

NT4K00LA

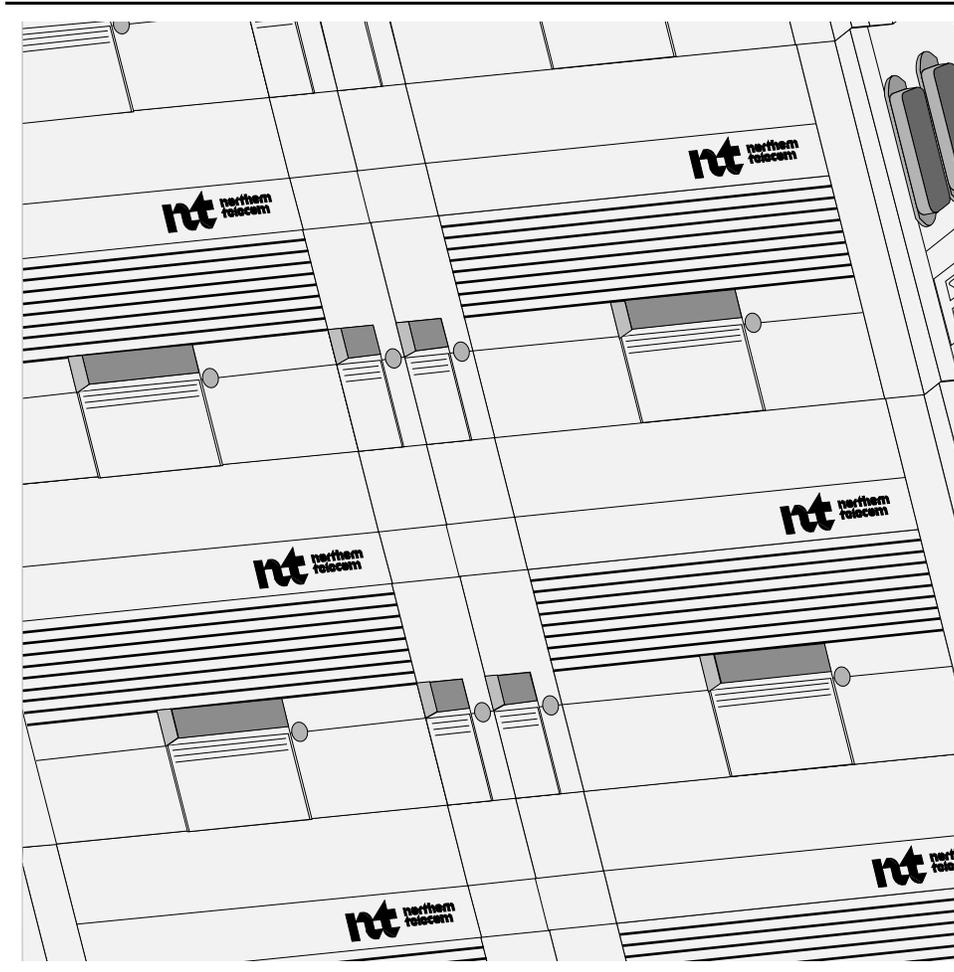
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SONET Products

AccessNode

Module Replacement Procedures

Issue 3.0 October 1999



SONET Products

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Module Replacement Procedures

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Publication history

October 1999

AN17 standard release, Issue 3.0. Changes include the following:

- In Chapter 2:
 - Procedure 2-11, “NT4K56: Transport interface card,” added note that primary and secondary TICs must be the same model.
 - Added new Procedure 2-12, “NT4K56CA: Asynchronous transport interface card firmware.”
- In Chapter 4:
 - changed VF cable replacement part numbers to new 50-pair cable numbers.
 - changed references in Procedure 4-1 from 4 VF cables to 2 VF cables; updated Figure 4-2.

June 1999

AN17 standard release, Issue 2.0. Added NT4K1740 fan unit to Chapter 6.

February 1999

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

- added information for Management by Release feature
- added cooling unit information to Chapter 6
- updated procedures for replacing TBIF and Alarm Relay Cards in Chapter 5
- added a procedure for initializing the replacement OPC hard disk in Chapter 7

June 1998

AN15 Standard 01.01 release of the document.

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AN12 Standard 01.01 release of the document.

November 1995

AN11 Standard 02.01 release of the document.

May 1995

An updated AN10 standard release of the document was issued. In the updated version, in Chapter 9, a new address and telephone number is provided for repair and return of circuit packs in the United States of America.

April 1995

AN10 Standard release of the document.

February 1995

AN10 Preliminary release of the document.

December 1994

AN08 Standard release of the document.

November 1994

AN07 reissue of standard.

June 1994

AN08 Preliminary release of the document.

April 1994

AN07 Standard release of the document.

May 1993

FWP06 Standard release of the document.

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About this document

This document provides maintenance procedures for replacing AccessNode modules, which include circuit packs and cards.

Note: Maintenance procedures for replacing AccessNode Express modules are documented in the *AccessNode Express Maintenance Guide*, 323-3051-211.

The operations controller (OPC) procedures in this document (although CMT-based) can be performed from a graphical terminal, however you must substitute the CMT keystrokes that are provided in the procedures with the graphical equivalent. Refer to the Graphical Reference card that is provided in the sleeve of this *Maintenance* volume. In addition a detailed reference manual is available in *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, in Volume 4A.

Audience

This document is for maintenance technicians and experienced installers from Nortel Networks or a telephone operating company.

Warnings and safety notices

This document contains notices that are designed to alert you about the risk of personal injury, or of damage to equipment.

Samples of the formats for dangers and caution notices used in this document are as follows:

	<p>DANGER Risk of personal injury A danger notice warns you about a risk of personal injury.</p>
---	--

	<p>CAUTION Risk to service or equipment A caution notice warns you about a risk of service interruption or of equipment damage.</p>
---	---

To avoid personal injury, follow all danger warnings provided with this product, along with the safety procedures established by your company.

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

References in this document

This document refers to the following documents:

Installation documents

- *Bay in Central Office Installation Manual—ABM*, 323-3001-201
- *Bay in Central Office Installation Manual—TBM*, 323-3001-202
- *Series 800A Outside Plant Cabinet Installation*, 323-3001-210

Commissioning and Testing, Volume 3

Operations, Administration, and Provisioning, Volume 4A

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

Maintenance, Volume 5A

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

Maintenance, Volume 5C

- *Routine Maintenance Procedures*, 323-3001-546

Overview of module replacement procedures

This chapter has general information for preparing for module replacements. It lists warnings and precautions for personal safety and for proper handling and operation of equipment.

Chapter contents

Refer to the table below for a list of the contents in this book and proceed to the page specified.

Topic	See
Replacing modules in a common-equipment shelf	page 2-1
Replacing modules in a copper-distribution shelf	page 3-1
Replacing a copper-distribution shelf	page 4-1
Replacing modules in a BIP	page 5-1
Replacing an ABM cooling unit	page 6-1
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Replacing a COP cooling unit in a working TBM bay	page 8-1
Common procedures	page 9-1
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Equipment cautions and warnings

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. When handling circuit packs, wear an antistatic wrist strap grounded to the ESD ground jack on the right side of the local craft access panel (LCAP).

Handling circuit packs

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



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. When handling circuit packs, wear an antistatic wrist strap grounded to the ESD ground jack on the right side of the local craft access panel (LCAP). 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.
Note: Proper packaging is especially important for heavier, dual-card units like the IRTU. 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 degrees 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.



DANGER

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 Networks 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 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.

Handling optical fibers

During service, maintenance, repair, or removal of cables or equipment, follow these rules:

- Avoid direct exposure to fiber ends or optical connector ends, where the laser signal can be accessed.
- Follow the manufacturer's instructions when using an optical test set. Incorrect calibration or control settings could result in hazardous levels of radiation.

Splicing optical fibers

During the splicing of any fiber cable, you may be required to look at the fibers using an eye loupe (a small magnifier). Take the following precautions:

- Prior to starting, power off all laser sources related to those fibers, and ensure they remain off (whether located at the central office, subscriber premises, or remote location).
- Prior to starting, disconnect any optical test sets from the fibers (whether locally or remotely connected).
- Use only the optical instruments approved by your company.

Repairing optical fibers

When there is an accidental break in the fiber feeder cable, take these steps:

- Notify both central-office personnel and field-repair personnel of the problem.
- Identify to central-office personnel which fibers have been damaged.
- Power off all laser sources related to the damaged fibers (whether located at the central office, subscriber premises, or remote location).

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.

Risk of possible service interruption

**CAUTION****Risk of possible service interruption**

Removal of certain in-service modules or fibers without following the procedures in this document, will result in data hits, voice glitches, or dropped calls on all integrated and universal line card services. Always follow the replacement procedures in this document, which instruct you to first change the state to out-of-service.

Service state can be confirmed visually by checking the state of the green Active LED on the card faceplate. If the green LED is on, the card is active and in service. The green LED will turn off when the card is inactive and out of service. The operating state can also be checked from the user interface.

Table 1-1 shows how to interpret the status of the green Active LED and the red Fail LED for each in-service module (circuit pack and card) in the AccessNode shelves. Table 1-1 also shows the typical and worst case duration of service interruption when an in-service module or fiber is incorrectly removed from a shelf. A blank entry in the table indicates that there is no service interruption.

