protection switch.

- 1 From the *System View* screen:
 - a. Select *Fault-Protection Switch*.
 - b. In the Windows-like explorer, expand/scroll down the directory until the desired AID is shown.
 - c. Click to highlight the desired AID.
 - d. Click on the **Select** button.
 - e. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
 - f. Click on *Clear*.
 - g. Click on the **Apply** button.
 - h. Read the information in the Caution box and then click on the **YES** button.
 - i. Click on the **Close** button.
-

- 2 *STOP! End of Supporting Element.*

END OF STEPS

Task 551: Clear ‘CTL/SYS50D Circuit Pack Failure’

When to use Use this procedure to clear a *CTL/SYS50D Circuit Pack Failure* alarm.

About side 0 and side 1 The CTL/SYS50D plus the CSIEX, CTL/EI and SWIEX are a group of four circuit packs that form a Side. Each SC shelf consist of two sides. They are referred to as Side 0 and Side 1. While one side is *Active* the other side is *Standby*. If, for example, Side 0 is the Active side and any one of its four circuit packs fails, then there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. When this switch occurs the new Active side will perform a soft reset. This reset should complete in approximately 5 to 6 minutes. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Required equipment

- WaveStar Craft Interface Terminal (WaveStar CIT)
- Wrist Strap
- Spare/replacement CTL/SYS50D circuit pack.

Task Complete the following series of steps to clear a *CTL/SYS50D Circuit Pack Failure* alarm.

1 From the *Alarm List*, determine the AID of the failed CTL/SYS50D circuit pack.

2 From the *System View* screen:

1. Left-click on *View-Protection*
2. Left-click on the tab labeled *Prot Grp*
3. In the Windows-like explorer screen, expand the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted.
4. Left-click on the **Select** button.

Important! A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Fail*) is enough to replace a defective circuit pack.

- 3 For the *View Protection* screen and for the field that is labeled *Switch Request State: Is Equipment Fail* listed?"

If...	No...
YES,	a protection switch is in effect. Continue with .
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 551-1: Perform a Manual Protection Switch on a CTL/SYS50D

- 4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

Important! The newly installed CTL/SYS50D should reinitialize (Green LED blinks and clears, and then no Red LED) in approximately 2 minutes.

- 5 Wait 2 minutes for this circuit pack to reinitialize.
-

- 6 Left-click on the *Update Alarms* button.
-

- 7 Does the list include this same CTL/SYS50D circuit pack failure alarm?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	continue.

8 Did you perform a *Manual Protection Switch* in ?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 551-2: Clear Protection Switch on a CTL/SYS50D
NO,	continue.

END OF STEPS

SE 551-1: Perform a Manual Protection Switch on a CTL/SYS50D

Task Perform the following steps to manually switch the system controller complex from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on *Fault-Protection Switch*.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen expand down the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted.
4. Click on the **Select** button.

Important! The right-hand part of the screen will display the selected *Protection Group AID*: (for example, esysctl 0). Also, this display shows sysctl 0 and sysctl 1 AIDs as well as their individual alarm status.

5. In the field labeled *Switch Type*: click on the drop-down arrow and:
 - if sysctl 0 is alarmed, then select Manual to Side 1
 - if sysctl 1 is alarmed, then select Manual to Side 0
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....



SE 551-2: Clear Protection Switch on a CTL/SYS50D

Task Perform the following steps to *Clear* an existing Manual Protection Switch.

1 From the *System View* screen:

1. Select *Fault-Protection Switch*.
2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. In the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
6. Click on **Clear**.
7. Click on the **Apply** button.
8. Read the information in the Caution box and then click on the **YES** button
9. Click on the **Close** button.

END OF STEPS



Task 552: Clear ‘CTL/SYS50DM Circuit Pack Failure’

Purpose Use this procedure to clear a *CTL/SYS50DM Circuit Pack Failure* alarm.

About side 0 and side 1 The CTL/SYS50DM is always used in a 1+1 equipment configuration. They are referred to as *ctlmem0* and *ctlmem1*. Their modes of operation are referred to as Active and Standby. If the current Active circuit pack should fail, then control will switch automatically to the Standby circuit pack. Thereafter, and following a short reboot interval, it becomes the new Active circuit pack. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Required equipment The following items are required before beginning this procedure:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement CTL/SYS50DM circuit pack.

Task Complete the following steps to clear an *CTL/SYS50DM Circuit Pack Failure* alarm.

1 From the *Alarm List*, determine the AID of the failed CTL/SYS50DM circuit pack.

2 From the *System View* screen:

1. Left-click on *View-Protection*
2. Left-click on the tab labeled *Prot Grp*
3. In the Windows-like explorer screen, expand down the directory on Bay _ and I/O Shelf _ until *1+1 ectlmemgrp* is displayed and highlighted.
4. Left-click on the **Select** button
5. A manual switch can be used if replacement of a circuit pack is necessary. This will be required only if something abnormal occurred. Under normal operations, an automatic switch with

proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State equals *Equipment Fail*) is enough to replace a defective circuit pack.

- 3 For the *View Protection* screen and for the field that is labeled *Switch Request State:*” Is *Equipment Fail* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 5.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 552-1: Perform a Manual Protection Switch on a CTL/SYS50DM

- 4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed CTL/SYS50DM should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 5 Wait 2 minutes for this circuit pack to initialize.

- 6 Left-click on the **Update Alarms** button.

- 7 Does the list include this same CTL/SYS50DM circuit pack failure alarm?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	continue.

8 Did you perform a *Manual Protection Switch* in Step 3?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 552-2: Clear Protection Switch on a CTL/SYS50DM
NO,	continue.

SE 552-1: Perform a Manual Protection Switch on a CTL/SYS50DM

Perform the following steps to manually switch the I/O shelf control from the current active side to the current standby side.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*
2. Left-click on the tab labeled *Prot Grp*
3. Left-click on the Windows-like explorer screen and, as appropriate, expand/scroll downward on Bay _ and I/O Shelf _ until *1+1 Equipment ectlmemgrp* is displayed and highlighted.
4. Left-click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *ectlmem*). Also, this display shows *ctlmem0* and *ctlmem1* AIDs as well as their individual alarm status.

5. In the field labeled *Switch Type*: left-click on the drop-down arrow and:
 - if *ctlmem0* is alarmed, then select *Manual to Side 1*
 - if *ctlmem1* is alarmed, then select *Manual to Side 0*
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	STOP! <i>End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

SE 552-2: Clear Protection Switch on a CTL/SYS50DM

Perform the following steps to *Clear* an existing Manual Protection Switch.

- 1 From the *System View* screen:
 1. Select *Fault-Protection Switch*
 2. In the Windows-like explorer, expand down the directory until the desired AID is shown
 3. Left-click to highlight the desired AID
 4. Left-click on the **Select** button
 5. In the right-hand side of the screen, left-click on the drop-down arrow beside the field labeled *Switch Type*:
 6. Left-click on *Clear*
 7. Left-click on the **Apply** button
 8. Read the information in the Caution box, and then left-click on the **YES** button
 9. Left-click on the **Close** button.

END OF STEPS

Task 553: Clear ‘CTL/MEM Circuit Pack Failure’

Purpose	Use this procedure to clear a <i>CTL/MEM Circuit Pack Failure</i> alarm.
About Primem0, Primem1, and Secmem	Primary mem0 (primem0) and Primary mem1 (primem1) do not form a protection group like other types of circuit packs. Instead, their Standby Status is either (a) Providing Service, (b) Hot Standby, (c) Warm Standby (this occurs during mirroring), (d) Cold Standby (this occurs when the NVM card fails to initialize), or (e) Equipment Fail. Thus, the craft cannot perform a protection switch on these two circuit packs. An alarmed CTL/MEM circuit pack will exhibit a lighted FAULT red LED and a not lighted ACTIVE green LED. Plus, the WaveStar CIT will display Equipment Fail for this circuit pack’s Standby Status.
Related equipment	Use the following equipment to complete the task to clear <i>CTL/MEM Circuit Pack Failure</i> alarm. • WaveStar Craft Interface Terminal (CIT) • Wrist strap • Spare/replacement CTL/MEM circuit pack.
Task	Complete the following steps to clear a <i>CTL/MEM Circuit Pack Failure</i> alarm. 1 From the <i>Alarm List</i>, determine the AID of the failed CTL/MEM circuit pack. 2 Instruct the on-site craft to go to the identified AID, and try to remove the NVM card by pressing on the circuit pack Eject button. Important! If this effort was successful, then exercise care to properly maintain the NVM card for use in the replacement circuit pack. Regardless of whether the on-site craft was successful in removing the NVM card - continue. Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

3 Instruct the on-site craft to:

1. Physically unlatch and remove the failed circuit pack
2. Remove the NVM card from the failed circuit pack, conditional that Step 2 was unsuccessful
3. Insert a known good replacement circuit pack.

Reference: Task 544: How to Eject an NVM Card from an Out-of-Service Circuit Pack

4 Insert the NVM card into the newly inserted CTL/MEM circuit pack.

Reference: Task 702: Remove/Insert a PCMCIA (NVM) Card

5 Wait 25 minutes for this circuit pack to reinitialize.

Important! The newly installed CTL/MEM with NVM card installed should reinitialize and complete mirroring (green LED blinks, no red LED) in approximately 25 minutes.

6 Left-click on the **Update Alarmws** button.

7 Does the list include this same CTL/MEM circuit pack failure alarm?

If...	Then...
YES,	go to Step 9.
NO,	continue.

8 *STOP! End of Task*

9 Escalate to the next higher level of technical support.

Task 554: Clear ‘CTL/EI Circuit Pack Failure’

Purpose Use this task to clear a *CTL/EI Circuit Pack Failure* alarm.

Related equipment Use the following equipment to complete the task to clear a *CTL/EI Circuit Pack Failure* alarm.

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement CTL/EI circuit pack.

About side 0 and side 1 The CTL/EI plus the CTL/SYS50D, CSIEX, and SWIEX are a group of four circuit packs that form a Side. Each SC shelf consists of two sides. They are referred to as Side 0 and Side 1. While one side is Active, the other side is Standby. If, for example, Side 0 is the Active side and any one of its four circuit packs fail, there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. When this switch occurs, the new Active side will perform a soft reset. This reset should complete in approximately 5 to 6 minutes. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Task Complete the following steps to clear a *CTL/EI Circuit Pack Failure* alarm.

1 From the *Alarm List*, determine the AID of the failed circuit pack.

2 From the *System View* screen:

1. Left-click on *View-Protection*.
2. Left-click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand down the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted.
4. Left-click on the **Select** button.

5. A manual switch can be used if replacement of a circuit pack is necessary. This will be required only if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Fail*) is enough to replace a defective circuit pack.

- 3 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Equipment Fail* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 4.
NO	you should perform a <i>Manual Protection Switch</i> . Reference: SE 554-1: Perform a Manual Protection Switch of Side_

- 4 Instruct the on-site craft to:

1. Physically unlatch and remove that circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed CTL/EI should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 5 Wait 2 minutes for this circuit pack to reinitialize.

- 6 Left-click on the **Update Alarms** button.

- 7 Does the list include this same CTL/EI circuit pack failure alarm?

If...	Then...
YES,	go to Step 9.

If...	Then...
NO,	continue.

.....

8 *STOP! End of Task.*

.....

9 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....

SE 554-1: Perform a Manual Protection Switch of Side_

Perform the following steps to manually switch the system controller group from the current active side to the current standby side.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
2. Left-click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* displayed and highlighted.
4. Left-click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *esysctl 0*). Also, this display shows*ei0* and*ei1* AIDs, as well as their individual alarm status.

5. In the field labeled *Switch Type*: left-click on the drop-down arrow and:
 - if*ei0* is alarmed, then select *Manual to Side 1*, or
 - if*ei1* is alarmed, then select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) Successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Task 555: Clear ‘CSIEX Circuit Pack Failure’

Purpose Use this task to clear a *CSIEX Circuit Pack Failure* alarm.

Required equipment The following are required in order to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement CSIEX circuit pack.

About side 0 and side 1 The CSIEX plus the CTL/SYS50D, CTL/EI, and SWIEX are a group of four circuit packs that form a Side. Each SC shelf consists of two sides. They are referred to as Side 0 and Side 1. While one side is Active, the other side is Standby. If, for example, Side 0 is the Active side and any one of its four circuit packs fail, then there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. When this switch occurs, the new Active side will perform a soft reset. This reset should complete in approximately 5 to 6 minutes. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Task Complete the following steps to clear a *CSIEX Circuit Pack Failure* alarm.

-
- 1** From the *Alarm List*, determine the AID of the failed circuit pack.
-
- 2** From the *System View* screen:
 1. Left-click on *View-Protection*
 2. Left-click on the tab labeled *Prot Grp*
 3. In the Windows-like explorer screen, expand/scroll down on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted
 4. Left-click on the **Select** button.
 5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations, an automatic switch with

proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State is *Equipment Fail*) is enough to replace a defective circuit pack.

- 3 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Equipment Fail* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 4.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 555-1: Perform a Manual Protection Switch of Side _ csiex_ (CSIEX)

- 4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

- 5 Wait 2 minutes for this circuit pack to reinitialize.

Important! The newly installed CSIEX should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 6 Left-click on the **Update Alarms** button.

- 7 Does the list include this same CSIEX circuit pack failure alarm?

If...	Then...
YES,	go to Step 9.
NO,	continue.

- 8 **STOP! End of Task.**

-
- 9** Escalate to the next higher level of technical support.

END OF STEPS

SE 555-1: Perform a Manual Protection Switch of Side _ csiex_ (CSIEX)

Perform the following steps to manually switch the system controller group from the current active side to the current standby side.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
2. Left-click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted.
4. Left-click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, esysctl 0). Also, this display shows csiex0 and csiex1 AIDs as well as their individual alarm status.

5. In the field labeled *Switch Type*: left-click on the drop-down arrow and:
 - if csiex0 is alarmed, then select *Manual to Side 1*
 - if csiex1 is alarmed, then select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, the list will display something like *Protection Switch (appropriate AID) Successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Task 556: Clear ‘SWIF Circuit Pack Failure’

Purpose Use this procedure to clear a *SWIF Circuit Pack Failure* alarm.

Required equipment Use the following equipment to complete the task to clear a *SWIF Circuit Pack Failure* alarm.

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWIF circuit pack.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand these warnings and precautions prior to performing this task.



CAUTION

For each I/O shelf, the first SWIF pair (SWIF10 and SWIF11) function to provide timing for each additional equipped SWIF pair. Therefore, the first SWIF pair is critical. Unless at least one circuit pack from the first SWIF pair is operational, the other SWIF pairs on this I/O shelf will not function.

About side 0 and side 1 The SWIF and CTL/SWITCH576 circuit packs always operate in a 1+1 equipment protection group. The SWIF and CTL/SWITCH576 circuit packs jointly make up what is referred to as the 1+1 Equipment eswitchgrp. Each eswitchgrp consists of two sides. They are referred to as Side 0 and Side 1. While one side is *Active* the other side is *Standby*. If, for example, Side 0 is the *Active* side and any one of its circuit packs fails, then there will be a switch to the *Standby* side (Side 1). Side 1 now becomes the *Active* side. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new *Standby* side. No switch back is required!

Task Complete the following steps to clear a *SWIF Circuit Pack Failure* alarm

1 From the *Alarm List*, determine whether or not there also exists:

- a *BSW Circuit Pack Failure*, or
 - a *SWITCH/STS576 Circuit Pack Failure*.
-

2

If the Alarm List...	Then...
also includes a <i>BSW Circuit Pack Failure</i>	replace the BSW circuit pack, and continue with Step 3. Reference: Task 557: Clear 'BSW Circuit Pack Failure'
also includes a <i>CTL/SWITCH576 Circuit Pack Failure</i>	replace the CTL/SWITCH576 circuit pack, and continue with Step 3. Reference: Task 559: Clear 'SWITCH/STS576 Circuit Pack Failure'
only includes a <i>SWIF Circuit Pack Failure</i>	continue with Step 5.

3 Left-click on the **Update Alarms** button.

4 Does the list still include a *SWIF Circuit Pack Failure* alarm?

If...	Then...
YES,	go to Step 5.
NO,	<i>STOP! End of Task.</i>

5 From the *Alarm List*, determine the AID of the failed SWIF circuit pack.

6 From the *System View* screen:

1. Left-click on *View-Protection*.

2. Left-click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand down the directory on Bay _ and I/O Shelf _ until *1+1 Equipment eswitchgrp* is displayed and highlighted.
4. Left-click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State: equals Equipment Fail*) is enough to replace a defective circuit pack.

-
- 7** For the *View Protection* screen and for the field that is labeled *Switch Request State: "Is Equipment Fail listed?"*

If...	Then...
YES,	a protection switch is in effect. Continue with Step 8.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 556-1: Perform a Manual Protection Switch of Side _swif_ (SWIF)

Important! For each I/O shelf, the first SWIF pair (SWIF10 and SWIF11) functions to provide timing for each additional equipped SWIF pair. Therefore, the first SWIF pair is critical. Unless at least one circuit pack from the first SWIF pair is operational, the other SWIF pairs on this I/O shelf will not function.

- 8** Instruct the on-site craft to:
1. Physically, unlatch and remove the alarmed circuit pack.
 2. Insert a known good replacement circuit pack.

Important! The newly installed SWIF circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

9 Wait 2 minutes for this circuit pack to reinitialize.

10 Left-click on the **Update Alarms** button.

11 Does the list include this same SWIF circuit pack failure alarm?

If...	Then...
YES,	go to Step 14.
NO,	continue.

12 Do you have local operating procedures that stipulate something like “Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0”?

If...	Then...
YES,	you should perform a <i>Manual to Side 0</i> protection switch. Important! Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection. Reference: SE 556-2: Perform a Manual Protection Switch to Side 0
NO,	continue.

13 *STOP! End of Task.*

14 Escalate to the next higher level of technical support.

END OF STEPS



SE 556-1: Perform a Manual Protection Switch of Side _swif_ (SWIF)

Task Perform the following steps to manually switch the switch fabric from the current active side to the current standby side.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
 2. Left-click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment eswitchgrp* is displayed and highlighted.
 4. Left-click on the **Select** button.
The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *eswitchgrp*). Also, this display shows*swif_0* and*swif_1* AIDs, as well as their individual alarm status.
 5. In the field labeled *Switch Type*: left-click on the drop-down arrow and:
 - if*swif_0* is alarmed, then select *Manual to Side 1*, or
 - if*swif_1* is alarmed, then select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side_* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch* (appropriate AID) *successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



SE 556-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
 2. Left-click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and Shelf _ until 1+1 Equipment eswitchgrp is displayed and highlighted
 4. Left-click on the **Select** button.
The right-hand part of the screen will display the selected *Protection Group AID*: (for example, ebswgrp_0). Also, this display shows swif_0 and swif_1 AIDs, as well as their individual alarm status.
 5. In the field labeled *Switch Type*: left-click on the drop-down arrow and select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side 0* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....
4 Escalate to the next higher level of technical support.

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E N D O F S T E P S
.....



Task 557: Clear ‘BSW Circuit Pack Failure’

Purpose Use this procedure to clear a *BSW Circuit Pack Failure* alarm.

Required equipment Use the following equipment to complete the task to clear a *BSW Circuit Pack Failure*:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement BSW circuit pack

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand these precautions prior to performing this task.



CAUTION

A double failure will cause a service outage for the entire NE. A double failure is defined as the simultaneous failure of two BSW circuit packs—where both occupy the same slot number, but one would be located in side 0 and the other would be located in side 1; for example, the BSW in side 0 slot #4 and the BSW in side 1 slot #4.



CAUTION

The failure of a BSW circuit pack in one shelf (for example, side 0 and slot #4) and the accidental removal of the corresponding circuit pack in the other shelf (for example, side 1 and slot #4) will also result in a service outage for the entire NE. The on-site craft should know, with certainty, the AID of a failed BSW circuit pack before removing any circuit pack.

About side 0 and side 1 The BSW circuit packs always operate in a 1+1 equipment protection group. This protection group is referred to as the *1+1 Equipment ebswgrp*. Each ebswgrp consists of two sides. They are referred to as

Side 0 and Side 1. While one side is *Active*, the other side is *Standby*. If, for example, Side 0 is the *Active* side and any one of its circuit packs fails, there will be a switch to the *Standby* side (Side 1). Side 1 now becomes the *Active* side. Subsequently, after the alarmed circuit pack in the opposite side has been replaced, that side will become the new *Standby* side. No switch back is required.

Task Complete the following steps to clear a *BSW Circuit Pack Failure* alarm.

Important! The 4608/1536 switch fabric consists of two switch shelves (which are referred to as side 0 and side 1), with each shelf containing 16 BSW circuit packs. A minimum of 16 BSWs is required to carry a single STS-1 cross-connection. These 16 BSWs can reside on either side of the switch fabric, some in side 0 and some in side 1, as long as they are located in distinct slots (1 through 16).

- 1 From the *Alarm List*, determine whether or not a *SWIF Circuit Pack Failure* also exists. Continue with Step 2.

2

If the Alarm List...	Then...
also includes a <i>SWIF Circuit Pack Failure</i> ,	replace the SWIF circuit pack, and continue with Step 3. Reference: Task 556: Clear 'SWIF Circuit Pack Failure'
does not include the <i>SWIF Circuit Pack</i> ,	continue with Step 5.

- 3 Click on the **Update Alarms** button.

- 4 Does the list still include a *BSW Circuit Pack Failure* alarm?

If...	Then...
YES,	go to Step 5.

If...	Then...
NO,	<i>STOP! End of Task.</i>

5 From the *Alarm List*, determine the AID of the failed BSW circuit pack.

6 From the *System View* screen:

1. Select **View > Protection**.
2. Expand **All BSW Groups**.
3. Select the **ebswgrp** that corresponds to the alarmed circuit pack.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State*: equals *Equipment Fail*) is enough to replace a defective circuit pack.

7 For the *View Protection* screen and for the field that is labeled *Switch Request State*: "Is Equipment Fail listed?"

If...	Then...
YES,	a protection switch is in effect. Continue with Step 8.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 557-1: Perform a Manual Protection Switch of Side _ bsw_ (BSW)

8 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed BSW should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 9 Wait 2 minutes for this circuit pack to reinitialize.

-
- 10 Click on the **Update Alarms** button.

-
- 11 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 14.
NO,	continue.

-
- 12 Do you have local operating procedures that stipulate something like “Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0”?

If...	Then...
YES,	you should perform a <i>Manual to Side 0</i> protection switch. Important! Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection. Reference: SE 557-2: Perform a Manual Protection Switch to Side 0
NO,	continue.

-
- 13 **STOP! End of Task.**

-
- 14** Escalate to the next higher level of technical support.

END OF STEPS



SE 557-1: Perform a Manual Protection Switch of Side _ bsw_ (BSW)

Task Perform the following steps to manually switch the I/O fabric from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on *Fault-Protection Switch*.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and Shelf _ until the appropriate *1+1 Equipment ebswgrp* is displayed and highlighted.
4. Click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *ebswgrp_0*). Also, this display shows*bsw_0* and*bsw_1* AIDs, as well as their individual alarm status.

5. In the field labeled *Switch Type*: click on the drop-down arrow and:
 - if*bsw_0* is alarmed, select *Manual to Side 1*, or
 - if*bsw_1* is alarmed, select *Manual to Side 0*
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



SE 557-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

- 1

From the *System View* screen:

1. Click on *Fault-Protection Switch*.

2. Click on the tab labeled *Prot Grp*.

3. In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment ebswgrp* is displayed and highlighted.

4. Click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, ebswgrp_0). Also, this display shows bsw_0 and bsw_1 AIDs, as well as their individual alarm status.

5. In the field labeled *Switch Type*: click on the drop-down arrow and select Manual to Side 0.

6. Click on the **Apply** button.

7. Read the information message and, as appropriate, click on the **YES** button.
- 2

Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side 0* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

- 3

Was the Manual Protection Switch command successful?

If...	Then...
YES,	STOP! End of dSupporting Task.

If...	Then...
NO,	continue.

4 Escalate to the next higher level of technical support.

END OF STEPS



Task 558: Clear ‘SWIEX Circuit Pack Failure’

Purpose Use this procedure to clear a *SWIEX Circuit Pack Failure* alarm.

Required equipment Use the following equipment to complete the task to clear a *BSW Circuit Pack Failure*:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWIEX circuit pack

About side 0 and side 1 The SWIEX plus the CSIEX, CTLEI and SYS50D are a group of four circuit packs that form a Side. Each SC shelf consist of two sides. They are referred to as Side 0 and Side 1. While one side is Active the other side is Standby. If, for example, Side 0 is the Active side and any one of it's four circuit packs fails - then there will be a switch to the Standby side (Side 1). Side 1 now becomes the Active side. When this switch occurs the new Active side will perform a soft reset. This reset should complete in approximately 5 to 6 minutes. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Task Complete the following steps to clear a *SWIEX Circuit Pack Failure* alarm.

1 From the *Alarm List*, determine whether or not there also exists:

- a *BSW Circuit Pack Failure*, or
 - a *CSIEX Circuit Pack Failure*, or
-

2

If the Alarm List...	Then...
also includes a <i>BSW Circuit Pack Failure</i> ,	replace the BSW circuit pack, and continue with Step 3. Reference: Task 557: Clear ‘BSW Circuit Pack Failure’

If the Alarm List...	Then...
also includes a <i>CSIEX Circuit Pack</i> ,	replace the CSIEX circuit pack, and continue with Step 3. Reference: Task 555: Clear ‘CSIEX Circuit Pack Failure’

-
- 3** Left-click on the **Update Alarms** button.
-

- 4** Does the list still include a *SWIEX Circuit Pack Failure* alarm?

If...	Then...
YES,	go to Step 5.
NO,	<i>STOP! End of Task.</i>

-
- 5** From the *Alarm List*, determine the AID of the failed SWIEX circuit pack.
-

- 6** From the *System View* screen:

1. Left-click on *View-Protection*.
2. Left-click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay sc and Shelf 1 until *1+1 Equipment esysctlgrp* is displayed and highlighted.
4. Left-click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack’s ACTIVE LED is not lighted and the *Switch Request State: is Equipment Fail* is enough to replace a defective circuit pack.

-
- 7** For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Equipment Fail* listed?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 5.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 558-1: Perform a Manual Protection Switch of the SYSCTL

-
- 8** Instruct the on-site craft to:
1. Physically unlatch and remove the alarmed circuit pack.
 2. Insert a known good replacement circuit pack.

Important! The newly installed SWIEX circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 9** Wait 2 minutes for this circuit pack to reinitialize.

-
- 10** Left-click on the **Update Alarms** button.

-
- 11** Does the list include this same SWIEX circuit pack failure alarm?

If...	Then...
YES,	go to Step 14.
NO,	continue.

-
- 12** Do you have local operating procedures that stipulate something like “Normal operations, for 1+1 Equipment protection groups, should be maintained on Side?”

If...	Then...
YES,	you should perform a <i>Manual to Side 0</i> protection switch. Important! Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection. Reference: SE 558-2: Perform a Manual Protection Switch to Side 0
NO,	continue.

-
- 13** *STOP! End of Task.*
-

- 14** Escalate to the next higher level of technical support.

