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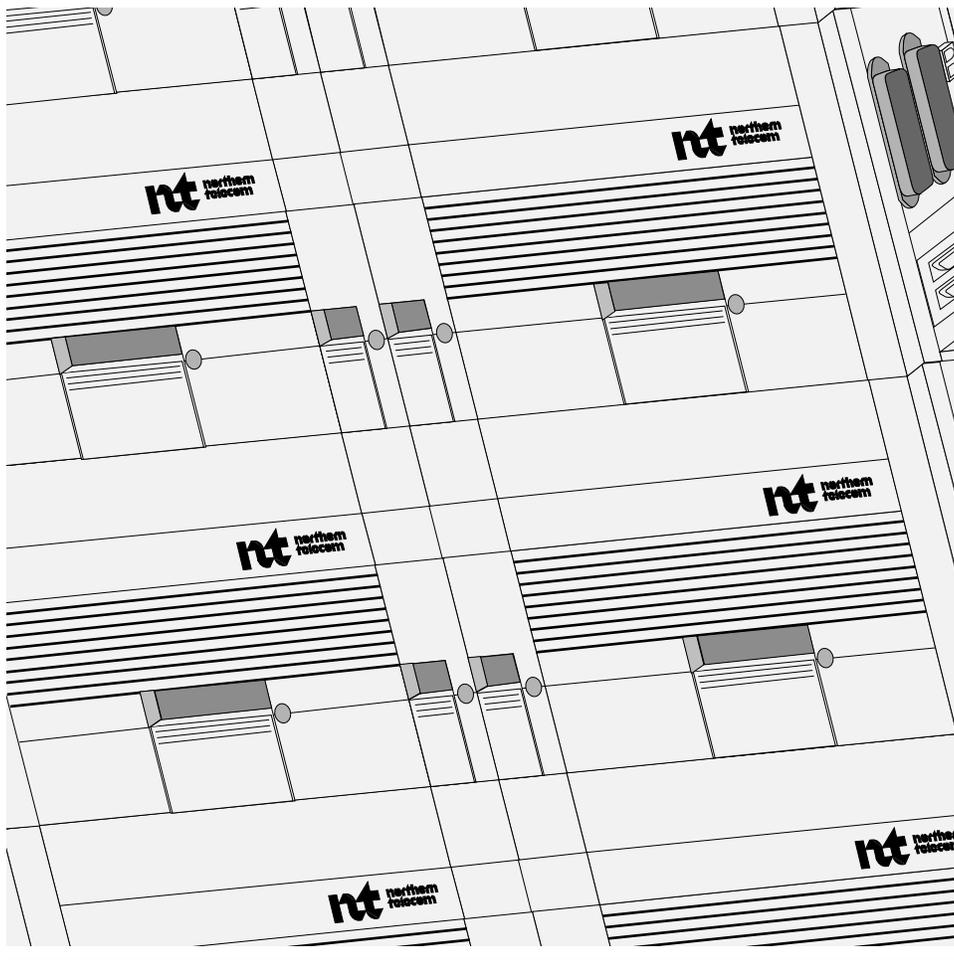
323-3001-221

SONET Products

AccessNode

Site Testing Procedures

Issue 2.0 June 1999



NORTEL
NETWORKS™

SONET Products

AccessNode

Site Testing Procedures

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AN12 Standard 01.01 release of the document that includes information on VTBM rings.

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AN11 Standard release of the document with OC-3 trib updates.

May 1995

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April 1995

Standard AN10 release of the document.

December 1994

Standard AN08 release of the document. Site testing procedures were previously documented in *Commissioning and Site Testing Procedures*, 323-3001-220 in the AN07 release of AccessNode. From this release forward, this document *Site Testing Procedures*, 323-3001-221, will contain site testing procedures.

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About this document

Use this document to conduct optional in-bay tests of system equipment in fiber-fed applications. All tests are performed prior to placing the system into service.

Note 1: Detailed line card testing is described in *Line Card Testing Procedures*, 315-3001-316 in *Operations, Administration, and Provisioning*, Volume 4B.

Note 2: Site testing for DS1-fed systems is described in *DS1 Feeder Testing Procedures*, 323-3001-225, in this volume.

Procedures in this document generally apply to both the access bandwidth manager (ABM) shelf and the transport bandwidth manager (TBM) shelf. When a procedure applies to one shelf type only, this is noted in the procedure title or introductory paragraph.

Audience

This document is for maintenance technicians and experienced installers from Nortel (Northern Telecom) or other telephone operating companies.

How to use this document

This document has the procedures for site testing an AccessNode. Do these procedures after each network element (NE) is commissioned. As a guide for using this document, an overview of the process using flowcharts and document task lists are provided in Chapter 1.

Warnings and safety precautions

This section has the samples of the danger and caution warnings for proper handling and operation of equipment.

To avoid injury, follow all danger warnings provided with this product, as well as safety procedures established by your company.

To avoid damage to equipment or service interruptions, follow all caution warnings provided with this product, as well as procedures established by your company.

Samples of danger and caution warnings follow.



DANGER

Risk of personal injury

A danger warning informs the reader of a risk of personal injury.



CAUTION

Risk of service interruption or equipment damage

A caution warning informs the reader of a risk of service interruption or equipment damage.



DANGER

Risk of electric shock

This warning advises you of a possible electrical hazard. When you see this warning, proceed with care, to avoid personal injury.

References in this document

This document refers to the following documentation:

Engineering, Configuration, and Ordering Guide, Volume 1

- *Mapper Layouts Planning Guide*, 323-3001-154
- *Line Card Applications and Special Services Engineering*, 323-3001-155
- *Site Installation Planning and Engineering*, 323-3001-200

Commissioning and Testing, Volume 3A

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

Commissioning and Testing, Volume 3B

- *Optional Commissioning Procedures*, 323-3001-220
- *System Testing Procedures*, 323-3001-222
- *DS1 Feeder Testing Procedures*, 323-3001-225

Operations, Administration, and Provisioning, Volume 4A

- *Network Element User Interface Description*, 323-3001-300
- *OPC User Interface Description*, 323-3001-301
- *System Administration Procedures*, 323-3001-302
- *Data Administration Procedures*, 323-3001-304

Operations, Administration, and Provisioning, Volume 4B

- *Provisioning and Operations Procedures*, 323-3001-310
- *Line Card Provisioning Procedures*, 323-3001-315
- *Line Card Testing Procedures*, 323-3001-316

Operations, Administration, and Provisioning, Volume 4C

- *System Expansion Procedures*, 323-3001-324

Maintenance, Volume 5A

- *Alarm and Trouble Clearing Procedures*, 323-3001-543

Maintenance, Volume 5C

- *Network Surveillance Procedures*, 323-3001-510
- *Routine Maintenance Procedures*, 323-3001-546
- *Module Replacement Procedures*, 323-3001-547

Separately Bound Documents

- *Bay in Central Office Installation Manual—ABM*, 323-3001-201
- *Bay in Central Office Installation Manual—TBM*, 323-3001-202

To test a remote fiber terminal (RFT) installed in a Modular Business Package (MBP), the following additional documentation is required.

- *Modular Business Package Installation Manual*, 323-3001-206

MPR25/MPR15 (NT5C06)

- *Switch Mode Rectifier*, 169-2071-500

To test an RFT installed in a Series 800A outside plant cabinet (OSP), the following document is required.

- *Series 800A Outside Plant Cabinet Installation Manual*, 323-3001-210

Overview of site testing

This chapter describes the steps required to perform optional site testing on a new system network element (NE) in a point-to-point, single-ended, or ring system. Site testing for DS1-fed systems is described in *DS1 Feeder Testing Procedures*, 323-3001-225, in this volume.

Site tests are usually performed in parallel with commissioning. The site that is commissioned and tested first depends on your system configuration. If you are commissioning a new or existing system with a portable operations controller (OPC), it is recommended that you start at the remote fiber terminal (RFT). If you are commissioning a new or existing system with a modular OPC, it is recommended that you start in the central office, at the fiber central office terminal (FCOT) or OPC shelf.

How to use this chapter

The procedures in this document are optional. Scan the following table to see which figures apply to your configuration:

If you have this system	then see
Point-to-point or Single-ended	Chapters 2 and 4
VTBM ring	Chapters 2, 3, and 4
DS1-fed	<i>DS1 Feeder Testing Procedures</i> , 323-3001-225, in this volume

If you are site testing a new single-ended system in an existing OPC span of control, then only the new RFT needs to be site tested (the existing OPC shelf is part of the new system and is already tested when it is first put into service).

If you cannot successfully complete these procedures, contact your next level of support.

The following table overviews the commissioning and testing process:

Commissioning and testing process overview	Document
<ul style="list-style-type: none"> • Start end-to-end tests on the new (not-in-service) system Access Node system: OPC, FCOT and RFT <p>These tests verify that the system is operational. Tests include:</p> <ul style="list-style-type: none"> - received optical power - software downloading and backing up - digital continuity - protection switching <p>It does not include end-to-end testing of line cards and DS1 tandem services.</p> <p>End-to-end tests for fiber-fed systems</p> <p>End-to-end tests for copper-fed systems</p>	<p><i>System Testing Procedures, 323-3001-222, in this volume</i></p> <p><i>DS1 Feeder Testing Procedures, 323-3001-225, in this volume</i></p>
<ul style="list-style-type: none"> • Ready the tested system for service • Provision the customer services <p>Test the line cards</p> <p>For provisioning information</p> <p>For line card testing information</p>	<p><i>Provisioning and Operations Procedures, 323-3001-310 in Operations, Administration, and Provisioning, Volume 4B</i></p> <p><i>Line Card Testing Procedures, 323-3001-316, Operations, Administration, and Provisioning, Volume 4B</i></p>
—end—	

Testing documents in the AccessNode library include:

Operations, Administration, and Provisioning, Volume 4C

- *System Expansion Procedures, 323-3001-324, Volume 4C.* This is used to test new functionality on an in-service system.

Maintenance, Volume 5

- *Routine Maintenance Procedures, 323-3001-546, Volume 5C.* This is used to test equipment on a routine basis.

Radio-frequency emissions notice

The following regulatory notice applies to AccessNode equipment:

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

Static electricity

It is usual for static electrical charges to build up on the body if a person walks a short distance. This buildup of static electricity is sufficient to damage some circuit packs if it is not properly discharged first. Circuit packs that are sensitive to damage by static electricity should be packaged in antistatic material. The following precautions are recommended.



CAUTION

Risk of equipment damage

Wear a grounded antistatic wrist strap or equivalent protection when handling circuit packs, to avoid damaging electronic parts.

Handling circuit packs

Units that are sensitive to static electricity are marked in their antistatic shipping bags with the following symbol:

ATTENTION

OBSERVER LES PRECAUTIONS
POUR LA MANIPULATION DES
DISPOSITIFS SENSIBLES AUX
CHARGES STATIQUES



ATTENTION

OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

To avoid static electrical damage when handling circuit packs, follow these rules:

- Do not remove circuit packs from their antistatic packages unless you are using antistatic protection, such as wearing an antistatic wrist strap. The wrist strap is attached to a long cord, that must terminate at a good ground source, so that static buildup is harmlessly discharged. Alternative antistatic methods include conductive carpet, conductive shoes, or heel grounders. Use the equipment recommended by your company.
- Handle each circuit pack by the faceplate or stiffener. Do not touch electrical connections, pins, or soldered surfaces.

Protect optical connectors by covering them with clean dust caps.

Storing and transporting circuit packs

When storing and transporting circuit packs, follow these rules:

- Never transport, stack or store circuit packs without first replacing them in their antistatic material and original shipping package. This avoids physical damage and accumulation of dirt or dust on goldplated contacts. Be careful not to damage any parts when inserting the circuit pack into its packaging.
- Avoid storage in areas where the relative humidity can exceed 95% and where the temperature can exceed 70°C, because boards may warp or corrode.

Laser radiation

AccessNode equipment and associated optical test sets use laser sources that emit light energy into fiber cables. This energy is within the red (visible) and infrared (invisible) regions of the electromagnetic spectrum.

Laser products are subject to federal and state or provincial regulations, and local practices. Regulation 21 CFR 1040 of the U.S. Bureau of Radiological Health requires manufacturers to certify each laser product as Class I, II, III, or IV, depending upon the characteristics of the laser radiation emitted. In terms of health and safety, Class I products present the least hazard (none at all), while Class IV products present the greatest hazard.



CAUTION

Risk of eye damage

At all times when handling optical fibers, follow the safety procedures recommended by your company.

Read and follow the precautions below, to decrease the risk of exposure to laser radiation.

Although Nortel S/DMS optical products have a Class I certification, hazardous exposure to laser radiation could occur when fibers that interconnect system components are disconnected or broken. Certain procedures carried out during testing require the handling of optical fibers without dust caps, and therefore increase the risk of exposure. Exposure to either visible or invisible laser light could cause eye damage under certain conditions.

The caution label at the right appears on the optical interface card, near the optical connector, and should be complied with.

Caution
Avoid direct exposure to beam. Invisible light can blind. Keep all optical connectors capped.

Equipment warning label

The equipment label is located in the top left corner of the back cover. It reads as follows:

To be installed only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA No. 70.

DS3 tests, STS-1 tests, and optical in-bay tests

This chapter describes how to test DS3 or STS-1 and optical equipment at a system network element (NE) supporting DS3 or STS-1 interfaces or a mix of DS1, DS3, and STS-1 interfaces.

You can test NEs that are not equipped with any DS1/VT or DS3 mappers or STS-1 interface cards by installing temporary DS1, DS3, STS-1 equipment and using the appropriate procedures. However, it is recommended that you use DS3 or STS-1 test procedures since they can be performed in a shorter period of time than the DS1 tests. Because there are no connections to a DSX-3/STS-1 cross-connect panel, digital signal continuity tests are not required. Because there is no protection mapper present, digital protection switching is not required. As a result, only optical receiver sensitivity and optical protection switching tests must be performed on systems not normally equipped with DS1s, DS3s, or STS-1s.

These procedures cover local in-bay tests on equipment located at a single NE and can form the basis for customer acceptance tests. Unless otherwise noted, one technician can perform these tests. End-to-end testing (between two NEs) of optical and digital equipment in a universal configuration is described in *System Testing Procedures*, 323-3001-222, in this volume.

Note 1: The Series 800A Outside Plant Cabinet and single-ended systems do not support DS3s.

Note 2: STS-1 tributaries are supported only on a TN_BLSR shelf.

How to use this chapter

Refer to the document task list in Chapter 1. The document task list identifies the procedures that must be performed.

Topic	See
Verifying STS-1 tributary SONET test set performance	page 2-6
Measuring optical receiver performance	page 2-8
Testing optical protection switching	page 2-18
Testing DS3 or STS-1 protection switching	page 2-32

If you cannot successfully complete these procedures, contact your next level of support.

DS3/STS-1 group and slot associations

DS3 or STS-1 circuit packs are in the lower level of the common equipment shelf. BNC input and output (I/O) cards are in the upper level. With DS3 mappers or STS-1 interface cards, “g1” refers to a group of modules including a working circuit pack and its corresponding three BNC I/O cards. Similarly, “p” refers to the group of modules including the protection circuit pack and the protection switcher cards.

The DS3 or STS-1 capacity of the system is dependent on the shelf type and the DS1, DS3, or STS-1 mix as well as the traffic that your system is carrying. For details about determining the capacity of your configuration, see *Optional Commissioning Procedures*, 323-3001-220, in this volume.

Group and slot association matrix

The group number you enter in a command string depends on the shelf type and function, the mapper type, and its slot location. Table 2-1 summarizes the group and slot associations for the different mappers and shelves.

Table 2-1
Group and slot association matrix

Mapper and shelf function		Mapper slot																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
DS1	DS1-fed ABM	G1	G2	P	G4															
	ABM FCOT or FCOT_BLSR	G1	G2	P	G4	G5	G6	G7	G8											
	TBM FCOT			G3	G4							G5	G6	P	G8	G9	G10	G11	G12	
	TBM FCOT_BLSR	G1	G2	G3	G4							G5	G6	P	G8	G9	G10	G11	G12	
	TBM TN_BLSR	G1	G2	G3	G4							G5	G6	G7	G8	G9	G10	G11	G12	P
DS3	ABM	P	S	G1		G2		G3												
	TBM FCOT	P	S								G1		-		G3		G4			
	TBM FCOT_BLSR or TN_BLSR	P	S								G1		G2*		G3		G4			
STS-1	TN_BLSR		S	P							G1		G2		G3		G4			
OC-3	ABM tributary	G3		G4	G1S		G2S													
	TBM tributary	G3		G4	G1S		G2S				G5	G6		G7	G8					
	Feeder									G1	G2									
OC-12	Feeder									G1	G2									
OC-12 VTBM	Feeder									G1	G2									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Note:		* For DS3 TBM FCOT_BLSR fiber-fed shelves, this group is available only if no DS1s are provisioned for that shelf.																		

Group and slot associations for DS3 or STS-1 cards

DS3 or STS-1 circuit packs are in the lower level of the common equipment shelf. DS3 or STS-1 input and output cards are in the upper level.

Note: The following tables do not imply that all slots are available for your configuration. For details about the capacity for each configuration, refer to the *Mapper Layouts Planning Guide*, 323-3001-154 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

For some tasks, you must also know the slot numbers of the input and output cards. Refer to the following tables to determine which the I/O slot(s) for the mapper you need.

If you are provisioning this equipment	For this shelf type	Then refer to
DS3 equipment	ABM	Table 2-2
	TBM	Table 2-3
STS-1 equipment	TBM	Table 2-4

For DS3 or STS-1 circuit packs, Tables 2-2, 2-3, and 2-4 show the association between mappers in the lower level of the common equipment shelf and input/output cards in the upper level.

DS3 I/O numbers

Table 2-2 lists the DS3 circuit pack groups for the ABM shelf functions. It also shows the association between mappers in the lower level of the shelf and input/output cards in the upper level.

Table 2-2
ABM DS3 mapper, group, and I/O numbers

Shelf function	Group or I/O slot	Mapper slot																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	-
RFT	Group	P	S	g1	—	g2	—	g3	—											
RFT_BLSR	I/O slots	—	—	34		38		42												
FCOT		—	—	35		39		43												
FCOT_BLSR		—	—	36		40		44												

Note 1: The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

Note 2: The symbol “P” in slot 1 denotes a protection mapper; the symbol “S” in slot 2 denotes a protection switch card.

Note 3: The symbol “g1” is a group of modules that include a working DS3 mapper circuit pack and its corresponding DS3 input circuit pack and DS3 output circuit pack.

Table 2-3 lists the DS3 circuit pack groups for the TBM shelf functions. It also shows the association between mappers in the lower level of the shelf, and input/output cards in the upper level.

Table 2-3
TBM DS3 mapper, group, and I/O numbers

Shelf function	Group or I/O slot	Mapper slot																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
FCOT	Group	P	S	—	—							g1	—	g2*	—	g3	—	g4	—	—
FCOT_BLSR	I/O slots	—	—									38		42*		46		50		
TN_BLSR		—	—									39		43*		47		51		
		—	—									40		44*		48		52		

Note 1: * This group is available for FCOT_BLSR shelves that have no DS1s provisioned.

Note 2: The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

Note 3: The symbol “P” in slot 1 denotes a protection mapper; the symbol “S” in slot 2 denotes a protection switch card.

Note 4: The symbol “g1” is a group of modules that include a working DS3 mapper circuit pack and its corresponding DS3 input circuit pack and DS3 output circuit pack.

STS-1 I/O numbers

Table 2-4 lists the STS-1 circuit pack groups for the TBM shelf functions. It also shows the association between mappers in the lower level of the shelf, and input/output cards in the upper level.

Table 2-4
TBM STS-1 mapper, group, and I/O numbers

Shelf function	Group or I/O slot	Mapper slot																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TN_BLSR	Group		S	P	—							g1	—	g2	—	g3	—	g4	—	—
	I/O slots	—	—									38		42		46		50		
		—	—									39		43		47		51		
		—	—									40		44		48		52		

Note 1: The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

Note 2: The symbol “P” in slot 3 denotes a protection mapper; the symbol “S” in slot 2 denotes a protection switch card.

Procedure 2-1

Verifying STS-1 tributary SONET test set performance

Use this procedure to verify STS-1 SONET test set performance. This verification is necessary to obtain reliable results when performing tests on a system equipped with STS-1 tributaries.

This procedure describes settings for HP test sets. Other brands of test sets use similar settings.

Requirements

You need the following tools and materials:

- one (1) HP 37704A SONET test set or equivalent
- one (1) electrical test cord

Action

Step	Action
------	--------

SONET test set

- | | |
|---|---|
| 1 | Set the Power switch to ON. |
| 2 | Set the Transmit Out settings as follows:

Transmit signal: STS-1

Clock sync: Internal or External BITS (as appropriate)

STS SPE under test: 1 |
| 3 | Set the Error Inject controls as follows:

Type: Line CV

Error Rate: OFF |

—continued—

Procedure 2-1 (continued)

Verifying STS-1 tributary SONET test set performance

Step	Action
-------------	---------------

STS-1 receiver test set

- 4 Set the receive settings to match the transmit settings.
- 5 Connect the electrical patchcord between input and output.

Verify test set

- 6 Press **Restart** on the test set.
The test set displays zero errors and alarms.
- 7 Press the **Single Bit Error Inject** button 3 times.
The STS-1 receiver test set displays 3 errors.
- 8 If you did not obtain the required results, check the settings and repeat the test. If necessary, replace the test set or the patchcords.
Note: Clean the STS-1 connectors and ensure proper mating of the connectors.
- 9 Disconnect the electrical patchcord.

Verify the STS-1 circuit pack

- 10 Connect the SONET test set to the STS-1 circuit pack under test.
- 11 Connect the output from the test set to the Receive of the STS-1 circuit pack.
Note: If you have more than one STS-1 interface circuit pack, you can daisy-chain them together by connecting the Transmit of the first STS-1 circuit pack to the Receive of the next. If the shelf is fully equipped with STS-1 tributaries, do this for all circuit packs. At the last circuit pack of the daisy-chain, connect the Transmit of the STS-1 circuit pack to the input of the test set.

—end—

Procedure 2-2

Measuring optical receiver performance

Use this procedure to verify OC-3/OC-12 receiver operation at minimum and maximum receiver input levels.