LED on in-service modules

Table 1-1

LEDs on in service modules—duration of service interruption if module is removed incorrectly

Module, circuit pack, card or fiber	Active green LED	Fail red LED	Duration of service interruption			
			Typical		Worst case	
			Near end	Far end	Near end	Far end
Proc (active) datasync on (1)*	ON	OFF (4)	< 30 s	< 30 s	30 s	30 s
Proc (active) no datasync (2)*	ON	OFF (4)	4.5 min	4.5 min	5 min (3)	5 min (3)
Processor (standby)	OFF	OFF	-	-	-	-
MIC	ON	OFF (4)	-	-	-	-
OPC	ON	OFF	-	-	-	-
TAC	ON	OFF	-	-	-	-
Rx Fiber (active)	n/a	n/a	40 ms	35 ms	70 ms	60 ms
Tx Fiber (active)	n/a	n/a	35 ms	40 ms	60 ms	70 ms
Rx Fiber (inactive)	n/a	n/a	-	-	-	-
Tx Fiber (inactive)	n/a	n/a	-	-	-	-
OC-12 (active)	ON	OFF	155 ms	40 ms	185 ms	70 ms
OC-12 (standby)	OFF	OFF	0 ms	0 ms	5 ms	5 ms
DS1	ON	OFF	-	40 ms	-	70 ms
DS1 (protection)	OFF (5)	OFF	-	-	-	-
ESI (active)	ON	OFF	-	-	-	-
ESI (standby)	OFF	OFF	-	-	-	-
TIC (primary)	ON	OFF	12.5 μ s	12 ms	1 ms	12 ms
TIC (secondary)	ON	OFF	12.5 μ s	-	1 ms	-
AIC (A)	ON	OFF	12.5 μ s	12.5 μ s	1 ms	1 ms
AIC (B)	ON	OFF	12.5 μ s	12.5 μ s	1 ms	1 ms
LIC (primary)	ON	OFF	45 s (7)	call drop	45 s (7)	call drop
LIC (secondary)	OFF (6)	OFF	12.5 μ s	12.5 μ s	1 ms	1ms
Line card	n/a	OFF	call drop	call drop	call drop	call drop
MTAC	n/a	OFF	-	-	-	-
CDSP	n/a	OFF	-	-	-	-
IRTU	ON	OFF	-	-	-	-
TXC	ON	OFF	-	-	-	-

Note 1: Undergoes CPSWACT: in-progress calls preserved; no new calls established.

Note 2: Undergoes Cold SWACT: in-progress calls dropped; no new calls established.

*(For notes 1 and 2, UDLC and DS1 Tandem calls are unaffected).

Note 3: Recovery could be marginally longer depending on switch audit activity.

Note 4: ON, if subset of card has failed (In-service, Partial fail).

Note 5: ON, if DS1 protection card is providing protection.

Note 6: ON, if secondary LIC is data active.

Note 7: Upon primary LIC removal, the corrupted line cards are reloaded (approximately 45 seconds).

LEDs on out-of-service modules, circuit packs, and cards

Table 1-2 shows how to interpret the green Active LED and the red Fail LED for an *out-of-service* module, circuit pack, or card in the AccessNode shelves.

Table 1-2

Status of the LEDs on out-of-service modules, circuit packs, and cards

Module, circuit pack, or card	Active (green) LED	Fail (red) LED
Processor	OFF	OFF
MIC	OFF	OFF
OPC (see Note1)	ON	OFF
TAC	OFF	OFF
OC-12	OFF	OFF
DS1	OFF	OFF
ESI	OFF	OFF
TIC	OFF	OFF
AIC	OFF	OFF
LIC (see note 2)	OFF	OFF
Line card	n/a	OFF
MTAC	n/a	OFF
CDSP (see note 2)	n/a	OFF
IRTU	OFF	OFF
TXC	OFF	OFF
Note 1: Out-of-service OPC cannot be removed until OPC shutdown is performed.		
Note 2: Red LED is ON if there is a failure on the card detected by hardware.		

LED on failed modules, circuit packs and cards

Table 1-3 shows how to interpret the green Active LED and the red Fail LED for a *failed* module, circuit pack, or card in the AccessNode shelves.

Table 1-3
Status of the LEDs on failed modules, circuit packs and cards

Module, circuit pack, or card	Active (green) LED	Fail (red) LED
Processor	OFF	ON
MIC	OFF	ON
OPC	OFF	ON
TAC	OFF	ON
OC-12	OFF	ON
DS1	OFF	ON
ESI	OFF	ON
TIC	OFF	ON
AIC	OFF	ON
LIC	OFF	ON
Line card	n/a	ON
MTAC	n/a	ON
CDSP	n/a	ON
IRTU	OFF	ON
TXC	OFF	ON

Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12

The group number you enter in a command string depends on the shelf type and function, the mapper type, and its slot location. Table 1-4 summarizes the group and slot associations for the different mappers and shelves.

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.

Table 1-4
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	G5	G6													
	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

- * For DS3 TBM FCOT_BLSR fiber-fed shelves, this group is available only if no DS1s provisioned for that shelf.

Group and slot associations for DS1, DS3, and STS-1 I/O cards

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
DS1 equipment	ABM	Table 1-5
	TBM	Table 1-6
DS3 equipment	ABM	Table 1-7
	TBM	Table 1-8
STS-1 equipment	TBM	Table 1-9

For DS1, DS3, and STS-1 circuit packs, Tables 1-5 through 1-9 show the association between mappers in the lower level of the common equipment shelf and input/output cards in the upper level.

For example, DS1 circuit pack group G1 refers to the group of modules including the working DS1/VT mapper circuit pack in slot 1 and its corresponding DS1 input and output cards in slots 30 and 32, respectively. Similarly, DS1 circuit pack group P refers to the group of modules including the protection DS1/VT mapper circuit pack in slot 3 and the DS1 protection bridge cards in slots 34 and 36.

DS1 I/O numbers

Table 1-5 lists the DS1 circuit pack groups for the access bandwidth manager (ABM) shelf functions. It also shows the association between mappers in the lower level of the shelf, and input cards and output cards in the upper level.

**Table 1-5
ABM DS1 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	g1*	g2*	P*	g4*	g5*	g6*	g7	g8											
RFT_BLSR	Input slot	30*	31*	34p*	35*	38	39	42	43											
FCOT	Output slot	32*	33*	36p*	37*	40	41	44	45											
FCOT_BLSR																				

Note 1: * DS1 equipment allowed in a DS1-fed ABM shelf.
Note 2: The symbol "p" in the DS1 input and output slots denotes a protection bridge card.
Note 3: The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

1-12 Overview of module replacement procedures

Table 1-6 lists the DS1 circuit pack groups for the different transport bandwidth manager (TBM) shelf functions. It also shows the association between mappers in the lower level of the shelf, and input cards and output cards in the upper level.

Table 1-6
TBM DS1 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			g3	g4							g5	g6	P	g8	g9	g10	g11	g12	
	Input slot			34	35							38	39	42p	43	46	47	50	51	
	Output slot			36	37							40	41	44p	45	48	49	52	53	
FCOT_BLSR	Group	g1*	g2*	g3	g4							g5	g6	P	g8	g9	g10	g11	g12	
	Input slot	30*	31*	34	35							38	39	42p	43	46	47	50	51	
	Output slot	32*	33*	36	37							40	41	44p	45	48	49	52	53	
TN_BLSR	Group	g1*	g2*	g3	g4							g5	g6	g7	g8	g9	g10	g11	g12	P
	Input slot	30*	31*	34	35							38	39	42	43	46	47	50	51	-
	Output slot	32*	33*	36	37							40	41	44	45	48	49	52	53	-

Note 1: * FCOT_BLSR and TN_BLSR shelves can contain two additional DS1 working groups (compared to an FCOT) when DS3 protection mappers are not used in slots 1 and 2. The two additional DS1 working groups are g1 (slots 1, 30, 32) and g2 (slots 2, 31, 33).

Note 2: The symbol “p” in the DS1 input and output slots denotes a protection bridge card.

Note 3: The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

DS3 I/O numbers

Table 1-7 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 1-7
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.

Table 1-8 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 1-8
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 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.

STS-1 I/O numbers

Table 1-9 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 1-9
TBM STS-1 interface, 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.

Replacing modules in a common-equipment shelf

This chapter provides procedures for replacing circuit packs, cards, and modules in an AccessNode access bandwidth manager (ABM) shelf or transport bandwidth manager (TBM) shelf. Observe and follow all safety precautions listed in “Overview of module replacement procedures” on page 1-1 of this document when handling circuit packs.

Note 1: Procedures for replacing the operations controller module (OPC) are documented in a separate chapter. See page 7-1 for OPC procedures.

Note 2: Maintenance procedures for replacing AccessNode Express modules are documented in the *AccessNode Express Maintenance Guide*, 323-3051-211.

Chapter contents

In the following table look up the circuit pack, card, or module to be replaced, and proceed to the specified page. The following table lists items alphanumerically, by product engineering code (PEC). If you cannot successfully complete these procedures, contact your next level of support.

PEC	Module description	See
NT4K30	BNC I/O card	page 2-3
NT4K31	DS1 protection bridge card	page 2-4
NT4K32	DS1 input card	page 2-6
NT4K33	DS1 output card	page 2-8
NT4K50	Side interconnect left circuit pack	page 2-10
NT4K51AA	Side interconnect right circuit pack	page 2-12
NT4K52	Processor card	page 2-13
NT4K53	Maintenance interface card	page 2-17
NT4K54	Test access card	page 2-21
NT4K55	Access interface card or loopback access interface card	page 2-23
NT4K56	Transport interface card (replacing)	page 2-31
NT4K56CA	Asynchronous transport interface card (firmware upgrade)	page 2-34
NT4K57	Integrated remote test unit (IRTU)	page 2-46
NT4K58CA	Test bypass pair input/output	page 2-48
NT4K58DA	PGTC/MTA input/output	page 2-50
NT4K58KA	Test access path card	page 2-52
NT4K58LA	Serial I/O card	page 2-54
NT4K58MA	Common equipment power card	page 2-56
NT4K60	DS3 or STS-1 protection switch circuit pack	page 2-62
NT4K75	Timing and cross-connect	page 2-63
NT7E01	OC-3 optical interface	page 2-66
NT7E02	OC-12 optical interface	page 2-76
NT7E04	DS1/VT mapper	page 2-84
NT7E05	OC-12 VTBM optical interface	page 2-89
NT7E08	DS3/STS mapper	page 2-97
NT7E09	STS-1 interface	page 2-101
NT7E19	External synchronization interface carrier	page 2-106
NT7E24	Operations controller module	page 7-1
NT7E27	External synchronization interface	page 2-112

Procedure 2-1

NT4K30: BNC I/O card

Use this procedure to replace an NT4K30 BNC I/O card in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Note: BNC I/O cards are used only with DS3/STS mapper and STS-1 interface cards.