END OF STEPS



SE 558-1: Perform a Manual Protection Switch of the SYSCTL

Task Perform the following steps to manually switch the system controller complex from the current active side to the current standby side.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
 2. Left-click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay sc and Shelf 1 until the *1+1 Equipment esysctlgrp* is displayed and highlighted.
 4. Left-click on the **Select** button.
The right-hand part of the screen will display the selected *Protection Group AID*: (for example, esysctl 0). Also, this display shows sysctl 0 and sysctl 1 AIDs, as well as their individual alarm status.
 5. In the field labeled *Switch Type*: left-click on the drop-down arrow and:
 - if sysctl 0 is alarmed, select *Manual to Side 1*, or
 - if sysctl 1 is alarmed, select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



SE 558-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the *System View* screen:

1. Left-click on *Fault-Protection Switch*.
 2. Left-click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment esysctlgrp* is displayed and highlighted.
 4. Left-click on the **Select** button.
The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *eswitchgrp_0*). Also, this display shows*swiex_0* and*swiex_1* AIDs, as well as their individual alarm status.
 5. In the field labeled *Switch Type*: left-click on the drop-down arrow and select *Manual to Side 0*.
 6. Left-click on the **Apply** button.
 7. Read the information message and, as appropriate, left-click on the **YES** button.
-

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side 0* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>

If...	Then...
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....

☐

Task 559: Clear ‘SWITCH/STS576 Circuit Pack Failure’

Purpose Use this task to clear a *SWITCH/STS576 Circuit Pack Failure* alarm.

About side 0 and side 1 The SWITCH/STS576 circuit packs always operate in a 1+1 equipment protection group. The SWIF and SWITCH/STS576 circuit packs jointly make up what is referred to as the 1+1 Equipment eswitchgrp. Each eswitchgrp consists of two sides. They are referred to as Side 0 and Side 1. While one side is *Active* the other side is *Standby*. If, for example, Side 0 is the *Active* side and any one of its circuit packs fails - then there will be a switch to the *Standby* side (Side 1). Side 1 now becomes the *Active* side. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new *Standby* side. No switch back is required.

Required equipment The following equipment is required in order to successfully complete this procedure:

- WaveStar Craft Interface Terminal (WaveStar CIT)
- Wrist Strap
- Spare/replacement SWITCH/STS576 circuit pack.

Task Complete the following steps to clear a *SWITCH/STS576 Circuit Pack Failure* alarm.

1 Does the **Alarm List** also include a *SWIF Circuit Pack Failure*?

If...	Then...
YES,	replace the SWIF circuit pack, and continue with Step 2.
NO,	continue with Step 4.

2 Click on the **Update Alarms** button.

-
- 3 Does the list still include a *SWITCH/STS576 Circuit Pack Failure* alarm?

If...	Then...
YES,	go to Step 4.
NO,	STOP! End of task.

-
- 4 From the **Alarm List**, determine the AID of the failed SWITCH/STS576 circuit pack.
-

- 5 From the **System View** screen:

- Click on **View Protection**.
- Click on the tab labeled **Prot Grp**.
- In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until **1+1 Equipment eswitchgrp** is displayed and highlighted.
- Click on the **Select** button.
- A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the **Switch Request State**: equals *Equipment Fail*) is enough to replace a defective circuit pack.

-
- 6** For the **View Protection** screen and for the field that is labeled **Switch Request State**: “Is *Equipment Fail* listed?”

If...	Then...
YES,	then a protection switch is in effect. Continue with Step 7.
NO,	then you should perform a Manual Protection Switch . Reference: SE 559-1: Perform a Manual Protection Switch to Side _

-
- 7** Instruct the on-site craft to:
- Physically unlatch and remove the alarmed circuit pack.
 - Insert a known good replacement circuit pack.

-
- 8** Wait 2 minutes for this circuit pack to reinitialize.

Important! The newly installed SWIF circuit pack should reinitialize (Green LED blinks and clears, and then no Red LED) in approximately 2 minutes.

-
- 9** Click on the **Update Alarm** button.

-
- 10** Does the list include the same SWIF circuit pack failure alarm?

If...	Then...
YES,	go to Step 13.
NO,	continue.

-
- 11** Do you have local operating procedures that stipulate something like “Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0?”

If...	Then...
YES,	perform a Manual to Side 0 protection switch.
NO,	continue. Important! Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection Reference: SE 559-2: Perform a Manual Protection Switch to Side 0.

-
- 12** Stop! End of Task.
-

- 13** Escalate to the next higher level of technical support.

SE 559-1: Perform a Manual Protection Switch to Side _

Task Perform the following steps to manually switch the switch fabric from the current active side to the current standby side.

1 From the System View screen:

- Click on **Fault-Protection Switch**.
- Click on the tab labeled **Prot Grp**.
- In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until **1+1 Equipment eswitchgrp** is displayed and highlighted.
- Click on the **Select** button.
- In the field labeled Switch Type: click on the drop-down arrow and:
 - if switch0-cp is alarmed, then select **Manual to Side 1**, or
 - if switch1-cp is alarmed, then select **Manual to Side 0**
- Click on the **Apply** button.
- Read the information message and, as appropriate, click on the **YES** button.

Important! The right-hand part of the screen will display the selected **Protection Group AID**: (for example, _-_ eswitchgrp). Also, this display shows switch0-cp and switch1-cp AIDs as well as their individual alarm status.

2 Refer back to the **System View** screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-switch side, would cause the command to fail. If the command was successful, then the list will display *Protection Switch* (appropriate AID) *Successful*.

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	Stop! End of Supporting Task.
NO,	continue.

4 Escalate to the next higher level of technical support.

SE 559-2: Perform a Manual Protection Switch to Side 0

Task Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the **System View** screen:

- Click on the **Fault-Protection Switch**.
- Click on the tab labeled **Prot Grp**.
- In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until **1+1 Equipment eswitchgrp** is displayed and highlighted.
- Click on the **Select** button.
- In the field labeled **Switch Type**: click on the drop-down arrow, and select **Manual to Side 0**.
- Click on the **Apply** button.
- Read the information message and, as appropriate, click on the **YES** button.

Important! The right-hand part of the screen will display the selected **Protection Group AID**: (for example, ebswgrp_0). Also, this display shows bsw_0 and bsw_1 AIDs as well as their individual alarm status.

2 Refer back to the **System View** screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side 0* command was successful.

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	Stop! End of Supporting Task.

If...	Then...
NO,	continue. Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-switch side, would cause the command to fail. If the command was successful, then the list will display something like <i>Protection Switch</i> (appropriate AID) <i>successful</i>.

-
- 4** Escalate to the next higher level of technical support.

Task 560: Clear ‘TMG/STRAT3 Circuit Pack Failure’

Purpose Use this procedure to clear a *TMG/STRAT3 Circuit Pack Failure* alarm.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement TMG/STRAT3 circuit pack

About Side 0 and Side 1 The two timing circuit packs are referred to as Side 0 and Side 1. While one side is *Active* the other side is either in *Standby* or *Equipment Fail*. There are three types of switching. These are referred to as (a) sync hardware, (b) sync reference, and (c) sync mode. Sync hardware protection switching (from the Active to the Standby) takes precedence over mode switching. Mode switching (from Locked to Holdover) would only come into play whenever a sync hardware protection switch would not be possible because of an *Equipment Fail* state on the alternate circuit pack. No switch back is required.

Task Complete the following steps to clear a *TMG/STRAT3 Circuit Pack Failure* alarm.

-
- 1** From the **Alarm List**, determine the AID of the failed circuit pack.
-
- 2** From the **System View** screen:
 1. Click on **View-Protection**.
 2. Click on the tab labeled **Prot Grp**.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until *1+1 Equipment etmggrp* is displayed and highlighted.
 4. Click on the **Select** button.
 5. In the right-hand part of the screen and under the heading Switch Status, observe which side is the *Active Side*:. If the indicated Active Side is the same as the Alarm Side (for example, *Active Side: 1* and *Side 1 Alarm Status: Critical*), then a manual switch to the other side may be required. This will only be required if

something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State*: equals *Equipment Fail*) is enough to replace a defective circuit pack.

3 Is the Active Side different from the side that is alarmed?

If...	Then...
YES,	a protection switch is in effect. Continue with Step 4.
NO, (Active side and Alarms side are the same)	you should perform a <i>Manual Protection Switch</i> . Reference: SE 560-1: Perform a Manual Protection Switch of Side _ tmg_ (TMG/STRAT3)

4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

Important! The newly installed tmg()-cp should reinitialize (green LED blinks, no red LED, and other circuitry components reinitialize) in approximately 2 minutes. Following a successful reinitialization, the Manual Switch should remain for another 7 minutes to allow the tmg()-cp to fully stabilize. After 7 minutes the Manual Switch can be cleared.

5 Once installed, wait 7 minutes for this circuit pack to completely stabilize.

6 Click on the **Update Alarms** button.

-
- 7** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 8.
NO,	<i>STOP! End of Task.</i>

-
- 8** Escalate to the next higher level of technical support.

E N D O F S T E P S

SE 560-1: Perform a Manual Protection Switch of Side _ tmg_ (TMG/STRAT3)

Perform the following steps to manually switch the timing circuit pack from the current active side to the current standby side.

1 From the **System View** screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled **Prot Grp**.
3. In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment etmggrp* is displayed and highlighted.
4. Click on the **Select** button.

NOTE: The right-hand part of the screen will display the selected *Protection Group AID:* (for example, 1-1 etmggrp). Also, this display shows*tmg0-cp* and*tmg1-cp* AIDs as well as their individual alarm status.

5. In the field labeled **Switch Type:** click on the drop-down arrow and:
 - if*tmg0-cp* is alarmed, then select **Manual to Side 1**, or
 - if*tmg1-cp* is alarmed, then select **Manual to Side 0**
6. Click on the **Apply** button.
7. Read the information message and, as appropriate, click on the **YES** button.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

2 Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar)

whether the *Manual to Side _* command was successful. Was the Manual Protection Switch command successful?

If...	Then...
YES	<i>STOP! End of Supporting Task.</i>
NO,	continue.

-
- 3** Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Task 561: Clear ‘ADJCTL/DCCEI Circuit Pack Failure’

Purpose Use this procedure to clear an *ADJCTL/DCCEI Circuit Pack Failure* alarm.

Required privilege code(s) The user must have a privilege code of M1 (or higher) to perform this task.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement ADJCTL/DCCEI circuit pack.

Task Complete the following steps to clear an *ADJCTL/DCCEI Circuit Pack Failure* alarm.

1 From the Alarm List, determine the AID of the failed ADJCTL/DCCEI circuit pack.

2 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to Properly Remove a Circuit Pack

Important! The newly inserted circuit pack should reinitialize within approximately 2 minutes – depending on other ongoing system activities

3 Click on the **Update Alarms** button.

-
- 4** Does the list include the ADJCTL/DCCEI circuit pack failure?.

If...	Then...
YES,	go to Step 6.
NO,	continue.

-
- 5** *STOP! End of Task.*
-

- 6** Escalate to your next higher level of technical support.

.....

E N D O F S T E P S

.....

Task 562: Clear ‘SWITCH/DS3EC1 Circuit Pack Failure’

Purpose Use this task whenever the NE Alarm List displays a *SWITCH/DS3EC1 Circuit Pack Failure*.

Required privilege code(s) The user must have a privilege code of M1 (or higher) to perform this task.

Required equipment The following list of equipment is required in order to successfully complete this procedure:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWITCH/DS3EC1 circuit pack.

Task Complete the following steps to clear a *SWITCH/DS3EC1 Circuit Pack Failure* alarm.

- 1 From the *Alarm List*, determine whether or not there also exists a *DS3EC1, Circuit Pack Failure*. Does the *Alarm List* also include an entry for a *DS3EC1, Circuit Pack Failure*?

If...	Then...
YES,	go to Step 2.
NO,	go to Step 5.

2

If the Alarm List also includes a...	Then replace the...
<i>DS3EC1 Circuit Pack Failure</i>	DS3EC1 Circuit pack Reference: Task 547: Clear ‘DS3EC1/8 Circuit Pack Failure’

- 3 Click on the **Update Alarms** button.

-
- 4** Does the list still include a SWITCH/DS3EC1 circuit pack failure.

If...	Then...
YES,	go to Step 9.
NO,	<i>STOP! End of Task.</i>

-
- 5** Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

.....

Important! The newly installed SWITCH/DS3EC1 should reinitialize (green LED blinks, no red LED) in approximately 2 minutes.

- 6** Wait 2 minutes for this circuit pack to reinitialize.

-
- 7** Click on the **Update Alarms** button.

-
- 8** Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 9.
NO,	<i>STOP! End of Task.</i>

-
- 9** Escalate to the next higher level of technical support.

.....

END OF STEPS



Task 563: Clear ‘SWITCH/STS768 Circuit Pack Failure’

Purpose Use this procedure to clear a *SWITCH/STS768 Circuit Pack Failure* alarm.

About side 0 and side 1 The SWITCH/STS768 circuit packs always operate in a 1+1 equipment protection group. The SWIF and SWITCH/STS768 circuit packs jointly make up what is referred to as the 1+1 Equipment eswitchgrp. Each eswitchgrp consists of two sides. They are referred to as Side 0 and Side 1. While one side is *Active* the other side is *Standby*. If, for example, Side 0 is the *Active* side and any one of its circuit packs fails - then there will be a switch to the *Standby* side (Side 1). Side 1 now becomes the *Active* side. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new *Standby* side. No switch back is required.

Required equipment Use the following equipment to complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWIF circuit pack
- Spare/replacement SWITCH/STS768 circuit pack.

Task Complete the following steps to clear a *SWITCH/STS768 Circuit Pack Failure* alarm.

- 1 From the **Alarm List**, determine whether or not there also exists a SWIF Circuit Pack Failure.

If the Alarm List...	Then...
also includes a <i>SWIF Circuit Pack Failure</i>	replace the SWIF circuit pack, and continue with Step 2. Reference: Task 556: Clear ‘SWIF Circuit Pack Failure’
does not include the <i>SWIF Circuit Pack</i>	continue with Step 4.

-
- 2 Click on the **Update Alarms** button.

-
- 3 Does the list still include a *SWITCH/STS768 Circuit Pack Failure* alarm?

If ...	Then ...
YES,	go to Step 4.
NO,	<i>STOP! End of Task.</i>

-
- 4 From the *Alarm List*, determine the AID of the failed SWITCH/STS768 circuit pack.

-
- 5 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until *1+1 Equipment eswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the *Switch Request State: equals Equipment Fail*) is enough to replace a defective circuit pack.

-
- 6 For the *View Protection* screen and for the field that is labeled *Switch Request State: "Is Equipment Fail listed?"*

If ...	Then ...
YES,	a protection switch is in effect. Continue with Step 7.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 563-1: Perform a Manual Protection Switch to Side _

-
- 7 Instruct the on-site craft to:
1. Physically unlatch and remove the alarmed circuit pack.
 2. Insert a known good replacement circuit pack.
-

Important! The newly installed SWIF circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 8 Wait 2 minutes for this circuit pack to reinitialize.
-

- 9 Click on the **Update Alarm** button.
-

- 10 Does the list include this same SWIF circuit pack failure alarm?

IF ...	THEN ...
YES,	go to Step 13.
NO,	continue. Important! Although there is no requirement, some customers may prefer to keep service on Side 0 (Side 0 as Active) and Side 1 available for protection.

- 11 Do you have local operating procedures that stipulate something like “Normal operations, for 1+1 Equipment protection groups, should be maintained on Side 0”?

If ...	Then ...
YES,	you should perform a <i>Manual to Side 0</i> protection switch. Reference: SE 563-2: Perform a Manual Protection Switch to Side 0
NO,	continue.

.....

12 *STOP! End of Task.*

.....

13 Escalate to the next higher level of technical support.

.....

.....

END OF STEPS

.....

SE 563-1: Perform a Manual Protection Switch to Side _

Perform the following steps to manually switch the switch fabric from the current active side to the current standby side.

1 From the **System View** screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment eswitchgrp* is displayed and highlighted.
4. Click on the **Select** button.

NOTE: The right-hand part of the screen will display the selected *Protection Group AID*: (for example, _-_ eswitchgrp). Also, this display shows switch0-cp and switch1-cp AIDs as well as their individual alarm status.

5. In the field labeled **Switch Type**: click on the drop-down arrow and:
 - if switch0-cp is alarmed, then select *Manual to Side 1*, or
 - if switch1-cp is alarmed, then select *Manual to Side 0*
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the **System View** screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command or an existing hardware failure on the switch-to-side would cause the command to fail. If the command was successful, then the list will display **Protection Switch** (appropriate AID) **Successful**.

.....

3 Was the Manual Protection Switch command successful?

If ...	Then
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

E N D O F S T E P S

.....

SE 563-2: Perform a Manual Protection Switch to Side 0

Perform the following steps to manually switch the I/O fabric from Side 1 to Side 0.

1 From the **System View** screen:

1. Click on **Fault-Protection Switch**.
 2. Click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and Shelf _ until *1+1 Equipment eswitchgrp* is displayed and highlighted.
 4. Click on the **Select** button.
NOTE: The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *ebswgrp_0*). Also, this display shows *...bsw_0* and *...bsw_1* AIDs, as well as their individual alarm status.
 5. In the field labeled **Switch Type**: click on the drop-down arrow and select *Manual to Side 0*.
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the **System View** screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the Manual to Side 0 command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like Protection Switch (*appropriate AID*) successful.

3 Was the Manual Protection Switch command successful?

If ...	Then ...
YES,	<i>STOP! End of Supporting Task.</i>

If ...	Then ...
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....

☐

Task 564: Clear ‘OC192/STM64 Circuit Pack Failure’

- Purpose** Use this task to:
- Obtain the identity of an alarmed OC192/STM64 circuit pack.
 - Replace the alarmed circuit pack.
 - Verify that the alarm has been cleared.

- Required equipment** Use the following equipment to complete this task:
- WaveStar Craft Interface Terminal (CIT)
 - Wrist strap
 - Spare/replacement OC192/STM64 circuit pack.

Important considerations **Important!** If the OC192/STM64 circuit pack is part of a 4-fiber BLSR/MS-SPRing port protection group, then it will be necessary to perform a Manual to Protection, Span switch before removing the circuit pack. As a contrast, if the OC192/STM64 circuit pack is part of a 2-fiber BLSR/MS-SPRing port protection group, then it will be necessary to perform a Manual to Protection, Ring switch before removing the circuit pack.

Review and consider the items listed below when a circuit pack failure alarm occurs.

1. An OC192/STM64 circuit pack can only be used in a 0x1 (unprotected) equipment configuration. However, the unprotected circuit pack may be used to support facilities that are:
 - a. BLSR/MS-SPRing protected
 - b. 1+1 protected
 - c. 0x1 unprotected
 - d. Protected at the far-end user location
2. Regarding revertive and nonrevertive switching:
 - a. For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
 - b. For 1+1 facilities the defaults are:

- Nonrevertive (but can be provisioned as revertive).
- At initial start-up of an NE, service is provided by the *working* line.
- At initial provisioning, service is provided by the *working* line.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear an *OC192/STM64 Circuit Pack Failure* alarm.

- 1 From the **Alarm List**, determine the AID of the failed circuit pack.

Important! The OC192/STM64 circuit pack may be part of: (a) BLSR/MS-SPRing facilities protection group, (b) part of a 1+1 facilities protection group, or (c) part of a 0x1 unprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

- 2 Is the failed circuit pack part of a BLSR, MS-SPRing, or 1+1 facilities protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 12.

3 From the *System View* screen:

1. Click on **View-Protection**.
2. Click on the tab labeled *Prot Grp* (which is the default tab).
3. In the Windows-like explorer screen, expand down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *_F BLSR ...*, or *1+1 Optical ...*) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted,
 - and for a 1+1 protection group — the **Switch Request State:** equals *Signal Failure* is enough to replace a defective circuit pack
 - and for a BLSR/MS-SPRing protection group — the **Ring Node APS (Automatic Protection Switch) State:** equals *Active* is enough to replace a defective circuit pack.

4 For the *View Protection* screen and for the field that is labeled (**Switch Request State:** “Is *Signal Failure* listed) or (**Ring Node APS [Automatic Protection Switch] State:** Is *Active* listed)?”

If...	Then...
YES,	a protection switch is in effect. Continue with Step 5
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 564-1: Perform a Manual Protection Switch on an OC192/STM64

Important! The OC192/STM64 is a single port type circuit pack. Therefore, for the application where it is supporting a BLSR/MS-SPRing facility protection group or a 1+1 facility

protection group, all traffic will be automatically switched to the other circuit pack upon declaring an OC192/STM64 circuit pack failure.

5 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
2. Physically unlatch and remove the alarmed circuit pack.
3. Insert a known good replacement circuit pack.
4. Clean and carefully reconnect the fibers

Important! The newly installed OC192/STM64 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes—depending on other ongoing system activities.

6 Wait for this circuit pack to initialize.

7 Click on the **Alarm List** button.

8 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 4?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 564-2: Clear protection switch on an OC192/STM64
NO,	continue.

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

Important! For the 0x1 OC192/STM64 applications, a circuit pack failure means a complete loss of service on this particular facility.

12 Instruct the on-site craft to:

1. Disconnect the two fibers from the subject circuit pack.
 2. Physically remove the failed circuit pack (AID from Step 1).
 3. Insert a known good replacement circuit pack.
 4. Clean and carefully reconnect the fibers.
-

Important! The newly installed OC192/STM64 circuit pack should reinitialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes—depending on other ongoing system activities.

13 Wait for this circuit pack to initialize.

14 Click on the **Alarm List** button.

15 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11.
NO,	go to Step 10.

END OF STEPS

SE 564-1: Perform a Manual Protection Switch on an OC192/STM64

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

.....

- 1** Is the OC192/STM64 circuit pack a member of a *4f BLSR*?

If...	Then...
YES,	go to Step 3.
NO,	continue with Step 2.

.....

- 2** From the *System View* screen:

1. Click on **Fault-Protection Switch**.
 2. Click on the tab labeled *Prot Grp*.
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2F BLSR ...*) is displayed. Then, highlight the appropriate protection group.
 4. Click on the **Select** button.
 5. If *BLSR/MS-SPRing..... East Port AID* is alarmed, then
 - for the field that is labeled *Direction*: select *West*
 - for the field that is labeled *Switch Type*: select *Manual to Protection, Ring*OR
 - If *1+1..... Working AID* is alarmed, then
 - for the field that is labeled *Switch Type*: select *Manual to Protection*
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

- 3** From the *System View* screen:

1. Click on **Fault-Protection Switch**.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *4F BLSR ...*) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If*West Working Port AID*..... is alarmed, then
 - for the field that is labeled *Direction*: select *West*
 - for the field that is labeled *Switch Type*: select *Manual to Protection, Span*
 OR
6. If*East Working Port AID*..... is alarmed, then
 - for the field that is labeled *Direction*: select *East*
 - for the field that is labeled *Switch Type*: select *Manual to Protection, Span*
7. Click on the **Apply** button.
8. Read the information message and, as appropriate, click on the **YES** button.

-
- 4** Refer back to the *System View* screen and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display *Protection Switch* (appropriate AID) *Successful*.

-
- 5** Was the *Manual Protection Switch* command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>

If...	Then...
NO,	continue.

6 Escalate to the next higher level of technical support.

END OF STEPS

SE 564-2: Clear protection switch on an OC192/STM64

Perform the following steps to *Clear* an existing Manual Protection Switch.

- 1 From the *System View* screen:
 1. Select **Fault-Protection Switch**.
 2. Click on the tab labeled *Ptn Grp*.
 3. In the Windows-like explorer, expand down the directory until the desired AID is shown.
 4. Click to highlight the desired AID.
 5. Click on the **Select** button.
 6. For the field that is labeled Direction: refer to what was previously manually switched in SE 564-1. As appropriate, select either *East* or *West*.
 7. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*:
 8. Click on **Clear**.
 9. Click on the **Apply** button.
 10. Read the information in the *Caution* box and then click on the **YES** button.
 11. Click on the **Close** button.
-

- 2 **STOP! End of Supporting Element.**

END OF STEPS



Task 566: Clear ‘CTL/SR50DC Circuit Pack Failure’

Purpose Use this procedure to clear a *CTL/SR50DC Circuit Pack Failure* alarm.

Required equipment The following items are required before beginning this procedure:

- WaveStar Craft Interface Terminal (CIT)
- Wrist Strap
- Spare/replacement CTL/SR50DC circuit pack.

About side 0 and side 1 The CTL/SR50DC is always used in a 1+1 equipment configuration. They are referred to as *ctlmem0* and *ctlmem1*. Their modes of operation are referred to as Active and Standby. If the current Active circuit pack should fail, control will automatically switch to the Standby circuit pack. Thereafter, and following a short reboot interval, it becomes the new Active circuit pack. Subsequently, after the alarmed circuit pack in the opposite side is replaced, that side will become the new Standby side. No switch back is required!

Task Complete the following steps to clear a *CTL/SR50DC Circuit Pack Failure* alarm.

1 From the *Alarm List*, determine the AID of the failed CTL/SR50DC circuit pack.

2 From the *System View* screen:

1. Click on *View-Protection*.
2. Click on the tab labeled *Prot Grp*.
3. In the Windows-like explorer screen, expand down the directory on Bay _ and I/O Shelf _ until *1+1 ectlmemgrp* is displayed and highlighted.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with

proper indications (for example, the circuit pack's ACTIVE LED is not lighted and the Switch Request State equals *Equipment Fail*) is enough to replace a defective circuit pack.

- 3 For the *View Protection* screen and for the field that is labeled *Switch Request State*: “Is *Equipment Fail* listed?”

If...	No...
YES,	a protection switch is in effect. Continue with Step 4.
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 566-1: Perform a Manual Protection Switch on a CTL/SR50DC

- 4 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

Important! The newly installed CTL/SR50DC should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes.

- 5 Wait 2 minutes for this circuit pack to initialize.

- 6 Click on the **Update Alarms** button.

- 7 Does the list include this same CTL/SR50DC circuit pack failure alarm?

If...	Then...
YES,	escalate to the next higher level of technical support.
NO,	continue.

8 Did you perform a *Manual Protection Switch* in Step 3?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 566-2: Clear Protection Switch on a CTL/SR50DC
NO,	continue.

END OF STEPS



SE 566-1: Perform a Manual Protection Switch on a CTL/SR50DC

Task Perform the following steps to manually switch the I/O shelf control from the current active side to the current standby side.

1 From the *System View* screen:

1. Click on *Fault-Protection Switch*.
2. Click on the tab labeled *Prot Grp*.
3. Click on the Windows-like explorer screen and, as appropriate, expand/scroll downward on Bay _ and I/O Shelf _ until *1+1 Equipment ectlmemgrp* is displayed and highlighted.
4. Click on the **Select** button.

The right-hand part of the screen will display the selected *Protection Group AID*: (for example, *ectlmem*). Also, this display shows *ctlmem0* and *ctlmem1* AIDs, as well as their individual alarm status.