This procedure verifies that the network element (NE) receives error-free digital signals when the OC-3/OC-12 input level is adjusted to a minimum value and then its maximum value.

Note: If the system has mixed tributaries, perform the test on the higher rate tributaries.

Requirements

Do the following before starting this procedure:

- Make sure the system is not in service.
- Calibrate the optical power meter using the manufacturer's instructions.
- Make sure the OC-3/OC-12 lockout and DS3 or STS-1 lockout are in effect, and the DS3 or STS-1 daisy chain and DS3/STS-1 transmission test set are connected.

Note: If the user is testing with a temporary DS3/STS mapper or STS-1 interface card, then you do not need to set up a daisy-chain, test by connecting the DS3/STS-1 test set directly to the temporary BNC I/O card.

- Connect a VT100 user terminal to the network element (NE) at the local craft access panel (LCAP). If required see *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.

You need the following materials to perform this procedure:

- a variable optical attenuator (VOA), Hewlett-Packard 8156A, or equivalent, with two optical patch cords
- an optical power meter, 1310/1550 nm with a range of -50 to +5 dB
- a DS3/STS-1 transmission test set (HP 156 MTS (Cerjac), or equivalent)
- two (2) coaxial cables with proper connectors (BNC-to-BNC)

—continued—

 Procedure 2-2 (continued)

Measuring optical receiver performance

**DANGER****Risk of injury or damage**

Read the warnings and precautions in Chapter 1 to minimize any risk to personnel and equipment.

**CAUTION****Clean optical connectors**

Clean optical connectors to minimize signal attenuation and test errors caused by impurities.

To establish traffic continuity in a point-to-point or ring system, the network element user interface (NEUI) tool is used to set up simple synchronous transport signal (STS-1) connections between the feeder (OC-3/OC-12) optical circuit packs and the DS1, DS3, STS-1, or OC-3 tributaries.

Note: Note STS-1 tributaries are supported only on a TN_BLSR shelf.

Action

Step Action

If	Then start at
this NE has a working DS3/STS mapper or STS-1 interface card	step 3
you are using a temporary DS3/STS mapper or STS-1 interface card for testing only	step 1

- 1 Connect the DS3/STS-1 transmission test set to the temporary BNC I/O card in the upper section of the common-equipment shelf as follows:

- DS3 or STS-1 transmit (Tx) to the BNC In port
- DS3 or STS-1 receive (Rx) to the BNC Out port

Be sure that the cable is connected properly.

The proper connection of the DS3/STS-1 test set to the temporary BNC I/O card is shown in Figure 2-1 on page 2-10.

—continued—

2-10 DS3 tests, STS-1 tests, and optical in-bay tests

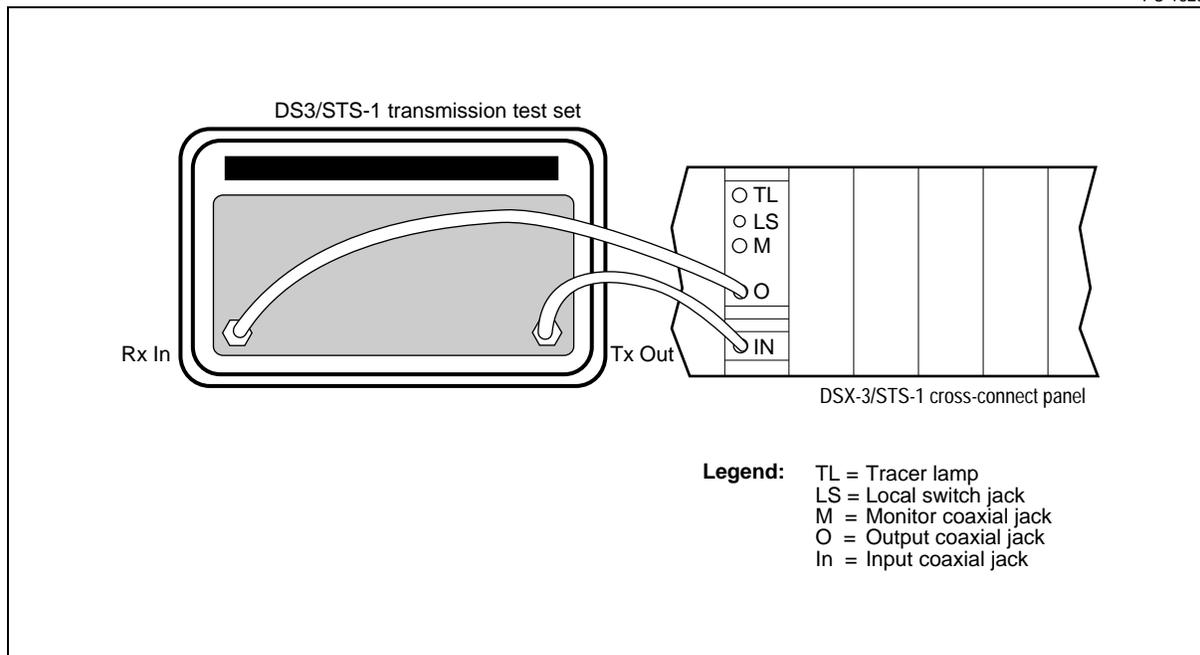
Procedure 2-2 (continued)

Measuring optical receiver performance

Step	Action
------	--------

Figure 2-1
DS3 or STS-1 test set connections to the temporary BNC I/O card

PC-16202



- 2 Press the Single Bit Error Inject button three times on the DS3/STS-1 test set.
The DS3/STS-1 test set displays 3 bit errors received.

If the errors are not detected, isolate the fault to the test cable or BNC I/O card and replace the defective part, then repeat this step.

Leave the DS3/STS-1 test set connected to the BNC I/O card.

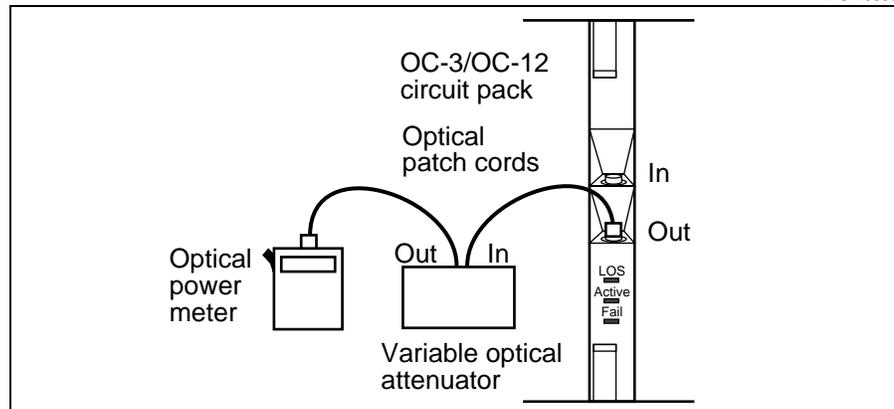
—continued—

Procedure 2-2 (continued)

Measuring optical receiver performance

- | Step | Action |
|------|---|
| 3 | As shown following, connect the output of the VOA to the optical power meter. Then connect the input of the optical attenuator to the transmit (Out) connector of the G1 OC-3/OC-12 circuit pack. |

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- 4 Set the VOA for single-mode, proper wavelength operation.



CAUTION

Risk of damage to the optical receiver

For the NT7E02 OC-12 long-reach (LR) interface circuit pack, received optical power must not exceed the following safe level: **-6.0 dBm**. Refer to *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

There are no damage levels for NT7E01 IR and LR, NT7E02 IR, and NT7E05 IR and LR optical interfaces.

—continued—

Procedure 2-2 (continued)

Measuring optical receiver performance

Step Action



CAUTION

Risk of receiver damage

Received optical power must not exceed -9.0 dBm and -6.0 dBm for the long-reach (LR) OC-3 and OC-12 optical interface circuit packs respectively. Received optical power must not exceed -6.0 dBm and -2.0 dBm for the intermediate-reach (IR) OC-3 and OC-12 optical interface circuit packs respectively.

Refer to *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

If the optical loop is very short, insert attenuation between the OC-3/OC-12 transmitter and receiver, to limit the received optical power to a safe level (for example, -15 dBm).

There are no damage levels for NT7E01 IR and LR, NT7E02 IR and NT7E05 IR, and LR optical interfaces.

- 5 Adjust the VOA to obtain the specified minimum reading of received optical power, as listed below for your optical interface circuit pack:

PEC	Module	Minimum receiver power ($P_{R\ min}$)
NT7E01CA/CB/CC/CD	OC-3 LR	-34.0 dBm
NT7E01DA/DB/DC/DD	OC-3 IR	-28.0 dBm
NT7E02KA/KB/KC/KD	OC-12 LR	-32.0 dBm
NT7E02LA/LB/LC/LD	OC-12 IR	-24.5 dBm
NT7E05AB/AC/AD	OC-12 VTBM LR	-29.5 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	-28.0 dBm
Note: The above values apply to Nortel-to-Nortel proprietary links. They also apply to Bellcore TR-NWT-000253 Midspan-meet links, with the following exceptions:		
NT7E05AB/AC/AD	OC-12 VTBM LR	-28.0 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	-28.0 dBm

—continued—

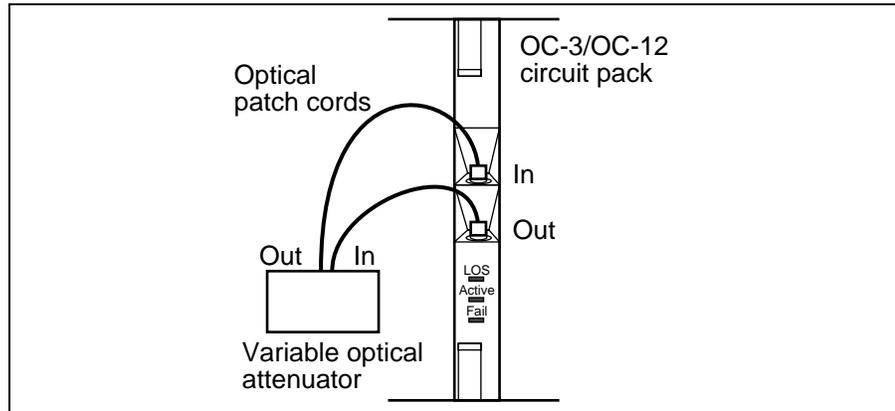
Procedure 2-2 (continued)

Measuring optical receiver performance

Step Action

- 6 As shown below, disconnect the optical test cord from the optical power meter and connect it to the G1 OC-3/OC-12 receive (In) connector.

PC-10554



If STS connections	Then go to
are established	step 8
are not set up yet	step 7

- 7 Set up STS-1 connections and establish DS3 or STS-1 traffic by entering:

csci
slat <p> or <s> ↵

where

<p> is used if primary optics are being tested

<s> is used if secondary optics are being tested

—continued—

2-14 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-2 (continued)

Measuring optical receiver performance

Step Action

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test.

Note 2: To maintain the STS-1 connections, you must remain in the same NEUI screen where you entered the above CI commands.

If you	Then
move from screen to screen	the connections are dropped
stay in the same screen	you can issue new commands without affecting traffic

8 On the DS3/STS-1 test set, press Start/Stop twice to reset the error count to zero.

The DS3/STS-1 test set indicates in process and displays 0 bit error.

9 Press the Single Bit Error Inject button three times.

The DS3/STS-1 test set indicates 3 bit errors received.

10 Reset the DS3/STS-1 test set and monitor for 15 minutes.

Requirement: The test set displays 0 bit error.

If the requirement is not met, try one or both of the following:

- the DS3/STS mapper or STS-1 interface card could be faulty. Repeat steps 8 to 10, using a different DS3/STS mapper or STS-1 interface card.
- the OC-3/OC-12 interface circuit pack could be faulty. Repeat steps 3 to 10, using a different OC-3/OC-12 interface circuit pack.

11 Connect the output of the VOA to the optical power meter as shown in step 3.



CAUTION

Risk of damage to the optical receiver

For the NT7E02 OC-12 long-reach (LR) interface circuit pack, received optical power must not exceed the following safe level: **-6.0 dBm**. Refer to *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

There are no damage levels for NT7E01 IR and LR, NT7E02 IR, and NT7E05 IR and LR optical interfaces.

—continued—

Procedure 2-2 (continued)

Measuring optical receiver performance**Step Action****CAUTION****Risk of increased optical errors**

Received optical power should not exceed the overload levels for optical interfaces meeting Nortel-to-Nortel proprietary links:

NT7E01 OC-3 LR: –10.0 dBm

NT7E01 OC-3 IR: – 8.0 dBm

NT7E02 OC-12 LR: – 7.0 dBm

NT7E02 OC-12 IR: – 4.0 dBm

NT7E05 OC-12 VTBM LR: 0.0 dBm

NT7E05 OC-12 VTBM IR: 0.0 dBm

The above overload levels also apply to optical interfaces in a Bellcore TR-NWT-000253 Midspan-meet specification, with the following exceptions:

NT7E05 OC-12 VTBM LR: – 8.0 dBm

NT7E05 OC-12 VTBM IR: – 8.0 dBm

- 12** Adjust the VOA to obtain the maximum acceptable reading of received optical power for your optical interface circuit pack shown in the following table.

PEC	Module	Maximum receiver power ($P_{R \max}$)
NT7E01CA/CB/CC/CD	OC-3 LR	–10.0 dBm
NT7E01DA/DB/DC/DD	OC-3 IR	– 8.0 dBm
NT7E02KA/KB/KC/KD	OC-12 LR	– 7.0 dBm
NT7E02LA/LB/LC/LD	OC-12 IR	– 4.0 dBm
NT7E05AB/AC/AD	OC-12 VTBM LR	0.0 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	0.0 dBm
Note: The above values apply to Nortel-to-Nortel proprietary links. They also apply to Bellcore TR-NWT-000253 Midspan-meet links, with the following exceptions:		
NT7E05AB/AC/AD	OC-12 VTBM LR	– 8.0 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	– 8.0 dBm

—continued—

2-16 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-2 (continued)

Measuring optical receiver performance

Step	Action
13	Repeat steps 6 through 12. When repeating step 10, monitor the DS3/STS-1 test set for five (5) minutes instead of fifteen (15) minutes.
14	Disconnect the optical patch cords from the G1 OC-3/OC-12 circuit pack.
15	Repeat steps 3 through 13 for the G2 OC-3/OC-12 circuit pack.
16	Disconnect the VOA and test cords from the G2 OC-3/OC-12 interface circuit pack.
17	Log in to the Network Element Status screen and remove the optical lockout. Use the substep applicable to your installed circuit packs. a. Release the NT7E01/NT7E02 OC-3/OC-12 lockout, by entering: pr;dtlprot <oc-n>↵ where <oc-n> is the type of optical carrier: oc3 or oc12 lockout re ↵ y ↵ <i>A dot is displayed in the Lockout field for the G1 OC-3/OC-12 circuit pack.</i> b. Release the lockout of the NT7E05 OC-12 VTBM circuit packs, by entering: pr;dtlprot oc12 g1 ↵ <i>The OC-12 Protection screen is displayed.</i> lockout re w g1 ↵ y↵ lockout re w g2 ↵ y↵ <i>Periods replace the asterisks in the LcktW column for circuit packs G1 and G2.</i>

—continued—

 Procedure 2-2 (continued)

Measuring optical receiver performance

Step Action

18 Remove the DS3 or STS-1 lockout by entering:

pr;dtlprot <type> ↵

lockout re <circuit pack group>↵

where

<type> is **ds3** or **sts1**

<circuit pack group> is the group with an asterisk in the lockout field

y ↵

A dot is displayed in the Lockout field.

If you used	Then
a temporary DS3/STS mapper or STS-1 interface card	leave the connection between the test set and BNC I/O card in place for the next procedure
test cords to set up a DS3 or STS-1 daisy chain	remove the DS3 or STS-1 daisy chain

—end—

Procedure 2-3

Testing optical protection switching

Use this procedure to verify the following protection switching features of the OC-3/OC-12 interface circuit packs:

- manually switch to the standby circuit pack
- force a switch to the standby circuit pack
- automatic switching occurs when the OC-3/OC-12 interface circuit pack fails or when the optical signal degrades
- automatic switching is inhibited when you lock out the active circuit pack
- forced switching overrides automatic switching which overrides manual switching

Alarms When a protection switch occurs, a minor alarm is generated. Alarms are also generated whenever a circuit pack or a fiber optic patch cable is removed. These alarms should clear when the equipment is reconnected.

You can review these alarms to verify the effectiveness of your actions during the test procedures, in addition to viewing the indications given on the detailed protection screen.

Note: If the system has mixed tributaries, perform the test on the higher rate tributaries.

Requirements

Do the following before starting this procedure:

- Make sure the system is not in service.
- Connect a VT100 user terminal to the network element (NE) at the local craft access panel (LCAP). Refer to *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.
- Calibrate the optical power meter using the manufacturer's instructions.

—continued—

 Procedure 2-3 (continued)

Testing optical protection switching

Requirements (continued)

You need the following equipment to perform this procedure:

- a DS3/STS-1 transmission test set (HP 156 MTS (Cerjac), or equivalent)
- two (2) coaxial cables with proper connectors (BNC-to-BNC)
- two (2) optical patch cords with miniature variable optical attenuator (mVOA), NT7E47AA/BA/CA/FA, 5 m long
- an optical power meter, 1310/1550 nm with a range of -50 to +5 dB


DANGER
Risk of injury or damage

Read the warnings and precautions in Chapter 1 to minimize any risk to personnel and equipment.

To establish traffic continuity with a point-to-point system or ring, a network element user interface (NEUI) tool is used to set up simple STS-1 connections between the feeder (OC-3/OC-12) optical circuit packs and the DS1/DS3, STS-1, or OC-3 tributaries. See page 3-2 for a description of the Connection Services Command Interpreter (CSCI) tool.

Note: STS-1 tributaries are supported only on a TN_BLSR shelf.

Action

Step	Action
------	--------

Setting up optical loopbacks

- | | |
|---|---|
| 1 | Connect one end of the attenuated optical patch cords with mVOA to the optical power meter. |
| 2 | Connect the other end of the optical patch cords with mVOA to the transmit (Out) connector of the G1 OC-3/OC-12 interface circuit pack. |

—continued—

Procedure 2-3 (continued)

Testing optical protection switching

Step Action



CAUTION

Risk of damage to the optical receiver

For the NT7E02 OC-12 long-reach (LR) interface circuit pack, received optical power must not exceed the following safe level: **-6.0 dBm**. Refer to *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

There are no damage levels for NT7E01 IR and LR, NT7E02 IR, and NT7E05 IR and LR optical interfaces.



CAUTION

Risk of attenuator damage

If the attenuation does not change after 1 full turn of the adjustment screw, stop turning in that direction. Instead, turn the screw in the opposite direction to restore the circuit pack to within the operating range.



CAUTION

Risk of receiver damage

Received optical power must not exceed -9.0 dBm and -6.0 dBm for the long-reach (LR) OC-3 and OC-12 optical interface circuit packs respectively. Received optical power must not exceed -6.0 dBm and -2.0 dBm for the intermediate-reach (IR) OC-3 and OC-12 optical interface circuit packs respectively.

Refer to *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

If the optical loop is very short, insert attenuation between the OC-3/OC-12 transmitter and receiver, to limit the received optical power to a safe level (for example, -15 dBm).

There are no damage levels for NT7E01 IR and LR, NT7E02 IR and NT7E05 IR, and LR optical interfaces.

—continued—

Procedure 2-3 (continued)
Testing optical protection switching

Step Action



CAUTION

Risk of increased optical errors

Received optical power should not exceed the overload levels for optical interfaces meeting Nortel-to-Nortel proprietary links:

NT7E01 OC-3 LR: -10.0 dBm

NT7E01 OC-3 IR: - 8.0 dBm

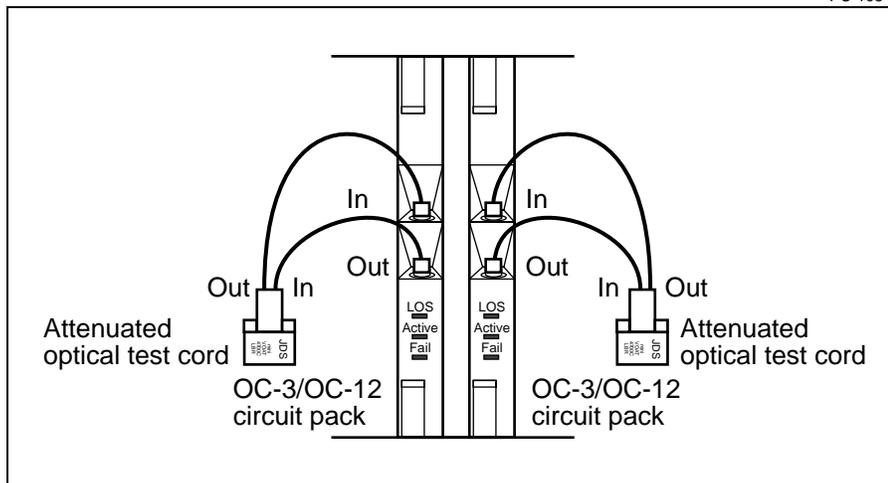
NT7E02 OC-12 LR: - 7.0 dBm

NT7E02 OC-12 IR: - 4.0 dBm

The above overload levels also apply to optical interfaces in a Bellcore TR-NWT-000253 Midspan-meet specification.

- 3 Adjust the mVOA to insert about 15 dB loss.
- 4 Disconnect the patch cord from the optical power meter and loop it back to the receive (In) connector of the G1 OC-3/OC-12 interface circuit pack, as shown below.

PC-10549



—continued—

2-22 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-3 (continued)

Testing optical protection switching

Step	Action
5	Using a second attenuated optical patch cord, repeat steps 1 through 4 for the G2 OC-3/OC-12 interface circuit pack.