Action

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



CAUTION

Possible loss of service

Replacing the BNC I/O card will cause a service failure to the DS3 input and output channel associated with it.

- 1 Remove the shelf cover.
Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.
- 2 Disconnect the DS3 or STS-1 cables from the BNC I/O card connectors.
Note: If cabling is congested, use a BNC removal/installation tool.
- 3 Loosen the hold-down screw on the faceplate and remove the BNC I/O card from the shelf.
- 4 Install the new BNC I/O card and tighten the hold-down screw.
- 5 Reconnect the BNC cables to the I/O card.
Note: If cabling is congested, use a BNC removal/installation tool.
- 6 Replace the shelf cover.
Note: For details, see the procedure for replacing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—end—

Procedure 2-2

NT4K31: DS1 protection bridge card

Use this procedure to replace a DS1 protection bridge card in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.



CAUTION

Protection unavailable

Removing the DS1 protection bridge card causes protection to be inoperative for all DS1/VT mappers.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Action

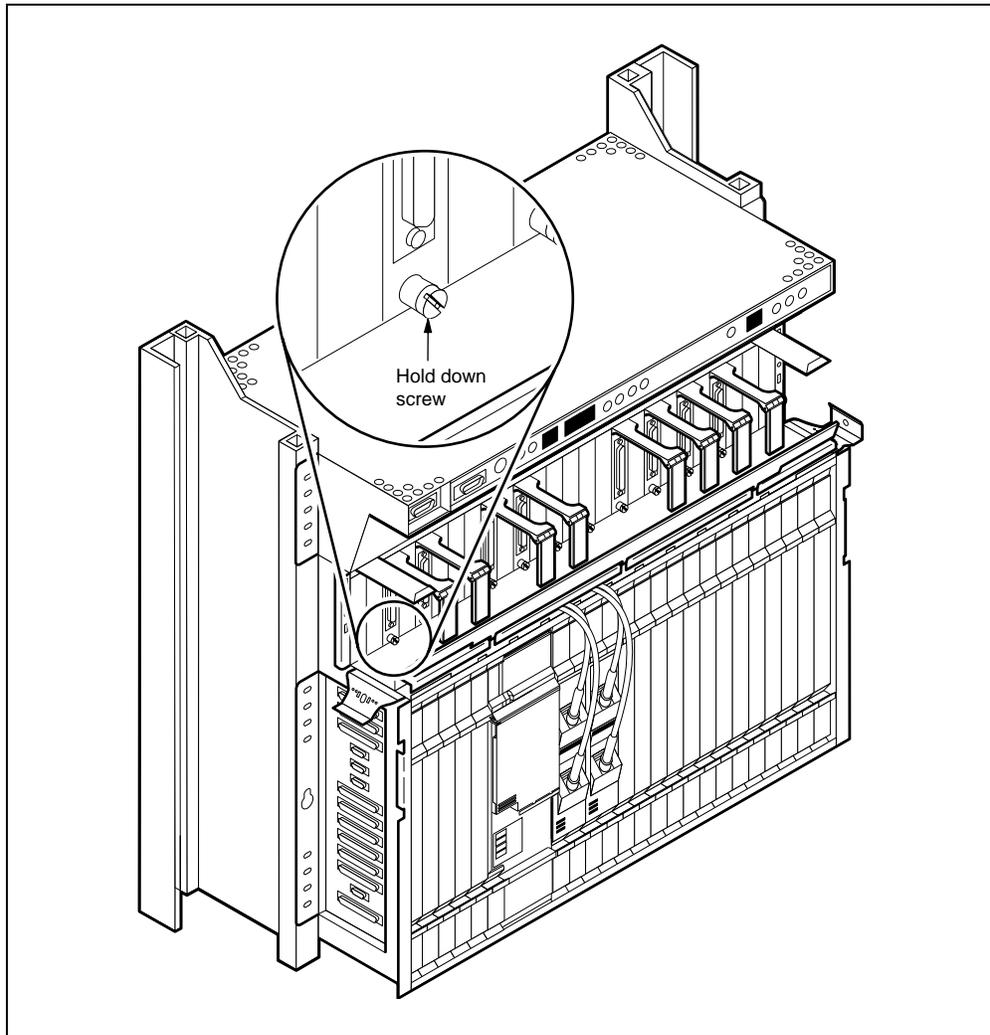
Step	Action
1	Lockout the protection bridge card from any possible protection switch attempts: pr;dtlprot ds1 ↵ lockout op p ↵ <i>The system prompts for confirmation. Enter:</i> y ↵ <i>An asterisk appears in the lockout columns for the P group.</i>
2	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
3	Unfasten the hold-down screw on the faceplate, as shown following, and remove the protection bridge card from the shelf by pulling outward on the hanging tab.

—continued—

Procedure 2-2 (continued)
NT4K31: DS1 protection bridge card

Step Action

PC-10633



- 4 Install the replacement bridge card in the shelf and fasten the hold-down screw on the faceplate.
- 5 From the detailed protection screen, release the protection switch lockout:
lockout re p.
The system prompts for confirmation. Enter:
y.
The asterisk in the Lockout column of the screen changes to a period (.).
- 6 Replace the shelf cover. See *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—end—

Procedure 2-3 NT4K32: DS1 input card

Use this procedure to replace a DS1 input card in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Action

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

- 1 Remove the shelf cover.

Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.



CAUTION

Service interruption

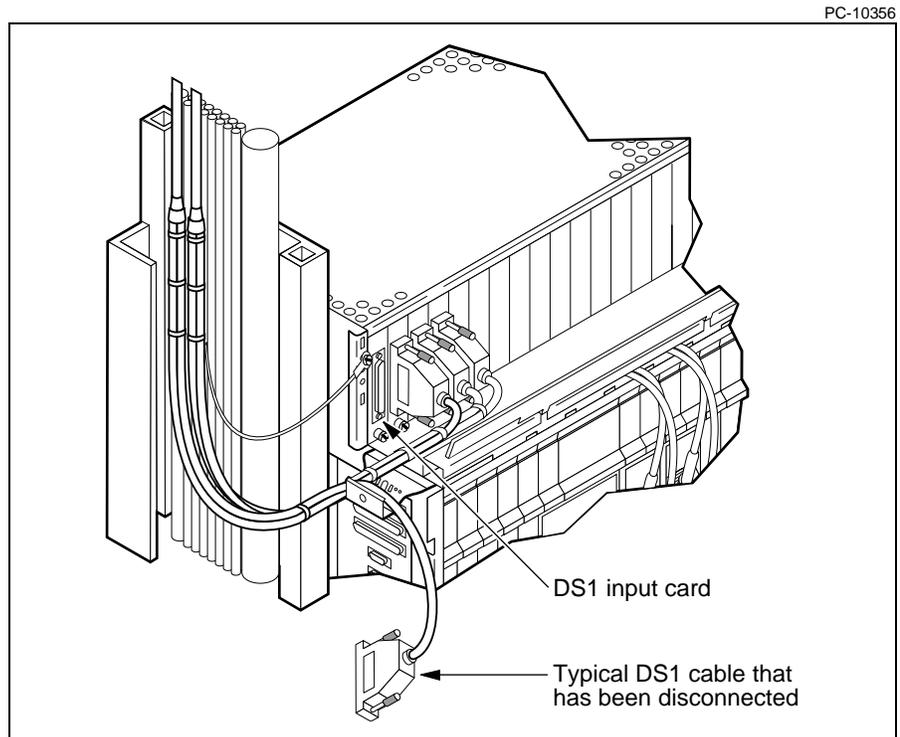
There are up to 14 DS1s associated with a DS1 input card. Removing the connector from a DS1 input card results in a loss of up to 14 DS1s to the corresponding DS1/VT mapper.

—continued—

Procedure 2-3 (continued)
NT4K32: DS1 input card

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

- | | |
|---|--|
| 2 | Disconnect the DS1 signal cable from the DS1 input card, as shown. |
|---|--|



- | | |
|---|--|
| 3 | Loosen the hold-down screw on the faceplate and remove the input card from the shelf. |
| 4 | Insert a replacement DS1 input card, and tighten the hold-down screw on the faceplate. |
| 5 | Reconnect the DS1 cable to the input card and fasten the connector hold-down screw. |
| 6 | Replace the shelf cover. |

Note: For details, see the procedure for replacing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—end—

Procedure 2-4 NT4K33: DS1 output card

Use this procedure to replace a DS1 output card in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Action

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

- 1 Remove the shelf cover.

Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.



CAUTION

Service interruption

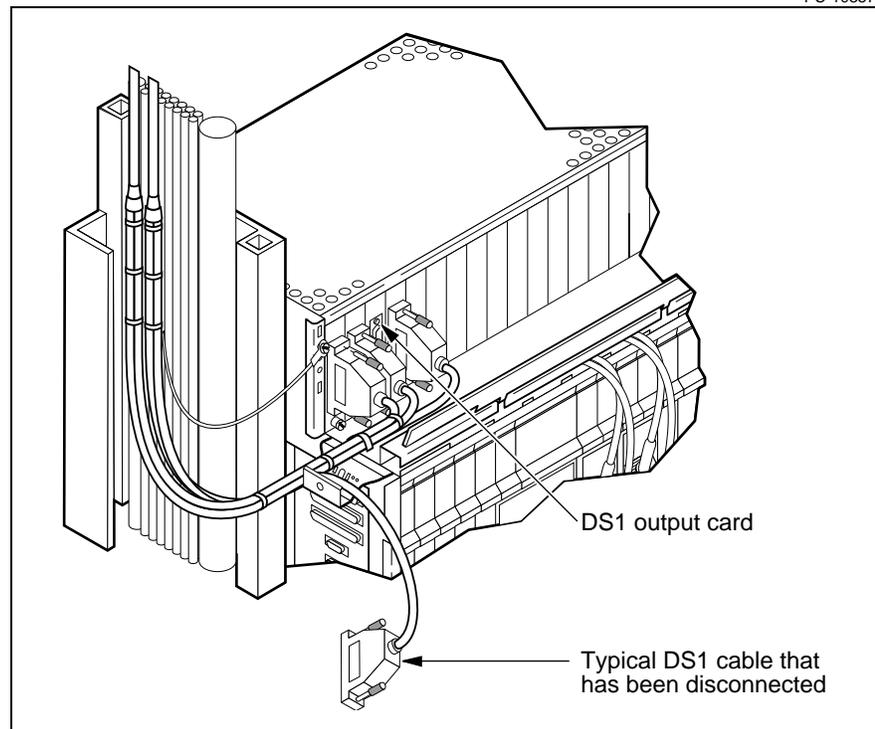
There are up to 14 DS1s associated with each DS1 output card. Removing the connector from a DS1 output card results in a loss of up to 14 DS1s to the corresponding DS1/VT mapper.