5. In the field labeled *Switch Type*: click on the drop-down arrow and:
 - if *ctlmem0* is alarmed, then select *Manual to Side 1*, or
 - if *ctlmem1* is alarmed, then select *Manual to Side 0*
 6. Click on the **Apply** button.
 7. Read the information message and, as appropriate, click on the **YES** button.
-

2 Refer back to the *System View* screen, and determine from the *Command List* (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display something like *Protection Switch (appropriate AID) successful*.

.....

3 Was the Manual Protection Switch command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

.....

4 Escalate to the next higher level of technical support.

.....

END OF STEPS

.....



SE 566-2: Clear Protection Switch on a CTL/SR50DC

Task Perform the following steps to *Clear* an existing Manual Protection Switch.

1 From the *System View* screen:

1. Select *Fault-Protection Switch*.
2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
3. Click to highlight the desired AID.
4. Click on the **Select** button.
5. In the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
6. Click on **Clear**.
7. Click on the **Apply** button.
8. Read the information in the Caution box and then click on the **YES** button
9. Click on the **Close** button.

END OF STEPS



Task 567: Clear ‘PPROC/STS192 Circuit Pack Failure’

- Purpose** Use this task to:
- Obtain the identity of an alarmed PPROC/STS192 circuit pack.
 - Replace the alarmed circuit pack.
 - Verify that the alarm has been cleared.

- Required equipment** Use the following equipment to complete this task:
- WaveStar Craft Interface Terminal (CIT)
 - Wrist strap
 - Spare/replacement PPROC/STS192 circuit pack.

- Important considerations** Review and consider the items listed below when a circuit pack failure alarm occurs.
1. A Pointer Processor circuit pack is always paired/mated with an OC-192 circuit pack. Thus, it is referred to with the acronym/ name PPROC/STS192. A PPROC/STS192 circuit pack can only be used in a 0x1 (unprotected) equipment configuration. However, the unprotected circuit pack may be used to support facilities that are:
 - a. 1+1 protected,
 - b. BLSR/MS-SPRing protected
 - c. 0x1 unprotected, or
 - d. Protected at the far-end user location.
 2. Regarding revertive and nonrevertive switching:
 - a. For 1+1 facilities, upon failure of the working circuit pack service will be automatically switched to the protection circuit pack. After replacing the failed circuit pack with a good circuit pack, service will continue to be provided from the protection circuit pack. *Thus, for 1+1 facilities, the protection switch is (by default) nonrevertive.*
 - b. For 1+1 facilities the defaults are:
 - Nonrevertive (but can be provisioned as revertive)
 - At initial start-up of an NE, service is provided by the *working* line

— At initial provisioning, service is provided by the *working line*.

Important! For 1+1 facilities where nonrevertive switching is being used, it CANNOT be assumed that service is being provided by the *working line*, or that service is being provided by the *protection line*. You must check to determine which is the *Active Port*.

Before you begin Prior to beginning this task, you must:

1. Have a WaveStar CIT that is connected to the subject NE.
2. Log in to the WaveStar CIT application, and subsequently log in to the subject WaveStar NE.
3. From the *System View* screen of the subject NE, click on the button that is labeled **Alarm List**.

Task Perform the following steps to clear a PPROC/STS192 *Circuit Pack Failure* alarm.

-
- 1 From the **Alarm List**, determine the AID of the failed circuit pack.

Important! The PPROC/STS192 circuit pack may be part of: (a) BLSR/MS-SPRing facilities protection group, (b) part of a 1+1 facilities protection group, (b) part of a 1+1 facilities protection group, or (c) part of a 0x1 unprotected group. Regardless of the type of facilities protection, the alarmed circuit pack will have its FAULT LED lighted continuous red, while the ACTIVE LED will not be lighted.

-
- 2 Is the failed circuit pack part of a BLSR, MS-SPRing, or 1+1 facilities protection group?

If...	Then...
YES,	continue with Step 3.
NO,	go to Step 12

-
- 3 From the *System View* screen, do the following:

1. Click on **View-Protection**.
2. Click on the tab labeled *Prot Grp* (which is the default tab).
3. In the Windows-like explorer screen, expand down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *_F BLSR ...*, or *1+1 Optical ...*) is displayed. Then highlight the protection group.
4. Click on the **Select** button.
5. A manual switch can be used if replacement of a circuit pack is necessary. This will only be required if something abnormal occurred. Under normal operations an automatic switch with proper indications (for example, the circuit pack's ACTIVE LED is not lighted,
 - and for a 1+1 protection group, the *Switch Request State: equals Signal Failure* is enough to replace a defective circuit pack
 - and for a BLSR protection group, the *Ring Node APS (Automatic Protection Switch) State: equals Active* is enough to replace a defective circuit pack.

-
- 4** For the *View Protection* screen and for the field that is labeled (*Switch Request State: Is Signal Failure* listed?) or (*Ring Node APS (Automatic Protection Switch) State: Is Active* listed?)

If...	Then...
YES,	a protection switch is in effect. Continue with Step 5
NO,	you should perform a <i>Manual Protection Switch</i> . Reference: SE 567-1: Perform a Manual Protection Switch on a PPROC/STS192

-
- 5** Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to Properly Remove a Circuit Pack

Important! The newly installed PPROC/STS192 circuit pack should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

6 Wait for this circuit pack to initialize.

7 Click on the **Alarm List** button.

8 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11
NO,	continue.

9 Did you perform a *Manual Protection Switch* in Step 5?

If...	Then...
YES,	you should perform a <i>Clear Protection Switch</i> . Reference: SE 567-2: Clear Protection Switch on a PPROC/STS192
NO,	go to Step 12

10 *STOP! End of Task.*

11 Escalate to the next higher level of technical support.

12 Instruct the on-site craft to:

1. Physically remove the failed circuit pack (AID from Step 1).
2. Insert a known good replacement circuit pack.

Reference: Task 700: How to Properly Remove a Circuit Pack

.....

Important! The newly installed PPROC/STS192 circuit pack should initialize (green LED blinks and clears, and then no red LED) in approximately 2 minutes – depending on other ongoing system activities.

13 Wait for this circuit pack to initialize.

.....

14 Click on the **Alarm List** button.

.....

15 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 11
NO,	go to Step 10

.....

E N D O F S T E P S

.....

SE 567-1: Perform a Manual Protection Switch on a PPROC/STS192

Perform the following steps to manually switch service from the alarmed circuit pack to the nonalarmed circuit pack.

- 1 Is this PPROC/STS192 circuit pack mated to an OC192/STM64 that is a member of a 4f BLSR/MS-SPRing?

If...	Then...
YES,	go to Step 3.
NO,	continue with Step 2.

- 2 From the *System View* screen:
 1. Click on **Fault-Protection Switch**.
 2. Click on the tab labeled *Prot Grp* (which is the default tab).
 3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *2f BLSR ...*) is displayed. Then, highlight the appropriate protection group.
 4. Click on the **Select** button.
 5. If ... *East Port AID*... is alarmed, then
 - for the field that is labeled *Direction*: select
West
 - for the field that is labeled *Switch Type*: select
Manual to Protection, Ring
 6. Click on the **Apply** button
 7. Read the information message and, as appropriate, click on the **YES** button.
-

- 3 From the **System View** screen:
 1. Click on **Fault-Protection Switch**.
 2. Click on the tab labeled **Prot Grp**.

3. In the Windows-like explorer screen, expand/scroll down the directory on Bay _ and I/O Shelf _ until the desired protection group (for example, *4f BLSR ...*) is displayed. Then, highlight the appropriate protection group.
4. Click on the **Select** button.
5. If *West Working Port AID* is alarmed, then
 - for the field that is labeled *Direction*: select
West
 - for the field that is labeled *Switch Type*: select
Manual to Protection, Span

OR
6. If *East Working Port AID*.... is alarmed, then
 - for the field that is labeled *Direction*: select
East
 - for the field that is labeled *Switch Type*: select
Manual to Protection, Span
7. Click on the **Apply** button.
8. Read the information message and, as appropriate, click on the **YES** button.

-
- 4** Refer back to the *System View* screen and determine from the Command List (which is the drop-down list immediately below the menu bar) whether the *Manual to Side _* command was successful.

Important! Any currently existing higher priority protection switch command, or an existing hardware failure on the switch-to-side, would cause the command to fail. If the command was successful, then the list will display *Protection Switch (appropriate AID) Successful*.

-
- 5** Was the *Manual Protection Switch* command successful?

If...	Then...
YES,	<i>STOP! End of Supporting Task.</i>
NO,	continue.

-
- 6** Escalate to the next higher level of technical support.

END OF STEPS

SE 567-2: Clear Protection Switch on a PPROC/STS192

Perform the following steps to *Clear* an existing Manual Protection Switch.

- 1** From the *System View* screen:
 1. Select **Fault-Protection Switch**.
 2. In the Windows-like explorer, expand down the directory until the desired AID is shown.
 3. Click to highlight the desired AID.
 4. Click on the **Select** button.
 5. On the right-hand side of the screen, click on the drop-down arrow beside the field labeled *Switch Type*.
 6. Click on *Clear*.
 7. Click on the **Apply** button.
 8. Read the information in the Caution box and then click on the **YES** button.
 9. Click on the **Close** button.
-

- 2** *STOP! End of Supporting Element.*

END OF STEPS



Task 568: Clear ‘SWITCH/STM1E4 Circuit Pack Failure’

Purpose Use this task whenever the NE Alarm List displays a *SWITCH/STM1E4 Circuit Pack Failure*.

Required privilege code The user must have a privilege code of M1 (or higher) to perform this task.

Required equipment The following list of equipment is required in order to successfully complete this task:

- WaveStar Craft Interface Terminal (CIT)
- Wrist strap
- Spare/replacement SWITCH/STM1E4 circuit pack.

Task Complete the following steps to clear a *SWITCH/STM1E4 Circuit Pack Failure* alarm.

- 1** From the Alarm List, determine whether or not an *STM1E/4 Circuit Pack Failure* also exists. Does the Alarm List also include an entry for an *STM1E/4 Circuit Pack Failure*?

If...	Then...
YES,	go to Step 2.
NO,	go to Step 5.

2

If the Alarm List also includes an...	Then replace the...
<i>STM1E/4 Circuit pack Failure</i>	STM1E/4 circuit pack Reference: Task 537: Clear ‘STM1E/4 Circuit Pack Failure’

- 3** Click on the **Update Alarms** button.

-
- 4 Does the list still include a SWITCH/STM1E4 circuit pack failure?

If...	Then...
YES,	go to Step 9.
NO,	<i>STOP! End of Task.</i>

-
- 5 Instruct the on-site craft to:

1. Physically unlatch and remove the alarmed circuit pack.
2. Insert a known good replacement circuit pack.

.....

Important! The newly installed SWITCH/STM1E4 should reinitialize (green LED blinks, no red LED) in approximately 2 minutes.

- 6 Wait 2 minutes for this circuit pack to reinitialize.

-
- 7 Left-click on the **Update Alarms** button.

-
- 8 Does the list include this same circuit pack failure alarm?

If...	Then...
YES,	go to Step 9.
NO,	<i>STOP! End of Task.</i>

-
- 9 Escalate to the next higher level of technical support.

.....

END OF STEPS



Task 573: Clear ‘Local Squelch Map Conflict’

Purpose The network element uses the squelch map during the ring loopback protection switching that may occur in a closed BLSR or MS/SPRing. Each cross-connection on the ring is provisioned with a source NE TID (“locA” in TL1 terms) and a destination NE TID (“locZ” in TL1 terms). When one or more of these values is invalid (not in the ring where the cross-connection resides) the NE reports a Local Squelch Map Conflict. This alarm often occurs when mult-ring traffic is provisioned incorrectly. Use this procedure to clear the alarm by modifying the appropriate cross-connection(s).

Important! This alarm can only occur when cross-connections were provisioned using TL1 commands directly. The graphical interface of the CIT does not allow you to enter invalid locA and locZ values. (You can only select source and destination NEs from a drop down. These may be incorrect for your cross-connection but not invalid in terms of the ring map.) For that reason this task is written in TL1 terms.

Required equipment The following equipment is required to perform this task:

- Craft Interface Terminal (CIT) or another interface that can send TL1 commands to the BandWidth Manager

Related information For related information, see the following:

- “Determining LocA and LocZ for Multi-Ring Traffic” in Chapter 2 of this manual

Example alarm

```
1-1-f20:MN,SQMAP-CONFL,NSA,01-01,23-53-45:  
\"Communications, BLSR prot grp, Local Squelch Map  
Conflict\"
```

This indicates that the conflict involves shelf 1-1, protection group f20.

Task summary The following steps summarize this task:

1. For single ring traffic, make a list of the NE TIDs in the ring. For multiple ring traffic, draw a map and table of the traffic. Refer to the Related information section(s) if necessary. Use your map and table as a guide for the rest of this task.

2. Make sure that each locA and locZ value in each cross-connection is in fact a TID of an NE in the ring and that the NE is the correct one.

Task details Complete the following steps to clear a “Local Squelch Map Conflict” alarm.

- 1 Make a note of the protection group AID listed in the alarm message. In our example above it is 1-1-f20.

- 2 Do one of the following:

If...	Then...
your traffic traverses more than one ring	go to step 4
your traffic traverses only one ring	go to step 3

- 3 Make a list of the NE TIDs in your ring. It may help to use a RTRV-MAP-RING command similar to the following example:

Example: RTRV-MAP-RING:CHICAGO:1-1-f20:ctag1;

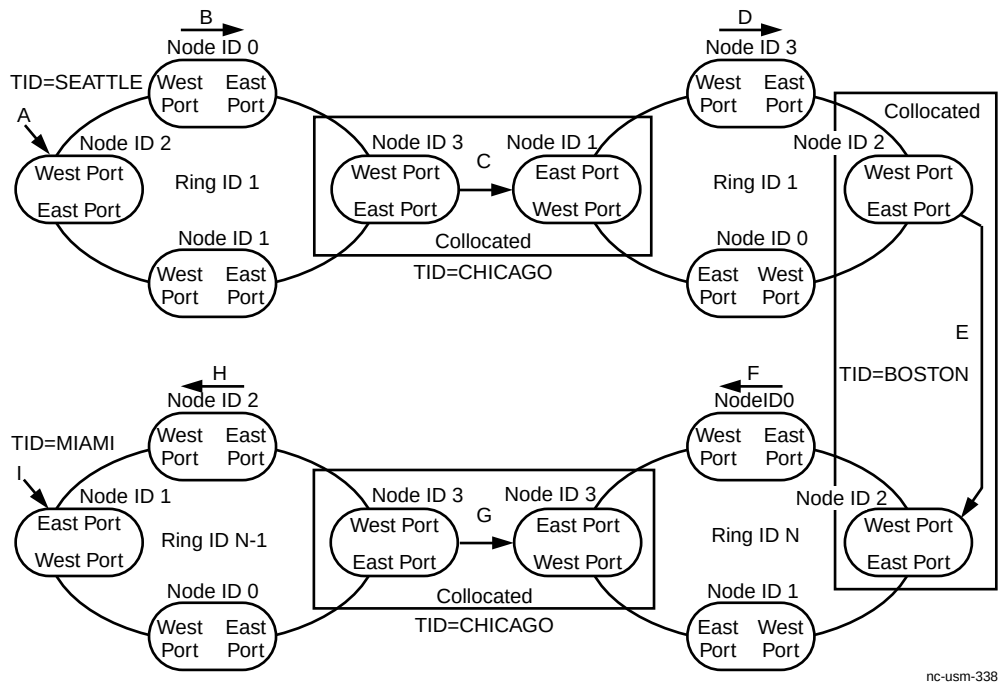
The output includes information in curly braces {}. The first field in each set of braces is a TID for one of the NEs in the ring.

- 4 Draw a map and table similar to the example below for the traffic you intend to provision. If you have doubts about which NEs to select as

sources or destinations, see “Determining LocA and LocZ for Multi-Ring Traffic” in Chapter 2.

Example:

The following figure shows traffic that traverses several BLSRs or MS-SPRings.



nc-usm-338

XConn	Type	LocA	LocZ
A	Add	none	CHICAGO
B	Through	SEATTLE	CHICAGO
C	Ring-to-Ring	SEATTLE	BOSTON
D	Through	CHICAGO	BOSTON
E	Ring-to-Ring	CHICAGO	NEWYORK
F	Through	BOSTON	NEWYORK
G	Ring-to-Ring	BOSTON	MIAMI
H	Through	NEWYORK	MIAMI
I	Drop	NEWYORK	none

-
- 5 The conflict could be caused by any one or more cross-connections on the ring whose protection group is identified in the alarm message. To get a list of all cross-connections on that ring, enter a RTRV-CRS command. For example, for our example above you could enter the following:

Example: RTRV-CRS-ALL:CHICAGO:1-1-f20-all-all-all:ctag1;

The output for each cross-connection looks similar to the following:

```
"1-1-u-#-12-1,1-1-f20-ww-04-02:STS3:OMODE=NORM,
LOCA=SEATTLE, SQFA=MVALID, LOCZ=MIAMI, SQFZ=MINVALID,
REPLEG=2WAY, LPBKSTAT=NO, TACCSTAT=NO, XCAPPL=10,
XCNUM=011031001"
```

-
- 6 The output from the RTRV-CRS includes the locA and locZ values. Compare these against the list you made in step 3 or the table you made in step 4 to determine which cross-connections need to be modified.

Important! Correcting the locA/locZ values for all cross-connections that show SQFA=MINVALID or SQFZ=MINVALID would clear the alarm. But note that you could also have a locA or locZ value that is valid, because it is in the ring map, but is not the correct destination NE.

-
- 7 Use the ED-CRS command to modify a problematic cross-connection. The following example modifies the locZ value of a cross-connection.

Example: ED-CRS-STS3:SEATTLE:1-1-u-#-12-1,1-1-f20-ww-04-02:ctag1:::LOCZ=CHICAGO;

-
- 8 Repeat step 7, if necessary, for each problematic cross-connection.

-
- 9 Use the RTRV-ALM command to verify that the SQMAP-CONFL alarm does not appear. You may want to narrow down the alarm list by specifying the AID of the protection group as in the example below.

Example: RTRV-ALM:SEATTLE:1-1-f20::ctag1;

-
- 10** Verify that your cross-connections are correct by repeating the RTRV-CRS command that you performed in step 5 and comparing the locA and locZ values to the table that you created.

END OF STEPS



Task 580: Clear STM64, STM16, STM4, STM1 or STM1E Multiplex Section ‘Signal Degraded’ or ‘Excessive Error’

Purpose	Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.
Required equipment	The following is a list of required equipment for completing this procedure: • WaveStar Craft Interface Terminal (CIT) • Wrist strap • Spare/replacement circuit pack • Optical power meter (to measure the received power level) • Fiber cleaning supplies.
Optional equipment	The following is a list of equipment that the craft may need occasionally: • Optical transmitter/receiver test set • Optical Time Domain Reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut) • Set of buildout pads (5, 10, 15 and 20); type depends on fiber connector being used
Safety precautions	To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand this precaution prior to performing this task.



CAUTION

The OBA has a maximum power output level of +17 dBm. If the far-end fiber is being fed by an OBA – then a 20-dB pad must be inserted between the OBA and the power meter. A pad is not

required in order to measure the output power level of an STM-64 OUT port.



CAUTION

The STM-4 circuit pack contains two ports. Most likely, only one port will be indicating an alarm, while the other port may be providing normal transmission. Care must be exercised to NOT disconnect the port that is not alarmed – else, service will be disrupted.



CAUTION

The STM-1 circuit pack contains 4 ports. Most likely, only one port will be indicating an alarm, while the other ports may be providing normal transmission. Care must be exercised to NOT disconnect the ports that are not alarmed – else, service will be disrupted.

Before you begin

Before you begin this task, it is important to understand that:

- An STM-1, STM-4, STM-16, or STM-64 MS Signal Degrade or MS Excessive Error condition has been detected on the identified incoming line.

NOTE: Likely causes, in terms of priority, are:

1. Degradation of the incoming fiber line
2. Dirty/contaminated optical connector(s)
3. Defective LBO at either the receiver or transmitter
4. Failure of the local receiver (resulting in degraded reception)
5. Failure of the upstream transmitter (resulting in degraded reception)

- An STM-1E/4 MS Signal Degrade or MS Excessive Error condition has been detected on the identified incoming line.

NOTE: Likely causes, in terms of priority, are:

6. Failure of the STM-1E office source
7. Failure of the STM-1E/4 port unit circuit pack (resulting in traffic degradation)

8. Loose coaxial connector on the shelf STM-1E connector panel

Task Complete the following steps to clear a MS Signal Degrade or MS Excessive Error alarm

- 1 From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

- 2 Refer to the Alarm List and determine whether there are associated equipment alarms at the local NE.

If...	Then...
YES,	go to Step 10
NO,	continue.

Important! Before you can determine whether associated alarms exist on the neighbor NE, it will be necessary to: (a) determine the identity of the immediate upstream neighbor NE, (b) determine the neighbor port's identity, (c) log in to the neighbor NE, and, (d) display that NE's alarm list.

- 3 From the local NE and on the CIT **System View** screen, select **Administration-OSI Neighbor Map**.

- 4 In the **Administration-OSI Neighbor Map** screen:

1. Select (highlight and click on) the **ADJCTL/DCCEI** circuit pack for the I/O shelf containing the alarmed port unit.
2. Click on the **Select** button.

- 5 In the **Neighbor Map for subject dccei-cp**,

1. Locate the column that is labeled *Local Port* and identify the row that lists the AID from Step 1.

2. Identify the corresponding immediate upstream neighbor port—which is the same row but in the *Nbr Port* column.
3. Identify the corresponding immediate upstream neighbor name—which is the same row but in the *Nbr NE Name* column.

6 Log in to the neighbor NE and display the alarm list.

Important! If a problem exists that prevents you from logging in to the neighbor NE, then you should: (a) have an on-site craft physically connect to the subject NE, (b) have the craft log in to that NE, and (c) display the **Alarm List**.

7 Are there associated equipment alarms with the remote/neighbor NE?

If...	Then...
YES,	go to Step 10.
NO,	continue.

8 Does the Alarm List include multiple MSDEG or MSEXC alarms?

If...	Then...
YES,	refer to your local procedures for reporting and repairing fiber troubles. <i>STOP! End of Task.</i>
NO, just the single MSDEG or MSEXC alarm,	continue.

9

If the local NE Alarm List display includes...	Then continue with...
OC192/STM64, MSDEG or MSEXC	Supporting Element Reference: SE 543-1: Clear 'OC192/STM64, Loss of Signal'
OC48/STM16, MSDEG or MSEXC	Supporting Element Reference: SE 543-2: Clear 'OC48/STM16, Loss of Signal'

If the local NE Alarm List display includes...	Then continue with...
OC12/STM4, MSDEG or MSEXC	Supporting Element Reference: SE 543-3: Clear 'OC12/STM4, Loss of Signal'
OC3/STM1, MSDEG or MSEXC	Supporting Element Reference: SE 543-4: Clear 'OC3/STM1, Loss of Signal'
STM1e, Loss of Signal	Supporting Element Reference: SE 543-6: Clear 'STM1E/4 Loss of Signal'

- 10** For each of the equipment alarms that is associated with MSDEG or MSEXC, proceed with the appropriate Task, as follows:

If the equipment alarm is...	Then continue with...
OC192/STM64, Circuit Pack Failure	Task Reference: Task 564: Clear 'OC192/STM64 Circuit Pack Failure'
OC48/STM16, Circuit Pack Failure	Task Reference: Task 548: Clear 'OC48/STM16 Circuit Pack Failure'
OC12/STM4, Circuit Pack Failure	Task Reference: Task 549: Clear 'OC12/STM4 Circuit Pack Failure'
OC3/STM1, Circuit Pack Failure	Task Reference: Task 550: Clear 'OC3/STM1 Circuit Pack Failure'
STM1E/4, Circuit Pack Failure	Task Reference: Task 537: Clear 'STM1E/4 Circuit Pack Failure'

- 11** *STOP! End of Task.*

Task 581: Clear STM64, STM16, STM4, STM1or STM1E 'Multiplex Section Remote Defect Indication'

Purpose	Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.
Required equipment	The following is a list of required equipment for completing this procedure: • WaveStar Craft Interface Terminal (CIT) • Wrist strap • Spare/replacement circuit pack • Optical power meter (to measure the received power level) • Fiber cleaning supplies.
Optional equipment	The following is a list of equipment that the craft may need occasionally: • Optical transmitter/receiver test set • Optical Time Domain Reflect-o-meter (OTDR) test set (to help locate a fiber bend or cut) • Set of buildout pads (5, 10, 15 and 20); type depends on fiber connector being used
Safety precautions	To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand this precaution prior to performing this task.



CAUTION

The OBA has a maximum power output level of +17 dBm. If the far-end fiber is being fed by an OBA – then a 20-dB pad must be inserted between the OBA and the power meter. A pad is not

required in order to measure the output power level of an STM-64 OUT port.



CAUTION

The STM-4 circuit pack contains two ports. Most likely, only one port will be indicating an alarm, while the other port may be providing normal transmission. Care must be exercised to NOT disconnect the port that is not alarmed – else, service will be disrupted.



CAUTION

The STM-1 circuit pack contains 4 ports. Most likely, only one port will be indicating an alarm, while the other ports may be providing normal transmission, Care must be exercised to NOT disconnect the ports that is not alarmed – else, service will be disrupted.

Before you begin Before you begin this task, it is important to understand that an STM-1, STM-4, STM-16, or STM-64 MSRDI condition has been detected on the identified incoming line.

NOTE: The likely cause of this alarm is the detection of one of the following conditions on the immediate upstream neighbor:

- STMLOS
- STMLOF
- MSEXC

Task Complete the following steps to clear a MSRDI alarm.

- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

Important! Before you can determine whether associated alarms exist on the neighbor NE, it will be necessary to: (a) determine the identity of the immediate upstream neighbor NE, (b) determine the neighbor port's identity, (c) log in to the neighbor NE, and, (d) display that NE's alarm list.

- 2** From the local NE and on the CIT **System View** screen, select **Administration-OSI Neighbor Map**.

-
- 3** In the **Administration-OSI Neighbor Map** screen:

1. Select (highlight and click on) the **ADJCTL/DCCEI** circuit pack for the I/O shelf containing the alarmed port unit.
2. Click on the **Select** button.

-
- 4** In the **Neighbor Map for subject dccei-cp**,

1. Locate the column that is labeled *Local Port* and identify the row that lists the AID from Step 1.
2. Identify the corresponding immediate upstream neighbor port—which is the same row but in the *Nbr Port* column.
3. Identify the corresponding immediate upstream neighbor name—which is the same row but in the *Nbr NE Name* column.

-
- 5** Log in to the neighbor NE and display the alarm list.

Important! If a problem exists that prevents you from logging in to the neighbor NE, then you should: (a) have an on-site craft physically connect to the subject NE, (b) have the craft log in to that NE, and (c) display the **Alarm List**.

-
- 6** Perform the corrective action defined for the condition detected at the immediate upstream neighbor port.

END OF STEPS



Task 582: Clear STM64, STM16, STM4, STM1or STM1E 'Multiplex Section Server Signal Failure'

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Task Complete the following steps to clear a MS SSF alarm.

- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

- 2** Make a note of any other alarms associated with this AID.
-

- 3** Follow the Task for clearing the alarm(s), which could be the following:

- Loss of Signal, see Task 543
 - Loss of Frame, see Task 545
-

- 4** After clearing the possible Loss of Signal or Loss of Frame alarm from the WaveStar CIT **System View**, left-click on the **Alarm List** button to verify that the MS SSF alarm has cleared.

END OF STEPS



Task 583: Clear ‘HP Signal Degrade’

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Task Complete the following steps to clear a HPDEG alarm.

- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

- 2** Identify all intermediate points on the transmission path upstream from the alarm detection.
-

- 3** Check all the intermediate points for the presence of the HPDEG alarm.
-

- 4** Identify the intermediate point on the transmission path that is closest to the termination point which has the HPDEG alarm.
-

- 5** View the alarms on the server layer associated with the intermediate point upstream from the point identified in Step 4 and look for MSDEG.
-

- 6** Is the MSDEG alarm present?

If...	Then...
YES,	go to Task 580.
NO,	continue.

.....

7 Is there a switch fabric equipment related alarm on the upstream NE?

If...	Then...
YES,	perform the task associated with that alarm.
NO,	escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Task 584: Clear ‘HP Unequipped’

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Before you begin This alarm is likely to be caused by a cross-connection provisioning error that resulted in traffic misconnection. Another possible, but unlikely, cause is the malfunction of the switch fabric in one of the NEs on the transmission path.

Task Complete the following steps to clear a HPUNEQ alarm.

-
- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

- 2** Identify all intermediate points on the transmission path upstream from the alarm detection.
-

- 3** Check all the intermediate points for the presence of the HPUNEQ alarm.
-

- 4** Identify the intermediate point on the transmission path that is closest to the termination point which has the HPUNEQ alarm.

-
- 5** Can you identify any cross-connection provisioning errors on the NE upstream from the NE identified in Step 4?

If...	Then...
YES,	correct those errors.
NO,	escalate to the next higher level of technical support.

END OF STEPS



Task 585: Clear ‘HP Excessive Error’

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Task Complete the following steps to clear a HPEXC alarm.

- 1** From the WaveStar CIT **System View**, left-click on the **Alarm List** button.

Important! Observe the column labeled **AID** and make a note of the entry for the alarm in question.

- 2** View the alarms on the server layer associated with the intermediate point upstream from the point where the alarm is detected (optical or electrical port) and look for MSDEG or MSEXC.
-

- 3** Is MSDEG or MSEXC present?

If...	Then...
YES,	go to Task 580.
NO,	continue.

- 4** Is there a switch fabric equipment related alarm on the upstream NE?

If...	Then...
YES,	perform the task associated with that alarm.
NO,	escalate to the next higher level of technical support.

END OF STEPS



Task 586: Clear 'HP Server Signal Failure'

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Before you begin The HPSSF alarm is an indication that HP (a client signal) is being forced to HPAIS (HP Alarm Indication Signal) as a result of a server layer defect such as MSSSF or MSAIS. Therefore to clear HPSSF you must clear MSSSF or MSAIS.

Task Complete the following steps to clear a HPSSF alarm.

-
- 1** View the alarms on the server layer associated with the HP signal that has the HPSSF alarm.
-

- 2** If the alarm is:

If...	Then...
MSSSF,	go to Task 582.
MSAIS,	escalate to the next higher level of technical support.

- 3** After clearing the possible MSSSF or MSAIS alarm, verify that the HPSSF alarm has cleared.

END OF STEPS



Task 587: Clear ‘DS3 Bit Error Rate’

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- WaveStar Craft Interface Terminal (CIT)

Before you begin The DS3 Bit Error Rate (T-BERL) alarm is likely to be caused by one of the following conditions on the incoming DS3 line:

- Failure of the DS3 office source
- Failure of the DS3/EC1 port unit circuit pack (resulting in traffic degradation)
- Loose coaxial connector on the shelf DS3 connector panel

Important! If the alarm is caused by the failure of the DS3 office source then clearing the alarm depends on clearing the problem with the external equipment.

Task If the problem is determined to not be caused by external equipment then complete the following steps to clear a T-BERL alarm.

1 View the alarms on the DS3 pack on the local NE.

2 Are there any DS3 equipment alarms?

If...	Then...
YES,	go to the associated Task(s).
NO,	make sure that the coaxial connectory on the shelf DS3 connector panel is secure.

-
- 3** View the alarms on the DS3 pack again. If any alarms remain, escalate to the next higher level of technical support.

END OF STEPS



Task 588: Clear ‘System in Maintenance Condition’

Purpose Use this procedure to localize the problem, identify its cause, and implement the correction which results in clearing the alarm.

Required equipment The following is a list of required equipment for completing this procedure:

- Cut-through window that can send TL1 commands to the BandWidth Manager
- WaveStar Craft Interface Terminal (CIT)

Related Information Refer to “RTRV-STATE-EQPT” in the TL1 Message Details manual to better understand the TL1 command and output parameters.

Task Follow the steps below to clear the maintenance condition.

.....

1 Log in to the local NE using the cut-through window and the CIT GUI.

.....

2 Use the following TL1 command, through the cut-through window, to determine the reason for the System in Maintenance condition:

RTRV-STATE-EQPT:t i d:s y s t e m:c t a g;

.....

3 Continue with the steps below.

If...	Then...
the output parameter is mcondrsn=CMD, and the user put the system in the Maintenance Mode manually, using the CIT	Verify that at least one of the PCMCIA Flash Disks in PRIMEM0 and PRIMEM1 has not been removed since the system was manually put into the Maintenance Condition. <i>Only then</i> use the CIT to enter the command that takes the system out of the Maintenance Mode: Fault > Enter/Exit Maintenance Condition > Exit Maintenance Condition. Otherwise, contact your next level of support. Important! Note that the system will go through a reset before it exits the Maintenance Mode
the system was NOT put in the Maintenance Mode manually and the output parameter “mcondrsn” is something other than “CMD”	escalate to the next higher level of technical support.

.....

END OF STEPS

.....



Part IV

Supporting Tasks

Task 700: How to Properly Remove a Circuit Pack

Purpose	On-site craft should use this procedure when removing a circuit pack from the shelf.
Reason to use this task	Each circuit pack, depending on its type, has either one or two latches. Each latch has a microswitch which is opened or closed according to the physical position of the latch. The system controller needs to know the status of this microswitch in order to manage certain real-time system functions. Typically, and as a worse case scenario, it will take the system controller a maximum of 5 seconds to recognize and respond to a latch open or close. Any latch can be opened without removing the circuit pack from the backplane connector. Important! Reiterating, do not remove a circuit pack in one continuous operation. More specifically, (a) open the latch in order to operate the microswitch, (b) wait 5 seconds, and as appropriate (c) open the latch/latches fully and gently pull the circuit pack from it's slot.
Required tools/equipment	The following items are required (on-site) in order to complete this task: • WaveStar Craft Interface Terminal (CIT) • Wrist strap • Appropriate replacement circuit pack.
Safety precautions	To assure both personal safety and the proper functioning of the equipment it is imperative to review and understand this and precaution prior to performing this task.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar BandWidth Manager system, to prevent electrostatic discharge damage to sensitive components.

Task Complete the following steps to replace a circuit pack.

-
- 1** Locate the static wrist strap and place on the appropriate wrist.

.....

Important! Prior to beginning this task, the on-site craft must have available, if applicable, the replacement circuit pack.

- 2** Instruct the on-site craft to:
 1. Operate latch momentarily.
 2. Wait 5 seconds for the system controller to recognize the latch operation.

-
- 3** Instruct the on-site craft to apply equal force to both upper and lower latches, if equipped, or force on the one latch and gently slide the circuit pack from the slot.

-
- 4** Instruct the on-site craft to place the removed circuit pack in a static bag/box for safe storage and, as applicable, shipping.

-
- 5** As appropriate, insert the new/replacement circuit pack into the vacant slot.

-
- 6** Remove the static wrist strap and properly store it.

END OF STEPS



Task 702: Remove/Insert a PCMCIA (NVM) Card

Purpose Use this procedure to:

1. Remove an NVM card from the CTLSYS50DM circuit pack, and/or
2. Insert an NVM card into the CTLSYS50DM circuit pack.

Important! You can use this procedure to remove an NVM card regardless of the operational state of the CTL/SYS50DM circuit pack.

As long as the CTL/SYS50DM circuit pack is not equipped with an NVM card, the user can insert an NVM card conditional that the circuit pack's LED is not red.

Conventions used in this task

PCMCIA is an interface standard. There is a variety of different I/O cards that are built with a PCMCIA interface; for example, modem cards, local area network (LAN) cards, and Non-Volatile Memory (NVM) cards. Within this task, the term NVM is used exclusively to mean the 220-megabyte card memory that provides a PCMCIA interface.

Important! Another possible point of confusion is that the craft may, at times, encounter the term flash memory. The term flash memory is synonymous with NVM.

Related information For related information see Chapter 2, *Maintenance and Trouble-Clearing* in this document.

Safety precautions



CAUTION

Do not ever remove an NVM card when the CTL/SYS50DM circuit pack's green LED is ON (either steady ON or blinking). Improper removal of an NVM card can result in damaged files and the generation of information messages such as "lost

clusters” and/or “missing/damaged sectors”.



CAUTION

Do not ever remove the NVM card by applying manual force. The mechanical eject mechanism, be it under hardware control or software control, should always (after pressing the “Eject Button”) eject the NVM card.



CAUTION

Under normal circumstances, the only time to remove an NVM card is whenever the circuit pack is physically inserted in a shelf and the shelf is powered up. If a circuit pack will boot up and give a green LED, then, and under those circumstances, the craft should not make any attempt but to remove the NVM card using the “Eject Button”.

Before you begin

Before beginning this task you should understand how the procedure *Remove an NVM Card* works during normal operations and how it should work during most types of failures.

Normal operations are defined as (a) whenever the CTL/SYS50DM circuit pack’s LED is steady or flashing green, plus (b) the MEM Active is green. Not normal operations are defined as whenever the green LED is steady or is NOT flashing green (for example, the green LED is not lighted but the red LED is lighted).

Whenever you first insert an NVM card, the “Eject Button” is under hardware control. After NVM card insertion and following a time interval of less than 5 seconds, the “Eject Button” comes under software control. Thus, during normal operations, the NVM “Eject Button” is under software control. If the CTL/SYS50DM should determine that the NVM has failed, then immediately after enabling its red LED the “Eject Button” will be returned to hardware control. If the CTL/SYS50DM is booting, then the recommendation on removing an NVM card is to wait until the boot sequence has completed and normal operations have been restored. If the CTL/SYS50DM has failed (its FAULT LED displays red), then the circuit pack should be replaced and the existing NVM, which contains the node’s generic and data, should

be removed and inserted into the new SYS50DM circuit pack. Normal operations should be restored whenever the circuit pack reboots.

Important! The craft at the WaveStar CIT must have a *Maintenance Privilege Code* of at least M4, a *Security Privilege Code* of at least S4, and a *Provisioning Privilege Code* of at least P1 in order to access the WaveStar CIT command **Enter/Exit Maintenance Condition**.

Task Complete the following steps to insert and/or remove an NVM card.

1 Select an action from the following table:

If you wish to...	Then you must...
Remove an NVM card,	have a Work Instruction (WI) and purpose in mind for the remove operation (for example, to create a backup NVM, to clear an alarm, and so forth). Reference: SE 702-1: “Remove an NVM Card” (-4)
Insert an NVM card,	have, in-hand, an NVM card of known origin and known condition and physically insert it into the identified CTL/SYS50DM circuit pack. Reference: SE 702-2: “Insert an NVM Card” (-6)

END OF STEPS



SE 702-1: Remove an NVM Card

Task Perform the following steps to remove an NVM card.

Important! The NE must be in MCOND before removing an NVM card

- 1 At the WaveStar CIT, select **Fault-Enter/Exit Maintenance Condition** and left-click.

Important! After clicking on the **YES** button, the following information message is displayed: “Execution of Enter Maintenance Condition may affect the NE Service. Do you want to execute this command?” As appropriate, left-click on the **YES** button.

If you executed the command (left-click on the **YES** button), then the System View window command list box should display Enter/“Exit Maintenance Condition (system) Successful”.

Result: The dialog box **Enter/Exit Maintenance Condition** and the current Maintenance Condition (ON or OFF) are displayed. As appropriate, select the button labeled **Enter Maintenance Condition**, and left-click on the **YES** button.

-
- 2 Located on the front and near the middle of the CTL/SYS50DM circuit pack is an “Eject Button”. With your finger, press the “Eject Button”. Refer to Figure 702-1, “Front/faceplate view of the SYS50DM circuit pack” (-5).

Important! If the associated CTL/SYS50DM is rebooting while the “Eject Button” is being pressed, then it will be necessary to: (a) wait until the reboot completes, (b) place the node in Maintenance Condition, and (c) subsequently press the “Eject Button” again.

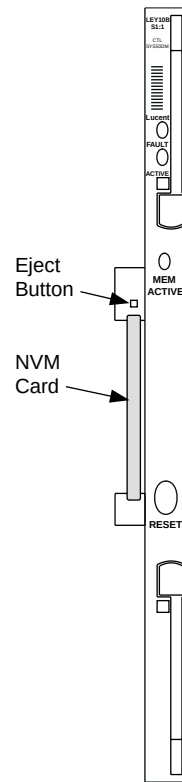
Result: After a few seconds, the CTL/SYS50DM circuit pack’s green LED should go off, and the mechanical eject mechanism should eject the NVM card.

-
- 3** Place your fingers on the card, and gently pull the NVM card from its slot.

Result: Disposition of the NVM card is determined by the WI, local operating procedures, and/or actual condition of the NVM card.

END OF STEPS

Figure 702-1 Front/faceplate view of the SYS50DM circuit pack



NC-USM-032

SE 702-2: Insert an NVM Card

Task Perform the steps below to insert an NVM card.

Important! All PCMCIA NVM cards have the same physical size and will fit into any PCMCIA slot. However, not all NVM cards have the same capacity. Different WaveStar products require different capacity NVM cards. Be sure to obtain the correct capacity NVM card for the application. Also, be sure that the card is correct for the subject NE.

- 1 Per the WI, or otherwise, obtain an NVM card and verify that it is appropriate (for example, correct generic/database and most recent backup) for the subject NE.

-
- 2 Orient the NVM card so that the writing on the card is left-side up, and the PCMCIA connector is the end that is to be inserted into the slot.

Important! The PCMCIA card should also have an arrow indicating the direction of movement for sliding into the slot.

-
- 3 Insert the NVM card into the slot, and operate the locking latch.

-
- 4 At the WaveStar CIT, select **Fault-Enter/Exit Maintenance Condition** and click.

Important! If you executed the command (left-click on the **YES** button), the System View window command list box should display “Enter/Exit Maintenance Condition (system) Successful”.

Result: The information message “Execution Exit Maintenance Condition may affect the NE service. Do you want to execute this command?”

END OF STEPS



Task 703: Clean Optical Fibers and Connectors

Purpose Use this procedure to clean optical fibers and connectors.

Important! All optical fiber connectors (ST[®], SC, and FC types) should be cleaned before making initial connections or reconnections per the following instructions. Only the connectors being assembled at this particular time should be cleaned.

To prevent contamination, keep all dust caps and plugs in place until you are instructed to remove them.

Required equipment Use the following items to clean optical fibers and connectors:

- CLETOP reel type A or B
- CLETOP stick
- Optical quality tissue (TEXWIPE, ABSORBOND[™] - TX404 or equivalent)
- Isopropyl alcohol (greater than 91% 2-propanol+water)
- Compressed gas (TX2510 AccuDuster III or equivalent)
- 300B microscope (comcode 104412077 — used for ST, SC, and FC type connectors)
- Optical power meter with appropriate connectors; for example, the HP8140A equipped with HP81401A (ITE#6550) or equivalent

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager, it is imperative to review and understand these warnings and precautions prior to performing this task.



WARNING

Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.

**WARNING**

Eye damage may occur if energized fibers and connectors are viewed using the 300B microscope. Verify that fibers and connectors are de-energized using an optical power meter.

**WARNING**

Alcohol is flammable and is harmful if swallowed, inhaled, or absorbed through the skin. Keep alcohol away from heat, sparks, or flames. Avoid contact with eyes, skin, and clothing.

**CAUTION**

Do not shake or tilt the compressed gas container. Use short quick blasts.

Related information For related information, see Chapter 5, *Circuit Pack/Port Unit Descriptions* in this manual.

Before you begin Proper cleaning will eliminate exposure to dirt that may cause permanent damage to the connector. Once a connector has been permanently damaged, cleaning will not repair the damage. A damaged connector is suspected when, despite rigorous cleaning, power remains low in the system. Therefore, proper cleaning is critical.

If a connector is damaged it must be replaced by installing a new jumper cable and/or port unit, depending on where the damage has occurred. Typically both mating ends of the connector become damaged. This damage may be caused when connectors are engaged or disengaged while significant optical power (greater than 3.0 dBm) is present in the connection. Do not attempt to clean optically powered connectors.

Task Complete the following steps to clean optical fibers and connectors.

1

If cleaning connector on...	Then...
optical jumpers and pigtails,	go to Step 2.
port unit faceplates,	go to Step 13.

2 Remove the optical connector from the lightguide buildout/optical port or remove the dust cap from the optical connector.

3 *Cleaning Connectors on Optical Jumpers and Pigtails*

Using an optical power meter, verify that the connector and fiber to be cleaned has been deenergized/deactivated.

4 Using a microscope (for example, a 300B microscope), verify that the connector is clean.

Reference: SE 703-1: “Verify Connector Is Clean Using 300B Microscope” (-7)

5

If the connector is...	Then...
clean,	<i>STOP! End of Task.</i>
not clean,	go to Step 6.

6 Using the CLETOP reel type A or B cleaner, clean the connector.

Reference: SE 703-2: “Clean Fiber Using CLETOP Reel Type A or B Cleaner” (-8)

7 Blow dry the connector ferrule with compressed gas. Hold the compressed gas can in an upright position while blow drying.

-
- 8** Using a microscope (for example, a 300B microscope), verify that the connector is clean.

Reference: SE 703-1: “Verify Connector Is Clean Using 300B Microscope” (-7)

9

If the connector is...	Then...
clean,	<i>STOP! End of Task.</i>
not clean,	go to Step 10.

Important! Do not use tissue types other than the type specified in this procedure.

- 10** Clean (if necessary) the cylindrical surface and the endface of the connector ferrule with a tissue dampened with isopropyl alcohol. Wipe the tip of the ferrule several times in orthogonal (90 degree) directions with a sufficient amount of alcohol present on the tissue. Make sure that the tissue is resting on an unyielding surface while wiping the ferrule tip. Any unused areas of the same tissue can be used for subsequent cleanings. Discard tissue in an appropriate manner when finished.
-

- 11** Repeat Step 6 through Step 8.
-

12

If the connector is...	Then...
clean,	<i>STOP! End of Task.</i>
not clean,	repeat Step 10. If the connector remains dirty after performing Step 10 twice, discard the jumper.

Important! To prevent contamination, keep the optical ports covered with a dust cap or plug when not in use.

13 *Cleaning Connectors on Port Unit Faceplates*

14 Remove (if necessary) the lightguide buildout from its base (buildout block).

Reference: “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)

15

If the optical port on the faceplate is...	Then...
removable,	go to Step 15
not removable,	go to Step 19. Important! The optical port is not removable when no lightguide buildout is used.

16

If the connector inside the faceplate is...	Then...
accessible,	go to Step 16.
not accessible,	go to Step 19.

17 Using the the cleaning cloth that is present on the tip of CLETOP stick, carefully wipe the ferrule endface.

18 Remove the protector caps and plugs (if equipped) from the buildout and buildout block, and store them in a clean container.

19 Place the lightguide buildout into its base (buildout block).

Reference: “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)

-
- 20** Use compressed gas to blow off any loose dirt on the tip of the ferrule or inside the sleeve. Hold the compressed gas nozzle one inch away from the tip of the ferrule or sleeve. Hold the compressed gas can in an upright position while blow drying.

END OF STEPS

SE 703-1: Verify Connector Is Clean Using 300B Microscope

Task Perform the following steps using the 300B microscope to verify the connector is clean.

- 1 Make sure that the viewing area of the microscope itself is free of any spots that might be confused with the spots from a contaminated connector. To verify, look into the microscope eyepiece from a distance of 1 inch without a connector attached to it. The white background displayed by the eyepiece of a clean microscope will be free of black spots and/or rings around the periphery.
- 2 Attach the connector to the microscope.
- 3 Look for a clean, white ferrule tip with a dark circle in the center (fiber cladding and core) by adjusting the focus setting on the microscope. The image on the microscope for a clean connector will be free of spots, streaks, and fiber particles. To confirm that the observed spots are on the connector, slowly disconnect the connector while viewing it through the microscope, and verify that the black spots fade away as the connector is removed from the microscope.

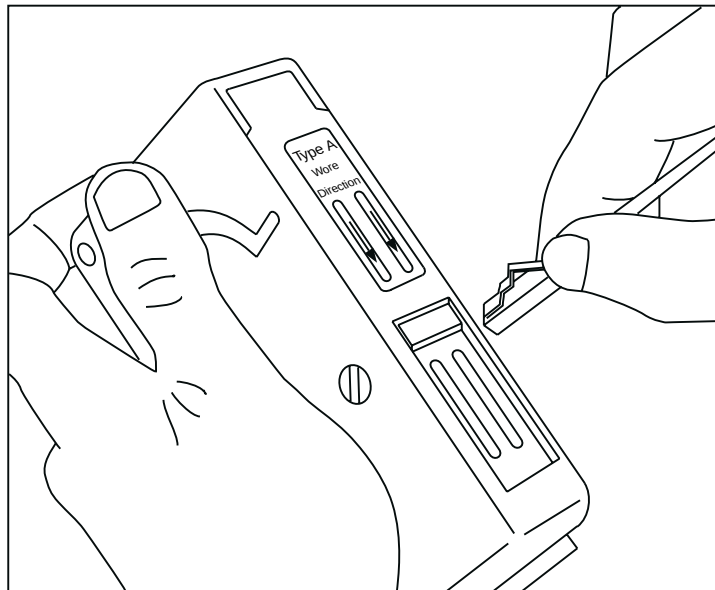
END OF STEPS

SE 703-2: Clean Fiber Using CLETOP Reel Type A or B Cleaner

Task **Important!** The CLETOP reel type A cleaner has two slots, and the CLETOP reel type B cleaner has only one slot.

To clean the connector, perform the following steps using the CLETOP reel type A or B cleaner.

- 1 Hold the CLETOP reel type A or B cleaner in the palm of one hand with the cleaning side facing you.



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- 2 Using the thumb of the same hand that is holding the cleaner, press the lever all the way down and hold. Do not release the lever.
- 3 While holding the lever down with one hand, use the other hand to press the optical ferrule endface against the cleaning cloth in any one slot and uniformly drag it in the direction indicated by the arrows on the cleaner. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.

.....

4 Rotate the connector 90 degrees.

.....

5

If using the CLETOP reel...	Then...
type A cleaner,	go to Step 6.
type B cleaner,	go to Step 8.

.....

6 Press the ferrule endface against the cleaning cloth in the other slot of the CLETOP reel type A cleaner and uniformly drag it in the direction shown by the arrows on the cleaner. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.

.....

7 Release the lever and allow it to return to its initial position.

STOP! End of Supporting Element.

.....

8 Release the lever of the CLETOP reel type B cleaner (allowing it to return to its initial position), and press the lever all the way down again and hold (advancing the cleaning cloth). Do not release the lever.

.....

9 Press the ferrule endface against the cleaning cloth in the slot of the CLETOP reel type B cleaner and uniformly drag it in the direction shown by the arrows on the cleaner. Make sure that the endface is in contact with the cleaning cloth at all times, and that uniform force is used while dragging it.

.....

10 Release the lever and allow it to return to its initial position.

.....

END OF STEPS

.....



Task 704: Inspect (Repair) Optical and/or Electrical Cable(s)

Purpose Use this procedure to correct an input or output cable problem such as a damaged or disconnected cable.

Important! This procedure uses the word *cable* in a general sense to refer to either the electrical coax cable or to the optical fibers.

Related information For related information, see Chapter 2, *Maintenance and Trouble-Clearing* in this document.

Task Complete the following steps to identify and repair any local cable problems.

-
- 1** As appropriate, remove the shelf front cover.
 -
 - 2** Verify that the cable(s) are properly connected.
 -
 - 3** Visually inspect each cable, starting at the connector on the local NE and going as far as practical (usually to an interconnection bay or to a cross-connect panel).
 -
 - 4** Follow local procedures to correct any problem(s) with the cable.
 -
 - 5** As appropriate, replace the front cover that was removed in .

END OF STEPS



Task 705: Remove/Replace Shelf Cover

Purpose Use this procedure to remove or replace a shelf cover.

Required equipment Use a wrist strap to remove or replace a shelf cover.

Safety precautions To assure both personal safety and the proper functioning of WaveStar BandWidth Manager, it is imperative to review and understand these warnings and precautions prior to performing this task.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar BandWidth Manager to prevent electrostatic discharge damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” in “About this Information Product.”

Related information For related information, see Chapter 3, *Product Description* in this manual.

Task Complete the following steps to remove or replace the shelf cover.

1

If the cover is being...	Then...
removed,	go to Step 2.
replaced,	go to Step 6.

2 At the bottom of the shelf cover, locate the two ¼-turn fasteners.

3 Use the appropriate size slotted screwdriver (or a dime) to rotate the ¼-turn fasteners counterclockwise 90 degrees so the slots are positioned vertically (unlocked position).

-
- 4** Grasp the cover and pull it forward until it is horizontal (rotated 90 degrees from the closed position).
-

- 5** Lift the pivot pins located at the top of the cover, push back, and lift up on the pins again to remove the cover from the shelf, then lift the cover up until it is free from the shelf framing.

Stop! End of Task.

- 6** Position the pivot pins located at the top of the cover under the flange on the shelf framing.
-

- 7** Close the cover and rotate the two ¼-turn fasteners 90 degrees clockwise using the screwdriver (or dime) until the fastener slots are horizontal (locked position).

END OF STEPS



Task 706: Replace a Defective Power Filter or PFVP

Purpose The power filter, whether it is a simple power filter or Power Filter with Voltage Protection (PFVP) is very reliable and rarely needs replacing. Currently, the power filter is not an orderable item, and thus no sparing policy exists.

What to do Follow these instructions to replace a failed power filter.

If...	Then...
a power filter fails,	contact a Lucent Technologies Customer Service Representative, and work out arrangements for obtaining a replacement.

Task 707: Install/Remove Lightguide Buildout (LBO)

- Purpose** Use this procedure to install or remove a lightguide buildout (LBO).
- Required equipment** Use a wrist strap to install or remove an LBO.
- Safety precautions** To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager, it is imperative to review and understand these warnings and precautions prior to performing this task.



WARNING

Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar BandWidth Manager to prevent electrostatic discharge damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” in “About this Information Product”.



CAUTION

A locking beam must only be pushed along a line perpendicular to the buildout body in the direction towards the buildout in order to avoid damage to the locking beam.