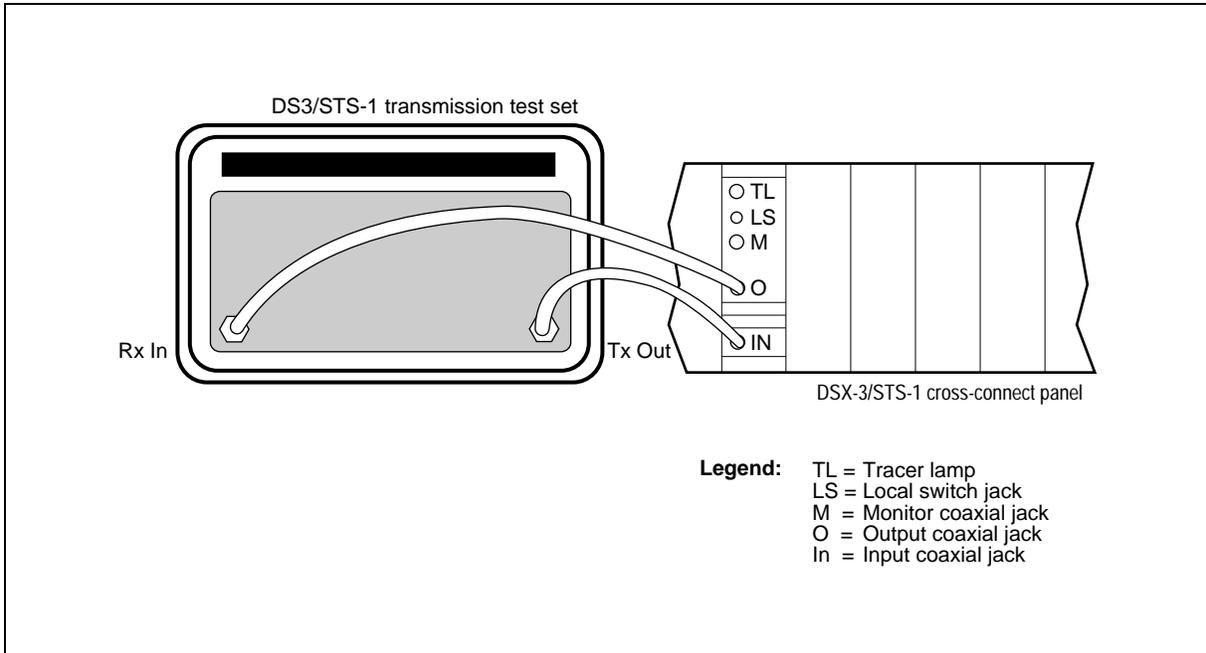
Setting up the DS3 transmission test set

If you are	Then go to
using a temporary DS3/STS mapper or STS-1 interface card	step 7
NOT using a temporary DS3/STS mapper or STS-1 interface card	step 6

- 6 Connect the DS3/STS-1 transmission test set to one DS3 or STS-1 circuit at the cross-connect panel as shown in Figure 2-2 on page 2-22.

Figure 2-2 DS3 or STS-1 transmission test set connections to the DSX-3/STS-1 cross-connect panel

PC-16202



Legend: TL = Tracer lamp
 LS = Local switch jack
 M = Monitor coaxial jack
 O = Output coaxial jack
 In = Input coaxial jack

If STS connections	Then go to
are established	step 8
are not set up yet	step 7

—continued—

Procedure 2-3 (continued)

Testing optical protection switching

- | Step | Action |
|------|--|
| 7 | <p>Set up STS-1 connections and establish DS3 or STS-1 traffic by entering:</p> <pre>csci slat <p> or <s> ↵</pre> <p>where</p> <p><p> is used if primary optics are being tested</p> <p><s> is used if secondary optics are being tested</p> |

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test.

Note 2: To maintain the STS-1 connections, you must remain in the same NEUI screen where you entered the above CI commands. If you move from one screen to another, the connections are dropped. If you stay in the same screen you can issue new commands without affecting traffic.

- | | |
|---|---|
| 8 | <p>On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.</p> |
|---|---|

The test set displays 0 bit error.

Testing manual switching

- | | |
|---|--|
| 9 | <p>Log in to the NE and display the protection status of the OC-3/OC-12 circuit packs by entering:</p> |
|---|--|

```
pr;dtlprot <oc3 or oc12> ↵
```

The OC-3/OC-12 Protection screen is displayed, showing two circuit packs in service.

Note 1: G1 corresponds to OC-3/OC-12 circuit pack in slot 9. G2 corresponds to OC-3/OC-12 circuit pack in slot 10.

Note 2: One circuit pack is active and the other is standby. The green (Active) LED is on for the active circuit pack. In the case of NT7E05 OC-12 VTBM circuit packs, however, both circuit packs are active.

Note 3: An OC-12 Protection screen is shown below. If a circuit pack is locked out, forced to protection, or automatically or manually switched to protection, an asterisk (*) is displayed in the appropriate field. A dot (.) indicates normal operation. A dash (-) indicates not applicable.

—continued—

2-24 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-3 (continued)

Testing optical protection switching

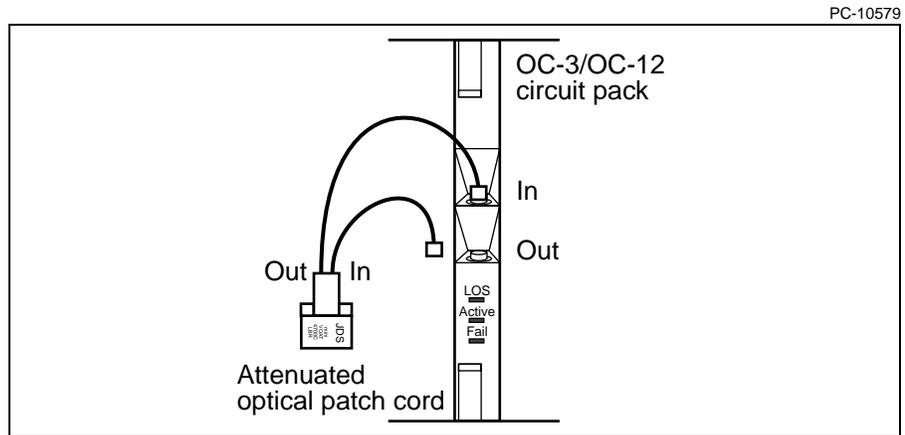
Step	Action
10	<p>Make sure G2 is the active circuit pack. If G1 is active, operate a manual switch, by entering:</p> <p>manual op g1 ↵</p> <p><i>You are prompted to confirm the command.</i></p> <p>y ↵</p> <p><i>For OC-12 VTBM, both cards remain active with the green LEDs turned on. For other OC-3/OC-12, the green (Active) LED turns off at OC-3/OC-12 G1 and lights on G2.</i></p>
11	<p>On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
12	<p>To verify DS3 or STS-1 continuity, press the Single Bit Error Inject button three times on the DS3/STS-1 test set.</p> <p><i>The DS3/STS-1 test set displays 3 bit errors received.</i></p>

Testing forced switching

13	<p>Force a switch to G1 by entering:</p> <p>forced op g2 ↵</p> <p><i>You are prompted to confirm the command.</i></p> <p>y ↵</p> <p><i>For both OC-12 VTBM and other OC-3/OC-12, the green (Active) LED on OC-3/OC-12 G1 turns on and the green (Active) LED on the OC-3/OC-12 G2 turns off.</i></p>
14	<p>To verify the DS3 or STS-1 signal continuity, press the Single Bit Error Inject button on the DS3/STS-1 test set three times.</p> <p><i>The DS3/STS-1 test set displays 3 bit errors received.</i></p>
15	<p>Disconnect the optical test cord from the transmit (Out) connector on G1 OC-3/OC-12.</p> <p><i>For OC-12 VTBM, G1 and G2 are both active with green LEDs. The OC-12 Protection screen displays an R in the Forced field of G2.</i></p> <p><i>For other OC-3/OC-12, the yellow loss-of-signal (LOS) LED on the G2 circuit pack turns on. G1 OC-3/OC-12 remains active due to the forced switch. As a result, DS3 signal continuity is lost.</i></p>

—continued—

Procedure 2-3 (continued)

Testing optical protection switching**Step Action**

- 16** To verify that DS3 or STS-1 signal continuity is lost, press the Start/Stop button twice, to reset the error count to zero.
The DS3/STS-1 test set indicates in process and displays a high error count.
- 17** Release the forced switch by entering:
forced re g2 ↵
y ↵
For OC-12 VTBM, G1 autoswitches to G2. The OC-12 Protection screen displays an asterisk () in the Auto field of G1. G1 active LED light is turned off, and G2 active LED remains on.*
For other OC-3/OC-12, by releasing the forced switch, you make it possible for an automatic switch to occur (from G1 to G2). G2 becomes active. The green (Active) LED on G2 turns on.
- 18** Reconnect the optical test cord to the transmit (Out) connector on G1 OC-3/OC-12.
G2 OC-3/OC-12 remains active.
- 19** On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.
The DS3/STS-1 test set indicates in process and displays 0 bit error.
- 20** To verify DS3 or STS-1 continuity, press the single bit error inject button three times on the DS3/STS-1 test set.
The DS3/STS-1 test set displays 3 bit errors received.

—continued—

Testing optical protection switching

Step Action

Testing automatic switching due to loss of optical signal

- 21** To cause an automatic switch of the optical facility, remove the optical test cord from the transmit (Out) connector of G2 OC-3/OC-12, as shown in the figure in step 15.
- For OC-12 VTBM, the OC-12 Protection screen displays an (*R) in the Auto field of G2. G2 active LED is turned off.*
- For other OC-3/OC-12, the OC-3/OC-12 Protection screen displays an asterisk (*) in the AutoSw field of G2. On the G2 OC-3/OC-12 circuit pack, the yellow loss-of-signal (LOS) LED turns on. The green (Active) LED on the G1 OC-3/OC-12 circuit pack indicates that circuit pack is now active.*
- 22** On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.
- The DS3/STS-1 test set indicates in process and displays 0 bit error.*
- 23** To verify DS3 or STS-1 continuity, press the Single Bit Error Inject button three times on the DS3/STS-1 test set.
- The DS3/STS-1 test set displays 3 bit errors received.*
- 24** Reconnect the optical test cord to the transmit (Out) connector of the G2 OC-3/OC-12 circuit pack.
- For OC-12 VTBM, the OC-12 Protection screen displays a (WR) in the Auto field of G2. Once the wait-to-restore period expires, the G2 active LED is lit.*
- For other OC-3/OC-12, the yellow loss-of-signal (LOS) LED goes off on the G2 circuit pack. The screen displays a dot (.) in the AutoSw field for the G2 circuit pack.*

—continued—

Procedure 2-3 (continued)

Testing optical protection switching**Step Action****Testing lockout from switching**

25 Operate a lockout on the OC-3/OC-12 interface circuit packs by entering:

For OC-12 VTBM	For other OC-3/OC-12
lockout op <work/prot> <unit> ↵ for example: lockout op prot g1	lockout op ↵

The screen displays a message warning that the command will affect service and asks you to confirm the command. Enter:

y ↵

For OC-12 VTBM, the OC-12 Protection screen displays an asterisk () in the LcktP field for G1. The lockout (LckOut) LED is lit on the maintenance interface card (MIC).*

For other OC-3/OC-12, the OC-3/OC-12 Protection screen displays an asterisk in the Lockout field for optical interface G1. A hyphen (-) in the Lockout field for G2 indicates that the lockout does not apply. The lockout (Lck Out) LED is lit on the maintenance interface card (MIC).

26 Simulate a loss of signal by removing the optical patch cord from the transmit (Out) connector of the OC-3/OC-12 G2 (for OC-12 VTBM) or G1 (for other OC-3/OC12).

For OC-12 VTBM, the OC-12 Protection screen remains the same. G1 and G2 both remain active with green LEDs turned on. Traffic does not switch to G1.

For other OC-3/OC-12, the yellow loss-of-signal (LOS) LED on G1 turns on. Traffic does not switch to G1.

27 To verify that DS3 or STS-1 signal continuity is lost, press the Start/Stop button on the DS3/STS-1 test set twice to reset the error count.

The DS3/STS-1 test set indicates in process and shows a high error count.

—continued—

Procedure 2-3 (continued)

Testing optical protection switching

Step	Action
28	Release the lockout on the OC-3/OC-12 interface circuit packs, allowing the automatic switch by entering:

For OC-12 VTBM	For other OC-3/OC-12
lockout re <work/prot> <unit> ↵ for example: lockout re prot g1	lockout re ↵

You are prompted to confirm the command.

y ↵

For OC-12, VTBM, the OC-12 Protection screen displays a dot (.) in all protection columns. G1 and G2 both remain active with green LEDs turned on.

For other OC-3/OC-12, the OC-3/OC-12 G2 becomes active and the green (Active) LED turns on. The OC-3/OC-12 Protection screen displays an asterisk () in the Auto (automatic switch) field for the G1. The screen displays a dot (.) in the Lockout field for interface circuit pack G2.*

29	On the DS3/STS-1 receiver test set, press the Start/Stop button twice to reset the error count to zero.
----	---

For OC-12 VTBM, the DS3/STS-1 test set indicates a high error count.

For other OC-3/OC-12, the DS3 test set indicates "in process" and displays 0 bit error.

30	To verify that DS3 or STS-1 continuity is restored, press the Single Bit Error Inject button three times on the DS3/STS-1 test set.
----	---

For OC-12 VTBM, the DS3/STS-1 test set indicates a high error count.

For other OC-3/OC-12, the DS3/STS-1 receiver test set displays 3 bit errors received.

31	Reconnect the optical patch cord to the transmit (Out) connector of OC-3/OC-12 G2 (for OC-12 VTBM) or G1 (for other OC-3/OC-12).
----	--

For OC-12 VTBM, the DS1 test set indicates "in process" and displays 0 bit error. The OC-12 Protection screen displays a dot (.) in all protection columns. G1 and G2 both remain active with green LEDs turned on.

For other OC-3/OC-12, the yellow loss-of-signal (LOS) LED goes off. The screen displays a dot (.) in the Auto (automatic switch) field for the G1.

—continued—

 Procedure 2-3 (continued)

Testing optical protection switching

Step	Action
------	--------

Testing automatic switching due to degradation of the optical signal

- | | |
|-----------|---|
| 32 | <p>On the active OC-3/OC-12 circuit pack (G2), cause a degradation of the optical signal by increasing the attenuation on the NT7E47 optical test cord, until an automatic switch occurs.</p> <p><i>The yellow loss-of-signal (LOS) LED on the G2 OC-3/OC-12 turns on. The OC-3/OC-12 Protection screen displays an asterisk (*) in the AutoSw field of OC-3/OC-12 G2. Traffic switches to G1, and its green (Active) LED turns on.</i></p> |
| 33 | <p>On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p> |
| 34 | <p>To verify that DS3 or STS-1 continuity exists, press the Single Bit Error Inject button three times on the DS3/STS-1 test set.</p> <p><i>The DS3/STS-1 test set displays 3 bit errors received.</i></p> |
| 35 | <p>Decrease the attenuation of the NT7E47 optical test cord, until the signal is restored.</p> <p><i>The yellow LED indicating loss-of-signal (LOS) turns off when the input signal level increases above the alarm threshold. The OC-3/OC-12 Protection screen displays a dot (.) in the AutoSw field of G2.</i></p> |
| 36 | <p>Operate a manual switch to make the G2 an active circuit pack once again by entering:</p> <p>manual op g1 ↵</p> <p><i>You are prompted to confirm the command.</i></p> <p>y ↵</p> <p><i>The green (Active) LED turns off at the G1 OC-3/OC-12 and lights on G2. Traffic switches to the G2 circuit pack.</i></p> |
| 37 | <p>On the DS3/STS-1 test set, press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p> |
| 38 | <p>To verify that DS3 or STS-1 continuity exists with the G2 OC-3/OC-12 as the active circuit pack, press the Single Bit Error Inject button three times on the DS3/STS-1 test set.</p> <p><i>The DS3/STS-1 test set displays 3 bit errors received.</i></p> |

—continued—

2-30 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-3 (continued)

Testing optical protection switching

Step Action

39 If protection switching requirements are not met, replace the faulty OC-3/OC-12 interface circuit pack.

If	Then go to
this NE has a working DS3/STS mapper card or STS-1 interface card	step 43
you are using a temporary DS3/STS mapper or STS-1 interface card for testing	step 40

40 Take the DS3 or STS-1 facility out of service for the DS3 or STS-1 circuit pack group and delete it. Do this by entering:

fa <type> <circuit pack group> all.

where

<type> is **ds3** or **sts1**

<circuit pack group> is **g1**

chgstate oos

y

The facility goes out of service (OOS).

delete

y

The facility is deleted.

41 Take the DS3 or STS-1 equipment group out of service and delete it by entering:

eq <type> <circuit pack group>.

where

<type> is **ds3** or **sts1**

<circuit pack group> is **g1**

chgstate oos

y

The equipment group goes out of service (OOS).

delete

y

The equipment group is deleted.

—continued—

Procedure 2-3 (continued)

Testing optical protection switching

Step	Action
42	Disconnect the DS3/STS-1 test set from the BNC I/O card. Remove the BNC I/O card. Use a small screwdriver to turn the locking screw to the left to unlock the I/O card. Remove the DS3/STS mapper or STS-1 interface card.
43	Leave the attenuated optical patch cords connected to the OC-3/OC-12 interface circuit packs. Leave the DS3/STS-1 test set connected to the DSX-3/STS-1 cross-connect panel for Procedure 2-4 on page 2-32.

—end—

Procedure 2-4

Testing DS3 or STS-1 protection switching

Use this procedure to test protection switching of DS3 or STS-1 facilities on a circuit pack basis at one site. The test sequence demonstrates that you can:

- manually switch the DS3 or STS-1 traffic to the protection circuit pack
- lockout a circuit pack and prevent it from switching to protection
- simulate an equipment failure and cause automatic switching to occur
- force a protection switch and override automatic switching

High priority DS3s/STS-1s can override protection of low priority DS3s/STS-1s.

Note: Do not perform this procedure if DS1, DS3, or STS-1 protection circuit packs are not installed. If the network element (NE) under test is not equipped with DS1s, DS3s, or STS-1 then a protection circuit pack will not be present; therefore this procedure can be omitted.

Alarms

When a protection switch occurs, a minor alarm is generated. Alarms are also generated whenever a circuit pack is removed from its backplane connector. These alarms should automatically clear when the circuit pack is re-engaged.

You can review these alarms to verify the effectiveness of your actions during the test procedures.

Requirements

Do the following before starting this procedure:

- Make sure the system is not in service.

To establish traffic continuity on a point-to-point or ring system, a network element user interface (NEUI) tool is used to set up simple synchronous transport signal (STS-1) connections between the feeder (OC-3/OC-12) optical circuit packs and the DS1, DS3, STS-1, or OC-3 tributaries. See page 3-2 for a description of the Connection Services Command Interpreter (CSCI) tool.

Note: STS-1 tributaries are supported only on a TN_BLSR shelf.

—continued—

 Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

In this procedure, manual switching, automatic switching, and lockout from switching require that one working and one protection DS3/STS mapper or STS-1 interface card be provisioned. Forced switching and priority override require that two working and one protection DS3/STS mappers or STS-1 interface cards be provisioned.

You need the following equipment to perform this procedure:

- a DS3/STS-1 transmission test set (HP 156 MTS (Cerjac), or equivalent)
- two (2) coaxial cables with the proper connectors (BNC-to-BNC)
- a VT100-compatible terminal, connected to the NE local craft access panel (LCAP)

The optical loopbacks (NT7E47) remain connected from the previous procedure. If you need to make the connections, see steps 1 through 5, starting on page 2-19. The DS3/STS-1 test set remains connected at the DSX-3/STS-1 cross-connect panel as described on page 2-22.


DANGER
Risk of injury or damage

Read the warnings and precautions in Chapter 1 to minimize any risk to personnel and equipment.

Action

Step	Action
------	--------

- | | |
|---|--|
| 1 | As shown in Figure 2-3 on page 2-34, set up the DS3/STS-1 test sets to transmit to both DS3/STS mappers or to both STS-1 interface cards. Connect one test set to the I/O cards for the G1 unit and the other test set to the I/O cards for the G2 unit. Table 2-1 on page 2-3 shows DS3 or STS-1 group and slot associations. |
|---|--|

—continued—

2-34 DS3 tests, STS-1 tests, and optical in-bay tests

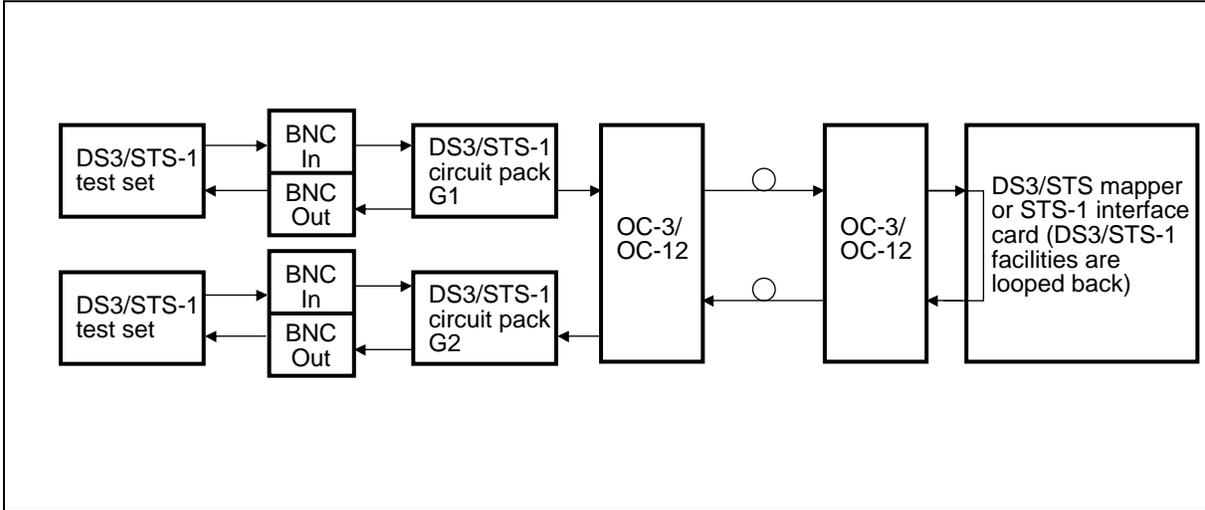
Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step Action

Figure 2-3
DS3 or STS-1 test set connections to BNC I/O cards

PC-16205



- 2 Press the Start/Stop button twice to reset the error count to zero.
The DS3/STS-1 test set indicates in process and displays 0 bit error.
- 3 To verify digital continuity, press the Single Bit Error Inject button three times.
The DS3/STS-1 test set indicates 3 bit errors received.
- 4 Log in to the Network Element Status screen.
- 5 Display the protection status of the DS3/STS mappers or STS-1 interface cards by entering:

pr;dtlprot <type> ↵

where

<type> is **ds3** or **sts1**

The DS3 Protection screen is displayed.