—continued—

Procedure 2-4 (continued)
NT4K33: DS1 output card

Step **Action**

- 2 Loosen the hold-down screw on the connector, and disconnect the DS1 cable from the DS1 output card (as shown following).



- 3 Loosen the hold-down screw on the faceplate and remove the output card from the shelf.
- 4 Insert a replacement DS1 output card and tighten the hold-down screw.
- 5 Reconnect the DS1 cable to the output card and tighten the hold-down screw.
- 6 Replace the shelf cover.

Note: For details, see the procedure for replacing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—end—

Procedure 2-5

NT4K50: Side interconnect left

Use this procedure to replace the side interconnect left circuit pack in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.



CAUTION

Service-affecting

When you pull this circuit pack out of its slot, you thereby remove the terminations for various backplane signals, resulting in signal degradation and possible loss of traffic.

Loss of functionality

All connectors on the side interconnect left must be disconnected before removing the circuit pack. This results in a loss of the following functions:

- backplane signal terminations
- breaker interface panel (BIP) control
- external synchronization interface (ESI)
- parallel telemetry
- control network
- RS-232 DTE
- RS-232 OPC
- serial telemetry
- cooling unit
- orderwire extension
- local craft access panel 1
- local craft access panel 2
- copper-distribution shelf metallic test access

Action

Step	Action
1	Ensure that all connectors are labeled with the same designations as the label on the side interconnect left circuit pack.
2	Disconnect all cables from the circuit pack connectors.
3	Loosen the two hexagonal screws located on the side of the circuit pack: one screw is located beside the label <i>Parallel Telem</i> ; the other is located between the two <i>LCAP</i> labels.

—continued—

Procedure 2-5 (continued)

NT4K50: Side interconnect left

Step	Action
4	Lift the ejector latches to disengage the circuit pack from the shelf, and pull it completely from its slot.
5	Gently push the replacement circuit pack in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
6	Secure the circuit pack by tightening the two hexagonal hold-down screws.
7	Starting from the top connector on the circuit pack, reconnect each of the connectors removed in step 2. Securely fasten each of the hold-down screws on the connectors.

—end—

Procedure 2-6

NT4K51AA: Side interconnect right

Use this procedure to replace the side interconnect right circuit pack in an access bandwidth manager (ABM) shelf.



CAUTION

Loss of service

All connectors on the side interconnect right must be disconnected before removing the circuit pack. This results in a loss of service to all line cards in the copper-distribution shelves.

Action

Step	Action
1	Ensure that all connectors are labeled with the same designations as the label on the side interconnect right circuit pack (CDS 1A through CDS 7B).
2	Turn off all circuit breakers on the breaker interface panel labeled CDS1 through to CDS 7.
3	Disconnect all cables from the side interconnect right circuit pack connectors. (These are the cables going to the copper-distribution shelves.)
4	Loosen the two screws located on the side of the circuit pack: one screw is located beside the label <i>CDS 2A (J3)</i> ; the other is located beside label <i>CDS 6B (J12)</i> .
5	Pull the ejector latches to disengage the circuit pack from the shelf, and pull it completely from its slot.
6	Gently push the replacement circuit pack in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
7	Secure the circuit pack by tightening the two hexagonal hold-down screws.
8	Starting from the top connector on the circuit pack, reconnect each of the connectors removed in step 3. Securely fasten each of the hold-down screws on the connectors.
9	After all copper-distribution shelf connectors are reconnected, return each of the breaker interface panel breakers to the on position.

—end—

Procedure 2-7

NT4K52: Processor card

Use this procedure to replace a processor card in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

Action

Step	Action								
1	Determine the current status of the processor card you wish to replace. <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>the active processor</td> <td>go to step 2</td> </tr> <tr> <td>the standby processor</td> <td>go to step 5</td> </tr> <tr> <td>a failed or out-of-service processor</td> <td>go to step 8</td> </tr> </tbody> </table>	If replacing	Then	the active processor	go to step 2	the standby processor	go to step 5	a failed or out-of-service processor	go to step 8
If replacing	Then								
the active processor	go to step 2								
the standby processor	go to step 5								
a failed or out-of-service processor	go to step 8								
2	From the network element status screen, display the screen for either processor: eq proc <group> ↵ where <group> group number of one of the processors: a or b								

The processor equipment screen appears.



CAUTION

Risk of possible service interruption

Check the “sync” status before performing the switch in step 3. If the processors are in “sync”, this will prevent calls from being dropped when a switch is performed. If the processors are not in “sync”, active calls will be dropped when a switch is performed.

—continued—

2-14 Replacing modules in a common-equipment shelf

Procedure 2-7 (continued)
NT4K52: Processor card

Step Action



CAUTION

Possible loss of service

DS1 and DS3 protection switching is unavailable during a switch of activity (SWACT) of the processor cards. If a DS1/VT mapper or a DS3/STS mapper fails while a SWACT is in progress, traffic cannot be switched to the protection mapper. During a SWACT of the processor cards, in-progress calls are preserved, but no new calls may be established. The maximum wait time for establishing new calls is 30 seconds. Protection switching is available (after the SWACT) when the user is prompted to log in to the network element.

3 Switch activity to the standby (redundant) processor:

switch↵

y↵

Note 1: During a processor card SWACT, the green active LED on working DS1/VT mappers and DS3/STS mappers goes out for approximately 20 seconds. The DS1/VT mappers are fully functional during this 20 second interval and there is no loss of traffic.

Note 2: You must wait 7 minutes before performing another protection switch on the same processor cards.

4 Log back in to the network element user interface.

Skip to step 6.

5 From the network element status screen, display the screen for the standby processor:

eq proc <group>↵

where

<group> group number of the standby processors: **a** or **b**

The processor equipment screen appears.

6 To prevent alarms from being raised when the circuit pack is removed, change the state of the processor:

chgstate oos↵

y↵

The state changes to out-of-service (OOS).

—continued—

Procedure 2-7 (continued)
NT4K52: Processor card

Step	Action
7	<p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546,546, in this volume.</p>
8	<p>Pull the circuit pack ejector latches to remove the processor card from the shelf.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <div style="display: flex; align-items: center;">  <div> <p>CAUTION</p> <p>Possible loss of service</p> <p>Check that the replacement processor card has the same PEC code as the other processor card in the ABM shelf. Processors with different PEC codes are not compatible. A service outage to all subscribers will occur if processors with different PEC codes are placed in the ABM shelf.</p> </div> </div> </div>
9	<p>Wait at least 10 seconds before installing the replacement card. Gently push the replacement circuit pack into the shelf slot until the ejector latches come in contact with the front of the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.</p> <p>While the software is being downloaded to the replacement processor card, the yellow Init LED on the maintenance interface card (MIC) is lit. The yellow Init LED on the MIC goes off when the software downloading is complete, which takes approximately 12 minutes.</p> <p>Note 1: Once synchronization is established between the active and the standby processor, there is a delay of approximately 2 minutes before the HMU and APU load names appear on the Processor equipment screen.</p> <p>Note 2: On insertion of an inactive processor card, if the red fail LED lights on both processors, replace the newly inserted processor.</p>
10	<p>If the automatic-in-service feature is set to on, and the circuit pack state automatically changes to in-service (IS), skip to step 12.</p>
11	<p>From the processor equipment screen, change the state of the replaced card to in-service:</p> <p>chgstate is ↵</p> <p><i>The state of the replaced processor card changes to in-service (IS).</i></p>
12	<p>Replace the shelf cover.</p> <p>Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>