- Related information**
- For related information, see Task 711: Select Lightguide Build-Out in this manual and the following sections in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1:
- Chapter 3, *Product Description*
 - Chapter 5, *Circuit Pack/Port Unit Descriptions*

Task

Complete the following steps to install or remove an LBO.

1

If the lightguide buildout is being...	Then go to...
installed,	Step 2.
removed,	Step 4.

2

Remove the protector caps and plugs (if equipped) from the buildout and buildout block, and store them in a clean container.

3

Align the buildout with the slot in the buildout block, push in, and rotate clockwise until locked into position.

Stop! End of Task.

Reference: SE 707-1: “Examples of Lightguide Buildouts and Buildout Blocks” (-3)

4

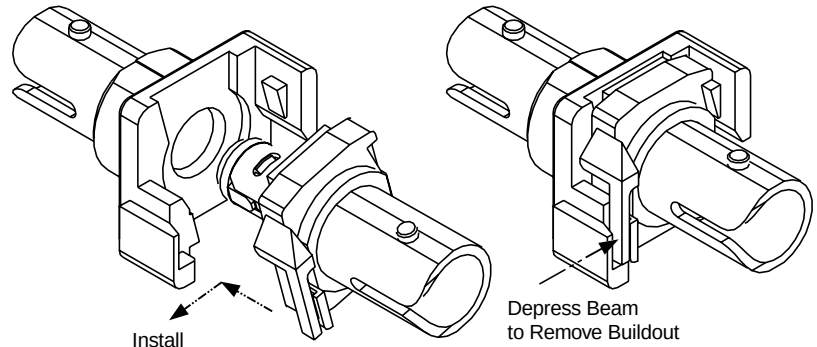
Depress the locking beam on the buildout, rotate counterclockwise, and separate from the buildout block by sliding apart.

Reference: SE 707-1: “Examples of Lightguide Buildouts and Buildout Blocks” (-3)

END OF STEPS

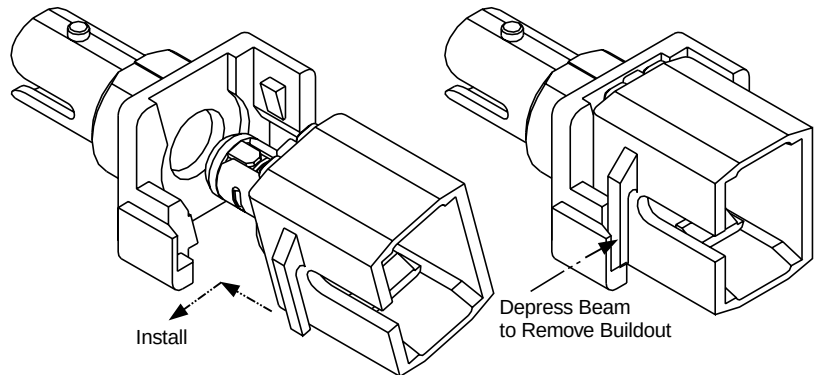
SE 707-1: Examples of Lightguide Buildouts and Buildout Blocks

Figure 707-1 ST Buildout and Buildout Block



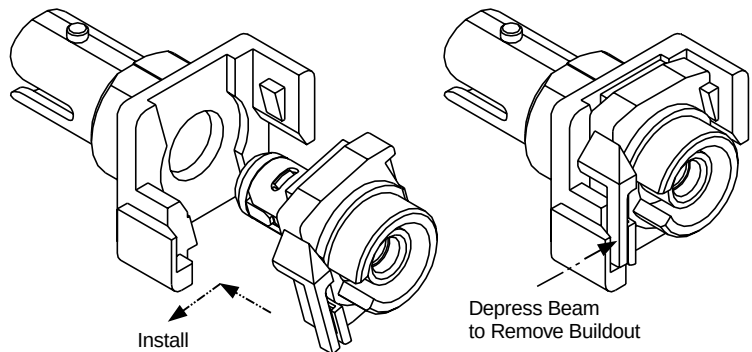
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Figure 707-2 SC Buildout and Buildout Block



NC-USM-137

Figure 707-3 FC Buildout and Buildout Block



NC-USM-136

Task 708: Make a Manual Optical Loopback

Purpose Use this procedure to loop back an *out-of-service* optical line at the faceplate connectors of the port unit.

Required equipment Use the following equipment to make a manual optical loopback:

- Wrist strap
- One lightguide jumper (package label FS1E-E-02) for each optical line to be looped back
- One 20-dB loss lightguide buildout (LBO) (code ASTM20 – part number 108053042 for *ST*[®] connectors) (single mode – multimode) for each OC-3 or OC-12 line to be looped back
- One 20-dB loss lightguide buildout (LBO) (code ASTS20 – part number 108053273 for ST connectors) (single mode – single mode) for each OC-48 optical line to be looped back
- One 15-dB loss lightguide buildout (LBO) (code ASTS15 – part number 108053240 for ST connectors) (single mode – single mode) for each OC-192 optical line to be looped back

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager, it is imperative to review and understand these warnings and precautions prior to performing this task.



WARNING

Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.



CAUTION

Traffic and service interruption can occur to other optical lines if they are accidentally looped back. Recheck the address (AID) of

the optical line being looped back.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar BandWidth Manager to prevent electrostatic discharge damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” in “About this Information Product.”

Related information

For related information see the following sections in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1:

- Chapter 3, *Product Description*
- Chapter 5, *Circuit Pack/Port Unit Descriptions*

Task

Complete the following steps to manually loop back an *out-of-service* optical line at the faceplate of a port unit.

.....

1

If the port unit is...	Then...
LEY14 OC12/STM4/1.3SR2 LEY16 OC3/STM1/1.3SR4	obtain a lightguide jumper (package label FS1E-E-02). These port units are equipped with a 0-dB loss lightguide buildout (LBO). No attenuation is required.
LEY13 OC12/STM4/1.3LR2 LEY15 OC3/STM1/1.3LR4	obtain a lightguide jumper (package label FS1E-E-02) and a 20-dB LBO (code ASTM20 – part number 108053042 for ST [®] connectors).
OC48/STM16	obtain a lightguide jumper (package label FS1E-E-02) and a 20-dB loss LBO (code ASTS20 – part number 108053273 for ST connectors).
OC192/STM64	obtain a lightguide jumper (package label FS1E-E-02) and a 15-dB loss LBO (code ASTS15 – part number 108053240 for ST connectors).

-
- 2** At the faceplate connectors of the port unit, remove the optical line connections. Make a record of these disconnections so they can be replaced after the test.

Reference: SE 708: “Remove the Optical Line Connections” (-5)

- 3** Remove the LBO from the *IN* connector of the port unit (if equipped).

Reference: Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)

- 4** Remove the protector caps from the ends of the lightguide jumper (loopback cable).
-

- 5** Clean the LBOs, fiber, and connectors.

Reference: Supporting “Task 703: Clean Optical Fibers and Connectors” (-1)

6

If the port unit is...	Then...
LEY14 OC12/STM4/1.3SR2 LEY16 OC3/STM1/1.3SR4	replace the 0-dB loss LBO (removed in Step 3 into the <i>IN</i> connector of the port unit. Reference: See Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)
LEY13 OC12/STM4/1.3LR2 LEY15 OC3/STM1/1.3LR4	install the 20-dB loss (code ASTM20) into the <i>IN</i> connector of the port unit. Reference: See Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)
OC48/STM16	install the 20-dB loss (code ASTS20) into the <i>IN</i> connector of the port unit. Reference: See Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)

If the port unit is...	Then...
OC192/STM64	install the 15-dB loss (code ASTS15) into the <i>IN</i> connector of the port unit. Reference: See Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)

-
- 7** Connect the lightguide jumper between the LBO on the *IN* connector and the corresponding *OUT* connector on the same port unit.
-
- 8** If required, repeat Step 2 through Step 7 to loop back another optical line.

END OF STEPS

SE 708-1: Remove the Optical Line Connections

Task Complete the following steps to remove the optical line connections at the faceplate connectors of the port unit.

Important! A wrong connection can be avoided by marking or recording all disconnections.

1 Remove the optical line connection from the *OUT* connector of the port unit and slide the protector cap over the end of the fiber.

2 Remove the optical line connection from the *IN* connector of the port unit and slide the protector cap over the end of the fiber.

END OF STEPS



Task 709: Replace Fan Unit

Purpose Perform this task *ONLY* when instructed to do so as part of a trouble-clearing task.

Required equipment The following equipment is required to complete this procedure:

- Replacement fan unit
- WaveStar Craft Interface Terminal (CIT) that is connected to the subject network element (NE)
- Wrist strap.

Safety precautions To assure both your personal safety and the proper functioning of the WaveStar BandWidth Manager product, it is imperative for you to review and understand these warnings and precautions prior to performing this task.



CAUTION

Never remove the fan unit unless you already have a replacement fan unit in hand and immediately perform the replacement, as instructed in this procedure. Leaving the fan unit out for more than 15 minutes can cause the associated network element to fail.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on an NE to prevent electrostatic discharge damage to sensitive components.



CAUTION

Leaving the fan unit out of the shelf for more than 15 minutes can cause the associated network element to fail. It is critical that you complete this procedure — as well as the referencing trouble-clearing procedure — soon after performing this step.

Related information For related information see Chapter 2, *Maintenance and Trouble-Clearing* in this document.

Task Complete the following steps to replace a fan unit.

- 1 Physically locate the replacement fan unit near to and within easy reach of the subject NE/shelf.
- 2 If applicable, remove the front cover of the subject NE/shelf.
- 3 With your fingers, unscrew (turn counter-clockwise) the two captive type thumbscrews that are located on the front (one right and one left) of the fan unit.
- 4 Gently and by applying an even force to both the left and right sides, pull the fan unit forward with the center mounted handle in order to remove it from the shelf.
- 5 Carefully insert the replacement new fan unit into the shelf. Again, use the center-mounted handle to push the “self-aligning” fan unit into the shelf.
- 6 Tighten (turn clockwise) the two thumbscrews in order to secure the fan unit into the shelf.
- 7 Return to the trouble-clearing task that referred you to this task.

END OF STEPS



Task 710: Replace a Defective Low Voltage Protection Unit (LVPU)

Purpose The LVPU is very reliable and rarely needs replacing. Currently, the LVPU is not an orderable item, and thus no sparing policy exists.

What to do Follow these instructions to replace a failed LVPU.

If...	Then...
an LVPU fails,	contact a Lucent Technologies Customer Service Representative, and work out arrangements for obtaining a replacement.

Task 711: Select Lightguide Buildout (LBO)

Purpose Use this procedure to select a lightguide build-out (LBO) based on the following:

- Type of port unit
- Measured received optical power (dBm) at the *IN* connector
- Type of optical connector

Important! Use this procedure to adjust the received optical power levels at the **IN** connector of the port unit. If connecting to a different system, refer to the appropriate procedure for that system.

Important! All WaveStar BandWidth Manager system port units require single-mode fiber.

Safety precautions To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager system, it is imperative to review and understand these warnings and precautions prior to performing this task.



CAUTION

The LBO must be placed on the IN connector of the port unit faceplate to prevent equipment damage.



CAUTION

Do not substitute single-mode to single-mode (SM-SM) LBOs for single-mode to multimode (SM-MM) LBOs. Substituting SM-SM LBOs for SM-MM LBOs could cause transmission errors and/or equipment damage.

- Related information**
- For related information, see Chapter 5, *Circuit Pack/Port Unit Descriptions* in the *WaveStar BandWidth Manager User Operations Guide*, 365-370-109 R4.1 and the following sections in this manual:
- Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)” (-1)
 - Supporting “Task 712: Measure Received Optical Power” (-1)

- Before you begin**
- Before you begin this task do the following:
- Verify the type of port unit used.
 - Obtain the received optical power measurement for the port unit using an optical power meter (for example, the HP8140A equipped with HP81401A ITE#6550 or equivalent). Refer to Supporting “Task 712: Measure Received Optical Power” (-1).
 - Verify the type of optical connector (ST[®], FC, or SC) used.

Task

Complete the following steps to select an LBO based on the type of port unit, received optical power, and type of optical connector.

1

If...	Then go to...
OC3/STM1 port unit,	Step 2.
OC12/STM4 port unit,	Step 2.
OC48/STM16 port unit,	Step 4.
OC192/STM64 port unit,	Step 6.

2 Based on the measured received optical power at the IN connector of the OC3/STM1 or OC12/STM4 port unit, determine the LBO value that is required.

Reference: SE 711-1: “LBO Values for OC3/STM1 and OC12/STM4 Port Units” (-4)

3 Based on the required optical connection (ST, FC, or SC), and the LBO value (determined in Step 2), select the required LBO.

STOP! End of Task.

Reference: SE 711-2: “Single-Mode to Multimode (SM-MM) LBOs” (-5)

-
- 4** Based on the measured received optical power at the **IN** connector of the OC48/STM16 port unit, determine the LBO value that is required.

Reference: SE 711-3: “LBO Values for OC48/STM16 Port Units” (-6)

-
- 5** Based on the required optical connection ($ST^{\circledR}$, FC, or SC) and the LBO value (determined in Step 4), select the required LBO.

STOP! End of Task.

Reference: SE 711-4: “Single-Mode to Single-Mode (SM-SM) LBOs” (-7)

-
- 6** Based on the measured received optical power at the **IN** connector of the OC192/STM64 port unit, determine the LBO value that is required.

Reference: SE 711-5: “LBO Values for OC192/STM64 Port Units” (-9)

-
- 7** Based on the required optical connection (ST, FC, or SC) and the LBO value (determined in Step 6), select the required LBO.

Reference: SE 711-4: “Single-Mode to Single-Mode (SM-SM) LBOs” (-7)

END OF STEPS



SE 711-1: LBO Values for OC3/STM1 and OC12/STM4 Port Units

Purpose The table below shows the port units, measured received optical power range, and the recommended LBO value.

Table 711-1 Received Optical Power and LBO Values for OC3/STM1 and OC12/STM4 Port Units

Port unit	Measured received optical power (dBm)	Recommended LBO value (dB)
LEY13 OC12/STM4/1.3LR2	0.0 to -4.9	15
	-5.0 to -9.9	10
	-10.0 to -14.9	5
	-15.0 and lower	0
LEY14 OC12/STM4/1.3SR2	2.0 to -2.9	15 ¹
	-3.0 to -7.9	10 ¹
	-8.0 and lower	0
LEY15 OC3/STM1/1.3LR4	0.0 to -4.9	15
	-5.0 to -9.9	10
	-10.0 to -14.9	5
	-15.0 and lower	0
LEY16 OC3/STM1/1.3SR4	0.0 to -3.9	15
	-4.0 to -7.9	10
	-8.0 and lower	0

Notes:

1. Used only when the opposite end of the optical span is equipped with a long-reach port unit.

SE 711-2: Single-Mode to Multimode (SM-MM) LBOs

Purpose The table below shows the SM-MM LBOs.

Table 711-2 SM-MM LBOs

Type of optical connection	LBO value (dB)	Product code	Comcode	Color
ST	0	A3070	106 795 354	White
	5	ASTM5	108 052 960	Gray or Beige
	10	ASTM10	108 052 994	Gray or Beige
	15	ASTM15	108 053 018	Gray or Beige
	20	ASTM20	108 053 042	Gray or Beige
FC	0	A3080	106 795 404	White
	5	AFCM5	108 107 285	Gray or Beige
	10	AFCM10	108 107 301	Gray or Beige
	15	AFCM15	108 107 327	Gray or Beige
	20	AFCM20	108 107 343	Gray or Beige
SC	0	A3060	106 708 951	White or Blue
	5	ASCM5	108 440 579	Gray or Beige
	10	ASCM10	108 440 595	Gray or Beige
	15	ASCM15	108 440 611	Gray or Beige
	20	ASCM20	108 440 637	Gray or Beige



**SE 711-3: LBO Values for OC48/STM16 Port
Units**

Purpose The table below shows the measured received optical power ranges and the recommended LBO values for OC48/STM16 port units.

**Table 711-3 Receive optical power and LBO values for
OC48/STM16 port units**

Measured received optical power (dBm)	Recommended LBO value (dB)
0.0 to -4.9	15
-5.0 to -9.9	10
-10.0 to -14.9	5
-15.0 and lower	0



SE 711-4: Single-Mode to Single-Mode (SM-SM) LBOs

Purpose The following tables provide details for the SM-SM LBO kits available.

ST-type SM-SM LBOs The table below shows the ST-type SM-SM LBOs. These LBOs are available in the ST-type LBO Kit Comcode: 108 812 231.

Table 711-4 ST-type SM-SM LBOs

LBO value (dB)	Product code	Comcode	Color
0	A3070	106 795 354	White or Blue
5	ASTS5	108 053 091	Green or Yellow
10	ASTS10	108 053 190	Green or Yellow
15	ASTS15	108 053 240	Green or Yellow
20	ASTS20	108 053 273	Green or Yellow

FC-type SM-SM LBOs The table below shows the FC-type SM-SM LBOs. These LBOs are available in the FC-type LBO Kit Comcode: 108 812 249.

Table 711-5 FC-type SM-SM LBOs

LBO value (dB)	Product code	Comcode	Color
0	A3080	106 795 404	White or Blue
5	AFCS5	108 107 095	Green or Yellow
10	AFCS10	108 107 194	Green or Yellow
15	AFCS15	108 107 244	Green or Yellow
20	AFCS20	108 107 277	Green or Yellow

SC-type SM-SM LBOs

The table below shows the SC-type SM-SM LBOs. These LBOs are available in the SC-type LBO Kit Comcode: 108 812 256.

Table 711-6 SC-type SM-SM LBOs

Loss value (dB)	Product code	Comcode	Color
0	A3060	106 708 951	White or Blue
5	ASCS5	108 314 501	Green or Yellow
10	ASCS10	108 314 600	Green or Yellow
15	ASCS15	108 440 538	Green or Yellow
20	ASCS20	108 440 561	Green or Yellow



SE 711-5: LBO Values for OC192/STM64 Port Units

Recommended LBO values The table below shows the measured received optical power range and the recommended LBO value.

Table 711-7 Receive optical power and LBO values for OC192/STM64 port units

Port unit	Measured receive optical power (dBm)	Recommended LBO value (dB)
LEY69 OC192/STM64/1.5IR1 LEY284-LEY299 OC192/STM64/POU	0.0 to -3.9	15
	-4.0 to -8.9	10
	-9.0 to -13.9	5
	-14.0 and lower	0
LEY97 OC192/STM64/1.5IRS1	0.0 to -1.9	10
	-2.0 to -5.9	5
	-6.0 and lower	0



Task 712: Measure Received Optical Power

- Purpose** Use this procedure to connect an optical power meter and measure the received optical power at the *IN* connector of a port unit.
- Required equipment** Use the following equipment to measure received optical power:
- Wrist strap
 - Optical power meter with appropriate connectors; for example, the HP8140A equipped with HP81401A (ITE#6550) or equivalent
- Safety precautions** To assure both personal safety and the proper functioning of the WaveStar BandWidth Manager, it is imperative to review and understand these warnings and precautions prior to performing this task.



WARNING

Unterminated optical connectors may emit invisible laser radiation. Eye damage may occur if beam is viewed directly or with improper optical instruments. Avoid direct exposure to beam.



CAUTION

Use a static ground wrist strap whenever handling circuit packs or working on a WaveStar BandWidth Manager to prevent electrostatic discharge damage to sensitive components. See “Electrostatic Discharge (ESD) Considerations” in “About this Information Product.”

- Related information** For related information, see the following sections in this document:
- Supporting “Task 711: Select Lightguide Buildout (LBO)”
 - Supporting “Task 707: Install/Remove Lightguide Buildout (LBO)”
 - Chapter 5, *Circuit Pack/Port Unit Descriptions*

Before you begin

Before you begin this task, do the following:

- Verify the type of port unit used.
- Verify the location of the port unit and **IN** connector.

Task

Complete the following steps to connect an optical power meter and measure the received optical power at the **IN** connector of a port unit.

-
- 1** Remove the optical fiber from the **IN** connector of the port unit faceplate.

.....

Important! Ensure that the optical power meter is set for the wavelength being measured (for example, 1310 nm or 1550 nm).

- 2** Connect the optical power meter to the optical fiber removed in Step 1, and obtain an optical power measurement. (Record the measurement for office records.)

-
- 3** Using the optical power measurement obtained in Step 2, determine if the optical power level is correct.

Reference: SE 712-1: “Received Optical Power” (-3)

.....

4

If the optical power level is...	Then...
correct (in range),	<i>STOP! End of Task.</i>
not correct (optical loss out of range),	check the upstream port unit and outside plant fiber.

.....

END OF STEPS



SE 712-1: Received Optical Power

Port Units and Received Optical Power Levels

The table below shows port units and the correct (in range) received optical power levels.

Table 712-1 Port Units and Correct (In Range) Received Optical Power Levels

Port unit	Maximum Received Power (PRmax) (dBm)	Receiver Sensitivity (PRmin) (dBm)	Recommended Minimum Receive Power Level at Installation (dBm)
LEY13 OC12/STM4/1.3LR2	−8.0	−30.5	−25.0
LEY14 OC12/STM4/1.3SR2	−8.0	−28.0	−27.0
LEY15 OC3/STM1/1.3LR4	−10.0	−34.0	−29.0
LEY16 OC3/STM1/1.3SR4	−8.0	−28.0	−27.0
LEY7 OC48/STM16/1.3LR1	−9.0	−27.0	−21.5
LEY8 OC48/STM16/1.5LR1	−9.0	−28.0	−21.5
LEY50–LEY65 OC48/STM16/DWDMxx	Refer to 365-575-380/365-370-370, WaveStar OLS 40G/80G, Applications, Planning, and Ordering Guide.		
LEY80–LEY95 OC48/STM16/POUxxxx	−9.0	−28.0	−21.5
LEY101–LEY180 OC48/STM16/WDMxxxx	Refer to 365-575-736, WaveStar Optical Line System (OLS) 400G Applications, Planning, and Ordering Guide.		
LEY69 OC192/STM64/1.5SR1	−8.0	−21.0	−17.0
LEY97 OC192/STM64/1.5IRS1	−3.0	−14.0	−10.0
LEY201–LEY240 OC192/STM64/WDMxxxx	Refer to 365-575-736, WaveStar Optical Line System (OLS) 400G Applications, Planning, and Ordering Guide.		
LEY284–LEY299 OC192/STM64/POUxxxx	−8.0	−21.0	−17.0



Glossary

Abbreviations and Acronyms

A ABN

Abnormal (condition)

ABS

Absent

AC

Alternating Current

ACO

Alarm Cut-Off

ACT

Active

ACU

Alarm Collection Unit (RR)

ADJCTL/DCC

Adjunct Control/32 Data Communication Channels circuit pack

ADJCTL/DCCEI

Adjunct Control/32 Data Communication Channels with External Interface circuit pack

ADM

Add/Drop Multiplexer

ADR

Add/Drop Ring

AGNE

Alarm Gateway Network Element

AID

Access Identifier

AIS

Alarm Indication Signal

AITS

Acknowledged Information Transfer Service: Confirmed mode of operation of the LAPD protocol.

ALS

Automatic Laser Shutdown

AMI

Alternate Mark Inversion

ANSI

American National Standards Institute

APD

Avalanche PhotoDiode

APS

Automatic Protection Switch

ASAP

Alarm Severity Assignment Profile

AS&C

Alarm, Status, and Control

APD

Avalanche PhotoDiode

APSD

Automatic Power Shutdown

ARM

Adaptive Receiver Module

AS

Alarm Suppression assembly

ASCII

American Standard Code for Information Interchange

ASN.1

Abstract Syntax Notation 1

ATC

Auxiliary Transmission Channel

ATM

Asynchronous Transfer Mode

ATPC

Automatic Transmit Power Control

AU

Administrative Unit

AU PTR

Administrative Unit Pointer

AU4AD

Administrative Unit 4 Assembler/Disassembler

AUG

Administrative Unit Group

AUTO

Automatic

AVAIL

Available

B B3ZS

Bipolar 3-Zero Substitution

B8ZS

Bipolar 8-Zero Substitution

BBTR

Backplane Bus Transceiver

BCLAN

Board Controller Local Area Network

BDFB

Battery Distribution and Fuse Bay

BER

Bit Error Rate

BIN

Binary

BIP-N

Bit Interleaved Parity-N

BISDN

Broadband Integrated Services Digital Network

BITS

Building Integrated Timing Source (clock)

BITS

Building Integrated Timing Supply

BLK

Blank

BLSR

Bidirectional Line-Switched Ring

BOC

Bell Operating Company

BSW

Byte Switch circuit pack

BUSTR

BUS Transmitter and Receiver

C C

Container

CAS

Channel Associated Signalling

CAT

Catastrophic

CC

Cross-Connection

CCITT

Comité Consultatif International Télégraphique & Téléphonique

CCS

Common Channel Signaling

CDRH

Center for Devices and Radiological Health

CEPT

Conférence Européenne des Administrations des Postes et des Télécommunications

CILINK

Communication Interface Link

CIT

Craft Interface Terminal

CL

Clear

CLEI

Common Language Equipment Identifier

CLLI

Common Language Location Identifier

CM

Configuration Management

CMI

Coded Mark Inversion

CMIP

Common Management Information Protocol. OSI standard protocol for OAM&P information exchange.