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
------	--------

Note: The screen shows whether a group is locked out, forced to protection, or automatically or manually switched to protection. A dot (.) in any field indicates no activity. An asterisk (*) indicates that protection is active. After causing a switch to protection, look at the display to verify that the switch has occurred as expected. A dash (-) indicates not applicable.

If STS connections	Then go to
are established	step 7
are not set up yet	step 6

- 6 Set up STS-1 connections and establish DS3 or STS-1 traffic by entering:

```
csci
slat <p> or <s> ↵
```

where

<p> is used if primary optics are being tested

<s> is used if secondary optics are being tested

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test.

Note 2: To maintain the STS-1 connections, you must remain in the same NEUI screen where you entered the above CI commands.

If you move from one screen to another, the connections are dropped. If you stay in the same screen you can issue new commands without affecting traffic.

If you	Then
move from one screen to another	connections are dropped
stay in the same screen	you can issue new commands without affecting traffic

Testing manual switching

- 7 Manually switch the DS3 or STS-1 traffic on the first working DS3/STS mapper or STS-1 interface card to protection.

Note 1: For simplicity in this procedure, the mapper under test is assumed to be mapper G1. If you are testing a working DS3/STS mapper or STS-1 interface card in a different slot, then when entering commands, substitute the applicable group number of the working DS3/STS mapper or STS-1 interface card. Table 2-1 on page 2-3 shows DS3 or STS-1 group and slot associations.

—continued—

Testing DS3 or STS-1 protection switching

Step	Action
	Enter: manual op g1 ↵ <i>You are prompted to confirm the command.</i> y ↵ <i>The appropriate protection screen displays an asterisk (*) in the Manual field for the G1 circuit pack group.</i>
8	Press the Start/Stop button twice to reset the error count to zero. <i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i>
9	To verify that DS3 or STS-1 continuity is maintained, press the Single Bit Error Inject button three times. <i>The DS3/STS-1 test set indicates 3 bit errors received.</i>
10	Release the manual switch on the first circuit pack by entering: manual re g1 ↵ <i>You are prompted to confirm the command.</i> y ↵ <i>The screen displays a dot (.) in the Manual field for the G1 circuit pack group.</i>
11	Press the Start/Stop button twice to reset the error count to zero. <i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i>
12	To verify that DS3 or STS-1 continuity is maintained, press the Single Bit Error Inject button three times. <i>The DS3/STS-1 test set indicates 3 bit errors received.</i>
13	To verify that DS3 or STS-1 continuity is maintained, press the Single Bit Error Inject button three times. <i>The DS3/STS-1 test set indicates 3 bit errors received.</i>
Testing lockout from switching (and automatic switching override)	
14	Operate a lockout on the first working DS3/STS mapper or STS-1 interface card by entering: lockout op g1 ↵ <i>You are prompted to confirm the command.</i> y ↵ <i>The appropriate protection screen displays an asterisk (*) in the Lockout field.</i>
15	Wearing antistatic wrist protection, remove the DS3/STS mapper or STS-1 interface card from its backplane connector. <i>Because you have locked out the first working mapper, the DS3 or STS-1 traffic cannot be rerouted to the protection mapper. Alarms are generated.</i>

—continued—

 Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
16	<p>To verify that DS3 or STS-1 traffic is lost, press the Start/Stop button twice on the DS3/STS-1 test set, to reset the error count.</p> <p><i>The DS3/STS-1 test set shows a high error count.</i></p>
17	<p>Release the lockout, allowing the automatic switch to protection by entering: lockout re g1 ↵ y ↵</p> <p><i>When you release the lockout of the first working mapper, the DS3s/STS-1s normally handled by that mapper are rerouted to the protection mapper. The appropriate protection screen displays an asterisk (*) in the AutoSw field. Alarms clear.</i></p>
18	<p>Press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
19	<p>To verify that DS3 or STS-1 continuity exists and that the DS3s/STS-1s are rerouted to the protection mapper, press the Single Bit Error Inject button three times.</p> <p><i>The DS3/STS-1 test set indicates 3 bit errors received.</i></p>
20	<p>Re-engage the first working DS3/STS mapper or STS-1 interface card into its backplane connector.</p> <p><i>After five minutes, the DS3 or STS-1 traffic reverts to the first working DS3/STS mapper or STS-1 interface card and the appropriate protection screen displays a dot (.) in the AutoSw field.</i></p>
21	<p>Press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
22	<p>To verify that DS3 or STS-1 continuity exists and that the DS3s/STS-1s have reverted to the first working mapper, press the Single Bit Error Inject button three times.</p> <p><i>The DS3/STS-1 test set indicates in process with 3 bit errors received.</i></p>

—continued—

2-38 DS3 tests, STS-1 tests, and optical in-bay tests

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step Action

Testing automatic switching due to failure of a DS3/STS mapper or STS-1 interface card

23 Wearing antistatic wrist protection, to simulate a circuit pack failure, remove the first working DS3/STS mapper or STS-1 interface card from its backplane connector.

The appropriate protection screen displays an asterisk (*) in the AutoSw field of the G1 circuit pack group. This indicates that the protection mapper has taken over for the disconnected circuit pack.

Note: The DS3s/STS-1s that are normally handled by the failed mapper (that is, the disconnected mapper) continue to enter and exit the common-equipment shelf by way of BNC I/O cards associated with that mapper. The traffic is rerouted to the protection mapper by way of the DS3 or STS-1 protection bus. This is in the backplane of the shelf.

24 Press the Start/Stop button twice to reset the error count to zero.

The DS3/STS-1 test set indicates in process and displays 0 bit error.

25 To verify that DS3 or STS-1 continuity is maintained, press the Single Bit Error Inject button three times.

The DS3/STS-1 test set indicates 3 bit errors received.

26 The next activity depends on the number of working DS3/STS mappers or STS-1 interface cards that are installed.

If you have	Then go to
one working DS3/STS mapper or STS-1 interface card	step 60
two or more working DS3/STS mappers or STS-1 interface cards	step 27

Testing forced switching (and automatic switching override)

Note: Two working DS3/STS mappers or STS-1 interface cards are required to test forced switching as described below. For simplicity in this procedure, the second working mapper is assumed to be G2. When entering commands, enter the group number of a second working DS3/STS mapper or STS-1 interface card in your shelf. For the group numbers associated with DS3/STS mappers or STS-1 interface cards, see Table 2-1 on page 2-3.

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
27	<p>Override the automatic switch by forcing the DS3s/STS-1s on the second working circuit pack to protection by entering:</p> <p>forced op g2 ↵</p> <p><i>You are prompted to confirm the command.</i></p> <p>y ↵</p> <p><i>The appropriate protection screen displays an asterisk (*) in the Forced field for the G2 circuit pack group. Traffic from the G2 mapper switches to the protection mapper. This displaces the traffic from the G1 mapper. Alarms are generated.</i></p>
28	<p>To verify that DS3 or STS-1 traffic from the G1 mapper is lost, press the Start/Stop button twice to reset the error count.</p> <p><i>The DS3/STS-1 test set connected to the G1 unit indicates in process and shows a high error count.</i></p>
29	<p>At the DSX-3/STS-1 cross-connect panel, connect the input of the test set to the output of the G2 mapper.</p>
30	<p>Press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
31	<p>To verify that DS3 or STS-1 continuity for DS3s/STS-1s on the G2 mapper is maintained, press the Single Bit Error Inject button three times.</p> <p><i>The DS3/STS-1 test set indicates 3 bit errors received.</i></p> <p>Note: The DS3s/STS-1s that are normally handled by the G2 mapper are forced onto the protection mapper. Those DS3s/STS-1s continue to enter and exit the common-equipment shelf by way of the BNC I/O cards associated with that mapper. The traffic is rerouted to the protection mapper by way of the DS3 or STS-1 protection bus. This is in the backplane of the shelf.</p>
32	<p>Release the forced switch on the second circuit pack by entering:</p> <p>forced re g2 ↵</p> <p><i>You are prompted to confirm the command.</i></p> <p>y ↵</p> <p><i>The screen displays a dot (.) in the Forced field. Alarms clear. The DS3s/STS-1s that are forced to the protection mapper revert to the G2 mapper. The protection mapper automatically resumes handling the DS3s/STS-1s from the G1 mapper that is still disconnected.</i></p>
33	<p>Press the Start/Stop button twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

- | Step | Action |
|------|---|
| 34 | To verify that DS3 or STS-1 continuity for DS3s/STS-1s on the G2 mapper is maintained (the DS3s/STS-1s that were forced onto the protection circuit pack have reverted to the G2 circuit pack), press the Single Bit Error Inject button three times.
<i>The DS3/STS-1 test set indicates 3 bit errors received.</i> |
| 35 | At the DSX-3/STS-1 cross-connect panel, connect the input of the test set to the output of the first working G1 mapper. |
| 36 | Press the Start/Stop button twice to reset the error count to zero.
<i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i> |
| 37 | To verify that DS3 or STS-1 continuity for DS3s/STS-1s from the G1 mapper is restored, (the protection mapper is again handling the DS3s/STS-1s from the G1 mapper), press the Single Bit Error Inject button three times.
<i>The DS3/STS-1 test set indicates 3 bit errors received.</i> |
| 38 | Reinsert the first working DS3/STS mapper or STS-1 interface card into its backplane connector.
<i>The appropriate protection screen displays WTR (wait-to-restore) in the AutoSw field.</i>
<i>After five minutes, the DS3s/STS-1s revert to the G1 working DS3/STS mapper or STS-1 interface card and the appropriate protection screen displays a dot (.) in the AutoSw field.</i> |
| 39 | Press the Start/Stop button twice to reset the error count to zero.
<i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i> |
| 40 | To verify that DS3 or STS-1 continuity exists and that the DS3s/STS-1s have reverted to the G1 mapper from the protection mapper, press the single bit error inject button three times.
<i>The DS3/STS-1 test set indicates 3 bit errors received.</i> |

Testing priority DS3 or STS-1 switching

Note: Two working DS3/STS mappers or STS-1 interface cards are needed to test priority switching. For simplicity, the second DS3/STS mapper or STS-1 interface card is assumed to be G2. See Figure 2-3 on page 2-34 for DS3 or STS-1 test setup.

If you have	Then
only one working mapper	go to step 60
more than one working mapper	continue at step 41

- 41 Review the priorities assigned to the DS3 or STS-1 groups on the appropriate protection screen.

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
42	<p>Display the protection provisioning screen by entering: protprov ↵ <i>The appropriate protection provisioning screen is displayed.</i></p>
43	<p>Assign a high priority to the first circuit pack by entering: priority g1 high ↵</p>
44	<p>Assign a low priority to the second circuit pack by entering: priority g2 low ↵</p>
45	<p>Quit, to return to the appropriate protection screen and review the priorities assigned to the DS3 or STS-1 groups by entering: quit ↵ <i>The G1 mapper should have high priority and the G2 mapper should have low priority.</i></p>
46	<p>Wearing antistatic protection, pull the low-priority DS3/STS mapper or STS-1 interface card (G2) out of its backplane connector. <i>The DS3 or STS-1 traffic automatically switches to the protection mapper. The DS3 or STS-1 protection screen displays an asterisk in the AutoSw field for the low-priority mapper.</i></p>
47	<p>Press the Start/Stop button on the test set connected to the low priority unit (G2) twice to reset the error count. <i>The DS3/STS-1 test set indicates "in process," and displays an error count of 0.</i></p>
48	<p>To verify that DS3 or STS-1 continuity exists and that the DS3s/STS-1 are rerouted from the G2 mapper to the protection mapper, press the single bit error inject button three times. <i>The DS3/STS-1 test set indicates in process and indicates 3 bit errors received.</i></p>
49	<p>Now leave the G2 mapper pulled out and pull the G1 (high-priority) mapper out of its backplane connector. <i>The DS3s/STS-1s normally handled by the high-priority mapper are rerouted to the protection mapper. The protection mapper cannot continue to handle the DS3s /STS-1s from the low-priority mapper. Consequently, those DS3s/STS-1s are lost.</i></p>
50	<p>To verify that the DS3s/STS-1 from the G2 mapper are lost, press the Start/Stop button on the DS3/STS-1 test set twice, to reset the error count. <i>The DS3/STS-1 test set indicates in process and indicates a high error count. Alarms are generated. The screen displays an asterisk (*) in the Auto field of the high-priority circuit pack.</i></p>

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
51	<p>Press the Start/Stop button on the test set connected to the high priority unit (G1) twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
52	<p>To verify that DS3 or STS-1 continuity exists and that the DS3s/STS-1s normally handled by the G1 (high-priority) mapper are rerouted to the protection mapper, press the single bit error inject button three times.</p> <p><i>The DS3/STS-1 test set indicates in process and indicates 3 bit errors received.</i></p>
53	<p>Reinsert the G1 (high-priority) DS3/STS mapper or STS-1 interface card into its backplane connector.</p> <p><i>DS3 or STS-1 traffic is restored to the high-priority mapper. The protection mapper resumes handling the low-priority DS3s/STS-1s from mapper G2. Alarms clear.</i></p>
54	<p>Press the Start/Stop button on the test set connected to the high priority unit (G1) twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
55	<p>To verify that DS3 or STS-1 continuity exists and that the protection mapper has resumed handling the DS3s/STS-1s from the G1 (high-priority) mapper, press the Single Bit Error Inject button three times.</p> <p><i>The DS3/STS-1 test set indicates in process and indicates 3 bit errors received.</i></p>
56	<p>Reinsert the G2 (low-priority) mapper into its backplane connector.</p> <p><i>The screen displays WTR (wait to restore) for five minutes, and then a dot (.), in the AutoSw field. When the G2 mapper goes back into service after the wait-to-restore period, it resumes handling the low-priority DS3s/STS-1s. Alarms clear.</i></p>
57	<p>Press the Start/Stop button on the test set connected to the low priority unit (G2) twice to reset the error count to zero.</p> <p><i>The DS3/STS-1 test set indicates in process and displays 0 bit error.</i></p>
58	<p>To verify that DS3 or STS-1 continuity exists and that the G2 (low-priority) mapper has resumed handling the low-priority DS3s/STS-1s, press the single bit error inject button three times.</p> <p><i>The DS3/STS-1 test set indicates in process and indicates 3 bit errors received.</i></p>

—continued—

Procedure 2-4 (continued)

Testing DS3 or STS-1 protection switching

Step	Action
59	Reassign a low priority to the first circuit pack by entering: protprov ↵ <i>The appropriate protection provisioning screen is displayed.</i> priority g1 low ↵ <i>The G1 mapper now has low priority.</i>
60	If protection switching did not function as expected, refer to <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543 in <i>Maintenance</i> , Volume 5A.
61	Return to the Network Element Status screen: fwpu i ↵
62	Remove all test equipment and test cords.

—end—

Tributary and optical tests for VTBM rings

Use this chapter to test DS1, DS3, and optical equipment at an AccessNode (system) network element (NE) Access Bandwidth Manager (ABM) shelf.

These procedures cover local in-bay tests on equipment located at a single NE, and can form the basis for customer acceptance tests. Unless otherwise noted, the tests can be performed by one technician. End-to-end testing (between two NEs) of optical and digital equipment is described in *System Testing Procedures*, 323-3001-222, in this volume.

Note: In a bidirectional line-switched ring (BLSR), both optical interfaces are active and are carrying traffic at all times.

How to use this chapter

Refer to the list below for the recommended sequence for performing site testing procedures for your configuration.

Topic	See
Verifying OC-3 tributary SONET test set performance	page 3-4
Performing optical interface receiver sensitivity tests	page 3-7
Performing DS1 switching tests	page 3-20
Performing DS3 switching tests	page 3-27

If you are unable to successfully complete these procedures, contact your next level of support.

VTBM rings

The term VTBM (virtual tributary bandwidth management) ring is used to distinguish the bidirectional line-switched rings (BLSRs) which use OC-12 VTBM optical interface units. A VTBM ring, also called a 2-card BLSR ring, uses two NT7E05 OC-12 VTBM circuit packs in the primary transport slots of each NE. OC-12 group G1 connects to the next NE in one direction of the ring, and G2 connects to the next NE in the other direction of the ring.

Testing requirements

During testing, some alarms remain active but can be ignored. These active alarms can be ignored because they are automatically resolved at the end of system testing. These active alarms are the following:

- invalid ring map alarms
- invalid neighbor alarms
- SONET DCC link fail alarms

Note: Read the warning and precautions in Chapter 1 to avoid any risk of injury to personnel and damage to the equipment.

CSCI—Connection services NE-based test tool

This tool is used for checking connection services at a NE. It is normally intended for use in resolving connection problems, but it also provides certain installation functions related to connection services. There are several subcommands provided by the connection services command interface (CSCI) tool. The four of interest to field technicians are:

- **SLAT** The system lineup and test (SLAT) tool provides temporary connections between the tributaries and the optics when doing stand-alone site testing on a NE. The users can select connection to either the primary (p) or the secondary (s) optics. In the case of an OC-12 ring NE, SLAT generates a dummy node map. This node map can be viewed using the SANDCI;NODE command.

SLAT locates all equipped tributaries, and connects them sequentially on the working STS-1s of the selected optics. When the working channels of the selected optics are used (in a ring ADM, STS-1s 1 to 6), it begins placing them on the other optics. That is, if there are more than 6 tributary terminations, there are some connections on the other optics. To determine which optics a tributary is connected to, invoke the QTRIB command described as follows. If the tributary is on the wrong optics for your testing, invoke the ENDSLAT command described as follows and then SLAT for the other optics.

- **ENDSLAT** This tool removes the connections established by SLAT. The connections are also removed if you QUIT from CSCI. ENDSLAT only removes connections which were setup after CSCI was entered.

ENDSLAT also removes the dummy node map created by SLAT on a ring node.

- **QTRIB** The query tributary (QTRIB) tool lists all of the equipped tributary circuit packs on a NE. Part of the data is the STS1 to which the tributary is connected. For any tributary it is possible to determine which optics a tributary has been connected with by the SLAT command. Output from QTRIB is in the format shown as follows.

PTID	SLOT	CARD	TRIB	PORT	FILL	STS	CPG	VT_STATES
7	11	DSI3	G1	1	all	1	G1	00000000
13	15	DSI1	G9	1	low	4	G1	00003FFF

Note 1: The PTID column is a composite number based on slot and port number. The CPG column lists the optic CPG to which the tributary is connected. The VT_STATES column lists the internal VT state information and is valid only for VT-managed tributaries.

Note: For STS-3c connections, the STS column shows only the lowest-numbered time slot for the transport channel; for example, 1 (for channels 1-3) and 4 (for channels 4-6). The PORT column shows only the first value for the OC-3 tributary, such as port 1.

Procedure 3-1

Verifying OC-3 tributary SONET test set performance

Use this procedure to verify OC-3 SONET test set performance. This verification is necessary so that reliable results can be obtained when carrying out tests on a system equipped with OC-3 tributaries.

This procedure describes settings for HP test sets. Other brands of test sets use similar settings.

Requirements

You need the following equipment for this procedure.

- one (1) HP 37704A SONET test set or equivalent, with an HP37776A (OC-12) optical interface
- one (1) miniature variable optical attenuator (mVOA) NT4E
- one (1) optical patch cord

Action

Step	Action
SONET test set	
1	Set the Power switch to on
2	Set the Transmit Out settings, as follows: Transmit signal: OC-3 Clock sync: Looptimed or external BITS (as appropriate) STS SPE under test: 1 Payload: DS3 Framing: M13 Pattern: PRBS
3	Set the Error Inject controls, as follows: Type: STS path CV Error Rate: OFF

—continued—

Procedure 3-1 (continued)

Verifying OC-3 tributary SONET test set performance

Step	Action
4	Set the receive settings to match the transmit settings. Also set the Results parameter as follows: Results: Error counts



DANGER

Risk of personal injury

Avoid direct exposure to laser beams or fiber. Follow the precautions listed in Chapter 1 when handling optical fibers.

- 5 Connect the optical patch cord between input and output.

Verify test set performance

- 6 Press Restart on the test set.
The test set displays zero errors and alarms.
- 7 Press the Single Bit Error Inject button three times.
Verify that the STS path CVs is equal to 3.



CAUTION

Risk of damage to the optical receiver

For the NT7E02 OC-12 long-reach (LR) interface unit, received optical power must not exceed the following safe level: **-6.0 dBm**. Refer to *Site Installation Planning and Engineering*, 323-3001-200, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

There are no damage levels for NT7E01 IR and LR, NT7E02 IR, and NT7E05 IR and LR optical interfaces.

- 8 If you did not obtain the required results, check the settings and repeat the test. If necessary, clean the optical connectors, make sure the connectors are correctly attached and repeat the test. If necessary, replace the test set, the optical patch cords, or both and repeat the test.
- 9 Disconnect the optical patch cord.

—continued—

3-6 Tributary and optical tests for VTBM rings

Procedure 3-1 (continued)

Verifying OC-3 tributary SONET test set performance

Step Action

Verify the OC-3 circuit pack

	<p>CAUTION Risk of damaging circuit pack Never connect an optical level higher than – 8.0 dBm for OC-3 IR –10.0 dBm for OC-3 LR.</p>
---	--

- 10 Connect the SONET test set to the OC-3 circuit pack under test.
- 11 Connect the output from the test set to the Receive of the OC-3 circuit pack.
Note: If you have more than one OC-3 tributary circuit pack, you can daisy-chain them together by connecting the Transmit of the first OC-3 circuit pack to the Receive of the next. If the shelf is fully equipped with OC-3 tributaries, do this for G1S, G3, G5, G7. Ensure that the output level of each OC-3 tributary circuit pack is -20 dBm. At the last circuit pack of the daisy-chain, connect the Transmit of the OC-3 circuit pack to the input of the test set.