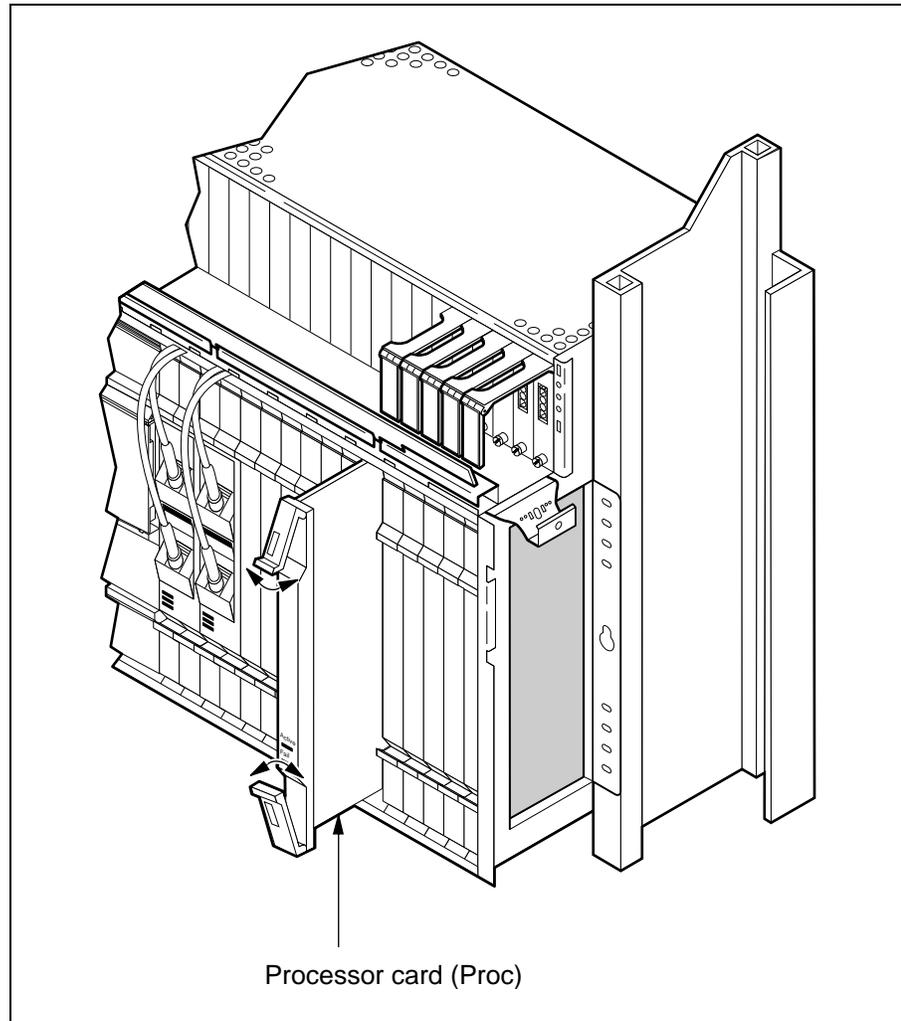
—continued—

2-16 Replacing modules in a common-equipment shelf

Procedure 2-7 (continued)
NT4K52: Processor card

Step Action

PC-10358



—end—

Procedure 2-8

NT4K53: Maintenance interface card

Use this procedure to replace the maintenance interface circuit pack in an access bandwidth manager (ABM) shelf or transport bandwidth manager (TBM) shelf.

Requirements

If a DS1 protection switch is in effect, clear the condition that resulted in the protection switch before replacing the maintenance interface card (MIC).

Action

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



CAUTION

Loss of protection switching

Removing the maintenance interface card (MIC) causes DS1 protection switching to be inoperative, and, if a DS1 protection switch is in effect, it is dropped. Before replacing the MIC, clear the condition that caused the DS1 protection switch to occur.

- 1 Determine the DS1 protection switching status. From the Network Element Status screen, display the protection switching screen:

```
pr.↓
listprot.↓
```
- 2 On the screen, is there a number (other than 0) beside the word `Act :` for a DS1 ? (For example, `Act : 1`).

If	Then
yes	go to step 3
no	go to step 4
- 3 Investigate the condition that caused the DS1 protection switch to occur. Do not continue with this procedure until the DS1 protection switch is cleared.
- 4 From the Network Element Status screen, display the maintenance interface equipment screen:

```
eq mic.↓
```

The MIC equipment screen appears.

—continued—

2-18 Replacing modules in a common-equipment shelf

Procedure 2-8 (continued)

NT4K53: Maintenance interface card

Step	Action
5	<p>To prevent alarms from being raised when the circuit pack is removed, take the maintenance interface card out of service:</p> <p>chgstate oos. y.</p> <p><i>The state of the MIC changes to out-of-service (OOS).</i></p>
6	<p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>
<div style="border: 1px solid black; padding: 10px;"><div></div><div><p>CAUTION Loss of functionality upon MIC removal Removing the maintenance interface card (MIC) causes the following functions to be inoperative:</p><ul style="list-style-type: none">• loss of DS1 protection switching. (For details, see caution box before step 1.)• Local craft access (orderwire)• serial and parallel telemetry scan points• common-equipment LEDs clock monitoring clock• DTE modem• external alarm drivers</div></div>	
7	<p>Pull the circuit pack ejector latches to remove the maintenance interface circuit pack from the shelf, as shown in Figure 2-1.</p>

—continued—

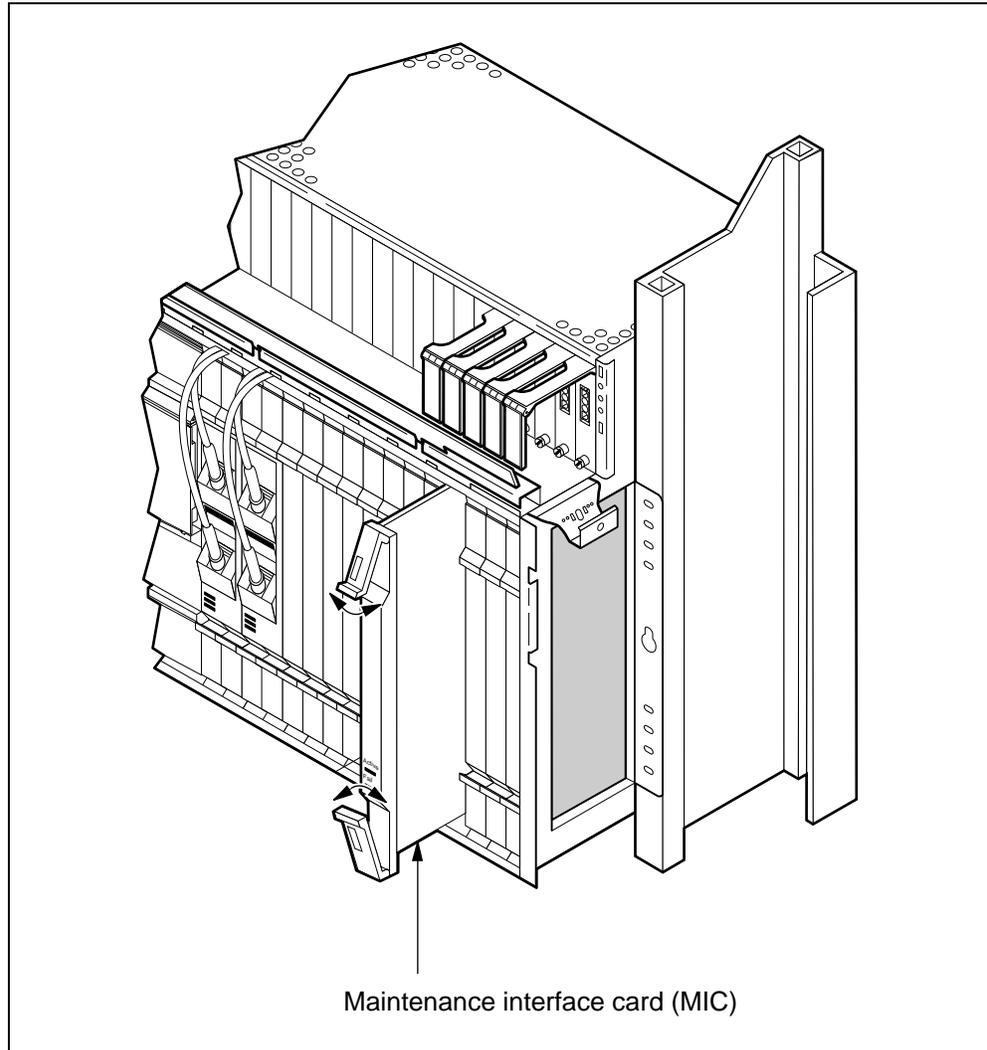
Procedure 2-8 (continued)

NT4K53: Maintenance interface card

Step Action

**Figure 2-1
Removing the MIC from the shelf**

PC-10359



—continued—

2-20 Replacing modules in a common-equipment shelf

Procedure 2-8 (continued)

NT4K53: Maintenance interface card

Step	Action
8	Wait at least 10 seconds before installing the replacement card. Insert a replacement maintenance interface card in the shelf. Gently push the replacement circuit pack in until the ejector latches come in contact with the front of the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
9	From the MIC equipment screen, change the state of the MIC to in service: chgstate is ␣ <i>The state of the MIC changes to IS.</i>
10	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—end—

Procedure 2-9

NT4K54: Test access card

Use this procedure to replace a test access card (TAC) in an access bandwidth manager (ABM) shelf.

Action

Step	Action
1	From the network element status screen, display the TAC equipment screen: eq tac. ↵ <i>The TAC equipment screen appears.</i>
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the TAC group to out-of-service: chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>
3	Confirm the state change: y. ↵ <i>The state changes to out-of-service (OOS).</i>
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Pull the circuit pack ejector latches to remove the circuit pack from its slot as shown in Figure 2-2.
6	Wait at least 10 seconds before installing the replacement card. Insert a replacement TAC in the shelf. Gently push the replacement card in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
7	If the automatic-in-service feature is set to on, and the circuit pack state automatically changes to in-service (IS), skip to step 9.
8	From the TAC equipment screen, change the state of the replacement TAC to in-service: chgstate is. ↵
9	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