CMISE

Common Management Information Service Element

CO

Central Office

CP

Circuit Pack

CPE

Customer Premises Equipment

CR

Critical (alarm)

CRC

Cyclical Redundancy Check

CSIE

Controlled System Interface Expander circuit pack

CSMA/CD

Carrier Sense Multiple Access with Collision Detection

CS&O

Lucent Technologies Customer Support and Operations

CSU

Channel Service Unit

CTIP

Customer Training and Information Products; now known as Lucent Learning Organization (LLO)

CTL

Control (circuit pack prefix)

CTL/EI

Control/External Interface circuit pack

CTL/MEM

Control/Memory circuit pack

CTL/SR50DC

Sub-Rack Duplex (MCA 50D) circuit pack

CTL/SYS50D

System Controller Duplex (MCA 50D) circuit pack

CTL/SYS50DM

System Controller Duplex (MCA 50D) with Non-Volatile Memory circuit pack

CTLI-D

Control Interface to Device

CTS

Customer Technical Support; now known as Technical Support Services (TSS)

CV

Coding Violation

CW

Continuous Wave (laser)

D DA

Discontinued Availability

DACS

Digital Access Cross-Connect System

dB

Decibels

DC

Direct Current

DCC

Data Communications Channel

DCE

Data Communications Equipment

DCN

Data Communications Network

DCS

Digital Cross-Connect System

DDF

Digital Distribution Frame

DIL

Dual In Line

DPLL

Digital Phase Locked Loop

DP-RING

Dedicated Protection Ring

DR

Digital Radio

DRI

Dual Ring Interworking

DRAM

Dynamic Random Access Memory

DS0, DS1, DS3

Digital Signal Levels 0, 1, 3

DS3EC1/8

8-port DS3 or EC-1 interface port unit

DS-N

Digital Signal, Level N

DS-NE

Directory Service Network Element

DSX

Digital Cross-Connect Frame

DTE

Data Terminating Equipment

DTMF

Dual Tone Multifrequency

DUS

Do not Use for Synchronization

DWDM

Dense Wavelength Division Multiplexing

E EBER

Equivalent Bit Error Rate

EC

Echo Cancellor

EC-1, EC-N

Electrical Carrier, Levels 1 and N

ECC

Embedded Control Channel

ECI

Equipment Catalog Item

EEPROM

Electrically Erasable Programmable Read-Only Memory

EF

Equipment Fail

EIA

Electronic Industries Association

EM

Event Management

EMC

Electromagnetic Compatibility

EMI

Electromagnetic Interference

EMS

Element Management System

EPROM

Erasable Programmable Read-Only Memory

EQ

Equipped

EQPT

Equipment

ES

Errored Seconds

ES

End System

ESD

Electrostatic Discharge

ESF

Extended Superframe Format

ETSI

European Telecommunications Standards Institute

EVT

Event

F FCC

Federal Communications Commission

FDA

Food and Drug Administration

FDDI

Fiber Distributed Data Interface

FE

Far End

FEBE

Far End Block Error

FEC

Forward Error Correction

FEPROM

Flash EPROM

FIT

Failure in Time

FTAM

File Transfer and Access Management

G GB

Gigabytes

Gb/s

Gigabits per second

GHz

Gigahertz

GNE

Gateway Network Element

GR

Geographic Redundancy

GR-XXX

Telcordia (Bellcore) General Requirement-XXX

H HDB3

High Density Bipolar 3

HDLC

High-Level Data Link Control

HE

Host Exchange

HMI

Human Machine Interface

HO

High Order

HPA

Higher Order Path Adaptation

HPC

Higher Order Path Connection

HPT

Higher Order Path Termination

HP-UX

Unix Operating System for Hewlett Packard platform

HS

High Speed

HW

Hardware

Hz

Hertz

I IAO LAN

Intraoffice Local Area Network

ID

Identifier

IEC

International Electrotechnical Commission

IEEE

Institute of Electrical and Electronics Engineers

I/O

Input/Output

IMF

Infant Mortality Factor

INTFC

Interface

IR

Intermediate Reach

IS

In Service

ISDN

Integrated Services Digital Network

ISM

Intelligent Synchronous Multiplexer

ITCO

Independent Telephone Company

ITM

Integrated Transport Management

ITM-NM

Integrated Transport Management Network Module

ITM-SC

Integrated Transport Management Subnetwork Controller

ITU

International Telecommunications Union

ITU-R

International Telecommunications Union — Radio standardization sector. Formerly known as CCIR: Comité Consultatif International Radio; International Radio Consultative Committee.

ITU-T

International Telecommunications Union — Telecommunication standardization sector. Formerly known as CCITT: Comité Consultatif International Télégraphique & Téléphonique; International Telegraph and Telephone Consultative Committee.

IXC

Interexchange Carrier

K**Kb/s**

Kilobits per second

L**LA**

Limited Availability

LAN

Local Area Network

LATA

Local Access and Transport Area

LBC

Laser Bias Current

LBFC

Laser Backface Currents

LBO

Lightguide Build-Out

LCN

Local Communications Network

LCT

Large Capacity Terminal

LEC

Local Exchange Carrier

LED

Light-Emitting Diode

LEN

Local Exchange Node

LGX

Lightguide Cross-Connect

LH

Long Haul

LLO

Lucent Learning Organization, formerly Customer Training and Information Products (CTIP)

LO

Low Order

LOF

Loss of Frame

LOM

Loss Of Multiframe

LOP

Loss of Pointer

LOS

Loss of Signal

LPA

Lower order Path Adaptation

LPBK

Loopback

LPC

Lower Order Path Connection

LPT

Lower Order Path Termination

LR

Long Reach

LS

Low Speed

LTE

Line Terminating Equipment

M**m**

Microns

mm

Micrometer

MB

Megabytes

Mb/s

Megabits per second

MCOND

Maintenance Condition

MEM

Memory

MIPS

Millions of Instructions Per Second

MJ

Major (alarm)

MMI

Man-Machine Interface

MML

Human-Machine Language

MN

Minor (alarm)

MS

Multiplex Section

ms

Millisecond

MS-SPRing

Multiplex Section Shared Protection Ring

MSOH

Multiplex Section OverHead

MTBF

Mean Time Between Failures

MTBMA

Mean Time Between Maintenance Activities

MTIE

Maximum Time Interval Error

MTPI

Multiplexer Timing Physical Interface

MTS
Multiplex Timing Source

MTTR
Mean Time To Repair

N **NA**
Not Applicable

NARTAC
North American Regional Technical Assistance Center

NCC
Network Communication Controller

NE
Network Element

NEBS
Network Equipment-Building System

NEE
Network Element Equivalent

NEF
Network Element Function

NEM
Network Element Manager

nm
Nanometer (10⁻⁹ meters)

NMA
Network Monitoring and Analysis System

NMON
Not Monitored

NMS
Network Management System

NNE

Non-SDH Network Element

NORM

Normal

NPI

Null Pointer Indication

NPPA

Non-Preemptible Protection Access

NRZ

Nonreturn to Zero

NSA

Non-Service Affecting

NSAP Address

Network Service Access Point Address (used in the OSI network layer 3)

NTF

No Trouble Found

NVM

Non-Volatile Memory

O O&M

Operation and Maintenance

OA

Optical Amplifier

OALAN

Overhead Access Local Area Network

OAM&P

Operations, Administration, Maintenance, and Provisioning

OC, OC-N

Optical Carrier

OC-1

Optical Carrier, Level 1 Signal (51.84 Mb/s)

OC-3

Optical Carrier, Level 3 Signal (155.52 Mb/s)

OC-3c

Optical Carrier, Level 3 Concatenated Signal (155.52 Mb/s)

OC-12

Optical Carrier, Level 12 Signal (622.08 Mb/s)

OC-48

Optical Carrier, Level 48 (2488.32 Mb/s) (2.5 Gb/s)

OC-192

Optical Carrier, Level 192 (9953.28 Mb/s) (10 Gb/s)

OC3/STM1/1.3LR4

Optical Carrier 3/Synchronous Transport Module 1 port unit in the 1.3 mm range with four bidirectional long reach ports.

OC3/STM1/1.3SR4

Optical Carrier 3/Synchronous Transport Module 1 port unit in the 1.3 mm range with four bidirectional short reach ports.

OC12/STM4/1.3LR2

Optical Carrier 12/Synchronous Transport Module 4 port unit in the 1.3 mm range with two bidirectional long reach ports.

OC12/STM4/1.3SR2

Optical Carrier 12/Synchronous Transport Module 4 port unit in the 1.3 mm range with two bidirectional short reach ports.

OC48/STM16

Optical Carrier 48/Synchronous Transport Module 16 port unit (generic reference to all OC48/STM16 port units).

OC48/STM16/1.3LR1

Optical Carrier 48/Synchronous Transport Module 16 port unit in the 1.3 mm range with one bidirectional long reach port.

OC48/STM16/1.5LR1

Optical Carrier 48/Synchronous Transport Module 16 port unit in the 1.5 mm range with one bidirectional

long reach port.

OC48/STM16/DWDM01-16

Optical Carrier 48/Synchronous Transport Module 16 port unit in 16 different wavelengths that are compatible with ITU wavelengths and WaveStar OLS 40G/80G without OTUs.

OC48/STM16/POU

Optical Carrier 48/Synchronous Transport Module 16 Passive Optic Unit port unit in 16 different wavelengths that are compatible with passive optical applications with dense wavelength division multiplexing systems. The 16 different codes of OC48/STM16/POU port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal.

OC48/STM16/WDM

Optical Carrier 48/Synchronous Transport Module 16 Wavelength Division Multiplexing port unit in the 1.5 mm range with one bidirectional short/intermediate reach port. The 80 different codes of OC48/STM16/WDM port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal. The OC48/STM16/WDM port units support 80 wavelengths for applications with WaveStar OLS 400G dense wavelength division multiplexing systems without OTUs.

OC192/STM64/1.5IR1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional extended intermediate reach port.

OC192/STM64/1.5SR1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional short/intermediate reach port.

OC192/STM64/POU

Optical Carrier 192/Synchronous Transport Module 64 Passive Optic Unit port unit in 16 different wavelengths that are compatible with passive optical applications with dense wavelength division multiplexing systems. The 16 different codes of OC192/STM64/POU port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal.

OC192/STM64/1.5IRS1

Optical Carrier 192/Synchronous Transport Module 64 port unit in the 1.5 mm range with one bidirectional intermediate reach port with Strong Forward Error Correction.

OC192/STM64/WDM

Optical Carrier 192/Synchronous Transport Module 64 Wavelength Division Multiplexing port unit in the 1.5 mm range with one bidirectional short/intermediate reach port. The 40 different codes of OC192/STM64/WDM port units are each designated by a 4-digit numeric suffix that corresponds to the frequency of the optical signal. The OC192/STM64/WDM port units support 40 wavelengths for applications with WaveStar OLS 400G dense wavelength division multiplexing systems without OTUs.

ODF

Optical Distribution Frame

OI

Operations Interworking

OLS

Optical Line System

OOF

Out-of-Frame

OOS

Out-of-Service

OPS/INE

Operations System for Intelligent Network Elements

OS

Operations System

OSI

Open Systems Interconnection

OSMINE

Operations Systems Modifications for the Integration of Network Elements

OTU

Optical Translator Unit (WaveStar OLS)

P PCB

Printed Circuit Board

PCM

Pulse Code Modulation

PCMCIA

Personal Computer Memory Card International Association

PDH

Plesiochronous Digital Hierarchy

PFVP

Power Filter with Voltage Protection

PI

Physical Interface

PM

Performance Monitoring

PMA

Performance Monitoring Application

PMD

Polarization Mode Dispersion

POH

Path Overhead

POP

Point of Presence

POTS

Plain Old Telephone Service

PP

Pointer Processing

PPROC/FO

Pointer Processor circuit pack for 192 STS-1/64 STM-1 equivalents with fan out

PRC

Primary Reference Clock

PRI

Primary

PROTN

Protection

PROV

Provisioned

PSA

Partially Service Affecting

PSDN

Public Switched Data Network

PSF

Power Supply Filter

PSTN

Public Switched Telephone Network

PTE

Path Terminating Equipment

PTY

Parity

PVC

Permanent Virtual Circuit

PWR

Power

PWR ON

Power On

Q**QAF**

Q Adapter Function (in NE)

QL

Quality Level

QOS

Quality of Service

QRSS

Quasi-Random Signal Source

R**RAM**

Random Access Memory

RCV

Receive

RCVR

Receiver

RDI

Remote Defect Indication

REI

Remote Error Indicator

RF

Radio Frequency

RFI

Remote Failure Indication

RPP

Reliability Prediction Procedure

RSOH

Regenerator Section OverHead; part of SOH

RST

Regenerator Section Termination

RT

Remote Terminal

RTRV

Retrieve

RZ

Return to Zero

S**SA**

Service Affecting

SAI

Station Alarm Interface

SASE

Stand Alone Synchronization Equipment

SCI

Station Clock Input

SCO

Station Clock Output

SD

Signal Degrade

SDH

Synchronous Digital Hierarchy

SDS

Standard Directory Service based on ANSI recommendation T1.245

SEC

SDH Equipment Slave Clock

SES

Severely Errored Seconds

SF

Superframe format

SFEC

Strong Forward Error Correction

SLC

Subscriber Loop Carrier

SH

Short Haul

SNCP

Sub-Network Connection Protection

SNR

Signal-to-Noise Ratio

SOH

Section Overhead

SONET

Synchronous Optical Network

SPE

Synchronous Payload Envelope

SR

Short Reach

SSM

Synchronization Status Marker

SSU_L

Synchronization Supply Unit — Local

SSU_T

Synchronization Supply Unit — Transit

STBY

Standby

STM-1, STM-N

Synchronous Transport Module, Levels 1 and N (155.52 Mb/s)

STM-4

Synchronous Transport Module Level 4 (622.08 Mb/s)

STM-4c

Synchronous Transport Module Level 4 Concatenated Signal (622.08 Mb/s)

STM-16

Synchronous Transport Module Level 16 (2488.32 Mb/s) (2.5 Gb/s)

STM-64

Synchronous Transport Module Level 64 (9953.28 Mb/s) (10 Gb/s)

STS

Synchronous Transport Signal

STS-1, STS-N

Synchronous Transport Signal, Levels 1 and N

STS-3

Synchronous Transport, Level 3

STS-3c

Synchronous Transport, Level 3 Concatenated Signal

STS-12

Synchronous Transport, Level 12

STS-12c

Synchronous Transport, Level 12 Concatenated Signal

SVC

Switched Virtual Circuit

SWC

Switch Center

SWIEX

Switch Interface Expander circuit pack

SWIF

Switch Interface circuit pack

SWITCH/DS3EC1

Switch circuit pack for 1xN DS3EC1/8 port unit protection switching

SWITCH/STM1E4

Switch circuit pack for 1xN STM1E/4 port unit protection switching

SWITCH/DS3EC1

Electrical Protection Switch for up to 96 DS3 or EC-1 signals port unit

SWITCH/STS576

576X576 STS-1/192x192 STM-1 Switch circuit pack

SWITCH/STS768

768X768 STS-1/256x256 STM-1 Switch circuit pack

SYNC

Synchronizer

T TA

Technical Advisory

TABS

Telemetry Asynchronous Byte Serial (Protocol)

TARP

Target Identifiers Address Resolution Protocol

TBD

To Be Determined

TBOS

Telemetry Byte-Oriented Serial (Protocol)

TCA

Threshold-Crossing Alert

TDM

Time Division Multiplexing

THz

Terrahertz (10¹² Hz)

TID

Target Identifier

TIRKS

Trunks Integrated Records Keeping System

TL1

Transaction Language 1

TMG/STRAT3

Stratum 3 Timing circuit pack

TR

Technical Requirement

TSA

Time Slot Assignment

TSI

Time Slot Interchange

TSS

Technical Support Services, formerly Customer Technical Support (CTS)

TU

Tributary Unit

TUG

Tributary Unit Group

U UAS

Unavailable Seconds

UITS

Unacknowledged Information Transfer Service. Unconfirmed mode of LAPD operation.

UNEQ

Path Unequipped

UPSR

Unidirectional Path-Switched Ring

V V

Volts

VAC

Volts Alternating Current

VC

Virtual Container

VDC

Volts Direct Current

VF

Voice frequency

VM

Violation Monitor

VMR

Violation, Monitor, and Removal

VT

Virtual Tributary

VT1.5

Virtual Tributary, Level 1.5

VT-G

Virtual Tributary Group

W WAD

Wavelength Add/Drop

WAN

Wide Area Network

WaveStar OLS 40G/80G/400G

WaveStar Optical Line System 40G/80G/400G

WaveStar SNMS

WaveStar SubNetwork Management System (formerly known as ITM SNC [Integrated Transport Management SubNetwork Controller])

WDCS

Wideband Digital Cross-Connect System

WDM

Wavelength Division Multiplexing

WRT

Wait to Restore Time

X X.25

An ITU standard defining the connection between a terminal and a public packet-switched network

Nu 0x1 Line Operation

me 0x1 means unprotected operation. The connection between network elements has one bidirectional line (no protection line).

1+1 Active Unit State

Indicates which unit (working or protection) is active.

1+1 Line Protection

A protection architecture in which the transmitting equipment transmits a valid signal on both the working and protection lines. The receiving equipment monitors both lines. Based on performance criteria and OS control, the receiving equipment chooses one line as the active line and designates the other as the standby line.

10G I/O Bay

A 10G I/O Bay is capable of housing one or two 10G I/O Shelves. Each 10G I/O Shelf is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf.

10G I/O Shelf

A 10G I/O Shelf may be housed in a 10G I/O Bay or a 10G/Universal I/O Bay. The 10G I/O Shelf is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf.

10G/SDH I/O Bay

A 10G/SDH I/O Bay is capable of housing two shelves. The 10G I/O Shelf (bottom) is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf. The SDH Universal I/O Shelf (top) is divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

10G/Universal I/O Bay

A 10G/Universal I/O Bay is capable of housing two shelves. The 10G I/O Shelf (bottom) is divided into a CTL/Switch Interface Sub-Shelf and a Facility/SWIF Interface Sub-Shelf. The Universal I/O Shelf (top) is divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

576x576 STS-1 Switch (SWITCH/STS576)

The SWITCH/STS576 circuit pack provides a 576x576 STS-1 equivalent (192x192 STM-1 equivalent) cross-connect function.

768x768 STS-1 Switch (SWITCH/STS768)

The SWITCH/STS768 circuit pack provides a 768x768 STS-1 equivalent (256x256 STM-1 equivalent) cross-connect function.

4608/1536 Platform

The equipment configuration that supports a 4608 STS-1/1536 STM-1 equivalent non-blocking service cross-connection capacity.

4608/1536 Switch Center

A 4608/1536 Switch Center is one fully-equipped Switch Shelf.

4608/1536 Switch Complex

A 4608/1536 Switch Complex is two Switch Bays or one Control/Switch Bay and one Switch Bay. Each bay is equipped with one fully-equipped Switch Shelf.

A Absent (ABS)

Used to indicate that a given circuit pack is not installed.

Access Identifier (AID)

A technical specification for explicitly naming entities (both physical and logical) of an NE using a grammar comprised of ASCII text, keywords, and grammar rules.

Active (ACT)

Used to indicate that a circuit pack or module is in-service and currently providing service functions.

Active Path

One of two signals entering a constituent path selector, the active path is the path currently being selected.

Add Connection

For the input side, it is any tributary from which the user can provision a cross-connection, in any port or port protection group which is NOT a BLSR/MS-SPRing. For the output side, it is any tributary to which the user can provision a cross-connection, in any port protection group which is a BLSR/MS-SPRing.

Add/Drop Multiplexer (ADM)

The term for a synchronous network element capable of combining signals of different rates and having those signals added to or dropped from the stream.

ADJCTL/DCC

Circuit pack that terminates 32 DCC channels. Two ADJCTL/DCC circuit pack are used in the System Controller Shelf.

ADJCTL/DCCEI

Circuit pack that combines the functionality of the ADJCTL/DCC and CTL/EI circuit packs. The ADJCTL/DCCEI circuit pack is used in the 10G I/O Shelf, the SDH Universal I/O Shelf, and the Universal I/O Shelf.

Alarm

Visible or audible signal indicating that an equipment failure or significant event/condition has occurred.

Alarm Correlation

The search for a directly-reported alarm that can account for a given symptomatic condition.

Alarm Cut-Off (ACO)

A button on the user panel used to silence audible alarms.

Alarm Cut-Off and Test (ACO/TST)

The name of a pushbutton on the user panel used to silence audible alarms.

Alarm Gateway Network Element (AGNE)

A defined Network Element in an alarm group through which members of the alarm group exchange information.

Alarm Indication Signal (AIS)

A code transmitted downstream in a digital network that indicates that an upstream failure has been detected and alarmed, if the upstream alarm has not been suppressed.

Alarm Severity

An attribute defining the priority of the alarm message. The way alarms are processed depends on the severity.

Alarm Severity Assignment Profile (ASAP)

A user provisioned mechanism to control an alarm level.

Alarm Suppression

Selective removal of alarm messages from being forwarded to the GUI or to network management layer OSs.

Alarm Throttling

A feature that automatically or manually suppresses autonomous messages that are not priority alarms.

Alternate Mark Inversion (AMI)

A line code that employs a ternary signal to convert binary digits, in which successive binary ones are represented by signal elements that are normally of alternative positive and negative polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

American Standard Code for Information Interchange (ASCII)

A standard 7-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

APS Channel

The signalling channel carried in the K1 and K2 bytes of the SONET overhead on the protection line. It is used to exchange requests and acknowledgments for protection switch actions.

Association

A logical connection between manager and agent through which management information can be exchanged.

Asynchronous

The essential characteristic of time-scales or signals such that their corresponding significant instants do not necessarily occur at the same average rate.

Asynchronous Transfer Mode (ATM)

A high-speed transmission technology characterized by high bandwidth and low delay. It utilizes a packet switching and multiplexing technique which allocates bandwidth on demand.

Attribute

Alarm indication level: critical, major, minor, or no alarm.

Autolock

Action taken by the system in the event of circuit pack failure/trouble. System switches to protection and

prevents a return to the working circuit pack even if the trouble clears. Multiple protection switches on a circuit pack during a short period of time cause the system to autolock the pack.

Autolock State

A state of the 1xN protection switch group with priority above “Automatic Protection Switching”, and below the commands Clear, Lockout, and Forced Switch. The Autolock State supports the following two states: Locked – indicating the existence of an autolock condition, in which traffic from a particular service circuit pack is locked to protection, Unlocked – indicating no autolock condition is present and normal 1xN protection switching is occurring.

Automatic (AUTO)

One possible state of a port or slot. When a port is in the AUTO state and a good signal is detected, the port automatically enters the IS (in-service) state. When a slot is in the AUTO state and a circuit pack is detected, the slot automatically enters the EQ (equipped) state.

Automatic Protection Switch

A protection switch that occurs automatically in response to an automatically detected fault condition.

Autonomous Message

A message transmitted from the controlled Network Element to the ITM-SC which was not a response to an ITM-SC originated command.

Auto-Provisioning

The ability to detect the presence of equipment, validate it, and then assign the original values to the newly created entity’s programmable parameters. These parameters are maintained in NVM and/or hardware registers. If a user has predefined some (or all) of the parameters associated with the entity, the auto-provisioning function validates the request, perhaps using some of the pre-provisioned data, and then assigns the programmable parameter values accordingly.

Avalanche Photodiode (APD)

A diode that increases its electrical conductivity by a multiplication effect when hit by light. APDs are used in lightwave receivers because the APDs have a greater sensitivity to weakened light signals (for example, those which have traveled long distances over fiber).

B Backout to a Previous Generic

The user initiated procedure whereby the system reverts from the current/most recent generic and back-to the previous generic.

Backup

The backup and restoration features provide the capability to recover from loss of NE data because of such factors as human error, power failure, NE design flaws, and software bugs.

Bandwidth

The difference in Hz between the highest and lowest frequencies in a transmission channel. The data rate that can be carried by a given communications circuit.

Baud Rate

Transmission rate of data (bits per second) on a network link.

Bidirectional Line

A transmission path consisting of two fibers that handle traffic in both the transmit and receive directions.

Bidirectional Line-Switched Ring (BLSR)

A bidirectional ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring. BLSRs are functionally equivalent to SDH Multiplexer Section Shared Protection Rings (MS-SPRings).

Bidirectional Ring

A ring in which both directions of traffic between any two nodes travel through the same network elements (although in opposite directions).

Bidirectional Switch

Protection switching performed in both the transmit and receive directions.

Bipolar 3-Zero Substitution (B3ZS)

A line coding technique that replaces three consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: first, this bit sequence accommodates the density requirements of the ones for digital T3 carrier, second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bipolar 8-Zero Substitution (B8ZS)

A line coding technique that replaces eight consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the density requirements of the ones for digital T1 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bit

The smallest unit of information in a computer, with a value of either 0 or 1.

Bit Error Rate (BER)

The ratio of error bits received to the total number of bits transmitted.

Bit Error Rate Threshold

The point at which an alarm is issued for bit errors.

Bit Interleaved Parity-N(BIP-N)

A method of error monitoring over a specified number of bits (BIP-3 or BIP-8).

BITS clock

A BITS (Building Integrated Timing Source) clock is simply a clock within a central office that distributes timing to all the equipment in that central office. The BITS clock is tied to an external, stable timing source, such as a GPS (global positioning satellite).

Blank (BLK)

The status of a circuit pack slot that contains a bus extender (blank) circuit pack.

Board Controller Local Area Network (BCLAN)

The internal local area network that provides communications between the line and board controllers on the circuit packs associated with a high-speed line.

Bridge Cross-Connection

The setting up of a cross-connection leg with the same input tributary as that of an existing cross-connection leg. Thus, forming a 1:2 bridge from an input tributary to two output tributaries.

Broadband Communications

Voice, data, and/or video communications at greater than 2 Mb/s rates.

Building Integrated Timing Supply (BITS)

A single clock that provides all the DS1 and/or composite clock timing reference to all other clocks in that building.

Byte

Refers to a group of eight consecutive binary digits.

Byte Switch (BSW)

A BSW (slice) circuit pack serves as a cross-connect at the byte level between STS-1/STM-1 signals for 4608x4608/1536x1536 switching.

C C-Bit

A framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3. This format provides for enhanced performance monitoring of both near-end and far-end entities.

Cell Relay

Fixed length cells. For example, ATM with 53 octets.

Central Office (CO)

A building where common carriers terminate customer circuits.

Channel

A sub-unit of transmission capacity within a defined higher level of transmission capacity.

Channel State Provisioning

A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service, and not monitored) for VT1.5 and STS-1 channels.

Circuit

A set of transmission channels through one or more network elements that provides transmission of signals between two points, to support a single communications path.

Clear Channel (CC)

A digital circuit where no framing or control bits are required, thus making the full bandwidth available for communications.

Clear Command

Clears any active WaveStar CIT switch request. Clear can be directed to a single electrical interface (working or protection) or to all electrical interfaces. The clear command is used to clear a Lockout, Forced Switch, or Manual Switch conditions, as well as release a Wait-to-Restore.

Closed 4-Fiber BLSR

When all four ports of the BLSR are selected, then the user can provision one of the four ports as the “East Working Port”, one port as the “East Protection Port”, one port as the “West Working Port” and one port as the “West Protection Port.” This arrangement is sometimes referred to as a two-sided node.

Closed Ring Network

A network formed of a ring-shaped configuration of network elements. Each network element connects to two others, one on each side.

Coding Violation (CV)

A performance monitoring parameter indicating that bipolar violations of the signal have occurred.

Collocated

System elements that are located in the same location.

Command Group

An administrator-defined group that defines commands to which a user has access.

Concatenation

A procedure whereby multiple virtual containers are associated one with each other resulting in a combined capacity that can be used as a single container across which bit sequence integrity is maintained.

Constituent Path Selector

A path-level protection switching function that selects the better of two constituent signals in the two logical

input tributaries and operates at the constituent signal rate. A path protection group in a cross-connection with an STS-3 or STS-12/STM-1 or STM-4 “pipe” cross-connection rate provides path-level protection switching for all the constituent signals carried by the cross-connection. There may be one or more constituent path selectors operating independently within each path protection group, one for each constituent signal in the logical output tributary. The path protection group adapts to the current constituent signal rates.

Constituent Signal

A signal at a constituent signal rate that is carried by a cross-connection leg.

Consultative Committee for the International Telephone and Telegraph (CCITT)

International Telephone and Telegraph Consultative Committee — An international advisory committee under United Nations’ sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

Control Complex

A Control Complex includes one equipped System Controller Bay or one Control/Switch Bay, which provides the main control functions for WaveStar BandWidth Manager.

Control/Switch Bay

The Control/Switch Bay is capable of housing a System Controller Shelf and a Switch Shelf.

Control/Switch Complex

A Control/Switch Complex comprises either one equipped System Controller Bay and two Switch Bays or one Control/Switch Bay and one Switch Bay. A Control/Switch Complex provides the main control and switching functions for WaveStar BandWidth Manager.