—end—

Procedure 3-2

Performing optical interface receiver sensitivity tests

Use this procedure to make sure the optical receive interface operates satisfactorily for maximum and minimum incoming optical levels.

Using DS1, DS3, or SONET test equipment, you can perform this procedure on OC-3, OC-12, and OC-12 VTBM circuit packs used as the optical feeder of a network element (NE). With SONET test equipment, you can perform this procedure on OC-3 tributary circuit packs.

Requirements

In this procedure, the user is setting up loopbacks on optical channels. Minor limitations associated with loopbacks include: data communication are not operational; removal or insertion of optical circuit packs could cause momentary extra alarms for feeder optics and DS1/DS3/OC-3 tributaries.

To establish traffic continuity, STS-1 connections have to be set up between the optical circuit packs and the tributaries (DS1, DS3, OC-3, or any combination). The loopback condition on the optical units requires a network element user interface (NEUI) command interpreter (CI) tool. This tool, the SLAT command, is available through the Connection Services Command Interpreter (CSCI) described on page 3-2. It is used to set STS-1 connections to the set of optical circuit packs being tested (primary or secondary optics).

Before starting this procedure, you must:

- make sure this system is not in-service
- make sure the applicable procedure as been performed to verify the transmission test set (SONET Procedure 3-1 on page 3-4.)
- be logged in to the NEUI at the main menu level

Note: For accurate results, clean the optical connectors and verify the optical meter calibration. Check for positive mating of fibers in optical connectors.

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Tools and materials

See Figure 3-1 on page 3-9 for the test setup. Make sure you have the following tools and materials:

- one (1) optical power meter (for 1300 nm and 1550 nm optics)

If testing OC-12 ring optics with DS1 or DS3 test equipment

- DS1 or DS3 transmission test set and two (2) appropriate patch cords (daisy chaining 14 DS1s also requires an additional 13 patch cords compatible with the cross-connect panel)
- two (2) high-precision variable optical attenuator (VOA) (for example, HP8156A) and four (4) single-mode optical patch cords, or
- two (2) single-mode optical patch cords with miniature variable optical attenuator (mVOA) and two (2) single-mode optical patch cords

If testing OC-12 ring and OC-3 tributary optics with SONET test equipment

- SONET transmission test set (transmit/receive)
- four (4) high-precision variable optical attenuators (VOA) (for example, HP8156A) and eight (8) single-mode optical patch cords, or
- four (4) single-mode optical patch cords with miniature variable optical attenuator (mVOA) and four (4) single-mode optical patch cords



DANGER

Risk of personal injury

Avoid direct exposure to laser beams or fiber. Follow the precautions listed in Chapter 1 when handling optical fibers.



CAUTION

Risk of damaging circuit packs

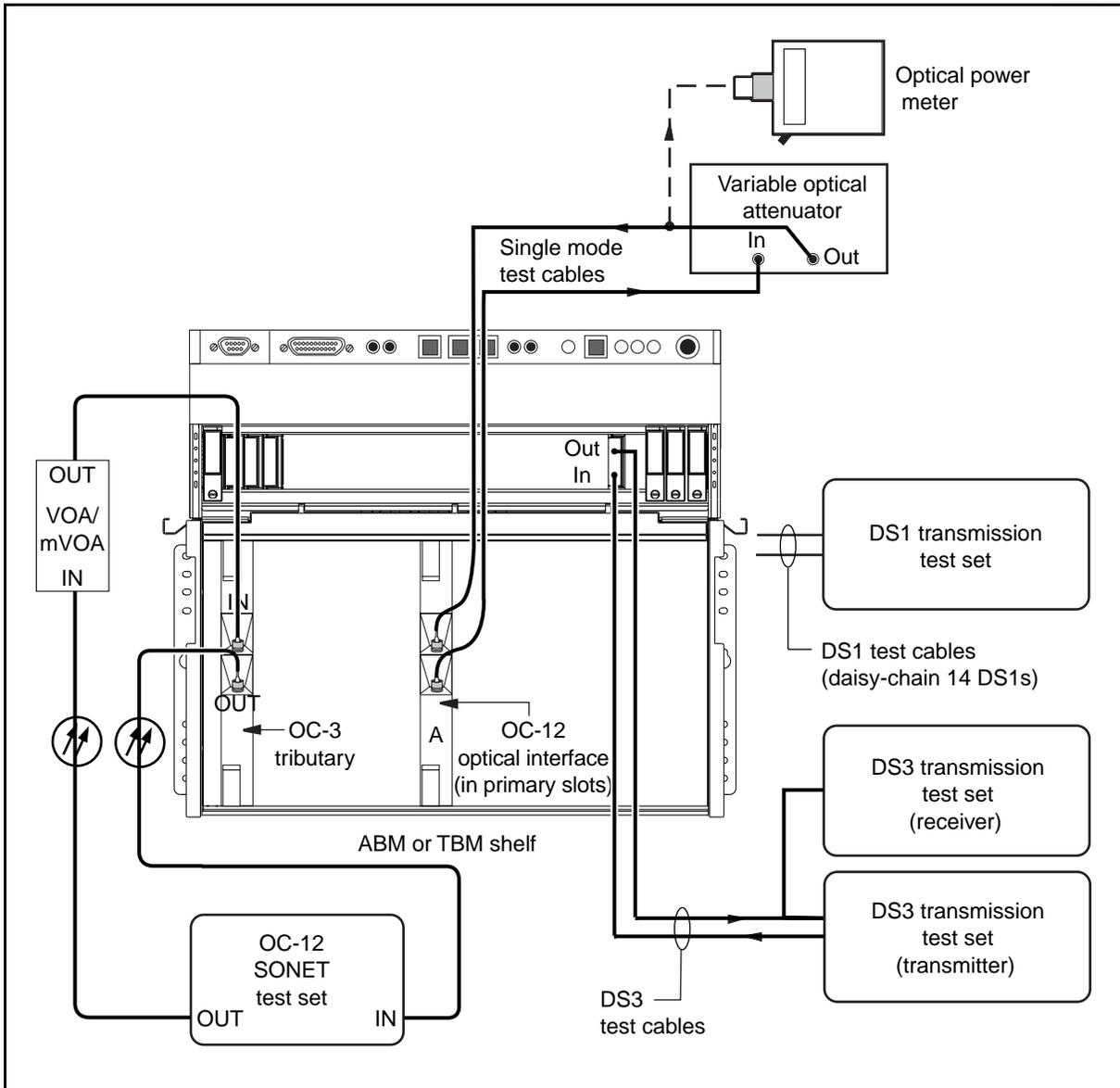
Avoid touching any components on the printed circuit board. Electrostatic-sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

Procedure 3-2 (continued)
Performing optical interface receiver sensitivity tests

Figure 3-1
OC-12 receiver sensitivity test setups

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—continued—

3-10 Tributary and optical tests for VTBM rings

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Action

Step Action



CAUTION

Risk of traffic loss

Make sure the system being tested is not carrying live traffic.



CAUTION

Risk of damaging circuit packs

Avoid touching any components on the printed circuit board. Electrostatic-sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.



DANGER

Risk of personal injury

Avoid direct exposure to laser beams or fiber. Follow the precautions listed in Chapter 1 when handling optical fibers.



CAUTION

Risk of damaging circuit packs

Never connect an optical level to the optical interface receiver higher than:

- 4.0 dBm for OC-12 IR
- 7.0 dBm for OC-12 LR 1310 nm optics
- 8.0 dBm for OC-12 LR 1550 nm optics
- 8.0 dBm for OC-3 IR
- 10.0 dBm for OC-3 LR
- 0.0 dBm for VTBM IR and VTBM LR optics (for Northern Telecom-only links)
- 8.0 dBm for VTBM IR and LR optics (Bellcore Midspan meet specifications).

—continued—

 Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step	Action
------	--------

Performing optical lockouts

- 1** If equipped, lockout the NT7E05 OC-12 VTBM circuit packs to prevent optical protection switching during testing, by entering:

pr; dp oc12 g1 ↵

The OC-12 Protection screen is displayed.

lockout op w g1 ↵

y ↵

lockout op w g2 ↵

y ↵

Asterisks () are displayed in the LcktW column for units G1 and G2.*

- 2** If equipped, lockout the NT7E01 OC-3 and NT7E02 OC-12 circuit packs to prevent optical protection switching during testing, by entering:

pr; dp <oc3 or oc12> ↵

The OC-3 /OC-12 protection screen is displayed.

lockout op <gx> ↵

y ↵

where

<gx> is one of the optical circuit pack groups listed on page 4-3 (refers to only OC-3)

The screen displays an asterisk () in the Lockout column for the specified optical group. The banner line is also updated under the Lockout column, and a "Lockout request" alarm is raised.*

- 3** Repeat step 2 once for each pair of equipped OC-3 or OC-12 circuit packs, including the optical feeder pair and all optical tributary pairs.

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step Action

Connecting loopbacks on the feeder optics



DANGER

Risk of eye injury

Avoid direct exposure to laser beam or fiber. Invisible light that can blind is present. Cap all optical connectors that are not terminated.

- 4** To set up a protected loopback of the G1 optical circuit pack, set the optical level before completing the connection.

If you are using a	Then go to
high precision variable optical attenuator (VOA)	substep a
miniature in-line variable optical attenuator (mVOA)	substep c

- a.** At the fiber patch panel (FPP), disconnect the fiber coming from the transmit (Out) connectors of the G1 optical circuit pack, and connect it to the input of the VOA.
- b.** Use an optical patch cord to connect the output of the VOA to the optical power meter. Go to step 5.
- c.** If you are using a patch cord with mVOA, connect the patch cord between the transmit (Out) connector of the G1 optical circuit pack and the optical power meter.
- d.** Make sure the mVOA is fully operational by following the instructions provided in its shipping package.

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests**Step Action****CAUTION****Risk of damage to the optical receiver**

For the NT7E02 OC-12 long-reach (LR) interface unit, received optical power must not exceed the following safe level: **-6.0 dBm**. Refer to *Site Installation Planning and Engineering*, 323-3001-200, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

There are no damage levels for NT7E01 IR and LR, NT7E02 IR, and NT7E05 IR and LR optical interfaces.

- 5 Adjust the VOA/mVOA so that the level indicated in the following table is read on the optical power meter.

PEC	Module	Minimum receiver power ($P_{R \min}$)
NT7E01CA/CB/CC/CD	OC-3 LR	-34.0 dBm
NT7E01DA/DB/DC/DD	OC-3 IR	-28.0 dBm
NT7E02KA/KB/KC/KD	OC-12 LR	- 2.0 dBm
NT7E02LA/LB/LC/LD	OC-12 IR	-24.5 dBm
NT7E05AB/AC/AD	OC-12 VTBM LR	-29.5 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	-28.0 dBm
Note: The above values for the OC-12 VTBM optical interface circuit packs are for a Nortel-to-Nortel proprietary link. For a link meeting the Bellcore Midspan-meet specification, the following values apply.		
NT7E05AB/AC/AD	OC-12 LR VTBM	-28.0 dBm
NT7E05BB/BC/BD	OC-12 IR VTBM	-28.0 dBm

If the requirement is not met, try the following in turn, and then repeat step 5:

- verify the optical power meter calibration
 - make sure positive mating of fibers in optical connectors
 - Clean all optical connectors as per *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.
- 6 Disconnect the optical patch cord or test cord from the optical power meter and connect it to the receive connector of the G1 optical circuit pack.

—continued—

3-14 Tributary and optical tests for VTBM rings

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step Action

7 If you have a second VOA or mVOA unit, repeat steps 4 to 6 for the optical circuit pack G2, except set the optical level at -20.0 dBm before connecting to the receive connector.

Connecting the test set

8 Set up your test set according to the chosen equipment:

If you are testing with	Then go to
DS1 transmission test set	step 9
DS3 transmission test set	step 10
SONET test set	step 11

Testing using a DS1 transmission test set

9 If you are testing with a DS1 transmission test set, connect the test set to the system shelf as follows:

- a. Connect a test cord from the output of the DS1 test set to the DS1 input card for the test mapper.
- b. Connect a test cord from the DS1 output card for the test mapper to the input of the DS1 test set.
- c. Daisy chain all 14 DS1 facilities on the test mapper.
- d. Settings on the DS1 test set should be as indicated in *Setting Up Your System: VTBM, 323-3001-230, in Commissioning Procedures, Volume 3A*.
- e. Provision DS1s for testing purposes. See *Setting Up Your System: VTBM, 323-3001-230, in Commissioning Procedures, Volume 3A*.

Go to step 12.

Testing using a DS3 transmission test set

10 If you are testing with DS3 transmission test equipment, connect the test sets to the system shelf as follows:

- a. Connect a test cord from the transmitter test set to the DS3 input jack for the test mapper.
- b. Connect a test cord from the DS3 output jack for the test mapper to the receiver test set.
- c. Settings on the DS3 test set should be as indicated in *Setting Up Your System: VTBM, 323-3001-230, in Commissioning Procedures, Volume 3A*.
- d. Provision a DS3 for testing purposes. See *Setting Up Your System: VTBM, 323-3001-230, in Commissioning Procedures, Volume 3A*.

Go to step 12.

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests**Step Action****Testing using a SONET test set**

- 11 If you are testing with a SONET test set, connect the test set to the OC-3 tributary circuit pack as follows:
- a. Connect an optical test cord with mVOA to the output of the SONET test set and connect the other end to the optical power meter.
 - b. Adjust the mVOA to obtain an output level of ~~transmit~~ (Out)20 dBm.
 - c. Disconnect the test cord from the optical power meter and connect it to the receive connector of the OC-3 tributary circuit pack.
 - d. Connect a second optical test cord from the transmit (Out) connector of the OC-3 circuit pack to the input of the SONET test set.
 - e. Settings on the SONET test set should be as indicated in Procedure 3-1.

Setting up STS-1 connections

- 12 Set up STS-1 connections by entering:

```
csci ↵
slat <p> or <s> ↵
```

where

<p> is used if primary optics are being tested.

<s> is used if secondary optics are being tested.

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test. Refer to page 3-2 for information about CSCI commands.

Note 2: To maintain the STS-1 connections, you must remain in the same network element user interface screen in which you typed the CI commands. If you move from one screen to another, the connections are dropped. If you stay in the same screen you can issue commands from the menu without affecting traffic.

Note 3: If SLAT is invoked from the NEUI main screen, the connections are saved as you use the NEUI screens.

Note 4: Make sure traffic is on the optic that you are testing. The green (active) LED should be lit. On an NWK ring ADM, remove and reinsert the ring loopback circuit pack if the green LED is not lit. The right circuit pack should now be active (the optic circuit packs in slot 5 and the ring loopback circuit pack in slot 7 are paired, and the optic circuit packs in slot 9 and the ring loopback circuit pack in slot 10 are paired).

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step Action

Verifying the optical receiver

- 13** Reset the receiver test set.
The receiver test set indicates in process and displays 0 bit error.
- 14** Using the transmitter test set, inject three single bit errors.
The three errors are recorded at the receiver test set.
- 15** Reset the receiver test set and monitor for 15 minutes.
If you are testing with DS1s and they are not daisy-chained (that is, only 1 DS1 port is used for this test), monitor the system for 3 hours.
The display indicates 0 bit error.
- If the requirement is not met, try the following in turn, and then repeat steps 13 to 15:
- Verify the optical meter calibration. Verify the digital or optical patch cords to the test sets.
 - Verify the optical patchcords for the OC-3 tributaries. Make sure of the positive mating of fibers in optical connectors.
 - Replace optics units as per *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.



CAUTION

Risk of increased optical errors

Received optical power should not exceed the overload levels for optical interfaces meeting Nortel-to-Nortel proprietary links:

NT7E01 OC-3 LR:	-10.0 dBm
NT7E01 OC-3 IR:	- 8.0 dBm
NT7E02 OC-12 LR:	- 7.0 dBm
NT7E02 OC-12 IR:	- 4.0 dBm
NT7E05 OC-12 VTBM LR:	0.0 dBm
NT7E05 OC-12 VTBM IR:	0.0 dBm

These overload levels also apply to optical interfaces in a Bellcore TR-NWT-000253 Midspan-meet specification, with the following exceptions:

NT7E05 OC-12 VTBM LR:	- 8.0 dBm
NT7E05 OC-12 VTBM IR:	- 8.0 dBm

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests**Step Action**

- 16 Adjust the VOA/mVOA to the overload level given in the following table.

PEC	Module	Maximum receiver power ($P_{R \max}$)
NT7E01CA/CB/CC/CD	OC-3 LR	-10.0 dBm
NT7E01DA/DB/DC/DD	OC-3 IR	-8.0 dBm
NT7E02KA/KB/KC/KD	OC-12 LR	-7.0 dBm
NT7E02LA/LB/LC/LD	OC-12 IR	-4.0 dBm
NT7E05AB/AC/AD	OC-12 VTBM LR	0.0 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	0.0 dBm
Note: The values for the OC-12 VTBM optical interface circuit packs are for a link meeting the Nortel-to-Nortel proprietary link specification. For a Bellcore Midspan-meet specification, the following exceptions apply.		
NT7E05AB/AC/AD	OC-12 VTBM LR	-8.0 dBm
NT7E05BB/BC/BD	OC-12 VTBM IR	-8.0 dBm

- 17 Disconnect the test cord at the G1 receive connector and connect it to the optical power meter. Reset the optical receive level for G1 optical circuit pack to -20 dBm, and then reconnect the test cord to G1 receive connector.

- 18 Repeat steps 5 to 17 to test receiver sensitivity of optical circuit pack G2.

Note: Where these steps refer to G1, read as G2. Where they refer to G2, read as G1.

When step 18 is completed, both G1 and G2 are still in loopback and receiving an optical level of -20 dBm.

- 19 Proceed according to your test method:

If you are testing with	Then go to
DS1 or DS3 test equipment	step 20
SONET test set and OC-3 tributaries	step 21

- 20 Leave DS1 /DS3 test equipment connected. Leave the optical loopback connected for protection switch testing.

Go to step 25.

—continued—

3-18 Tributary and optical tests for VTBM rings

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step	Action
------	--------

Testing OC-3 tributary receiver sensitivity

- | | |
|----|--|
| 21 | If not already connected, connect the SONET test set to the OC-3 tributary circuit pack as follows: <ol style="list-style-type: none">Connect an optical test cord with mVOA between the output of the SONET test set and the optical power meter.Repeat step 5 to set the optical level to the minimum signal.Disconnect the test cord from the optical power meter and connect it to the receive connector of the OC-3 tributary circuit pack.Connect a second optical test cord from the transmit (Out) connector of the OC-3 circuit pack to the input of the SONET test set. |
| 22 | Perform steps 13 to 17. |
| 23 | Repeat steps 21 to 22 for each equipped OC-3 tributary circuit pack. |
| 24 | If you are not doing further DS1 or DS3 testing , then you do not require the optical loopbacks: <ol style="list-style-type: none">Remove all optical patch cords and the SONET test set.Reconnect optical patch cords between optical circuit packs and the fiber patch panel. |
| 25 | Drop the STS-1 test connections by entering:
endslat ↵
<i>Traffic is no longer carried.</i> |
| 26 | If operated, release the lockout from the NT7E01 OC-3 and NT7E02 OC-12 optical circuit packs:
pr; dp <oc3 or oc12> <gx> ↵
<i>The OC-3 /OC-12 protection screen appears.</i>
lockout re ↵
y ↵
<i>The screen displays a period (.) in the Lockout column. The banner line is also updated under the lockout column, and the "Lockout request" alarm is cleared.</i> |

—continued—

Procedure 3-2 (continued)

Performing optical interface receiver sensitivity tests

Step	Action
27	<p>If operated, release the lockout of the NT7E05 OC-12 VTBM circuit packs, by entering:</p> <p>pr; dp oc12 g1 ↵</p> <p><i>The OC-12 Protection screen is displayed.</i></p> <p>lockout re w g1 ↵</p> <p>y ↵</p> <p>lockout re w g2 ↵</p> <p>y ↵</p> <p><i>Periods replace the asterisks in the LcktW column for units G1 and G2.</i></p>

—end—

Procedure 3-3 Performing DS1 switching tests

Use this procedure to test DS1 protection switching capability (both manual and automatic) on a new network element (NE) before performing the end-to-end test.

Requirements

In this procedure, the user is doing loopbacks on optical channels and there are minor limitations on the system in these conditions. Those limitations are: data communication is not operational, only bidirectional optical switching mode is supported, and removal of optical circuit packs could cause momentary extra alarms for optics and tributaries (DS1, DS3, or both).

Before starting this procedure, you must

- be logged in to the NEUI at the main menu level
- make sure that the initial commissioning is completed
- make sure the procedure “Performing optical interface receiver sensitivity tests” on page 3-7 is completed

Tools and materials

- one (1) DS1 digital transmission test set (Tx, Rx) (for example, Tau-Tron S5104)
- one (1) variable optical attenuator (VOA) (for example, HP 8156A) with single-mode optical patch cords
- one (1) optical meter (for 1310 nm and 1550 nm optics)
- one (1) VT100-compatible CRT with user interface cable
- two (2) DS1 patch cords (bantam-to-NE 310 connectors)
- fourteen (14) DS1 patch cords (bantam-to-bantam connectors)



CAUTION

Risk of traffic loss

Make sure the system being tested is not carrying live traffic.



CAUTION

Risk of damaging circuit packs

Avoid touching any components on the printed circuit board. Electrostatic-sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

 Procedure 3-3 (continued)
Performing DS1 switching tests

Action

Step	Action
1	Make sure all the optical circuit packs are in loopback. This means that the fiber connected to the receiver plug (Rx) comes from the transmitter (Tx) of the same circuit pack. At a VTBM node, this must be done for OC-12 G1 and G2. This was completed in Procedure 3-2 on page 3-7.
2	With the protection and one working DS1 VT mapper circuit pack (G1 to G12) equipped, apply a DS1 input signal to the circuit pack, port 1 only, at the local DSX-1 cross-connect panel.
3	At the cross-connect panel, daisy chain all the DS1 ports of the working DS1 VT mapper circuit pack. For example, port 1 OUT to port 2 IN, port 2 OUT to port 3 IN, and so on. Connect port 14 OUT to the DS1 receiver error detector. See Figure 3-2 on page 3-22 and Figure 3-3 on page 3-23.
4	Make sure all the DS1 facilities of the working mapper are activated (IS) by entering: facility ds1 <gx> all ↵ query <gx> ↵ where <gx> is the number of the working mapper (g1 to g12)
5	Access the detailed protection screen for DS1 by entering: protectn ↵ dtlprot ds1 ↵
6	Set up STS-1 connections and establish DS1 traffic by entering: csci slat <p or s> ↵ where <p> is used if primary optics are being tested <s> is used if secondary optics are being tested

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test.