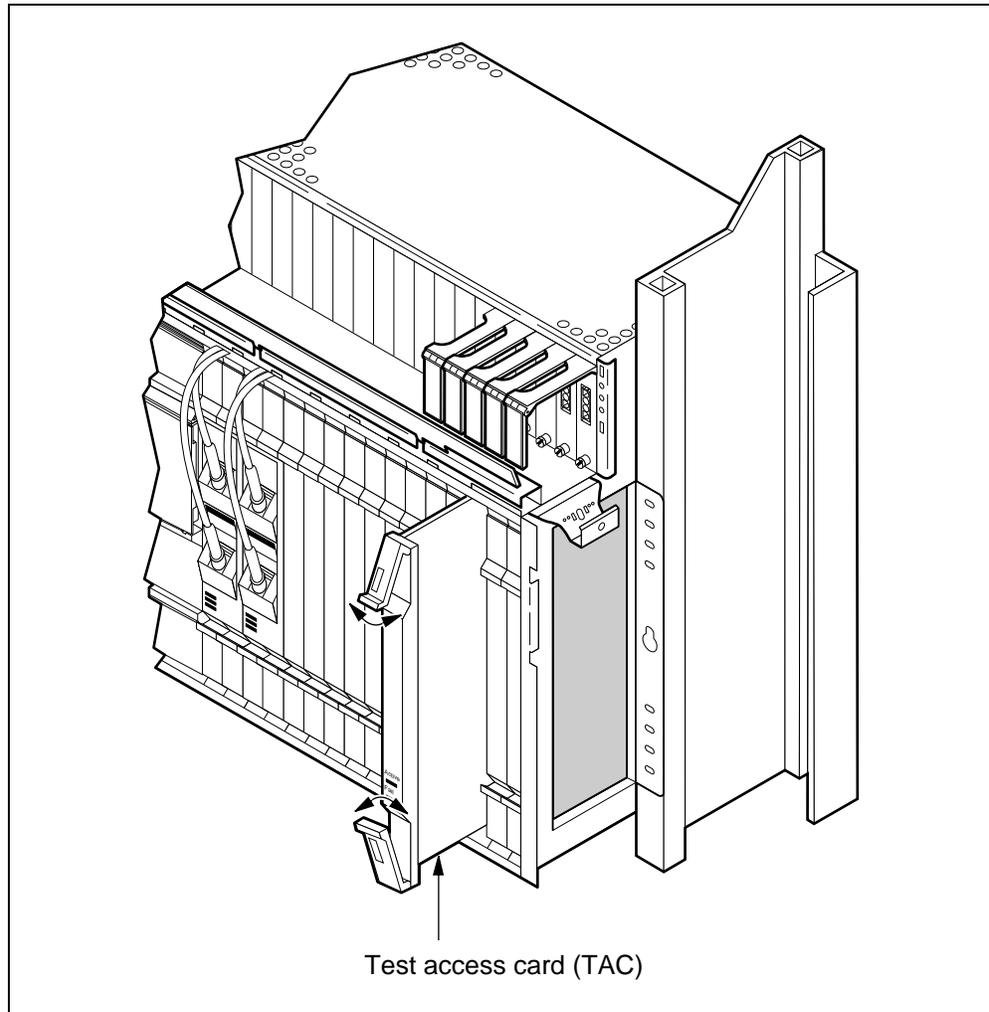
—continued—

2-22 Replacing modules in a common-equipment shelf

Procedure 2-9 (continued)
NT4K54: Test access card

Figure 2-2
Removing the TAC

PC-10711



—end—

Procedure 2-10

NT4K55: Access interface card or loopback access interface card

Use this procedure to replace an access interface card (AIC) or a loopback access interface card (LAIC) in an access bandwidth manager (ABM) shelf.

Note: The AIC and LAIC cards are not interchangeable. The LAIC card is used only in AccessNode Express (ANX) systems. You cannot replace an AIC card with a LAIC card, or vice versa. You also cannot have both an AIC and a LAIC circuit pack in the same ABM shelf.

Action

Step	Action						
	<table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>an in-service AIC/LAIC</td> <td>go to step 1</td> </tr> <tr> <td>a failed or out of service AIC/LAIC</td> <td>go to step 4</td> </tr> </tbody> </table>	If replacing	Then	an in-service AIC/LAIC	go to step 1	a failed or out of service AIC/LAIC	go to step 4
If replacing	Then						
an in-service AIC/LAIC	go to step 1						
a failed or out of service AIC/LAIC	go to step 4						
1	<p>From the network element status screen, display the AIC/LAIC equipment screen by entering:</p> <pre>eq aic <group> ↵</pre> <p>where</p> <p><group> group number of the AIC/LAIC being replaced: a or b</p>						

The AIC/LAIC equipment screen appears.

Note: The `eq aic` command is used for both AIC and LAIC cards.



CAUTION

Risk of possible service interruption

If an AIC is taken out of service using the EQ AIC command, and if the other AIC not being replaced has been in service for less than two minutes, dropped calls may result. This may occur even though the unreplaced AIC may show as being in service. Allow AICs to be in service for at least two minutes before taking the other AIC out of service.

—continued—

2-24 Replacing modules in a common-equipment shelf

Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the AIC/LAIC to out-of-service (OOS): chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>
3	Confirm the state change by entering: y. ↵ <i>The state changes to OOS.</i>
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Pull the circuit pack ejector latches to remove the AIC/LAIC circuit pack from its slot as shown in Figure 2-3.

—continued—

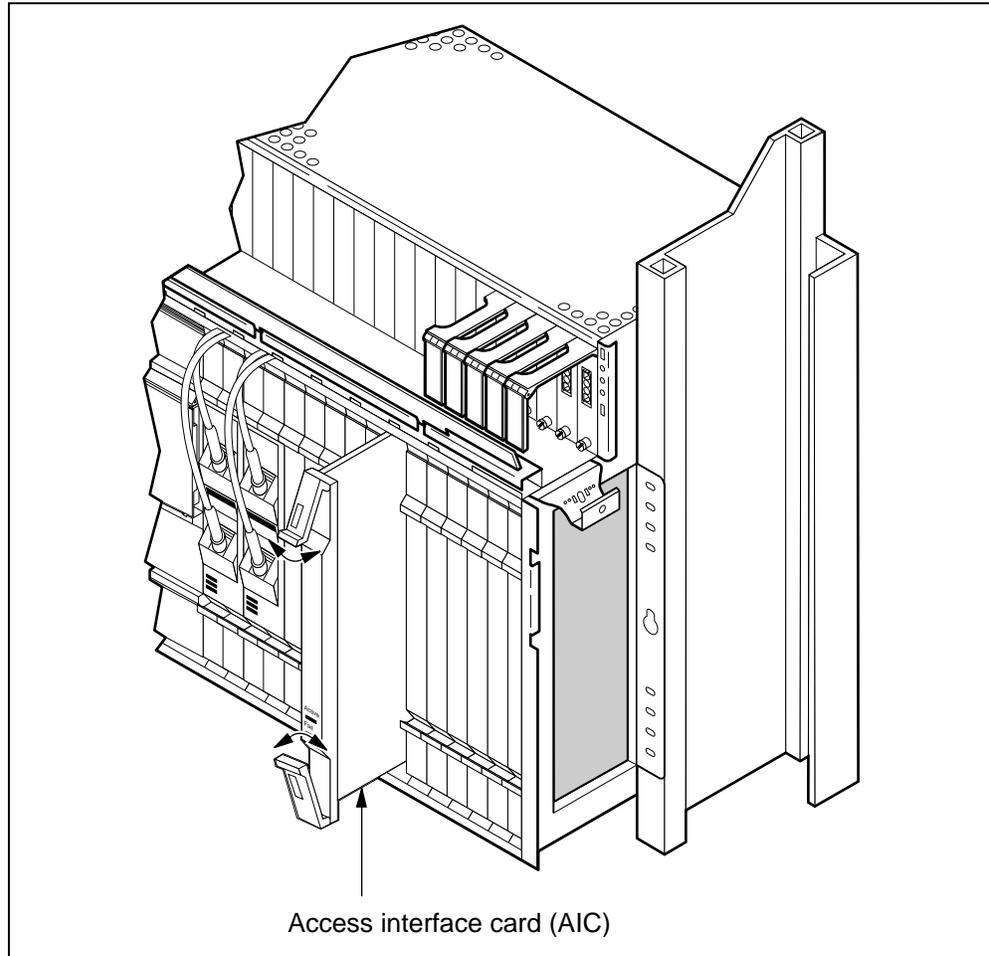
Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step Action

Figure 2-3
Replacing the AIC/LAIC circuit pack

PC-10710



—continued—

Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action						
6	Wait at least 10 seconds before installing the replacement card. Insert a replacement AIC/LAIC in the shelf. Gently push the replacement card in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.						
7	What type of circuit pack are you replacing?						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>AIC</td> <td>Go to step 32.</td> </tr> <tr> <td>LAIC</td> <td>Go to step 8.</td> </tr> </tbody> </table>	If	Then	AIC	Go to step 32.	LAIC	Go to step 8.
If	Then						
AIC	Go to step 32.						
LAIC	Go to step 8.						
8	Type the following: quit all. ↵						
9	Open the AccessNode Express upgrade tool: anxupgci. ↵ <i>The ANXUPGCI tool loads and the ANXUPGCI prompt appears, followed by this message:</i> ANXUPGCI : ANXUPGCI is used to upgrade the Loopback AIC and the Shelf Processor. Please type HELP for more information. Note: For more information about manual upgrade procedures, see <i>AccessNode Express Commissioning and OAM&P</i> , 323-3051-220.						
10	Verify that the firmware has the correct load. Type the following: laicloads. ↵ <i>The current load is displayed:</i> -- Loopback AIC A -- The current load is LAICL15BJ -- Loopback AIC B -- The current load is LAICL15BJ						
11	Upgrade the firmware: upgrade laic <group> fw where <group> group number of the LAIC being replaced: a or b <i>The following message appears:</i> Upgrade the firmware - are you sure? Please confirm ("Yes" or "No"):						

—continued—

 Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action
12	Confirm the upgrade: y ↵ <i>The following message appears:</i> The loopback AIC upgrade has been initiated. Use the LAICSTATUS command to obtain status information.
13	Check the status of the upgrade: laicstatus ↵ <i>The following message appears:</i> --- Loopback AIC A --- Status: Loopback AIC upgrade completed successfully!
14	Upgrade the boot load: upgrade laic <group> boot ↵ where <group> group number of the LAIC being replaced: a or b <i>The following message appears:</i> Upgrade the boot load - are you sure? Please confirm ("Yes" or "No"):
15	Confirm the upgrade: y ↵ <i>The following message appears:</i> The Loopback AIC upgrade has been initiated. Use the LAICSTATUS command to obtain status information.
16	Check the status of the upgrade: laicstatus ↵ <i>The following message appears:</i> --- Loopback AIC A --- Status: Loopback AIC upgrade completed successfully!
17	At the CI (>) prompt, type: quit ↵ mapci ↵ <i>The MAPCI screen appears.</i>
18	Type: fwpui ↵ <i>The Network Element Status screen appears.</i>