Control System Interface Expander (CSIEX)

The CSIEX circuit pack expands CTLI-D interfaces that connect to the SWIEX circuit packs and the SEC memory circuit packs. The CSIEX circuit pack also expands ON (Operations Network) interfaces that connect to the Facility Interface Sub-Shelf

Co-Resident

A hardware configuration where two applications can be active at the same time independently on the same hardware and software platform without interfering with each others functioning.

Correlation

A process where related hard failure alarms are identified.

Craft Interface Terminal (CIT)

The user interface terminal used by craft personnel to communicate with a network element.

Critical (CR)

Alarm that indicates a severe, service-affecting condition.

Cross-Connect Capacity

The total bandwidth of cross-connections as measured by the bandwidth of input and output tributaries. A system with N STS-1/STM-1 equivalent input tributaries and N STS-1/STM-1 equivalent output tributaries (referred to as “NxN”) provides a cross-connection capacity of N STS-1/STM-1 equivalents. This system could provide N one-way point-to-point cross-connections or N^2 two-way point-to-point cross-connections at the equivalent rate of STS-1/STM-1.

Cross-Connect Loopback

A cross-connection from an input tributary to the output of that same tributary via the cross-connect fabric.

Cross-Connect Rate

The attribute of a cross-connection that defines the constituent signal rate(s) it can carry. For a cross-connection with an STS-3/STM-1 “pipe” cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-3c/STM-1c signal or three STS-3/STM-1 signals. Similarly, for a cross-connection with an STS-12/STM-4 “pipe” cross-connection rate, the constituent signals carried by the cross-connection can be either an STS-12c/STM-4c signal or an allowed mix of STS-12c/STM-1c signals and STS-3/STM-1 signals.

Cross-Connect Topologies

The different types of cross-connections, or configurations, that may be provisioned. These include: bridging, path-protected, and point-to-point. The topology of a cross-connection defines the number of legs in the cross-connection, whether the inputs and/or outputs of some legs are the same logical tributary, and whether any path protection groups are included.

Cross-Connection

Path-level connections between input and output tributaries or specific ports within a single NE.

Cross-connections are made in a consistent way even though there are various types of ports and various types of port protection. Cross-Connections are reconfigurable interconnections between tributaries of transmission interfaces.

Cross-Connection Leg

A one-way connection provisioned from one logical input tributary to one logical output tributary. Each leg is identified as an entity by its logical input and output tributaries, its cross-connection rate, and the type of cross-connection topology. The operation of retrieving cross-connections can be done in terms of cross-connection legs between specific logical tributaries.

Cross-Connection Type

A provisionable parameter whereby the user selects the type as 1 Way Point to Point, or 2 Way Point to Point.

Crosstalk

An unwanted signal introduced into one transmission line from another.

CTL/EI

Circuit pack that selects the 10Base-T from an ADJCTL/DCC circuit pack and routes it to the backplane.

CTL/MEM

The CTL/MEM circuit pack stores information for WaveStar BandWidth Manager. A CTL/MEM circuit pack may be designated as either PRI (Primary) or SEC (Secondary).

CTL/SR50DC

The CTL/SR50DC circuit pack is a main controller (without memory) for WaveStar BandWidth Manager. The CTL/SR50DC is part of the 10G I/O Shelf.

CTL/Switch Interface Sub-Shelf

The top portion of a 10G I/O Shelf which is equipped with ten SWITCH/STS768 packs, two TMG/STRAT3 packs, two CTL/SR50DC packs, and four PPROC/FO packs.

CTL/SYS50D

The SYS50D circuit pack is a main controller (without memory) for WaveStar BandWidth Manager. The SYS50D is part of the System Controller Shelf.

CTL/SYS50DM

The SYS50DM circuit pack is a main controller for WaveStar BandWidth Manager. Two SYS50DM circuit packs are included in all modules of the Facility Interface Sub-.

Current Value

The value currently assigned to a provisionable parameter.

Cut-Through

Refers to a simple ASCII interface to an NE. It enables the user to send TL1 messages directly to the NE with no interpretation or assistance provided by the WaveStar CIT.

D Data

A collection of system parameters and their associated values.

Database Administrator

A user who administers the database of the application.

Data Communications Channel (DCC)

The embedded overhead communications channel in the synchronous line, used for end-to-end communications and maintenance. The DCC carries alarm, control, and status information between network elements in a synchronous network.

Data Communications Equipment (DCE)

The equipment that provides signal conversion and coding between the data terminating equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

Data Terminating Equipment (DTE)

The equipment that originates data for transmission and accepts transmitted data.

DDM-1000

Lucent Technologies' Dual DS3 Multiplexer – A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or a 90 Mb/s or 180 Mb/s optical signal.

DDM-2000

Lucent Technologies SONET-ready network multiplexer that can function as a lightwave terminal. It is designed primarily for loop feeder and interoffice applications that work in existing asynchronous as well as the emerging SONET networks. Multiplexers that multiplex DS1, DS3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

Default

An operation or value that the system or application assumes, unless a user makes an explicit choice.

Default Provisioning

The parameter values that are preprogrammed as shipped from the factory.

Defect

A limited interruption of the ability of an item to perform a required function. It may or may not lead to maintenance action depending on the results of additional analysis.

Demultiplexer

A device that splits a combined signal into individual signals at the receiver end of transmission.

Demultiplexing

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

Dense Wavelength Division Multiplexing (DWDM)

Transmitting two or more signals of different wavelengths simultaneously over a single fiber.

Deprovisioning

The inverse order of provisioning. To manually remove/delete a parameter that has (or parameters that have) previously been provisioned.

Digital Cross-Connect Panel (DSX)

A panel designed to interconnect equipment that operates at a designated rate. For example, a DSX-3

interconnects equipment operating at the DS3-rate.

Digital Multiplexer

Equipment that combines several digital signals into a single composite digital signal by time-division multiplexing.

Digital Signal Levels 0, 1, 3 (DS0, DS1, DS3)

An ANSI-defined signal or service level corresponding to the following: DS0 is 64 Kb/s, DS1 is 1.544 Mb/s (equivalent to T1), and DS3 is 44.736 Mb/s (equivalent to 28 T1 channels or T3).

Dimmed

The state of a control whose normal functionality is not currently available to a user (also referred to as grayed or disabled).

Directory Name

An ASCII string that fully specifies the path and the name of the target directory where the generic to be downloaded, the database to be restored, or the database to be backed up is to be found.

Directory Service Network Element (DSNE)

A designated network element that is responsible for administering a database that maps network element names (TIDs) to addresses [NSAPs (network service access points)] in an OSI subnetwork. There can be one DSNE per ring. A DSNE can also be a GNE.

Dispersion

Time-broadening of a transmitted light pulse.

Dispersion Shifted Optical Fiber

1330/1550 nm minimum dispersion wavelength.

Divergence

When there is unequal amplification of incoming wavelengths, the result is a power divergence between wavelengths.

Doping

The addition of impurities to a substance in order to attain desired properties.

Double Click

To click twice rapidly with the left mouse button. This executes the default command in the Right Click Pop-up Menu. If there is no default command, then double-clicking will have no effect.

Downstream

At or towards the destination of the considered transmission stream, for example, looking in the same direction of transmission.

Downstream Pack

Given a pack-to-pack interface, the downstream pack is the receiving pack.

Drop and Continue

A circuit configuration that provides redundant signal appearances at the outputs of two network elements in a ring. Can be used for Dual Ring Interworking (DRI) and for video distribution applications.

Drop-Down Menu

A menu that is displayed from a menu bar.

DS1 Signal

Signal with a data rate of 1.544 Mb/s.

DS3EC1/8

Port unit that provides 8 bidirectional ports at the DS3-rate or EC-1-rate.

DS3EC1 Connector Panel

The two panels on one or both sides of a Facility Interface Sub-Shelf (Universal I/O Shelf) containing DS3EC1/8 port units. The DS3EC1/8 Connector Panels provide an interface between the DS3EC1/8 port units and the backplane via BNC connectors.

DS3 Format

Specifies the line format of a DS3 interface port, such as M23 or C-bit parity.

DS3 Idle Signal

A signal that can be applied to any output port that is not cross-connected to an input port. This signal lets downstream network elements know that the facility is operating normally even though it is not sending a normal DS3 signal.

DS3 Signal

A logical or electrical B3ZS signal with a data rate of 44.736 Mb/s.

DSX-1, 2, 3

Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the DS1, DS2, or DS3 level.

Dual Ring Interworking (DRI)

A topology in which two rings are interconnected at two nodes on each ring and operate so that inter-ring traffic is not lost in the event of a node or link failure at an interconnecting point.

E Electrical Carrier, Level 1 (EC-1)

An electrical interface signal at the SONET rate of STS-1.

Electrical Module

One of the ways the bottom portion of a Universal I/O Shelf, the Facility Interface Sub-Shelf, may be populated. DS3EC1/8 port units are used to populate an Electrical Module.

Electromagnetic Compatibility (EMC)

A measure of equipment tolerance to external electromagnetic fields.

Electromagnetic Interference (EMI)

High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.

Electronic Industries Association (EIA)

A trade association of the electronic industry that establishes electrical and functional standards.

Electrostatic Discharge (ESD)

Static electrical energy potentially harmful to circuit packs and humans.

Entire System Start-Up Stage A

The amount of time from power-on reset (including system controller downloads to the individual controllers) until transmission is up. This should normally be less than 5 minutes.

Entire System Start-Up Stage B

The amount of time from power-on reset until the system is completely available for any external commands. This should normally be less than 5 minutes.

Entity

A specific piece of hardware (usually a circuit pack, slot, or module) that has been assigned a name recognized by the system.

Entity Identifier

The name used by the system to refer to a circuit pack, memory device, or communications link.

Equipment Fail (EF) State

The protection group shall enter the EF state when any of its circuit packs are in the EF state, and no higher priority request (for example, Clear, Forced Switch) is present. The protection group leaves the EF state when all EF indications are cleared, or a higher priority request is received.

Equipment Protection

Relates to the DS3 and EC-1 electrical interfaces, which are protected by 1xN equipment protection. This means that protection switching for electrical interfaces is supported at the level of the port unit (circuit pack).

Equipped (EQ)

Status of a circuit pack or interface module that is in the system database and physically in the frame, but

not yet provisioned.

Erbium

A soft rare earth element used in metallurgy and nuclear research.

Erbium Doped Fiber Amplifier (EDFA)

An amplifier that performs by having a light signal pass through a section of erbium-doped fiber and using the laser pump diode to amplify the signal.

Errored Seconds (ES)

A performance monitoring parameter. ES “type A” is a second with exactly one error; ES “type B” is a second with more than one and less than the number of errors in a severely errored second for the given signal. ES by itself means the sum of the type A and type B ESs.

Establish

A user initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware.

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A user initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware.

Event

A significant change. Events in controlled Network Elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled Network Element, the controlled Network Element will generate an alarm or status message and send it to the management system.

Event Driven

A required characteristic of a network element or software system: NEs are reactive systems, primarily viewed as systems that wait for and then handle events. Events are provided by the external interface packages, the hardware resource packages, and also by the software itself.

Exclude

A user initiated command, at the WaveStar CIT, to remove an entity from service.

Extended Superframe Format (ESF)

A T-1 format that uses the framing bit for non-intrusive signaling and control. A T-1 frame is sent 8,000 times a second, with each frame consisting of a payload of 192 bits, and with each frame preceeded by a framing bit. Because ESF only requires 2,000 framing bits for synchronization, the remaining 6,000 framing bits can be used for error detection.

Externally Timed

An operating condition of a clock in which it is locked to an external reference and is using time constants

that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

Extract

To physically remove a circuit pack from a slot, thus causing a system initiated removal of an entity from service.

Extra traffic

Unprotected traffic that is carried over protection channels when their capacity is not used for the protection of working traffic.

F Facility

A one- or two-way circuit that carries a transmission signal.

Facility Interface Sub-Shelf

The bottom portion of a Universal I/O Shelf or an SDH Universal I/O Shelf which may be equipped, depending on the port units and circuit packs used, as a DS3EC1 Electrical, Optical, or a Mixed Module (Universal I/O Shelf) or an STM1e Electrical or Mixed Module (SDH Universal I/O Shelf).

Facility Loopback

A facility loopback is where an entire line is looped back.

Facility Roll

The disconnection of the circuit cross-connecting input tributary to an output tributary followed, within the required completion time (≤ 2.5 ms), by a cross-connection of an input tributary to an output tributary.

Facility/SWIF Interface Sub-Shelf

The bottom portion of a 10G I/O Shelf which may be equipped with OC192/STM64 port units and one to four pairs of SWIF packs.

Failures in Time (FIT)

Circuit pack failure rates per 109 hours as calculated using the method described in Reliability Prediction Procedure for Electronic Equipment, Telcordia Method I, Issue 5, September 1995.

Far End (FE)

Any other network element in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

Far-End Block Error (FEBE)

An indication returned to the transmitting node that an errored block has been detected at the receiving node. A block is a specified grouping of bits.

Far-End Receive Failure (FERF)

An indication returned to a transmitting Network Element that the receiving Network Element has detected an incoming section failure. Also known as RDI (Remote Detect Indication).

Fault

Term used when a circuit pack has a hard (not temporary) fault and cannot perform its normal function.

Fault Management

Collecting, processing, and forwarding of autonomous messages from network elements.

Fiber Distributed Data Interface (FDDI)

Fiber interface that connects computers and distributes data among them.

File Transfer and Access Management (FTAM)

FTAM is the Open Systems Interconnection (OSI) standard for file transfer, file access, and file management.

Flash EPROM

A technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

Folded Rings

Folded (collapsed) rings are rings without fiber diversity. The terminology derives from the image of folding a ring into a linear segment.

Forced

Term used when a circuit pack (either working or protection) has been locked into a service-providing state by user command.

Forced Switch to Protection

The WaveStar CIT command that forces the protection group to be the “Active Unit.” The clear command is required to remove the Forced Switch state. While in the Forced Switch state the system may not switch the active unit either automatically, by means of the WaveStar CIT Forced Switch, or Manual Switch command.

Forward Error Correction (FEC)

A technique used by a receiver to correct errors incurred during transmissions over a communications channel without requiring retransmission of any information by the transmitter. FEC typically involves a convolution of the transmitter using a common algorithm and embedding sufficient redundant information in the data block to allow the receiver to correct. While this technique is processor-intensive, it improves the efficiency of the network.

Frame

The smallest block of digital data being transmitted.

Frame Relay (FR)

A form of packet switching that relies on high-quality phone lines to minimize errors. It is very good at handling high-speed, bursty data over wide area networks. The frames are variable lengths and error checking is done at the end points.

Framework

An assembly of equipment units, such as a rack, that is capable of housing shelves.

Free Running

An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000 ADR

Lucent Technologies' OC-48 rate Add/Drop Rings lightwave Terminal for 2-fiber BLSRs. It is designed primarily for interoffice applications. It supports adds, drop, and through connections for DS3/EC-1, OC-3, IS-3, and OC-12.

G Gateway Network Element (GNE)

A network element that passes information between other network elements and management systems through a data communication network.

H Hard Failure

An unrecoverable nonsymptomatic (primary) failure that causes signal impairment or interferes with critical network functions, such as DCC operation.

High Level Data Link Control (HDLC)

OSI reference model datalink layer protocol.

Holdover

An operating condition of a clock in which its local oscillator is not locked to an external reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

Host Controller

The NSAP of the subject NE.

Hot Keys

A keyboard key or key combination that invokes a particular command.

Hot Standby

A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack. It has the same signal as the service going through it, so that choice is all that is required.

Human Machine Language (MML)

A standard language developed by the ITU for describing the interaction between humans and dumb terminals.

I Idle

An output port not cross-connected to an input port.

Idle Code

A signal transmitted downstream automatically from an idle output port. It can also be transmitted downstream by a manual command from a cross-connected output port.

Include

A user initiated command, at the WaveStar CIT, to restore an entity to service.

Individual Controller Start-Up Stage A

The amount of time from power-on reset until transmission is established for an individual controller. This should normally be less than 2.5 minutes.

Individual Controller Start-Up Stage B

The amount of time from power-on reset until the individual controller is completely available for any external commands. This should normally be less than 3 minutes.

Insert

To physically insert a circuit pack into a slot, thus causing a system-initiated restoral of an entity into service and/or creation of an entity and associated attributes.

In-Service (IS)

A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

Integrated Transport Management Network Module (ITM NM)

Lucent Technologies' integrated network management system that provides a broad end-to-end view of the SONET network.

Integrated Transport Management SubNetwork Controller (ITM SNC)

Lucent Technologies' SONET element management layer system that provides fault, configuration, and security functions through the use of a GUI.

Interface Capacity

The total number of STS-1/STM-1 equivalents (bidirectional) tributaries in all transmission interfaces with which a given I/O Shelf can be equipped at one time. The interface capacity varies with equipage.

I/O Complex

There are two types of I/O Complexes: local and remote (future). A local I/O Complex is one or more

collocated Universal I/O Bays that are electrically cabled to an associated Switch Complex. A remote I/O Complex (future) is one or more I/O Bays that are located up to 1000 cable-feet away from and optically connected (using optical remoting) to an associated Switch Complex.

J Jitter

Short term variations of amplitude and frequency components of a digital signal from their ideal position in time.

L Lead Time

The time interval between placement of a product order and receipt of the product.

Lightguide Build-Out (LBO)

An attenuating (signal-reducing) element used to keep an optical output signal strength within desired limits.

Lightguide Cross-Connect (LGX)

A SONET device that contains ports for optical fiber connections to an optical network element (NE). An LGX is used to make and change connections to an NE without changing the cabling on the NE itself.

Line

A transmission medium, together with the associated equipment, required to provide the means of transporting information between two consecutive network elements. One network element originates the line signal; the other terminates it.

Line Build Out (LBO)

An equalizer network that guarantees the proper signal level and shape at the DSX panel.

Line Controller Local Area Network (LCLAN)

The internal local area network that provides communications between the controlled circuit packs.

Line Protection

The optical interfaces can be protected by line protection. Line protection switching protects against failures of line facilities, including the interfaces at both ends of a line, the optical fibers, and any equipment between the two ends. Line protection includes protection of equipment failures.

Line Timing

Refers to a network element that derives its timing from an incoming OC-N/STM-N signal.

Link

The mapping between in-ports and out-ports. It specifies how components are connected to one another.

Literal Character

A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

Local Area Network (LAN)

A communications network that covers a limited geographic area, is privately owned and user administered, is mostly used for internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed.

Local I/O Complex

A local I/O Complex is one or more co-located Universal I/O Bays that are electrically cabled to an associated Switch Complex.

Location

An identifier for a specific circuit pack, interface module, interface port, or communications link.

Lockout of Protection

The WaveStar CIT command that prevents the system from switching traffic to the protection line from a working line. If the protection line is active when a “Lockout of Protection” is entered – this command causes the working line to be selected. The protection line is then locked from any Automatic, Manual, or Forced protection switches.

Lockout State

The Lockout State shall be defined for each working or protection circuit pack. The two permitted states are: None – no lockout is set for the circuit pack, Set – the circuit pack has been locked out. The values (None & Set) shall be taken independently for each working or protection circuit pack.

Logical Tributary

With regards to electrical ports and unprotected optical ports – a logical tributary is the same as the port tributary. With regards to port protection groups – a logical tributary is a path-level unit of bandwidth within a port protection group.

Loopback

Type of diagnostic test used to compare an original transmitted signal with the resulting received signal. A loopback is established when the received optical or electrical external transmission signal is sent from a port or tributary input directly back toward the output.

Loop Timing

A special case of line timing. It applies to network elements that have only one OC-N/STM-N interface. For example, terminating nodes in a linear network are loop timed.

Loss Budget

Loss (in dB) of optical power due to the span transmission medium (includes fiber loss and splice losses).

Loss of Frame (LOF)

A failure to synchronize to an incoming signal.

Loss of Pointer (LOP)

A failure to extract good data from a signal payload.

Loss of Signal (LOS)

The complete absence of an incoming signal.

M M23-Format

A standard framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3 (sometimes referred to as M13-format, without C-bit parity).

Major

Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

Maintenance Condition

An equipment state in which some normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that can not be performed while normal service is being provided.

Manual Switch State

A protection group shall enter the Manual Switch State upon the initiation and successful completion of the Manual Switch command. The protection group leaves the Manual Switch state by means of the Clear or Forced Switch commands. While in the Manual Switch state the system may switch the active unit automatically if required for protection switching.

Mapping

The logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices or addresses on another network.

Mediation Device (MD)

Allows for exchange of management information between Operations System and Network Elements.

Mid-Span Meet

The capability to interface between two lightwave network elements of different vendors. This applies to high-speed optical interfaces.

Minor (MN)

Indicates a non-service-affecting failure of equipment or facility.

Miscellaneous Discrete Interface

Allows an operations system to control and monitor equipment collocated within a set of input and output

contact closures.

Mixed Module

One of the ways the bottom portion of an SDH Universal I/O Shelf or a Universal I/O Shelf, the Facility Interface Sub-Shelf, may be populated. A combination of OC48/STM16, OC12/STM4, OC3/STM1, and DS3EC1/8 port units is used to populate a Mixed Module (Universal I/O Shelf). A combination of OC48/STM16, OC12/STM4, OC3/STM1, and STM1E/4 port units is used to populate a Mixed Module (an SDH Universal I/O Shelf).

Modify

A user initiated command, at the WaveStar CIT, to modify attributes within an existing entity.

Module

Term used to designate an equipped shelf. For example, a SWIF Module is a Switch Interface Sub-Shelf that is equipped with SWIF packs.

Multiplexer

A device (circuit pack) that combines two or more transmission signals into a combined signal on a shared medium.

Multiplexer Section Shared Protection Ring (MS-SPRing)

A ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring. MS-SPRings are functionally equivalent to SONET Bidirectional Line-Switched Rings (BLSRs).

Multiplexing

The process of combining multiple signals into a larger signal at the transmitter by a multiplexer. The large signal is then split into the original smaller signals at the receiver by a demultiplexer.

N Network Element (NE)

A node in a telecommunication network that supports network transport services and is directly manageable by a management system.

Network Monitoring and Analysis (NMA)

An operations system designed by Telcordia which is used to monitor network facilities.

Network Service Access Point (NSAP) Address

Network Service Access Point Address (used in the OSI network layer 3). An automatically assigned number that uniquely identifies a Network Element for the purposes of routing DCC messages.

Node

A network element in a ring or, more generally, in any type of network. In a network element supporting interfaces to more than one ring, node refers to an interface that is in a particular ring. Node is also defined

as all equipment that is controlled by one system controller. A node is not always directly manageable by a management system.

Non-Blocking Service Cross-Connection Capacity

The service cross-connection capacity that is guaranteed to the user to be free from blocking. The system architecture allows for terminating a total transmission capacity on the transmission interfaces that is in excess of the non-blocking service cross-connection capacity of the system. Only the capacity that can be terminated on the main cross-connection fabric without blocking makes up the non-blocking service cross-connection capacity.

Non-Preemptible Protection Access (NPPA)

Non-preemptible protection access increases the available span capacity for traffic which does not require protection by a ring, but which cannot be preempted.

Non-Revertive Switching

In non-revertive switching, an active and standby line exist on the network. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the active line. The original active line then becomes the standby line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

Non-Volatile Memory (NVM)

Memory that retains its stored data after power has been removed. An example of NVM would be a hard disk.

No Request State

This is the routine-operation quiet state in which no external command activities are occurring.

Not Monitored (NMON)

A provisioning state for equipment that is not monitored or alarmed.

O On-Cable Identifier

Also known as the Physical Shelf Identifier. This is a user provisionable parameter.

One-Way Path-Protected Cross-Connection

A two-legged interconnection between two STS-N/STM-N input tributaries and one STS-N/STM-N output tributary. It consists of one path protected group with two legs, a working leg and a protection leg. The path protection group is provisioned to provide path-level protection switching for all the constituent signals carried by the cross-connection. Each leg must be at the same cross-connection rate.

One-Way Point-to-Point Cross-Connection

A one-legged interconnection, that supports one-way transmission, between an input tributary and an output tributary at a particular transmission rate (for example, STS-1/STM-1).

One-Way Roll Cross-Connection

An operation consisting of moving the INPUT of any existing leg of any cross-connection from a given tributary to a second tributary, while leaving the output unchanged. Typically, a roll is used as a tail-end switch in a facility or tributary rolling operation, whereby traffic is moved from the facility to another or from one tributary to another on the facility. The head-end side of a facility or tributary roll usually has a bridge established (in one NE) so that the traffic flows on both the old and new facilities. This serves to minimize the signal interruption time when the roll is carried out to that introduced by the roll itself (in the other NE). A roll is inherently a one-way operation, but because facilities are generally two-way, a head-end bridge/tail-end roll sequence is typically done on both directions.

Open 4-Fiber BLSR/MS-SPRing

When only two ports of the BLSR/MS-SPRing are selected, then the user can provision the two ports in either of two ways, (a) one port as the “West Working Port” and one port as “West Protection Port”, or (b) one port as the “East Working Port” and one port as “East Protection Port.” This arrangement is also sometimes referred to as a one-sided node.

Open Ring Network

A network formed of a linear chain-shaped configuration of network elements. Each network element connects to two others, one on each side, except for two network elements at the ends which are connected on only one side. A closed ring can be formed by adding a connection between the two end nodes.

Open Systems Interconnection (OSI)

Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO).

Operations Interface

Any interface providing you with information on the system behavior or control. These include the equipment LEDs, user panel, WaveStar CIT, office alarms, and all telemetry interfaces.

Operations Interworking (OI)

The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET/SDH network or from a centralized operations system.

Operations System (OS)

A central computer-based system used to provide operations, administration, and maintenance functions.

Operations System for Intelligent Network Elements (OPS/INE)

A Telcordia configuration management operations system.

Operator

A user of the system with operator-level user privileges.

Optical Carrier 3/Synchronous Transport Module 1 (OC3/STM1)

The OC3/STM1 port unit provides a bidirectional port which is provisionable at either the OC-3- or

STM-1-rate. The OC3/STM1 port unit is used in the OC3/STM1 Optical Modules and the Mixed Modules of the Facility Interface Sub-Shelf.

Optical Carrier 12/Synchronous Transport Module 4 (OC12/STM4)

The OC12/STM4 port unit provides a bidirectional port which is provisionable at either the OC-12- or STM-4-rate. The OC12/STM4 port unit is used in the OC12/STM4 Optical Modules and the Mixed Modules of the Facility Interface Sub-Shelf.

Optical Carrier 48/Synchronous Transport Module 16 (OC48/STM16)

The OC48/STM16 port unit provides a bidirectional port which is provisionable at either the OC-48- or STM-16-rate. The OC48/STM16 port unit is used in the OC48/STM16 Optical Modules and the Mixed Modules of a Facility Interface Sub-Shelf.

Optical Carrier 192/Synchronous Transport Module 64 (OC192/STM64)

The OC192/STM64 port unit provides a bidirectional port which is provisionable at either the OC-192- or STM-64-rate. The OC192/STM64 port unit is used in the OC192/STM64 Optical Module of the Facility/SWIF Interface Sub-Shelf of the 10G I/O Shelf.