Note 2: To maintain the STS-1 connections, you must remain in the same NEUI screen where you entered the CI commands. If you move from one screen to another, the connections are dropped. If you stay in the same screen you can issue new commands without affecting traffic.

—continued—

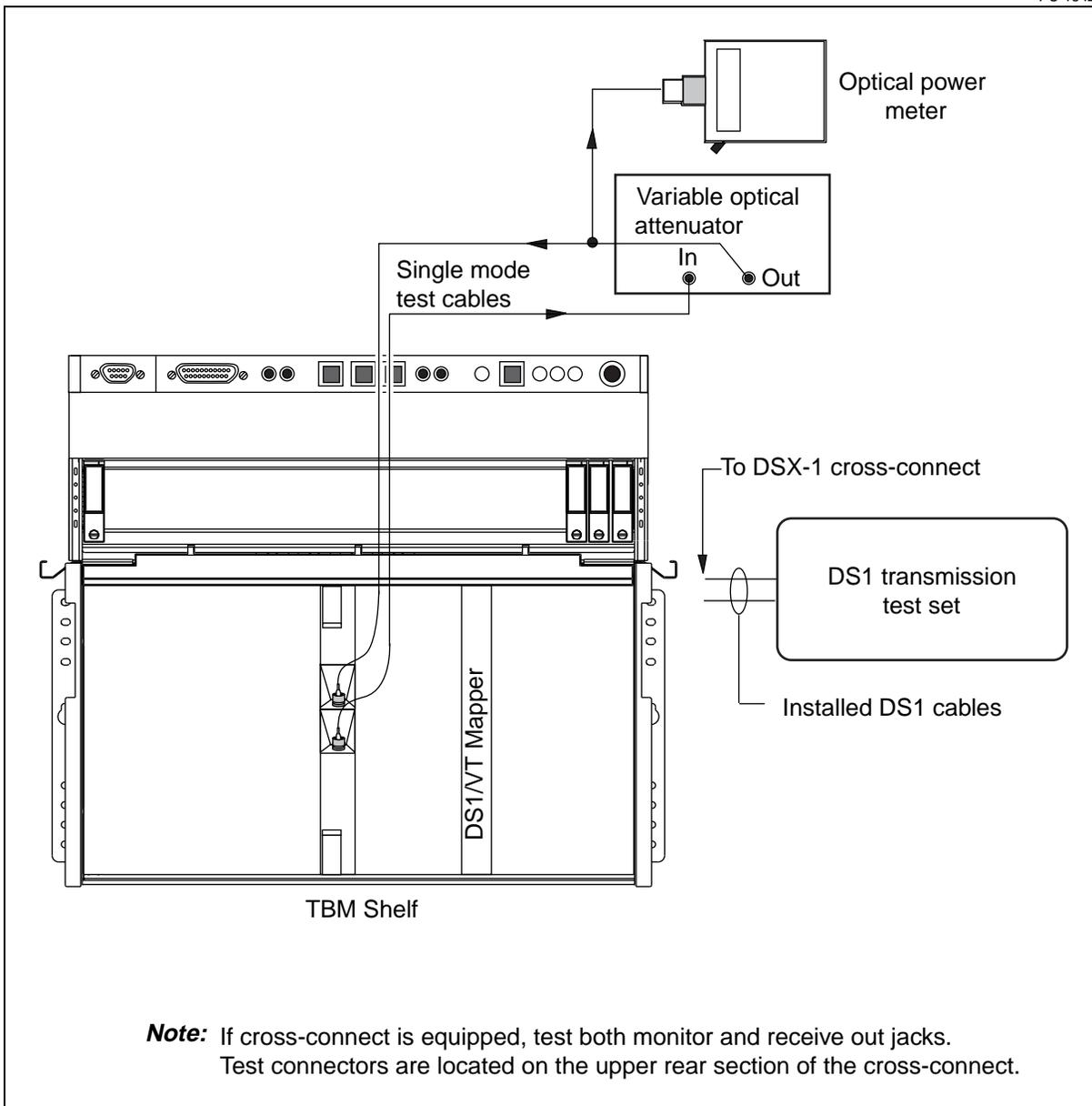
3-22 Tributary and optical tests for VTBM rings

Procedure 3-3 (continued)
Performing DS1 switching tests

Step Action

Figure 3-2
Switching test setup

PC-15426



Note: If cross-connect is equipped, test both monitor and receive out jacks.
Test connectors are located on the upper rear section of the cross-connect.

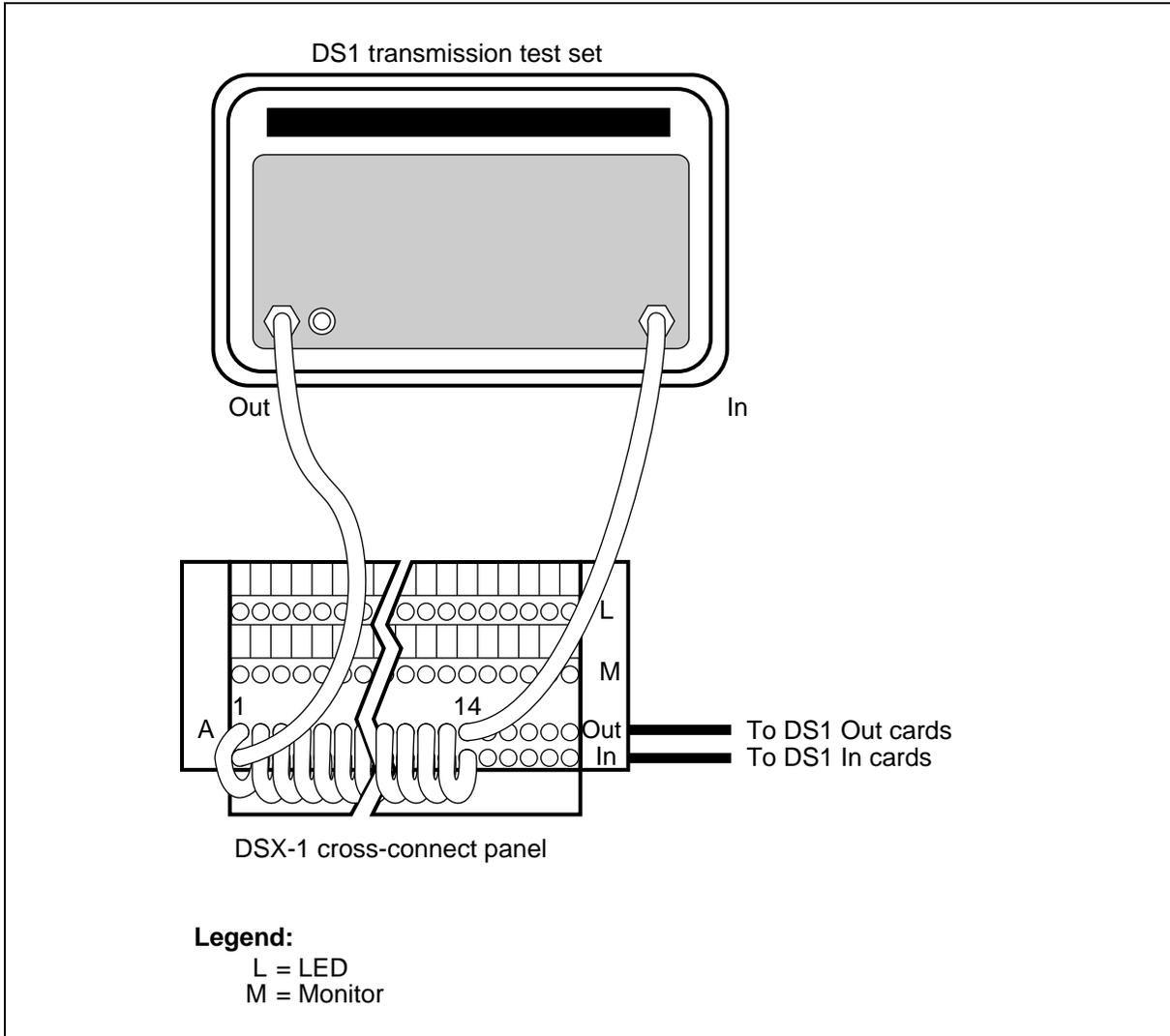
—continued—

Procedure 3-3 (continued)
Performing DS1 switching tests

Step	Action
------	--------

Figure 3-3
DS1 switching test setup

PC-1869



—continued—

3-24 Tributary and optical tests for VTBM rings

Procedure 3-3 (continued)

Performing DS1 switching tests

Step	Action
7	Make sure the active LEDs on both G1 and G2 are lit. Ring protection works on a channel basis and not on a circuit pack basis: channels 1 to 6 are for traffic and channels 7 to 12 are for protection.
8	Monitor the output of Gx circuit pack, port 14.
9	Make sure the DS1 traffic continuity is maintained error free. If this requirement is not met, then verify traffic continuity of each port individually until the defective port is found. To correct the problem, see <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A.

Manual and forced switch

Note: Switching can cause a 60-ms hit. This hit occurs when you initiate the switch and when you release the switch. After the switch is performed, the traffic stabilizes and should be error free.

10 Operate a manual switch on mapper Gx by entering:

manual op <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g12)

DS1 traffic transfers to mapper P and the mapper P active LED is ON.

DS1 traffic is error free.

The user interface protection screen indicates an asterisk () under the Manual switch field (active).*

11 Release the manual switch by entering:

manual re <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g12)

Traffic transfers immediately to mapper Gx and the mapper Gx active LED is ON.

The asterisk () is replaced by a dot (.) in the Manual switch field.*

DS1 continuity is maintained.

—continued—

Procedure 3-3 (continued)

Performing DS1 switching tests**Step Action**

- 12** Operate a forced switch on mapper Gx by entering:

```
forced op <gx> ↵  
yes ↵
```

where

<gx> is the number of the working mapper (g1 to g12)

DS1 traffic transfers to mapper P and the mapper P active LED is on.

DS1 traffic is error free.

The user interface protection screen indicates an asterisk () under the Forced switch field (active) and a Request (R) replaces the asterisk (*) in the Manual switch field.*

Lockout switch

- 13** Operate a lockout on mapper Gx by entering:

```
lockout op <gx> ↵  
yes ↵
```

where

<gx> is the number of the working mapper (g1 to g12)

DS1 traffic transfers from mapper P to mapper Gx and is running error free.

The user interface protection screen indicates an asterisk () under the Lckt switch field (Gx) and a request (R) replaces the asterisk (*) in the Forced switch field (Gx).*

The mapper Gx active LED is ON.

- 14** Release the lockout on mapper Gx by entering:

```
lockout re <gx> ↵  
yes ↵
```

where

<gx> is the number of the working mapper (g1 to g12)

Traffic transfers to mapper P and is running error free.

The user interface protection indicates a period (.) instead of an asterisk () in the Lckt switch field (Gx) and the request (R) in the Forced switch field is replaced by an asterisk (*).*

—continued—

3-26 Tributary and optical tests for VTBM rings

Procedure 3-3 (continued)

Performing DS1 switching tests

Step Action

15 Release the manual switch by entering:

manual re <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g12)

Traffic remains on Mapper P.

The request (R) is replaced by a dot (.) in the Manual switch field (Gx).

DS1 continuity is maintained.

16 Release the forced switch by entering:

forced re <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g12)

Traffic transfers immediately to mapper Gx and mapper Gx active LED is ON.

The user interface protection screen indicates a period (.) under the Lckt, Manual, and Forced switch field.

DS1 continuity is maintained.

Automatic switch

17 Remove DS1 VT mapper Gx.

Traffic transfers to mapper P. The user interface screen indicates an asterisk () under the Auto field for mapper Gx. Traffic is running error free.*

18 Reinsert DS1 VT mapper Gx. After the 5-minute wait-to-restore period, verify that traffic is restored to mapper Gx.

19 Drop the STS-1 connections by entering:

endslat ↵

DS1 traffic is no longer carried.

20 Repeat steps 5 to 19 for the remaining DS1 VT mappers.

21 Continue with "Performing DS3 switching tests" on page 3-27 if the shelf has mixed DS1/DS3 tributaries.

—end—

Procedure 3-4

Performing DS3 switching tests

Use this procedure to test DS3 protection switching capability (both manual and automatic) on a new network element (NE) before performing the end-to-end test.

Requirements

In this procedure, the user is doing loopbacks on optical channels and there are minor limitations on the system in these conditions. Those limitations are: data communication not operational, and removal of optical circuit packs could cause momentary extra alarms for optics and tributaries (DS1, DS3, or both).

To establish traffic continuity, a network element user interface (NEUI) tool is used to set up simple STS-1 connections between the feeder (OC-3/OC-12) optical circuit packs and the DS1/DS3/OC-3 tributaries. See page 3-2 for a description of useful commands of the Connection Services Command Interpreter (CSCI) tool.

Before starting this procedure, you must

- be logged in to the NEUI and be at the main menu level
- make sure the procedure “Performing DS1 switching tests” on page 3-20 is completed if your system has a DS1/DS3 mix

Tools and materials

- one DS3 digital transmission test set (Tx) (for example, Tau-Tron S5200)
- one DS3 digital transmission test set (Rx) (for example, Tau-Tron S5200)
- one variable optical attenuator with single-mode optical patch cords
- one optical meter (for 1310 nm and 1550 nm optics)
- two DS3 coaxial test cords with proper connectors (WECO-BNC)
- one VT100 compatible CRT with user interface cable
- three DS3 coaxial cords (BNC-to-BNC connectors)



CAUTION

Risk of traffic loss

Make sure the system being tested is not carrying live traffic.



CAUTION

Risk of damaging circuit packs

Avoid touching any components on the printed circuit board. Electrostatic-sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

3-28 Tributary and optical tests for VTBM rings

Procedure 3-4 (continued)

Performing DS3 switching tests

Action

Step	Action
1	Make sure all the optical circuit packs are in loopback, this means that the fiber connected to the receiver plug (Rx) comes from the transmitter (Tx) of the same circuit pack. At a VTBM node, this must be done for OC-12 G1 and G2. This is completed in Procedure 3-2 on page 3-7.
2	With the protection and one working DS3/STS mapper circuit pack equipped (G1 to G4), apply a DS3 input signal to the circuit pack, port 1 only, at the DSX-3 cross-connect panel.
3	At the cross-connect panel, daisy chain all the DS3 ports of the working DS3/STS mapper circuit pack (that is, port 1 OUT to port 2 IN, port 2 OUT to port 3 IN). Connect port 3 OUT to the DS3 receiver error detector. See Figure 3-4 and Figure 3-5.
4	Make sure all the DS3 facilities of mapper Gx are active (IS) by entering: facility ds3 <gx> all ↵ query <gx> ↵ where <gx> is the number of the working mapper (g1 to g4)
5	Access the detailed protection screen for DS3 by entering: protectn ↵ dtlprot ds3 ↵
6	Set up STS-1 connections and establish DS3 traffic by entering: csci slat <p or s> ↵ where <p> is used if primary optics are being tested. <s> is used if secondary optics are being tested.

Note 1: Use QTRIB to make sure the tributary being used for testing is connected to the optic under test.

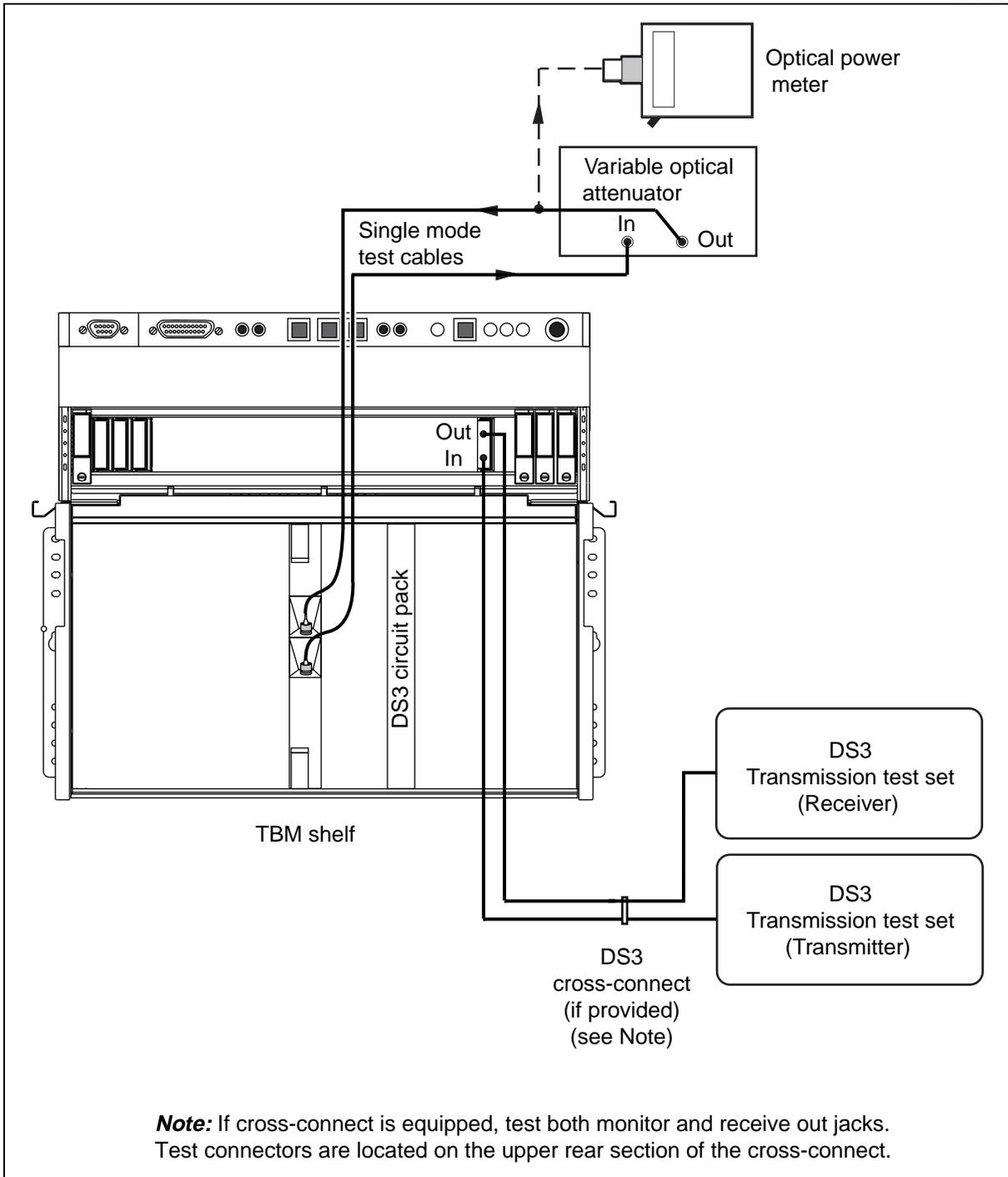
Note 2: To maintain the STS-1 connections, you must remain in the same NEUI screen where you typed the CI commands. If you move from one screen to another, the connections are dropped. If you stay in the same screen you can issue new commands without affecting traffic.