—continued—

2-28 Replacing modules in a common-equipment shelf

Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action
19	At the NEUI (>) prompt, type: eq aic <group> ↵ where <group> group number of the LAIC being replaced: a or b <i>The LAIC equipment screen appears.</i>
20	At the NEUI (>) prompt, type: chgstate is ↵ <i>The following message is displayed:</i> The ChgState command has been received. It will be processed.
21	At the NEUI (>) prompt, type: chgstate oos ↵ <i>The system prompts for confirmation of the state change.</i>
22	Confirm the state change by entering: y ↵ <i>The following message appears:</i> The ChgState command has been received. It will be processed.
23	Type: quit all ↵ <i>The CI: > prompt appears.</i>
24	At the CI (>) prompt, type: anxupgci ↵ <i>The following message appears:</i> ANXUPGCI : ANXUPGCI is used to upgrade the Loopback AIC and the Shelf Processor. Please type HELP for more information.
25	Upgrade the cpld load: upgrade laic <group> cpld ↵ where <group> group number of the LAIC being replaced: a or b

—continued—

 Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action
	<p><i>The following message appears:</i></p> <pre>Upgrade the cpld load - are you sure? Please confirm ("Yes" or "No"):</pre>
26	<p>Confirm the upgrade:</p> <pre>y</pre> <p><i>The following message appears:</i></p> <pre>The Loopback AIC upgrade has been initiated. Use the LAICSTATUS command to obtain status information.</pre>
27	<p>Check the status of the upgrade:</p> <pre>laicstatus</pre> <p><i>The following message appears:</i></p> <pre>--- Loopback AIC A --- Status: Loopback AIC upgrade completed successfully!</pre>
28	<p>Close the ANXUPGCI tool:</p> <pre>quit</pre>
29	<p>To return to the NEUI, enter:</p> <pre>fw</pre>
30	<p>From the network element status screen, display the LAIC equipment screen by entering:</p> <pre>eq aic <group></pre> <p style="margin-left: 40px;">where</p> <p style="margin-left: 80px;"><group> group number of the LAIC being replaced: a or b</p>
31	<p><i>The LAIC equipment screen appears.</i></p> <p>From the LAIC equipment screen, change the state of the circuit pack to in-service by entering:</p> <pre>chgstate is</pre> <p><i>The following message appears:</i></p> <pre>ChgState is The ChgState command has been received. It will be processed.</pre>

—continued—

2-30 Replacing modules in a common-equipment shelf

Procedure 2-10 (continued)

NT4K55: Access interface card or loopback access interface card

Step	Action						
32	Are you also replacing the other AIC/LAIC? <table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>yes</td><td>Wait one minute, then go to step 1.</td></tr><tr><td>no</td><td>Go to step 33.</td></tr></tbody></table>	If	Then	yes	Wait one minute, then go to step 1.	no	Go to step 33.
If	Then						
yes	Wait one minute, then go to step 1.						
no	Go to step 33.						
33	Replace the shelf cover. For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.						

—end—

Procedure 2-11

NT4K56: Transport interface card

Use this procedure to replace a transport interface card (TIC) in an access bandwidth manager (ABM) shelf.

Action

Step	Action								
	<p>Note: You must replace both the primary and secondary TICs with the same model (NT4K56AC, NT4K56CA, or NT4K56BA) for the system to operate properly. For a description of the different models, refer to <i>Configuration and Equipment Description</i>, 323-3001-100, in <i>Description</i>, Volume 2.</p>								
1	<p>From the network element status screen, display the equipment screen for the TIC being replaced:</p> <pre>eq tic <group>↓</pre> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><group> group number of the primary TIC: a or b</p> <p><i>The TIC equipment screen appears.</i></p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If replacing</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>a primary in-service TIC</td> <td>go to step 2</td> </tr> <tr> <td>a secondary in-service TIC</td> <td>go to step 3</td> </tr> <tr> <td>a failed or out-of-service TIC</td> <td>go to step 5</td> </tr> </tbody> </table>	If replacing	Then	a primary in-service TIC	go to step 2	a secondary in-service TIC	go to step 3	a failed or out-of-service TIC	go to step 5
If replacing	Then								
a primary in-service TIC	go to step 2								
a secondary in-service TIC	go to step 3								
a failed or out-of-service TIC	go to step 5								
2	<p>Switch service from the primary TIC to the secondary TIC:</p> <pre>switch↓</pre> <pre>y↓</pre>								
3	<p>To prevent alarms from being raised when the circuit pack is removed, change the state of the TIC to out-of-service (OOS):</p> <pre>chgstate oos↓</pre> <p><i>The system prompts for confirmation of the state change.</i></p>								
4	<p>Confirm the state change:</p> <pre>y↓</pre> <p><i>The state changes to OOS.</i></p>								
5	<p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>								

- 1 From the network element status screen, display the equipment screen for the TIC being replaced:

```
eq tic <group>↓
```

where

<group> group number of the primary TIC: **a** or **b**

The TIC equipment screen appears.

If replacing	Then
a primary in-service TIC	go to step 2
a secondary in-service TIC	go to step 3
a failed or out-of-service TIC	go to step 5

- 2 Switch service from the primary TIC to the secondary TIC:

```
switch↓
```

```
y↓
```

- 3 To prevent alarms from being raised when the circuit pack is removed, change the state of the TIC to out-of-service (OOS):

```
chgstate oos↓
```

The system prompts for confirmation of the state change.

- 4 Confirm the state change:

```
y↓
```

The state changes to OOS.

- 5 Remove the shelf cover.

Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—continued—

2-32 Replacing modules in a common-equipment shelf

Procedure 2-11 (continued)

NT4K56: Transport interface card

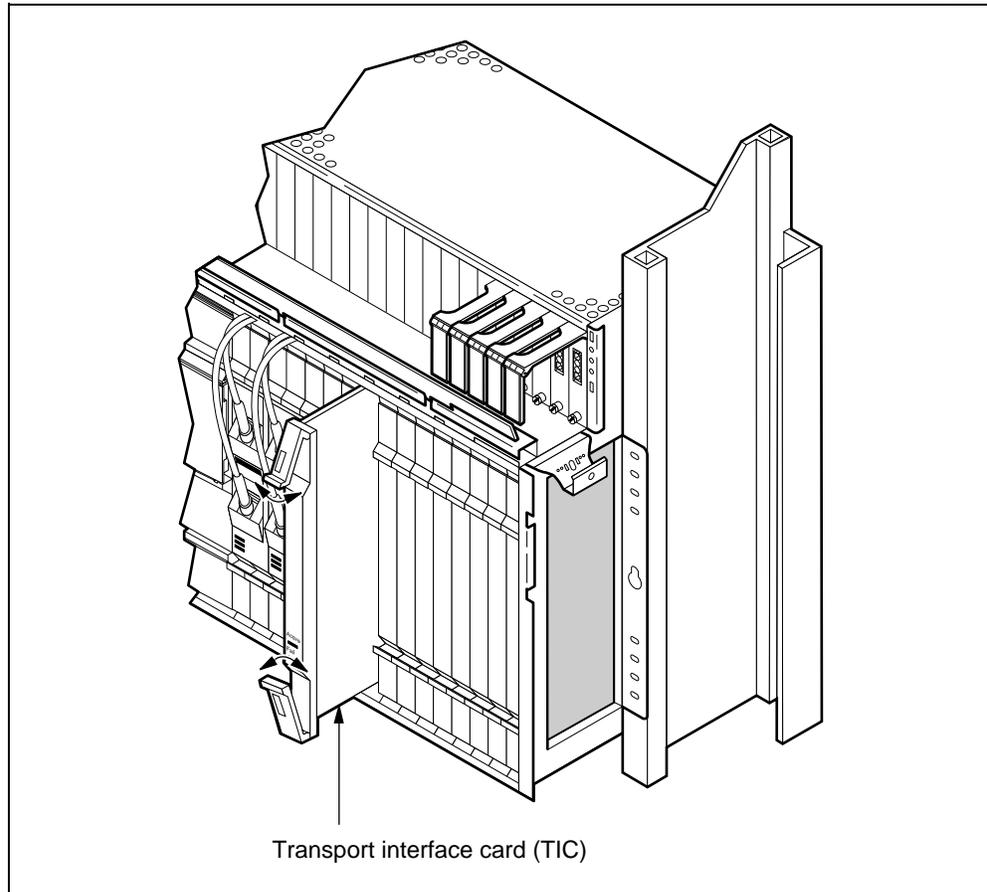
Step	Action
6	Pull the circuit pack ejector latches to remove the circuit pack from its slot as shown in Figure 2-4.
7	Wait at least 30 seconds before installing the replacement card. Insert a replacement TIC in the shelf. Gently push the replacement card in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
8	If the automatic-in-service feature is set to on, and the circuit pack state automatically changes to in-service (IS), skip to step 10.
9	From the TIC equipment screen, change the state of the circuit pack to in-service: chgstate is ↵
10	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—continued—

Procedure 2-11 (continued)
NT4K56: Transport interface card

Figure 2-4
Replacing a TIC

PC-10709



—end—

Procedure 2-12

NT4K56CA: Asynchronous transport interface card firmware

This procedure describes how to perform a firmware upgrade for the asynchronous transport interface card (ATIC), NT4K56CA.

Note: Only the firmware for the NT4K56CA (ATIC) model is upgradable; you cannot upgrade firmware for TIC model NT4K56AB, NT4K56AC, or NT4K56BA.

Manual firmware upgrades

This procedure explains how to perform a manual firmware upgrade on a network element (NE).

Performing a manual firmware upgrade

You must upgrade both ATIC circuit cards on each NE.

This section describes the material and information necessary for performing a manual firmware upgrade.

Consult your Nortel Networks technical representative for the appropriate system software upgrade Change Application Procedure (CAP) to use.