Optical Carrier N (OC-N)

An optical carrier signal at the SONET rate of N, where N equals 1, 3, 12, 48, or 192. The basic rate of an OC-1 signal is 51.84 Mb/s, equivalent to an STS-1, with other values of N direct multiples of this basic rate.

Optical Channel

An OC-N/STM-N wavelength within an optical line signal. Multiple channels, differing by 1.5m in wavelength, are multiplexed into one signal.

Optical Line Signal

A multiplexed optical signal containing multiple wavelengths or channels.

Optical Module

One of the three ways the bottom portion of a Universal I/O Shelf, the Facility Interface Sub-Shelf of a Universal I/O Shelf, may be populated. Either OC48/STM16, OC12/STM4, or OC3/STM1 port units are used to populate optical modules. The Facility/SWIF Interface Sub-Shelf of a 10G I/O Shelf may be equipped with OC192/STM64 port units.

Original Value Provisioning

Preprogramming of a system's original values at the factory. These values can be overridden using local or remote provisioning.

Outage

A disruption of service that lasts for more than 1 second.

Out-of-Service

The circuit pack is not providing its normal service function (removed from either the working or protection

state) either because of a system problem or because the pack has been removed from service.

P Parameter

A variable that is given a value for a specified application. A constant, variable, or expression that is used to pass values between components.

Parity Check

Tests whether the number of ones (or zeros) in an array of binary bits is odd or even; used to determine that the received signal is the same as the transmitted signal.

Pass-Through

Paths that are cross-connected directly across an intermediate node in a network.

Path

A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

Path Overhead (POH)

Informational bytes assigned to, and transported with the payload until the payload is demultiplexed. It provides for integrity of communication between the point of assembly of a virtual container and its point of disassembly.

Path Protection Group

The part of a cross-connection topology that is provisioned to provide path-level protection switching for all the constituent signals carried by the cross-connection. A path protection group can be identified as an entity by its logical output tributary and its cross-connection rate. A path protection group consists of one or more constituent path selectors.

Path Terminating Equipment

Network elements in which the path overhead is terminated.

Performance Monitoring (PM)

Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Peripheral Control and Timing Facility Interface (PCTFI)

A proprietary physical link interface supporting the transport of 21x2 Mb/s signals.

Platform

A family of equipment and software configurations designed to support a particular application.

Plesiochronous Network

A network that contains multiple subnetworks, each internally synchronous and all operating at the same

nominal frequency, but whose timing may be slightly different at any particular instant.

Polarization Mode Dispersion (PMD)

Output pulse broadening due to random coupling of the two polarization modes in an optical fiber.

Port (also called Line)

The physical interface, consisting of both an input and output, where an electrical or optical transmission interface is connected to the system and may be used to carry traffic between network elements. The words “port” and “line” may often be used synonymously. “Port” emphasizes the physical interface, and “line” emphasizes the interconnection. Either may be used to identify the signal being carried.

Port Protection Group

A user provisioned association of protected optical interface ports. This association is used for line protection. The group of ports represent both a protection switching entity and also a set of lines that carry services to/from another network element. The port protection groups also determine the set of logical tributaries from and to which cross-connections can be provisioned.

Port State Provisioning

A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports.

Port Tributary

A path-level unit of bandwidth within a port, or the constituent signal/signals being carried in this unit of bandwidth. It may generally be assumed that a port tributary is an STS-1/STM-1 tributary unless specified otherwise. For a port which is NOT in a port protection group (electrical port or unprotected group), a port tributary is the same entity as a logical tributary.

Port Unit

A transmission circuit pack that receives and transmits optical or electrical signals.

PPROC/FO

The PPROC/FO circuit pack, located in the CTL/Switch Interface Sub-Shelf of the 10G I/O Shelf, provides an interface between the OC192/STM64 port units and the SWITCH/STS768 packs.

Preprovisioning

The process by which the user specifies parameter values for an entity in advance of some of the equipment being present. These parameters are maintained only in NVM. These modifications are initiated locally or remotely by either a CIT or an OS. Preprovisioning provides for the decoupling of manual intervention tasks (for example, install circuit packs) from those tasks associated with configuring the node to provide services (for example, specifying the entities to be cross-connected).

Primary (PRI)

Designates a CTL/MEM circuit pack as the primary storage device for WaveStar BandWidth Manager.

Proactive Maintenance

Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal failure or signal degrade defect.

Protection

Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against equipment failures.

Protection Access

To provision traffic to be carried by protection tributaries when the port tributaries are not being used to carry the protected working traffic.

Protection AID

This shall be the port AID which has been assigned to be the protection port.

Protection Group Configuration

The members of a group and their roles, for example, working protection, line number, etc.

Protection Path

One of two signals entering a path selector used for path protection switching or dual ring interworking. The other is the working path. The designations working and protection are provisioned by the user, whereas the terms active path and standby path indicate the current protection state.

Protection Port Alarm Status

The highest alarm status associated with the protection port. Values shall be: Critical, Major, Minor, or Not Alarmed.

Protection State

When the working unit is currently considered active by the system and that it is carrying traffic. The “active unit state” specifically refers to the receive direction of operation — since protection switching is unidirectional.

Protection Tributary

A port tributary which can be used to protect the traffic carried by a working tributary in a port protection group, or a Logical Tributary that is associated with a Working Tributary within a common port protection group.

Provisioned (PROV)

Indicating that a circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

Provisioning

The modification of certain programmable parameters that define how the node functions with various installed entities. These modifications are initiated locally or remotely by either a CIT or an OS. They may

arrive at the node via the IAO LAN, CIT port, or any DCC channel. The provisioned data is maintained in NVM and/or hardware registers.

R Radio Buttons

A standard Windows control that allows a user to select from a fixed set of mutually exclusive choices (also referred to as option buttons).

Reactive Maintenance

Refers to detecting defects/failures and clearing them.

Rearrangement

An internal roll feature that allows for removing fragmented bandwidths between shelves. The roll is an “errorless roll” between connections. The rearrangement function allows the repositioning of STS-1/STM-1 or STS-3/STM-1 tributaries from the SWITCH/STS576 to the BSW or the HS switch. The reason for repositioning tributaries is to make STS-1s/STM-1s contiguous, and therefore, prevent blocking situations when cross-connecting concatenated signals.

Receive-Direction

The direction towards the Network Element.

Regeneration

The process of reconstructing a digital signal to eliminate the effects of noise and distortion.

Reliability

The ability of a software system performing its required functions under stated conditions for a stated period of time. The probability for an equipment to fulfill its function. Some of the ways in which reliability is measured are: MTBF (Mean Time Between Failures) expressed in hours; Availability = $(MTBF)/(MTBF+MTTR)(\%)$ [where MTTR = mean time to restore]; outage in minutes per year; failures per hour; percentage of failures per 1,000 hours.

Remote Defect Indication (RDI)

An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure. [Previously called far-end-receive failure (FERF).]

Remote Failure Indication (RFI)

A signal that alerts upstream path-terminating equipment that a downstream failure has been alarmed along the path. This action prevents multiple alarms from being activated for the same failure and ensures that a technician is dispatched to correct the failure. (Previously called yellow signals.)

Remote Network Element

Any Network Element that is connected to the referenced Network Element through either an electrical or optical link. It may be the adjacent node on a ring, or N nodes away from the reference. It also may be at the same physical location but is usually at another (remote) site.

Remove

A user initiated command at the WaveStar CIT to delete an entity and its associated attributes from the system.

Reservations

Allows the user the option of “reserving” any tributaries on any transmission interfaces for the following two purposes: first, to enhance cross-connection completion performance and second, to allow an OS that does not have all of the information needed to make such cross-connections. The reservation of a tributary creates a two-way connection for that tributary between the transmission interface (for example, OC48/STM16, etc.) and the interface to the main cross-connection fabric (SWIF circuit pack), but not through the main cross-connect fabric (BSW). If tributaries at both ends of a desired cross-connection have these established connections, then a subsequent request to make a cross-connection between these tributaries needs only to operate on the main cross-connect fabric, not on the main fabric plus two interface shelf fabrics.

Retrieve

A user initiated command at the WaveStar CIT to retrieve an entity state/status from the NE.

Return to Zero

A code form having two information states (termed zero and one) and having a third state or an at-rest condition to which the signal returns during each period.

Revertive

A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the working equipment is active, and the protection equipment is standby) after any failure conditions that caused a protection switch to occur, clear, or after any external switch commands are reset. (See “Non-Revertive.”)

Revertive Switching

In revertive switching, there is a working and protection high-speed line, circuit pack, etc. When a protection switch occurs, the protection line, circuit pack, etc. is selected. When the fault clears, service “reverts” to the working line.

Right Click

To select an object by pressing and releasing the right mouse button which brings up a Right Click Pop-up Menu. The default command may be brought up by double-clicking on an object with the right mouse button.

Right Click Pop-up Menu (RCPM)

A menu which is displayed at the location of a selected object; the commands contained within the RCPM are contextually relevant to that object. Users may configure mouse buttons to their preferences, so that the pop-up menu may in fact be accessed via the left mouse button. The default menu item, if any, is shown in bold.

Ring

A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over the protection capacity.

Ring Side

When an optical interface is provisioned as a member of a port protection group for a specific type of protection, the port (line) is assigned a ring-side (West or East) and/or line name (working or protection) to identify its role. A 4-fiber BLSR/MS-SPRing has four lines identified by West and East ring-sides and as working and protection lines within each side. With 1+1 line protection there are two lines identified as working and protection lines. With 1xN line protection there are N+1 lines identified as working lines through N and a protection line.

Roll Cross-Connection

A user operation which results in moving the input of any existing leg of any cross-connection from a given tributary to a second tributary, while leaving the output unchanged. Typically, a roll is used as a tail-end switch in a “facility or tributary rolling” operation, whereby traffic is moved from one facility to another or from one tributary to another on a facility. The head-end side of a facility or tributary roll usually has a bridge established (in one NE) so that the traffic flows on both the old and new facilities, minimizing the signal interruption time when the roll is carried out to that introduced by the roll itself (in the other NE). A roll is inherently a one-way operation, but because facilities are generally two-way, a head-end bridge/tail-end roll sequence is typically done on both directions.

Router

An interface between two networks. While routers are like bridges, they work differently. Routers provide more functionality than bridges. For example, they can find the best route between any two networks, even if there are several different networks in between. Routers also provide network management capabilities such as load balancing, partitioning of the network, and trouble-shooting.

S SDH I/O Bay

An SDH I/O Bay is capable of housing two SDH Universal I/O Shelves. The SDH Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

SDH Universal I/O Shelf

An SDH Universal I/O Shelf may be housed in an SDH I/O Bay or a 10G/SDH I/O Bay. The SDH Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

Secondary (SEC)

Designates a secondary CTL/MEM circuit pack as the secondary storage device for WaveStar BandWidth Manager.

Section

The portion of a transmission facility, including terminating points, between a terminal network element and a line-terminating network element, or two line-terminating network elements.

Section Layer

The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

Self-Healing

A network's ability to automatically recover from the failure of one or more of its components.

Server

Computer in a computer network that performs dedicated main tasks which generally require sufficient performance.

Severely Errored Seconds (SES)

This performance monitoring parameter is a second in which a signal failure occurs, or more than a preset amount of coding violations (dependent on the type of signal) occur.

Service

The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

Service Cross-Connection Capacity

The capacity that can be used for carrying service traffic. Any cross-connection capacity that is required for transmission interface protection switching is separate and does not reduce the service cross-connection capacity.

Service Preserving Reset

A reset on a controller that does not cause transmission hardware devices to be reset. Transmission service is preserved in the sense that the devices continue to operate and carry service.

Service Preserving Reset With Database Reload from NVM

A service preserving reset in which the database will be loaded from NVM into RAM and device settings will be rewritten to reflect values stored in NVM. If the values in NVM disagree with current device settings in hardware, then transmission could be impacted when new device settings are written.

Shelf View

A graphical depiction of one shelf. Selectable objects in this view are the shelf, the slots/circuit packs, and the ports.

Shortcut Key

A keyboard key or key combination that invokes a particular command. Also referred to as an accelerator key or a hot key.

Signal-to-Noise Ratio (SNR)

The relative strength of signal compared to noise.

Signal Rate

An attribute that defines the bit-rate and format of the signal. The signal rate is defined by the STS-N path-level signal bit-rate and format including the presence or absence of concatenation.

Single-Ended Operations

Provides operations support from a single location to remote Network Elements in the same SONET subnetwork. With this capability you can perform operations, administration, maintenance, and provisioning on a centralized basis. The remote Network Elements can be those that are specified for the current release.

Single-Mode Fiber (SM)

An 8-m diameter low-loss, long-span optical fiber typically operating at either 1310 nm, 1550 nm, or both.

Site Address

The unique address for a Network Element.

Slot

A physical position in a shelf for holding a circuit pack and connecting it to the backplane. This term is also used loosely to refer to the collection of ports or tributaries connected to a physical circuit pack placed in a slot.

Slot Provisioned

A slot will transition from empty to equipped when the circuit pack insertion is detected, validated, and the hardware registers are loaded. The slot remains so provisioned until the object is deprovisioned.

Software Backup

The process of saving an image of the current network element's databases, which are contained in its NVM, to a remote location. The remote location could be the WaveStar CIT or an OS.

Software Download

The process of transferring a generic (full or partial) or provisioned database from a remote entity to the target network element's memory. The remote entity may be the WaveStar CIT or an OS. The download procedure uses bulk transfer to move an uninterpreted binary file into the network element.

Software ID

Number that provides the software version information for the system.

Software Installation

The process of actually interpreting and unpacking the binary program of data, that was loaded in the NVM by a previous software download operation, and copying the constituent data items to their designated locations within the network element's memory.

Software Restore

The inverse of a Software Backup. The process of simultaneously copying the backed-up database, from the remote location, to the current network element's Primary-0 NVM and Primary-1 NVM.

Software Upgrade

A combination of the (a) software download, (b) install, and (c) commit process. An upgrade is performed when the system software is to be changed to a new release.

Span

An uninterrupted bidirectional fiber section between two network elements.

Span Growth

A type of growth in which one wavelength is added to all lines before the next wavelength is added.

Squelch Map

This map contains information for each cross-connection in a ring and indicates the source and destination nodes for the low-speed circuit that is part of the cross-connection. This information is used to prevent traffic misconnection in rings with isolated nodes or segments.

Standby

The circuit pack is in service but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

Standby Path

One of two signals entering a constituent path selector, the standby path is the path not currently being selected.

State

The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

Status

The indication of a short-term change in the system.

STM-1 Equivalent

Unit of cross-connection capacity in terms of STM-1 bandwidth units, independent of the actual mix of cross-connection rates.

STM1E/4

Port unit that provides 4 bidirectional ports at the STM-1e-rate.

STM1e Connector Panel

The two panels on one or both sides of a Facility Interface Sub-Shelf (SDH Universal I/O Shelf) containing STM1E/4 port units. The STM1e Connector Panels provide an interface between the STM1E/4 port units and the backplane via 43-type or 1.6/5.6 connectors.

STS-1E

Now referred to as EC-1. A signal typically carried by coaxial cables from one equipment location to another. The term EC-1 refers to the organization and data rate of the signal and also to the voltage template the signal must conform to and the impedances for which the voltage template is valid.

STS-1 Equivalent

Unit of cross-connection capacity in terms of STS-1 bandwidth units, independent of the actual mix of cross-connection rates.

STS-1

The basic building block logical signal in the SONET standard with a data rate of 51.84 Mb/s.

STSX-1

Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the STS-1 level.

Subnetwork

A group of interconnected/interrelated Network Elements. The most common connotation is a synchronous network in which the Network Elements have data communications channel (DCC) connectivity.

Superframe Format (SF)

A DS1 framing format in which 24 DS0 timeslots plus a coded framing bit are organized into a frame which is repeated 12 times to form the superframe.

Suppression

A process where service-affecting alarms that have been identified as an “effect” are not displayed to a user.

SWIF Module

A SWIF Module is a Switch Interface Sub-Shelf equipped with either one pair (96 STS-1/32 STM-1 equivalents) or two pairs (192 STS-1/64 STM-1 equivalents) of SWIF packs.

Switch Bay

A Switch Bay is equipped with a fully-equipped Switch Shelf. The spaces above and below the Switch Shelf are reserved for future features.

Switch Center (SWC)

Logical grouping of BSW switch packs, TMG/STRAT3 circuit packs and SWIEX circuit packs in a Switch Shelf. The number of these circuit packs needed for a SWC depends on the size of the switch.

Switch Complex

The 4608/1536 Switch Complex includes two Switch Bays or one Control/Switch Bay and one Switch Bay. The 9216/3072 Switch Complex includes four Switch Bays or one Control/Switch Bay and three Switch Bays. Each bay is equipped with one fully-equipped Switch Shelf.

Switch Interface (SWIF)

The SWIF circuit pack converts TXI data format into the byte-sliced format utilized by the BSW circuit pack.

Switch Interface Capacity

The service-carrying capacity STS-1/in STM-1 equivalent “Inter-Connection Links” between the transmission interface shelves and the main cross-connection fabric. Each STS-1/STM-1 equivalent of switch interface bandwidth interconnects to one STS-1/STM-1 equivalent of main fabric bandwidth (that is to say, one STS-1/STM-1 equivalent inlet and one STS-1/STM-1 equivalent outlet). The sum of all the switch interface capacity that can be equipped in the system is equal to the non-blocking service cross-connection capacity of the system.

Switch Interface Sub-Shelf

The top portion of a Universal I/O Shelf which may be equipped, depending on the port units and circuit packs used, with either one or two pairs of SWIF circuit packs. The Switch Interface Sub-Shelf provides the interface between the transmission port units in the Facility Interface Sub-Shelf and the main switch fabric provided by the Switch Shelves.

SWITCH/DS3EC1

Port unit responsible for implementing DS3EC1/8 1x12 protection switching for up to 96 DS3 or EC-1 signals.

SWITCH/STM1E4

Port unit responsible for implementing STM1E/4 1x8 protection switching.

Switch Shelf

The Switch Shelf is located in the middle of a Switch Bay or below a System Controller Shelf in a Control/Switch Bay. A fully-equipped Switch Shelf contains 16 BSW circuit packs (for 4608/1536 switching) and two TMG and SWIEX circuit packs.

Synchronization Messaging

Synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

Synchronous

The essential characteristic of time scales or signals such that their corresponding significant instances occur at precisely the same average rate, generally traceable to a single Stratum-1 source.

Synchronous Digital Hierarchy (SDH)

A hierarchical set of digital transport structures, standardized for the transport of suitable adapted payloads over transmission networks.

Synchronous Network

The synchronization of transmission systems with synchronous payloads to a master (network) clock that

can be traced to a reference clock.

Synchronous Optical Network (SONET)

The North American standard for the rates and formats that defines optical signals and their constituents.

Synchronous Payload

Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame. Therefore, no variable bit-stuffing rate adjustments are required to fit the payload in the transmission signal.

Synchronous Payload Envelope (SPE)

The combined payload and path overhead of an STS-1, STS-3c, STS-12c or STS-48c signal.

Synchronous Transport Signal (STS, STS-N)

The basic logical building block signal for SONET with a rate of 51.84 Mb/s for an STS-1 signal and a rate of N times 51.84 Mb/s for an STS-N signal.

Synchronous Transport Signal, Level N, Concatenated (STS-Nc)

A concatenated SONET payload signal at the STS-N rate, where N equals 3, 12, or 48. For example, an STS-3c signal is constructed by concatenating three STS-1 signals into a signal that uses a single path overhead, rather than three.

System Controller Bay

The bottom shelf is available to house the NCC and the middle shelf is equipped with a System Controller Shelf.

System Controller Shelf

Located in the middle shelf of the System Controller Bay or the top of a Control/Switch Bay, the System Controller Shelf houses the main controllers for WaveStar BandWidth Manager.

System View

A graphical depiction of the entire Network Element. Selectable objects in this view are the bays and shelves.

T T1

A carrier system that transmits at the rate of 1.544 Mb/s (a DS1 signal).

T2

A carrier system that transmits at the rate of 6.312 Mbps (a DS2 signal).

T3

A carrier system that transmits at the rate of 44.736 Mbps (a DS3 signal).

Target Identifier (TID)

A provisionable parameter that is used to identify a particular Network Element within a network. It is a character string of up to 20 characters where the characters are letters, digits, or hyphens (-).

Telcordia Technologies

Telcordia Technologies (formerly Bellcore) is a well-recognized telecommunications' standards organization.

Test Access

A set of cross-connection topologies used in conjunction with a testing system to monitor and "split" signal paths for purposes of fault isolation.

Through (or Continue) Cross-Connection

A cross-connection within a ring, where the input and output tributaries have the same tributary number but are in lines opposite each other.

Threshold-Crossing Alert (TCA)

A message type sent from a Network Element that indicates that a certain performance monitoring parameter has exceeded a specified threshold.

Through Timing

Refers to a network element that derives its transmit timing in the east direction from a received line signal in the east direction and its transmit timing in the west direction from a received line signal in the west direction.

Time Division Multiplexing (TDM)

A technique for transmitting a number of separate data, voice, and/or video signals simultaneously over one communications medium by interleaving a portion of each signal one after another.

Time Slot Assignment (TSA)

A capability that allows any tributary in a ring to be cross-connected to any tributary in any lower-rate, non-ring interface or to the same-numbered tributary in the opposite side of the ring.

Time Slot Interchange (TSI)

The ability of the user to assign cross-connections between any tributaries of any lines within a Network Element. Three types of TSI can be defined: Hairpin TSI, Interring TSI (between rings), and Intraring TSI (within rings).

Timing/Stratum 3 (TMG/STRAT3)

TMG/STRAT3 circuit pack provides a Stratum 3 clock for its shelves.

Tooltip

A standard Windows control that provides a small pop-up window that provides descriptive text (such as a label) for a control or graphic object.

Transaction Language One (TL1)

A machine-to-machine communications language that is a subset of ITU's human-machine language.

Transmit-Direction

The direction outwards from the Network Element.

Tributary

A path-level unit of bandwidth within a port, or the constituent signal(s) being carried in this unit of bandwidth, for example, an STS-1 tributary within an OC-N port.

True Wave™ Optical Fiber

Lucent Technologies' fiber generally called non-zero dispersion-shift fiber, with a controlled amount of chromatic dispersion designed for amplified systems in the 1550/1310 nm range.

Two-Way Point-to-Point Cross-Connection

A two-legged interconnection, that supports two-way transmission, between two and only two tributaries.

Two-Way Roll

The operation which moves a two-way cross-connection between tributary i and tributary j to a two-way cross-connection between the same tributary i and a new tributary k with a single user command.

U Unavailable Seconds (UAS)

In performance monitoring, the count of seconds in which a signal is declared failed or in which 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

Unidirectional Path-Switched Ring (UPSR)

Path-Switched rings employ redundant fiber optic transmission facilities in a pair configuration, with one fiber transmitting in one direction (for example, East) and the backup fiber transmitting in the other direction (for example, West). If the primary ring fails, then the protection ring takes over.

Universal I/O Bay

A Universal I/O Bay is capable of housing two Universal I/O Shelves. The Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

Universal I/O Shelf

A Universal I/O Shelf may be housed in a Universal I/O Bay or a 10G/Universal I/O Bay. The Universal I/O Shelves are each divided into a Switch Interface Sub-Shelf and a Facility Interface Sub-Shelf.

Upstream

At or towards the source of the considered transmission stream, for example, looking in the opposite direction of transmission.

Upstream Pack

Given a pack-to-pack interface, the upstream pack is the transmitting pack.

User Privilege

Permits a user must perform on the computer system on which the system software runs.

User-to-Network Interface (UNI)

The specifications for the procedures and protocols between a user and the Asynchronous Transfer Mode (ATM) network.

V Value

A number, text string, or other menu selection associated with a parameter.

Variable

An item of data named by an identifier. Each variable has a type, such as Int or Object, and a scope.

Violation Monitor and Removal (VMR)

A provisionable mode for DS3 output that causes parity violations to be monitored and corrected before the DS3 signal is B3ZS encoded.

Virtual

Refers to artificial objects created by a computer to help the system control shared resources.

Virtual Circuit

A logical connection through a data communication (for example, X.25) network.

Virtual Tributary (VT)

A structure designed for transport and switching of sub-STs-1 payloads. There are currently four sizes: VT1.5 (1.728 Mb/s), VT2 (2.304 Mb/s), VT3 (3.456 Mb/s), and VT6 (6.912 Mb/s).

Virtual Tributary Group (VT-G)

A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte interleaved with the VT-organized synchronous payload envelope.

Voice Frequency (VF) Circuit

A 64 kilobit per second digitized signal.

Volatile Memory

Type of memory that is lost if electrical power is interrupted.

VT1.5 Tributary

A SONET logical signal with a data rate of 1.728 Mbps. In the 9-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group

occupies twelve columns of the 9-row structure and, for VT1.5s, contains four VTs per group.

W Wait-to-Restore (WTR)

Applies to revertive switching operation. The protection group enters the WTR state when all Equipment Fail (EF) conditions are cleared, but the system has not yet reverted back to its working line. The protection group remains in the WTR state until the Wait-to-Restore timer completes the WTR time interval.

Wait to Restore Time (WRT)

Corresponds to the time to wait before switching back after a failure has cleared (in a revertive protection scheme). The WRT can be between 0 and 15 minutes, in increments of one minute.

Wavelength Add/Drop (WAD)

The process of adding and dropping wavelengths to provide more efficient transmission.

Wavelength Division Multiplexing (WDM)

A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

Wavelength Interchange

The ability to change the wavelength associated with an OC-N signal into another wavelength.

WaveStar Optical Line System

Lucent Technologies' lightwave transmission system. Utilizing DWDM technology, the system combines multiple signals of different wavelengths, transmits the resulting signal over a single fiber, and then demultiplexes the signal at the receive end.

WaveStar SNMS

WaveStar SubNetwork Management System (formerly known as ITM SNC [Integrated Transport Management SubNetwork Controller]).

Wide Area Network (WAN)

A communication network that uses common-carrier provided lines and covers an extended geographical area.

Wideband Communications

Voice, data, and/or video communication at digital rates from 64 kb/s to 2 Mb/s.

Wizard

A form of user assistance that automates a task through a dialog with the user.

Working

Label attached to a physical entity. In case of revertive switching the working line or unit is the entity that is carrying service under normal operation. In case of nonrevertive switching the label has no particular

meaning.

Working AID

This shall be the port AID which has been assigned to be the working port.

Working Path

One of two signals entering a constituent path selector, the working path is the path carried by the working cross-connection leg of the path protection group.

Working Port Alarm Status

The highest alarm status associated with the working port. Values are: Critical, Major, Minor, or Not Alarmed.

Working State

A working unit that is currently considered active by the system and is carrying traffic in the working state.

Working Tributary (same as “service tributary”)

A Logical Tributary. A member of a Protection Group. The tributary that is currently carrying traffic, but, which can be protected.

X X.25 Interface/Protocol

The ITU packet-switched interface standard for terminal access that specifies three protocol layers: physical, link, and packet for connection to a packet-switched data network.

X-Terminal

Workstation that can support an X-Windows interface.

Z Zero Code Suppression

A technique used to reduce the number of consecutive zeros in a line-coded signal (B3ZS, B8ZS).



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