—continued—

Procedure 3-4 (continued)
Performing DS3 switching tests

Figure 3-4
Switching test setup

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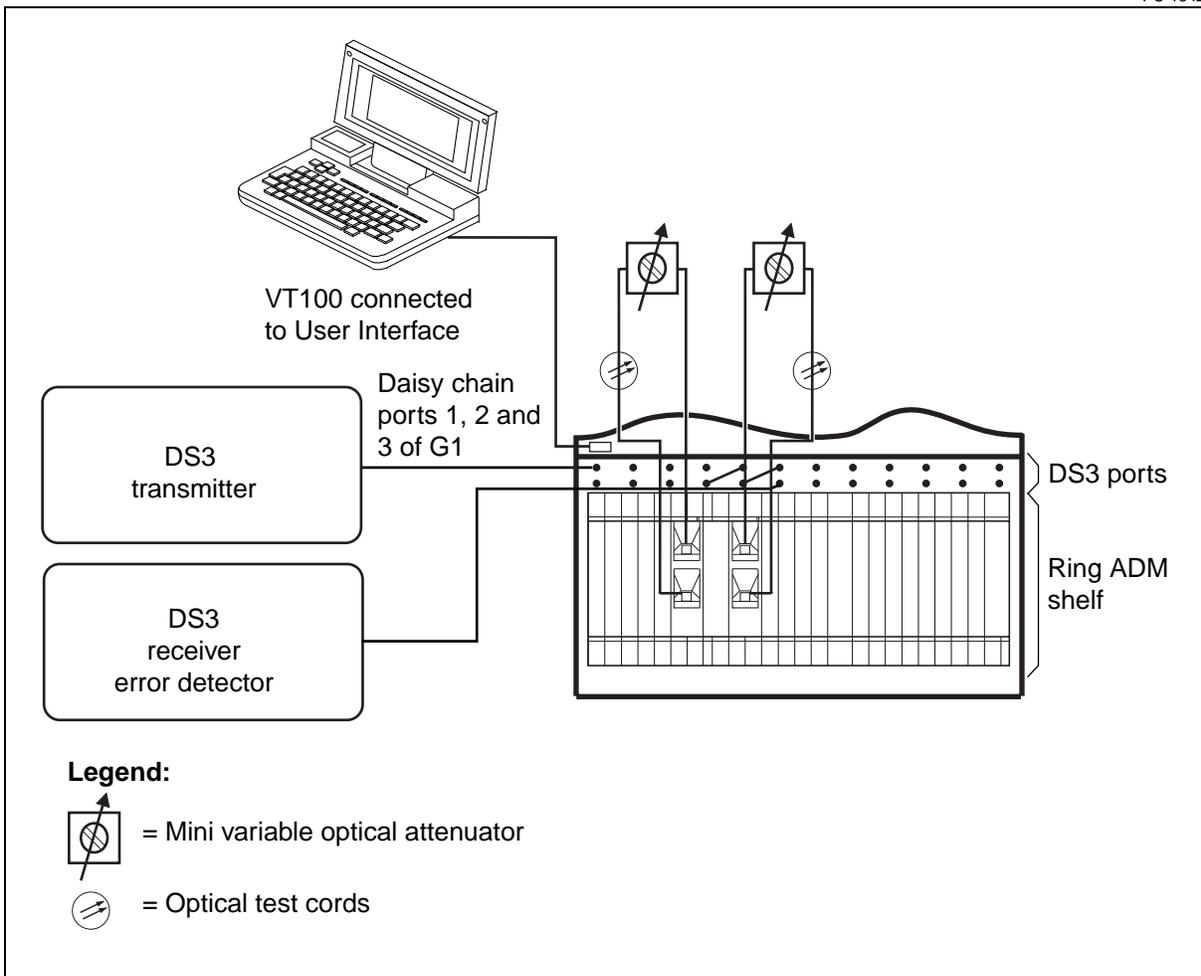
—continued—

Procedure 3-4 (continued)
Performing DS3 switching tests

Step Action

Figure 3-5
DS3 switching test setup

PC-15428



—continued—

Procedure 3-4 (continued)
Performing DS3 switching tests

Step	Action
7	Make sure the optical channel G1 is active and the active LED is lit.
8	Monitor the output of Gx circuit pack, port 3.
9	Make sure the DS3 traffic continuity is maintained error free. If this requirement is not met, then verify traffic continuity for each individual port until the defective port is found. Refer to <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A.
Manual switch	
	Note: Switching can cause a 60-ms hit. This hit occurs when you initiate the switch and when you release the switch. After that the traffic stabilizes and should be error free.
10	Operate a manual switch on mapper Gx by entering: manual op <gx> ↵ yes ↵ where <gx> is the number of the working mapper (g1 to g4) <i>DS3 traffic transfers to mapper P and the mapper P active LED is ON. DS3 traffic is error free. The user interface protection screen indicates an asterisk (*) under the Manual switch field (active).</i>
11	Release the manual switch by entering: manual re <gx> ↵ yes ↵ where <gx> is the number of the working mapper (g1 to g4) <i>Traffic immediately transfers to mapper Gx and the mapper Gx active LED is ON. The asterisk (*) is replaced by a dot (.) in the Manual switch field. DS3 continuity is maintained.</i>
12	Repeat step 10 and operate a force switch on mapper Gx by entering: forced op <gx> ↵ yes ↵ where <gx> is the number of the working mapper (g1 to g4) <i>DS3 traffic remains on mapper P. DS3 traffic is error free. The user interface protection screen indicates an asterisk (*) under the Forced switch field (active) and a request (R) replaces the asterisk (*) in the Manual switch field.</i>

—continued—

3-32 Tributary and optical tests for VTBM rings

Procedure 3-4 (continued)

Performing DS3 switching tests

Step	Action
-------------	---------------

Lockout switch

13 Operate a lockout on mapper Gx by entering:

lockout op <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g4)

DS3 traffic transfers from mapper P to mapper Gx and is running error free. The user interface protection screen indicates an asterisk () under the Lckt switch field (Gx) and a request (R) replaces the asterisk (*) in the Forced switch field (Gx). The mapper Gx active LED is ON.*

14 Release the lockout on mapper G1 by entering:

lockout re <gx> ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g4)

Traffic transfers to mapper P and is running error free. The user interface protection indicates a period (.) instead of an asterisk () in the Lckt switch field (Gx) and the request (R) in the Forced switch field is replaced by an asterisk (*).*

15 Release the manual switch by entering:

manual re <gx > ↵
yes ↵

where

<gx> is the number of the working mapper (g1 to g4)

Traffic remains on Mapper P. The request (R) is replaced by a dot (.) in the Manual switch field (Gx). DS3 continuity is maintained.

—continued—

Procedure 3-4 (continued)

Performing DS3 switching tests**Step Action**

16 Release the forced switch by entering:

forced re <gx> ↵

yes ↵

where

<gx> is the number of the working mapper (g1 to g4)

Traffic transfers immediately to mapper Gx and mapper Gx active LED is ON. The user interface protection screen indicates a period (.) under the Lckt, Manual, and Forced switch field. DS3 continuity is maintained.

Automatic switch

17 Remove DS3/STS mapper Gx.

Traffic transfers to mapper P. The user interface screen indicates an asterisk () under the AutoSw field for mapper Gx. Traffic is running error free.*

18 Reinsert DS3/STS mapper Gx. After the 5-minute wait-to-restore period, verify that traffic is restored to mapper Gx.

19 Drop the STS-1 connections by entering:

endslat ↵

DS3 traffic is no longer carried.

20 Repeat steps 5 to 19 for the remaining DS3/STS mappers.

—end—

Preparing for system integration

This chapter has the final procedures required for commissioning and testing a network element (NE) before starting system tests.

The NE must be stable before you integrate it with the rest of the system. Do not connect the system optical fibers to an NE until you successfully complete the tests in this document to ensure the stability of the NE.

How to use this chapter

The following procedures are found in this chapter:

Topic	See
Enabling and disabling VTBM TIC VT1.5 alarms	page 4-2
Connecting the network element to the system	page 4-6
Setting up end-to-end synchronization	page 4-9
Provisioning DS1s for an integrated configuration	page 4-12
Provisioning a new host switch for an RFT	page 4-16
Assigning new connections	page 4-20

Note 1: The backup tape has all operations controller (OPC) data, including the OPC and NE software loads that were operational when the backup was made. If you are currently using a later version of the NE software, you have to reinstall it on the portable OPC after restoring the commissioning data.

Note 2: The backup tape used during commissioning also has the OPC and NE software loads that were operational when the backup was made. If you must retrieve the commissioning tape contents after a new version of the NE software is loaded on the OPC, then you *must* reinstall the new NE software on the OPC *after* retrieving the contents of the tape.

If you cannot successfully complete these procedures, contact your next level of support.

Procedure 4-1

Enabling and disabling VTBM TIC VT1.5 alarms

Use this procedure to enable or disable VTBM VT1.5 facility alarms that are associated with the transport interface card (TIC) facility. The procedure also describes how to enable synchronous transport signal-1 (STS-1) and VT1.5 facility alarms for connections terminating at the TIC.

When the default STS-1 map is invoked, it creates STS-1 and VT1.5 connections to the TIC. STS-1 and VT1.5 alarms are enabled by default when an STS-1 or VT1.5 connection is added. If any of these connections are not going to be used, then disable alarms associated with unused STS-1s and VT1.5s.

Note: A preferred alternative to disabling alarms for unused VT1.5s is to take the VT1.5s out of service. This prevents unnecessary alarms from being raised. See the procedure for changing a facility operating state in *Provisioning and Operations Procedures*, 323-3001-310 in the *Operations, Administration, and Provisioning Guide*, Volume 4B.

—continued—

 Procedure 4-1 (continued)

Enabling and disabling VTBM TIC VT 1.5 alarms

In the default map, change the STS-1 alarms as follows:

If you have	Then
an integrated configuration	STS-1 #1 is used; disable alarms for STS-1 #2
a universal configuration with no DS1 tandem services	STS-1 #2 is used; disable alarms for STS-1 #1
a combined configuration	both STS-1 #1 and STS-1 #2 are used; do not disable alarms
a TR-08 configuration	STS-1 #1 is used; disable alarms for STS-1 #2

In the default map, change the VT1.5 alarms as follows:

If you have	Then
an integrated configuration	up to 28 VT1.5s are used on STS-1 #1; disable unused VT1.5s on STS-1 #1 and #2
a universal configuration	up to 28 VT1.5s are used on STS-1 #2; disable unused VT1.5s on STS-1 #1 and #2
a combined configuration	both STS-1 #1 and STS-1 #2 are used; disable unused VT1.5s on STS-1 #1 and #2
a TR-08 configuration	VT1.5s 1, 5, 9, 13, 17, 21, and 25 are used for the "A" span on STS-1 #1. This corresponds to DS1 ports 1, 5, 9, and 13 on DS1 card #1 and DS1 ports 3, 7, and 11 on DS1 card #2, respectively. Disable unused VT1.5s on STS-1 #1 and #2

Requirements

Do the following before starting this procedure:

- Make sure you are logged in to the network element user interface (NEUI).
- Be familiar with the command conventions described in Chapter 1 of *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.

—continued—

4-4 Preparing for system integration

Procedure 4-1 (continued)

Enabling and disabling VTBM TIC VT 1.5 alarms

Action

Step	Action
1	<p>Display the TIC Facility screen for the STS-1. This screen requires alarms to be provisioned:</p> <p>fa tic <sts#> ↵</p> <p>where</p> <p><sts #> is the number of the STS-1 facility: 1 or 2.</p> <p><i>The TIC Facility screen is displayed for the selected STS-1.</i></p>
2	<p>Display the alarm provisioning screen:</p> <p>almprov ↵</p> <p><i>The TIC Fac Alarm Provisioning screen is displayed.</i></p>
3	<p>Set the STS-1 facility alarm points for on or off as required:</p> <p>editstat <#> <status> ↵</p> <p>where</p> <p><#> is the alarm point number. See Table 4-1 for a complete list of alarms.</p> <p><status> is the status of the alarm point: on or off. See Table 4-1 for defaults.</p>

Table 4-1
STS-1 Facility Alarm Points

#	Alarm point	Default
1	STS-1 Rx unequipped	on
2	STS-1 Rx RFI	on
3	STS-1 Rx path trace failure	on
4	STS-1 signal label mismatch	on

If you set an alarm point to off, the system prompts for confirmation.
Enter:

y ↵

The screen is updated with the new alarm point settings in reverse video.

Repeat step 3 for each alarm to be provisioned. When all the required alarms are provisioned, continue with step 4.

—continued—

Procedure 4-1 (continued)

Enabling and disabling VTBM TIC VT1.5 alarms

Step	Action
-------------	---------------

4	Return to the TIC Facility screen: quit ↵ <i>The TIC Facility screen is displayed.</i>
----------	---

—end—

Procedure 4-2

Connecting the network element to the system

Use this procedure to verify the connection between the user terminal and the NE through the local craft access panel (LCAP). Also use this procedure to connect the system optical fibers to the NE.

Requirements

Before starting this procedure:

- Make sure all site testing and NE commissioning must be successfully completed.
- Ensure the system is not in service.
- Obtain a VT100-compatible terminal and a correct cable is required.



DANGER

Risk of injury or damage

Read the warnings and precautions in Chapter 1 to minimize any risk to personnel and equipment.

Note: Steps 1 to 3 verify the communications path from the user terminal, through the LCAP to the maintenance interface card (MIC). If you verified this in an earlier procedure, then go to step 4.

Action

Step	Action
------	--------

Logging in to an NE from the LCAP

- 1 Connect the VT100 terminal to the 25-pin D-subminiature female connector on the LCAP. If necessary, see the procedure “Connecting a local terminal to the network element,” in *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.

—continued—

Procedure 4-2 (continued)

Connecting the network element to the system

Step	Action
2	<p>To verify that the basic system is working properly, bring up the login screen at the VT100 terminal, by pressing the Break key.</p> <p><i>The command interpreter (CI) pre-login screen appears, with the following prompt:</i></p> <p style="padding-left: 40px;">?</p> <p><i>This verifies the presence of the NE software load. It also verifies the communications path from the user terminal, through the LCAP to the MIC.</i></p> <p>If the CI prompt is not displayed:</p> <ul style="list-style-type: none"> • verify the communications path from the user terminal to the LCAP • check that the MIC is operational by checking its LEDs on the MIC
3	<p>Log in to the network element user interface (NEUI). If necessary, see <i>Network Element User Interface Description</i>, 323-3001-300, in <i>Operations, Administration, and Provisioning</i>, Volume 4A.</p> <p><i>The Network Element Status screen appears.</i></p>

Connecting the optical fibers and cleaning up

4 Before connecting optical fibers, read the following Caution.



CAUTION
Risk of receiver damage

Received optical power must not exceed -9.0 dBm and -6.0 dBm for the long-reach (LR) OC-3 and OC-12 optical interface circuit packs respectively. Received optical power must not exceed -6.0 dBm and -2.0 dBm for the intermediate-reach (IR) OC-3 and OC-12 optical interface circuit packs respectively.

See Tables 9-1 through 9-5 in *Site Installation Planning and Engineering*, 323-3001-200 in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

If the optical loop is very short, insert attenuation between the OC-3/OC-12 transmitter and receiver, to limit the received optical power to a safe level (for example, -15 dBm).

No damage levels exist for NT7E01 IR and LR, NT7E02 IR and NT7E05 IR, and LR optical interfaces.

—continued—

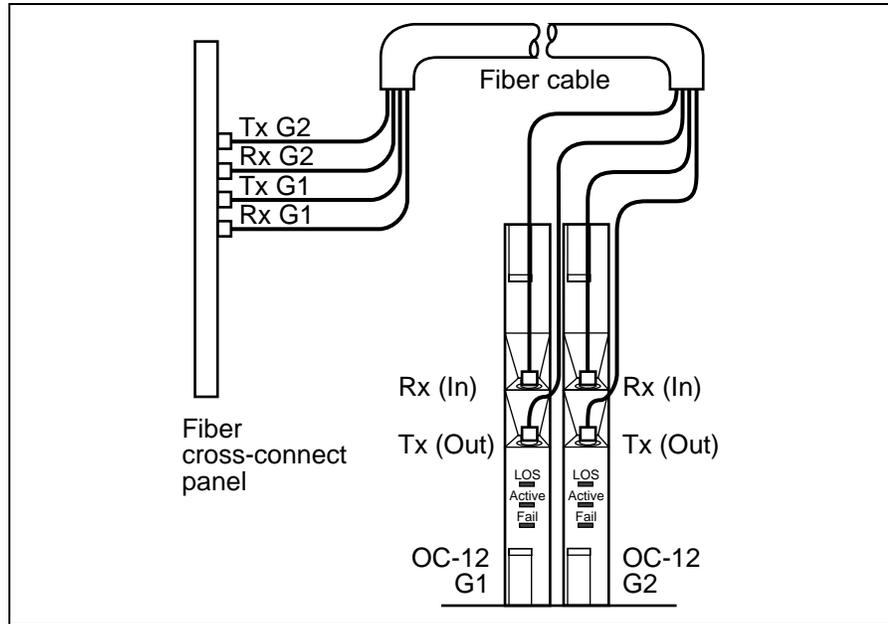
4-8 Preparing for system integration

Procedure 4-2 (continued)

Connecting the network element to the system

- | Step | Action |
|------|--|
| 5 | At the systems bay, connect the optical pigtails to their respective transmit (Out) and receive (In) connectors on OC-3/OC-12 interface circuit packs G1 and G2, as shown. |

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CAUTION

Risk of equipment damage

When you are not conducting tests on a shelf, the shelf cover should be in place because it is an integral part of the air flow and electromagnetic interface (EMI) designs. Make sure circuit packs are fully engaged or removed before installing the shelf cover. Installing the cover with the circuit packs disengaged could damage the equipment.

- 6 Complete the connections to the office alarm system.
- 7 Make sure no active alarms are being generated by the NE.
- 8 Remove all test equipment.
- 9 Log out of the NEUI by entering:
logout ↵
The CI pre-login screen appears.

—end—

Procedure 4-3

Setting up end-to-end synchronization

Use this procedure to set up the synchronization at the remote fiber terminal (RFT). The external synchronization interface (ESI) is installed at the fiber central office terminal (FCOT) where the building integrated timing supply (BITS) is located. The RFT usually depends on the FCOT for synchronization. Only one of the network elements (NEs) in a sub-network can interface to the external synchronization source; the other NE is then looptimed to the first.



CAUTION

Risk of service loss

Set the RFT clock source to looptimed. If you do not perform this procedure, insufficient synchronization could affect service. This procedure must be performed even if no external synchronization source connected at the FCOT.

Requirements

Before starting this procedure:

- Make sure the system is not in service.
- Install the ESI cable as described in *Bay in Central Office Installation Manual—ABM*, 323-3001-201 or *Bay in Central Office Installation Manual—TBM*, 323-3001-202.
- Connect a VT100-compatible user terminal to the NE.

Action

Step	Action
1	Log into the network element user interface (NEUI) at the RFT. <i>The Network Element Status screen appears</i>

—continued—

4-10 Preparing for system integration

Procedure 4-3 (continued)

Setting up end-to-end synchronization

Step	Action
2	<p>Lock out the OC-3/OC-12 circuit pack so that optical protection switching does not occur when you set the synchronization options. Enter:</p> <pre>pr;dtlprot <oc-n> ↵</pre> <p>where</p> <p><oc-n> is the type of optical carrier: oc3 or oc12</p> <p><i>The OC-3/OC-12 Protection screen appears</i></p> <pre>lockout op ↵</pre> <pre>Work/Prot ↵</pre> <pre>Unit ↵</pre> <p><i>The following message appears:</i></p> <p>This lockout of Protection command may affect service. The protection WILL be blocked in the ENTIRE ring if any LP-R switch is active ANYWHERE on the ring INCLUDING the affected span.</p> <p>Please confirm ("Yes" or "No")</p> <p><i>Confirmation of the lockout is requested.</i></p> <pre>y ↵</pre> <p><i>An asterisk(*) appears in the Lockout tP field for the G1 circuit pack.</i></p>
3	<p>Set the shelf clock source to linetimed mode by entering:</p> <pre>eq sh ↵</pre> <p><i>The Shelf Equipment screen appears.</i></p> <p>Enter:</p> <pre>edit ↵</pre> <p><i>The Edit Shelf menu appears.</i></p> <p>Enter:</p> <pre>clocksrc linetimed ↵</pre> <p><i>A confirmation is requested.</i></p> <p>Enter:</p> <pre>y ↵</pre> <p><i>The Clock Source field changes to linetimed.</i></p>

—continued—

Procedure 4-3 (continued)

Setting up end-to-end synchronization

Step	Action
4	<p>Remove the lockout on the OC-3/OC-12 circuit pack. Enter:</p> <pre>quit ↵ pr;dtlprot <oc-n> ↵</pre> <p>where</p> <p><oc-n> the type of optical carrier: oc3 or oc12</p> <p>Enter:</p> <pre>lockout re ↵ Work/Prot ↵ Unit ↵ y ↵</pre> <p><i>A dot (.) appears in the Lockout field for the G1 OC-3/OC-12 circuit pack.</i></p>
5	<p>Log out of the NEUI.</p>

—end—

Procedure 4-4

Provisioning DS1s for an integrated configuration

Use this procedure to perform final provisioning of DS1 facilities (also called DS1 ports) before connecting an integrated or combined system to an S/DMS SuperNode switch. Final DS1 provisioning is done so that integrated system provisioning and testing can begin. Integrated system provisioning and testing from the switch maintenance access position (MAP) command interpreter (CI) is described in digital multiplex switch DMS-family switching documentation.

Note: Integrated system refers to a digital multiplex switch (IDLC), and combined refers to a system configured both as a IDLC and as a universal digital loop carrier (UDLC).

Do not perform this procedure on a universal configuration. DS1 provisioning for a universal configuration is performed after system (end-to-end) testing is completed. System (end-to-end) testing is described in *System Testing Procedures*, 323-3001-222, in this volume.

Action

Step	Action				
1	<p>Log in to the Network Element Status screen and display the DS1 Edit Facility screen for the GR-303 DMS, GR-303 MVI, or TR-08 DS1 mapper by entering:</p> <pre>facility ds1 <circuit pack group> <port> ↵</pre> <p>where</p> <table><tr><td><circuit pack group></td><td>the group number of the DS1 mapper: See Table 4-2 on page 4-5 for an ABM shelf. See Table 4-3 on page 4-6 for a TBM shelf.</td></tr><tr><td><port></td><td>the number of the DS1 port: 1 to 14</td></tr></table>	<circuit pack group>	the group number of the DS1 mapper: See Table 4-2 on page 4-5 for an ABM shelf. See Table 4-3 on page 4-6 for a TBM shelf.	<port>	the number of the DS1 port: 1 to 14
<circuit pack group>	the group number of the DS1 mapper: See Table 4-2 on page 4-5 for an ABM shelf. See Table 4-3 on page 4-6 for a TBM shelf.				
<port>	the number of the DS1 port: 1 to 14				

The DS1 Facility screen for the selected mapper appears.

Note: If you are using the default map, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1, for the DS1/VT mappers assigned for GR-303 DMS, GR-303 MVI, or TR-08 services.

—continued—

Procedure 4-4 (continued)

Provisioning DS1s for an integrated configuration**Step Action**

2 The parameter values for integrated DS1 ports should be as follows:

Parameter values	Definition
line coding:	b8zs (for GR-303 DMS or GR-303 MVI links) ami (for TR-08 links)
line build out	depends on the distance to the switch: short is for less than 46 m (150 ft) medium is for 46 to 137 m (150 to 450 ft) long is for 137 to 200 m (450 to 655 ft)
alarm encoding	ones
frame format	extended superframe (for GR-303 DMS or GR-303 MVI links) dlc (for TR-08 A link) superframe (for TR-08 B, C, and D links)
synchronization	byte synchronous

Because initial DS1 provisioning is performed in *Commissioning and Testing*, Volume 3A, some of the parameters may already be set as specified above. To reprovision any of the parameters, first take the DS1 facility out of service (OOS). Do this by entering:

chgstate oos ↵

You are prompted to confirm the command.

Enter:

y ↵

The facility is placed out of service.

To change the parameters, display the Edit Facility screen by entering:

edit ↵

The Edit Facility screen appears.

—continued—

4-14 Preparing for system integration

Procedure 4-4 (continued)

Provisioning DS1s for an integrated configuration

Step Action

3 Change the parameters as required.

If you are provisioning	Then do
facility identifier	step a
line coding	step b
line build-out	step c
frame format	step d
alarm encoding	step e
synchronization	step f
performance monitoring	step g

All newly provisioned values appear in reverse video as they are changed.

a. Provision the DS1 facility identifier by entering:

facid <identifier> ↵

where

<identifier> is an alphanumeric string up to 38 characters

Note: Lowercase characters are translated to uppercase. If you want the facility ID to have mixed case characters or non-alphanumeric characters, such as spaces, hyphens, or slash marks, begin the identifier string with a single quotation mark (').

b. Provision the type of line coding by entering:

lcoding <type> ↵

where

<type> is the type of line coding:

b8zs (for GR-303 DMS or GR-303 MVI) or **ami** (for TR-08)

c. Provision the line build-out range by entering:

lbo <range> ↵

where

<range> is the line build-out range:

short (less than 46m)

medium (46m to 137m)

long (137m to 200m)

—continued—

 Procedure 4-4 (continued)

Provisioning DS1s for an integrated configuration

Step	Action
	<p>d. Provision the framing format by entering:</p> <p>framefmt <format> ↵</p> <p>where</p> <p><format> is the framing format:</p> <p>extended superframe (for GR-303 DMS or GR-303 MVI)</p> <p>dlc (for TR-08 A link)</p> <p>superframe (for TR-08 B, C, and D links)</p>
	<p>e. Provision the type of alarm encoding by entering:</p> <p>alarmenc ones ↵</p> <p>Note: Alarm encoding for GR-303 DMS and TR-08 DS1s can be set only to 'ones'.</p>
	<p>f. Provision the synchronization mode by entering:</p> <p>synchr bytesynchronous ↵</p> <p>Note: Synchronization for GR-303 DMS, GR-303 MVI, and TR-08 DS1s can only be set to 'bytesynchronous'.</p>
	<p>g. Provision performance monitoring by entering:</p> <p>pmprov <status> ↵</p> <p>where</p> <p><status> is the status of the DS1 facility performance monitoring: enable or disable</p>
4	<p>Put the DS1 facility back in service (IS) by entering:</p> <p>quit ↵</p> <p>chgstate is ↵</p> <p><i>The facility goes in to service.</i></p>
5	<p>Repeat steps 1 through 4 for each DS1 facility to be provisioned for integration.</p>
6	<p>Exit to the Network Element Status screen by entering:</p> <p>quit ↵</p>

—end—

Procedure 4-5

Provisioning a new host switch for an RFT

Use this procedure to add a new host switch to a specific remote fiber terminal (RFT). Two kinds of host switches are supported: GR-303 DMS hosts and GR-303 MVI hosts. Each RFT can have a maximum of five hosts. After you add five hosts, the Add button is disabled. Repeat this procedure for each new RFT.

Note: GR-303 DMS is an interface to digital multiplex switch (DMS) switches. GR-303 MVI is a multi-vendor interface (MVI) to switches other than DMS switches.

When you add a host, the system automatically assigns an interface group (IG) number, ranging from one to five. The system identifies the IG by its common language location identifier (CLLI), or host name, and the integrated digital terminal (IDT) number.

The Host Provisioning Manager allows you to determine which of the RFT's hosts will be the primary alarm recipient of the RFT's alarm notifications. Only a DMS host can be the primary host; therefore, the first DMS host added is the default primary host.

When the lines of an RFT are associated with more than one switch, the system allows you to determine which DS1s are connected to each switch using the Manage Facility Assignments dialog in the Connection Manager tool.

Incorrect host

You can incorrectly add a host, for example, by misspelling the CLLI. An association to the host is established, but you cannot provision from this host. To recover, complete the following steps:

- 1 From the Host Provisioning Manager tool at the operations controller (OPC):
 - a. Delete the incorrect host.
 - b. Add the correct host.

—continued—

Procedure 4-5 (continued)

Provisioning a new host switch for an RFT

- 2 From the DMS-100 host switch, the integrated digital terminal (IDT) must be busied (command **BSY**), off-lined (command **OFFL**), busied again, then returned to service (command **RTS**). Alternatively, both embedded operations channels on the IDT can be busied, then both returned to service.

Requirements

Before performing these procedures, you must do the following:

- Verify that an OPC is connected to the network element (NE) and a VT100-compatible terminal is connected to the OPC.
- Have a userID and password that permit access to the Host Provisioning Manager tool.
- Read the command conventions for the interface you are using, either character-mode terminal (CMT) or graphical, in *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A.

—continued—

Action

Step	Action
1	<p>Log in to the OPC and open the Host Provisioning Manager tool (located under the Prov Admin toolset).</p> <p><i>The main window of the Host Provisioning Manager tool appears. The cursor is in the RFT field.</i></p>
2	<p>Display the Chooser menu by pressing Ctrl_L / (or Keypad 3).</p> <p><i>The Chooser menu appears showing the RFTs that are in the OPC's span of control.</i></p>



CAUTION

Risk of communication loss between the Subscriber Carrier Module-100 Access (SMA) and RFT

Ensure that each host name (common language locator identifier or CLLI) in the displayed list is unique. Duplicate host names indicate datafill errors at the host switch in tables OFCENG and RDTINV. If duplicate host names exist, ensure that the NETWORK_ELEMENT_ID parameter in table OFCENG is unique for each host switch and different from fiber central office terminal (FCOT) (if applicable) and RFT numbers.

- 3 Use the arrow keys to move to the RFT for which you want to provision a host; press **Space** (or Keypad **0**) to select the RFT.
- The list of hosts shows the hosts that have been provisioned on the selected RFT.*
- Note:** The Add button is disabled after you add five hosts.
- 4 Tab to the Add button and select it.
- The Add interface group information dialog appears.*
- 5 For the host you are adding, enter the host name CLLI (up to a 16-character alphanumeric string). Then, tab to the IDT number field and enter the IDT number for the new host name.
- Note:** The Host Provisioning Manager does not verify the accuracy of the host name or the IDT.
- If you make an incorrect entry while provisioning a GR-303 DMS interface, you cannot establish an association between the intended DMS host and the AccessNode, even though the physical connections are in place.
- If you make an incorrect entry while provisioning a GR-303 MVI interface, you can establish an association between the intended MVI host and the AccessNode if the physical connections are in place.

—continued—

Procedure 4-5 (continued)

Provisioning a new host switch for an RFT

- | Step | Action |
|----------|--|
| 6 | <p>Tab to either the GR-303 DMS or GR-303 MVI button for the type of host interface you are adding, then press Ctrl_A (or keypad 0).</p> <p><i>The selected interface type is marked. This type will appear in the Interface column of the Provisioned Hosts list.</i></p> |
| 7 | <p>Tab to the OK button, then press Ctrl_A (or keypad 0).</p> <p><i>The new host CLLI appears in the Host Provisioning Manager list.</i></p> |
| 8 | <p>Repeat steps 2 through 7 for each RFT that is placed into service.</p> |
| 9 | <p>To close the Host Provisioning Manager tool, complete the following instructions:</p> |

To	Press
display the window menu	<p>Ctrl_L W (or keypad 6)</p> <p><i>The window menu appears.</i></p>
exit	<p>Space (or keypad 0)</p> <p><i>The tool closes.</i></p>

—end—

Procedure 4-6

Assigning new connections

Use this procedure to display end-to-end connections in the operations controller (OPC) span of control and to add a connection to the list. You can modify the list using the sort and filter commands in the List and View menus.

A DS1 facility can be assigned a tandem, GR-303 digital multiplex switch (DMS), GR-303 multi-vendor interface (MVI), virtual line concentrating module (VLCM), or TR-08 service. Tandem and TR-08 services are nonswitched and nonlocally switched connections to the special services digital network (SSDN). GR-303 DMS and GR-303 MVI are switched services.

Facility assignment is done using the Connection Manager tool located in the Provisioning Administration toolset or Network Administration toolset on the operations controller (OPC) user interface.

Some of the steps in this procedure address setting up VT-managed connections. These steps apply only to network elements in a VTBM ring. For network elements that are in point-to-point systems, single-ended systems, or DS1-fed systems, the navigation tables guide you to the steps you need to perform.

Note: When choosing GR-303 DMS or GR-303 MVI, you must also assign the host and logical port on the host. When choosing TR-08, you must also assign the system ID and link ID.

Requirements

Before performing this procedure, do the following:

- Verify that you are logged in to the OPC user interface.
- Have a user ID and password that allow you to access the User Session Manager window.
- Verify that you have provisioned a host for all GR-303 DMS DS1s and GR-303 MVI DS1s that are assigned a service. This should have been completed in Procedure 4-5 on page 4-16.
- Read the command conventions for the interface you are using, either character-mode terminal (CMT) or graphical, in *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A.

—continued—

Procedure 4-6 (continued)
Assigning new connections

Action

Step	Action
------	--------

- 1** Open the Connection Manager tool located under the Network Admin toolset from the User Session Manager window.
- If you do not know how to do this, see *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A. *The main window of the Connection Manager tool appears. The cursor is set on the first line of the Connection ID field.*
- Note 1:** If you are opening the Connection Manager for the first time and you have set up no STS connections, the table in the screen below is empty.

If the connection is	Then
VT-managed	go to step 2
STS-managed	go to step 11

- 2** Tab to the Manage VT connections in the lower right corner of the Connection Manager window, then press **Ctrl_A** (or Keypad **0**).
- The Manage VT Connections window appears showing the configuration. The cursor is located at the End NE A: field.*
- The Manage VT Connections window allows you to set up a new VT connection, or to view or change existing ones. This window shows the configuration name, the two end network elements, the channel and the route.
- After you fill in the required fields, a list of VT connections associated with the specified VT-managed path appears.

If you want to	Then
change the Configuration field	go to step 3
continue with the End NE A: field	go to step 4

- 3** More than one configuration must be set up by moving the cursor to the Configuration field. Press **Ctrl_L /** (or Keypad **3**) to display the Chooser menu.
- The cursor is set at the End NE A: field.*
- 4** Display the Chooser menu by pressing **Ctrl_L /** (or Keypad **3**).
- The facilities that are provisioned for the end NE A pair are shown in the Chooser menu.*

—continued—

4-22 Preparing for system integration

Procedure 4-6 (continued)

Assigning new connections

- | Step | Action |
|------|---|
| 5 | Select an End NE A from the list by pressing Space (or Keypad 0). |
| 6 | Tab to the End NE Z: field. Display the Chooser menu by pressing Ctrl_L / (or Keypad 3).
<i>The Chooser menu. shows the facilities that are provisioned for the end NE Z pair.</i> |
| 7 | Select an End NE Z from the list by pressing Space (or Keypad 0).
<i>The NE you selected appears in the End NE Z: field.</i> |
| 8 | Tab to the STS-1 channel field. Display the chooser menu by pressing Ctrl_L / (or Keypad 3).
<i>The Chooser menu. shows the facilities that are provisioned for the STS-1 channel.</i> |
| 9 | Select the STS-1 channel from the list by pressing Space (or Keypad 0).
<i>The selected STS-1 channel appears in the STS-1 channel field. A list appears under the section titled, Complete VT-Managed STS-1 Channel.</i> |
| 10 | Tab to the Route field and use the arrow keys to select Short or Long. Use Ctrl_A (or Keypad 0) to select it. |

If you want to	Then do the following
return to the Connection Manager Window	tab to the Done Return button and select it by pressing Ctrl_L (or Keypad 0)
display the Manage Facility Assignment window	tab to and select Facility Assignments from the lower right corner of the Manage VT Connections window. Continue with step 11.

—continued—

Procedure 4-6 (continued)
Assigning new connections

Step Action

Displaying the Manage Facility Assignments window

11 You can bring up the Manage Facility Assignments window two ways:

If the connection is	If you are in the	Then do the following
STS-managed	Connection Manager window	Tab to the Connection ID list. Select the List item menu. Select Manage Facility Assignments from the List item menu.
VT-managed	Manage VT Connections window	Make sure you have completed steps 2 through 8. Select Facility Assignments from the lower right corner of the Manage VT Connections window. Select Manage Facility Assignments from the Global menu.

12 Assign the DS1 a service.

If you want to assign the DS1 as	Then go to
Tandem	step 13
GR-303 DMS	step 18
GR-303 MVI	step 29
TR-08	step 40
VLCM	step 51

Assigning the DS1 as Tandem

13 From the Manage Facility Assignments screen, you can change the End NE A or End NE Z fields.

- a. Tab to the End NE A field and display the Chooser menu by pressing **Ctrl_L** / (or Keypad **3**).
- b. Select an available NE from the Chooser menu by pressing **Space** (or Keypad **0**).
- c. Repeat the same procedure to change the End NE Z field.

The NE A Tributary and NE Z Tributary list appear. Note the different assignments under the Assignment column.

14 Tab to an unassigned or assigned facility you want to assign as tandem.

15 Select the List item menu using **Ctrl_L** (or Keypad **2**).

The List item menu appears.

—continued—

4-24 Preparing for system integration

Procedure 4-6 (continued)

Assigning new connections

-
- | Step | Action |
|------|--------|
|------|--------|
-
- 16 Move to the Assign as Tandem command, then press **Space** (or Keypad **0**).
The Assignment column shows Tandem for the selected Facility.
- 17

If you want to	Then
make another assignment	return to step 12
exit from the tool	go to step 60

Assigning the DS1 as GR-303 DMS

- 18 From the Manage Facility Assignments screen, you can change the End NE A or End NE Z fields.
- a. Tab to the End NE A field and display the Chooser menu by pressing **Ctrl_L /** (or Keypad **3**).
 - b. Select an available NE from the Chooser menu by pressing **Space** (or Keypad **0**).
 - c. Repeat the same procedure to change the End NE Z field.
- The NE A Tributary and NE Z Tributary list appear. Note the different assignments under the Assignment column.*
- 19 Using the arrow keys move the cursor to an unassigned or assigned facility you want to assign as GR-303 DMS.
- 20 Select the List item menu using **Ctrl-L** (or Keypad **2**).
The List item menu appears.
- 21 Using the arrow keys, move to the Assign as GR-303 DMS command, then press **Space** (or Keypad **0**).
The Assign as GR-303 DMS dialog appears. The cursor is on the IG Number field.
The Assign as GR-303 DMS dialog allows you to assign a DS1-TIC VT to a specific RDTLink number of a GR-303 DMS.
- 22 To specify a GR-303 DMS IG number (host ID). Press **Ctrl_L /** (or Keypad **3**) to display the Chooser menu.
- 23 From the Chooser menu use the arrow keys to move to the IG number you need.
- 24 Press **Space** (or Keypad **0**) to select the IG number.
The fields in the dialog are automatically filled in.
- 25 Select the **OK** button to return to the Manage Facility Assignments screen.
A warning dialog appears.

—continued—

Procedure 4-6 (continued)
Assigning new connections

Step Action

26 Select the **OK** button from this dialog to continue.

The Manage Facility Assignments window appears.

27 Note that the Assignment column on the Manage Facility Assignments window reflects the GR-303 DMS selection you have just made.

28

If you now want to	Then
make another assignment	return to step 12
exit from the tool	go to step 60

Assigning the DS1 with GR-303 MVI

29 From the Manage Facility Assignments screen, you can change the End NE A or End NE Z fields.

- a. Tab to the End NE A field and display the Chooser menu by pressing **Ctrl_L /** (or Keypad **3**).
- b. Select an available NE from the Chooser menu by pressing **Space** (or Keypad **0**).
- c. Repeat the same procedure to change the End NE Z field.

The NE A Tributary and NE Z Tributary list appears. Note the different assignments under the Assignment column.

30 Using the arrow keys move the cursor to an unassigned or assigned facility you want to assign as GR-303 MVI.

31 Select the List item menu by pressing **Ctrl_L** (or Keypad **2**).

The List item menu appears.

32 Using the arrow keys, move to the Assign as GR-303 MVI command, then press **Space** (or Keypad **0**).

The Assign as GR-303 MVI dialog appears.

Note that the cursor is on the IG Number field. The Assign as GR-303 MVI dialog allows you to assign a DS1-TIC VT to a specific RDTLink number of a GR-303 MVI host.

33 To specify a GR-303 MVI IG number (host ID), press **Ctrl_L /** (or Keypad **3**) to display the Chooser menu at the IG Number field.

—continued—

Procedure 4-6 (continued)
Assigning new connections

- | Step | Action |
|------|--|
| 34 | From the Chooser menu use the arrow keys to move to the IG number you need. |
| 35 | Press Space (or Keypad 0) to select the IG number.
<i>The fields in the Assign as GR-303 MVI dialog are automatically filled in.</i> |
| 36 | Select the OK button to return to the Manage Facility Assignments screen.
<i>A warning dialog appears.</i> |
| 37 | Select the OK Return button from this dialog to continue.
<i>The Manage Facility Assignments window appears.</i> |
| 38 | The Assignment column on the Manage Facility Assignments window reflects the GR-303 MVI selection you have just made. |
| 39 | |

If you now want to	Then
make another assignment	return to step 12
exit from the tool	go to step 60

Assigning the DS1 as TR-08

- 40 From the Manage Facility Assignments screen, you can change the End NE A or End NE Z fields.
- a. Tab to the End NE A field and display the Chooser menu by pressing **Ctrl_L /** (or Keypad **3**).
 - b. Select an available NE from the Chooser menu by pressing **Space** (or Keypad **0**).
 - c. Repeat the same procedure to change the End NE Z field.
- The NE A Tributary and NE Z Tributary list appear.*
Note the different assignments under the Assignment column.
- 41 Using the arrow keys move the cursor to an unassigned or assigned facility you want to assign as TR-08.
- Note:** For TR-08 compatibility, the TIC must be PEC NT4K56AC or NT4K56CA. (The NT4K56AB model does not support TR-08.)
- 42 Select the List item menu using **Ctrl_L** (or Keypad **2**).
- The List item menu appears.*

—continued—

Procedure 4-6 (continued)
Assigning new connections

- | Step | Action | | | | | | |
|--------------------------------------|---|--------|------|--------------------------------------|---------------|--------------------------------|---------------|
| 43 | <p>Using the arrow keys, move to the Assign as TR-08 command, then press Space (or Keypad 0).</p> <p><i>The Assign as TR-08 dialog appears.</i></p> <p>Note that the cursor is at the System Number field.</p> <p>Use the Assign as TR-08 dialog when a DS1 is being assigned to TR-08 service. You must specify the system number and link id values in the Assign as TR-08 dialog to complete the assignment.</p> | | | | | | |
| 44 | <p>To specify a system number (host ID), use Ctrl_L (or Keypad 3) to display the List menu at the System Number field.</p> | | | | | | |
| 45 | <p>From the List menu use the arrow keys and move to the system number you need.</p> | | | | | | |
| 46 | <p>Select the system number you want from the List menu by pressing Space (or Keypad 0).</p> <p><i>The System Number field as well as the Link ID field are automatically filled in when the selection is complete. If you made an incorrect selection, an Attention dialog appears requesting that you make a valid selection.</i></p> <table border="1" data-bbox="529 1003 1330 1131"> <thead> <tr> <th>If you</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>want to change the suggested Link ID</td> <td>go to step 47</td> </tr> <tr> <td>do NOT want change the Link ID</td> <td>go to step 49</td> </tr> </tbody> </table> | If you | Then | want to change the suggested Link ID | go to step 47 | do NOT want change the Link ID | go to step 49 |
| If you | Then | | | | | | |
| want to change the suggested Link ID | go to step 47 | | | | | | |
| do NOT want change the Link ID | go to step 49 | | | | | | |
| 47 | <p>Tab to the Link ID field, then display the Chooser menu by pressing Space (or Keypad 3).</p> <p>Note: Only TR-08 links (A, B, C, and D) that are not yet selected are displayed.</p> | | | | | | |
| 48 | <p>Move to the Link ID you want, then press Space (or Keypad 0).</p> <p><i>The first link provisioned in a system must be the A-link. The A-link carries the derived data link (DDL) format. Subsequent links can be B, C, or D.</i></p> | | | | | | |
| 49 | <p>Select the OK button if you want to initiate the assignment of the TR-08 service for the selected DS1.</p> <p><i>The assignment of the DS1 in the Facilities list in the main window is changed to the TR-08 system number (1 to 7) and the link number (A, B, C, or D).</i></p> <p>Note: The Assignment column on the Manage Facility Assignments window shows the TR-08 selection you have just made.</p> | | | | | | |

—continued—

Procedure 4-6 (continued)
Assigning new connections

Step Action

50

If you now want to	Then
make another assignment	return to step 12
exit from the tool	go to step 60

Assigning the DS1 as VLCM

51 From the Manage Facility Assignments screen, you can change the End NE A or End NE Z fields.

- a. Tab to the End NE A field and display the Chooser menu by pressing **Ctrl_L /** (or Keypad **3**).
- b. Select an available NE from the Chooser menu by pressing **Space** (or Keypad **0**).
- c. Repeat the same procedure to change the End NE Z field.

The NE A Tributary and NE Z Tributary list appear.

Note the different assignments under the Assignment column.

52 Using the arrow keys move the cursor to an unassigned or assigned facility you want to assign as VLCM.

Note: For DMS Access, the APC card must be NT4K52GB.

53 Select the List item menu using **Ctrl_L** (or Keypad **2**).

The List item menu appears.

54 Using the arrow keys, move to the Assign as VLCM command, then press **Space** (or Keypad **0**).

The Assign as VLCM dialog appears.

55 In the System Number field, press **Ctrl_L** (or Keypad **3**) to display the chooser menu.

56 Use the arrow keys to move to the system number you want, then press **Space** (or Keypad **0**).

57 Tab to the Switch Port Number field, then press **Ctrl_L** (or Keypad **3**) to display the chooser menu.

The chooser menu appears.

58 Use the arrow keys to move to the switch port you want, then press **Space** (or Keypad **0**).

The switch port number appears in the Switch Port Number field.

Note: Ports 0 and 3 are reserved as signalling links. When you provision port 0 or 3, a dialog appears. The dialog allows you to assign a remote maintenance module (RMM) channel to the signalling link so you can perform line/loop testing.

—continued—

Procedure 4-6 (continued)
Assigning new connections

Step Action

- 59** Tab to the OK button, then press **Ctrl_A** (or Keypad **0**).
The DS1 in the facilities list on the main window changes to VLCM.

If you want to	Then go to
make another assignment	step 12
exit from the tool	step 60

- 60** To close the tool:
- a. From the Manage Facility Assignments window, tab to the Done Return button then press **Space** or (Keypad **0**).
The Connection Manager window appears.
 - b. From the Connection Manager window, display the Window menu by pressing **Ctrl_L W** (or Keypad **6**).
 - c. Select the Exit command by pressing **Space** (or Keypad **0**).
The User Session Manager appears.

—end—

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Site Testing Procedures

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