Materials and information required during a firmware upgrade

This section lists the materials and information necessary for performing a manual firmware upgrade.

Terminal equipment required

To perform a manual firmware upgrade, you must have access to the OPC user interface (UI). You can access the OPC UI in one of three ways:

- VT-100 compatible terminal connected directly to OPC port 1 or port b on the Primary OPC. Do not connect your VT-100 terminal to the local craft access panel (LCAP). The OPC port must be configured to support a VT-100 terminal. If necessary, reconfigure the port to support a VT-100 terminal.
 - To connect a VT-100 terminal to OPC port 1 or port b, see *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A.
 - To reconfigure the primary OPC port 1 or b, see *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A. Before you reconfigure the OPC port, note the current configuration of the port in Table 2-1 on page 2-35.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware**CAUTION****Loss of functionality**

If you reconfigure the OPC from X.25, the visibility of the OPC and all network elements in the OPC span of control is lost for X.25 interfaces. Personnel using the X.25 interfaces to monitor the OPC and its NEs cannot monitor the OPC during the firmware upgrade. The VT-100 terminal can be used to monitor the OPC and its NEs during the firmware upgrade.

Before reconfiguring the OPC, advise the appropriate personnel of the loss of functionality.

- VT-100 compatible terminal connected directly to the LCAP port on the NE.
- Network Manager or INM Station. You can use Network Manager to perform the firmware upgrade if you log in to the OPC from the Network Manager using an OPC character mode terminal (CMT) login session.

List of materials required

Table 2-1 lists the materials and information you need to perform a manual firmware upgrade. Place a check in the first column of the table when you have the material or information required.

Table 2-1
List of materials

✓	Quantity	Material
	1	NT7E44RA or RB cable to connect a VT-100 terminal to OPC port 1 or b
	1	Blank DDS (Digital Data Storage) tape for OPC database backup
	1	Anti-static wrist strap or equivalent per person
	1	DDS (Digital Data Storage) tape with the upgrade firmware release
	-	The latest Nortel Networks system software upgrade CAP document
	-	The root userid and password for the primary and backup OPCs
	-	The admin userid and password for the NE to be upgraded
	-	The configuration of OPC port 1 or b before it is reconfigured (_____)

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Limitations

The following restrictions and limitations apply to a manual firmware upgrade:

- You can upgrade only one ATIC circuit card at a time.
- You cannot use Lanpar VT-100 compatible terminals to perform a manual firmware upgrade as they are not fully VT-100 compatible.
- You cannot cancel the upgrade process once you start it, except when the system or procedure presents that option.

Requirements

Before beginning a manual firmware upgrade, you must meet the following requirements:

- Make sure that the NE is alarm free.
- Arrange for a maintenance technician, if required, to insert and remove a database backup tape at the primary OPC site.
- Make sure that connectivity exists between the OPC and NE.
- Familiarize yourself with the OPC, NE, and ANX user interfaces (UI). Refer to the following documents:
 - the OPC UI, review *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A.
 - the NE UI, review *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.
 - the ANX UI, review *TL1 User Guide*, 323-3051-312.
- Make sure that the OPC port (port 1 or B [J07] for an ABM or port 1 for a TBM) is configured as **Terminal** if the upgrade is performed from a VT-100 type terminal. See *System Administration Procedures*, 323-3001-302, in *Operations, Administration, and Provisioning*, Volume 4A, for information on how to reconfigure OPC ports.
- Back up the OPC software. See *Data Administration Procedures*, 323-3001-304, in *Operations, Administration, and Provisioning*, Volume 4A, for information on how to back up the OPC software.
- Make sure that all users except the one performing the upgrade log out. Inform all OPC users and surveillance groups that a firmware upgrade will occur.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware**Traffic impact****CAUTION****Loss of service**

You must follow all manual firmware upgrade procedures closely to avoid any unforeseen problems. Perform the firmware upgrade at the **lowest traffic period** of the day.

The manual firmware upgrade process does not impact traffic.

Upgrade process overview

Table 2-2 gives an overview of the manual firmware upgrade process. It briefly describes the different tasks to be executed and gives an estimated time required to complete each procedure. Use this table to track your progress.

Perform the firmware upgrade procedures in the order listed in Table 2-2. Perform all steps in each procedure sequentially. Do **NOT** skip any step or procedure unless the procedure states that you can skip a part of the process.

Table 2-2
Manual firmware upgrade process

✓	Step	Procedure	Tasks	Time Estimate
	Before you begin		<ul style="list-style-type: none"> Verify the alarm status of the system. Create a database backup on tape of the OPC software (if required). 	time varies depending on the condition of the system
	1 - ATIC firmware release verification	steps 1 through 18	<ul style="list-style-type: none"> Log in to the OPC and NE. 	10 to 30 minutes
	2 - ATIC firmware upgrade and verification	steps 19 through 34	<ul style="list-style-type: none"> Access the ANXUPGCI tool. Upgrade the ATIC boot firmware for ATIC A. Upgrade the ATIC boot firmware for ATIC B. Verify that the ATIC was correctly upgraded. 	30 to 40 minutes (for an NE with dual ATICs)

NE firmware upgrade

Use Table 2-3 on page 2-38 to track which ATICs you need to upgrade. You can track up to three network elements on this table. As you follow this procedure, place a check mark next to the ATIC that you upgrade.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Table 2-3
NE firmware upgrade worksheet

NE Number			
NE Name			
ATIC Upgrade	A [] Upgraded ___ B [] Upgraded ___	A [] Upgraded ___ B [] Upgraded ___	A [] Upgraded ___ B [] Upgraded ___

Use this procedure to verify and upgrade the firmware running on the

- operations controller (OPC)
- access processing unit (APU) circuit cards on the NE
- asynchronous transport interface circuit cards (ATICs) on the NE

Materials required

The following materials are required to perform this procedure:

- VT-100 terminal
- the appropriate Nortel Networks software upgrade Change Application Procedure (CAP) document
- one NT7E44RA or RB cable

Action

Step Action

Log in to the OPC

- 1** Log in to the OPC using the VT100 terminal.
- 2** Enter the root userid and password.
The TERM = (vt100) prompt appears.
- 3** Press the **Return** key.
The opc> prompt appears.
- 4** Type:
opcui ↵
The User Session Manager screen appears.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware**Step Action****Verify the OPC software release**

- 5** Verify that the OPC is running the correct software release. To display the OPC software release, press **Ctrl_T 2**.

If the OPC is running the**Then**

correct software release

go to step 6.

incorrect software release

upgrade the OPC software to AN17.20 or higher before continuing with this procedure.

Note: If you cannot determine the correct software release for the OPC, use the *Upgrade Notification Package* document or call your Nortel Networks technical representative.

- 6** Press **Ctrl_T 0**.

The User Session Manager screen appears.

- 7** Tab to the Available Tools window.

- 8** Using the arrow keys, move to NE Login Manager, and then press **Ctrl_A** (or keypad **0**).

The NE Login Manager screen appears.

- 9** Tab to the **[Refresh list • R]** button, and then press **Ctrl_A** (or keypad **0**).

All network elements in the OPC span of control are listed in the Available Nodes window.

- 10** Tab to the Available Nodes window. Use the arrow keys to move to the NE that needs to be upgraded, then press **Ctrl_A** (or keypad **0**).

The NE ID and NE name display in the Network Element: > field.

- 11** Tab to the **[Login • L]** button, and then press **Ctrl_A** (or keypad **0**).

- 12** At the NE login prompt, type the admin level userid and password for the NE.

- 13** A warning message appears. Read the message, and then press the **Return** key to see the end of the message.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Step Action

Verify the APU software release

14 Press the **Return** key again to verify that the access processing unit (APU) is running the latest software release.

The software release version displays.

If the APU is running

Then

software release 17.20 or higher

go to step 15.

a software release prior to 17.20

call you Nortel Networks representative to upgrade the APU software before continuing with this procedure.

15 To track the firmware upgrade process on the NE, add the following information to the top two rows of Table 2-3 on page 2-38 for the NE you are upgrading:

- NE Number
- NE Name

16 Type:

anxupgci ↵

The following message appears:

ANXUPGCI :

ANXUPGCI is used to upgrade the Loopback AIC, TIC and the Shelf Processor. Please type HELP for more information.

Note: If the tool is in use by another user, a message similar to the following appears: User count exceeded; ANXUPGCI in use by OPERATOR. Reset the tool:

toolsup ↵

reset anxupgci ↵

quit ↵

and start step 16 again.

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

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

Verify the ATIC firmware release

17 At the CI (>) prompt, type:

ticloads ↵

The ANXUPGCI displays the firmware load running on ATIC A and B. It should look similar to the following:

```
--- TIC A ---
FPGA code version: 4
--- TIC B ---
FPGA code version: 4
```

Note: All firmware releases displayed here are examples only. Refer to the system software upgrade CAP for the release you are using or call your Nortel Networks technical representative to determine the correct firmware release.

18 Determine if the ATICs are running the correct firmware:

If the ATIC firmware release is	Then
the correct firmware release	go to step 19.
not the correct firmware release	put a check mark inside the ATIC Upgrade row in Table 2-3 on page 2-38 for the ATICs that need to be upgraded. Go to step 19.

Note: If you cannot determine the correct firmware release for the ATIC, use the system software upgrade CAP or call your Nortel Networks technical representative to determine if the upgrade path is supported before proceeding.

Upgrade ATIC (NT4K56CA)

Note: The steps below guide you through the following process: verify that ATIC A is in secondary state, upgrade ATIC A, switch ATIC B to secondary state, and then upgrade ATIC B. In this way, you upgrade the firmware on both ATICs while each is in the secondary state.

19 If not already opened, log in to the OPC and open the NE Login Manager. (For detailed information, see steps 1 through 8.)

The NE Login Manager screen appears.

Note 1: For an NE equipped with dual ATICs, this firmware upgrade process is not service affecting; that is, no services are affected.

Note 2: During a firmware upgrade, a switch of activity (SWACT) cannot occur. Therefore, while one ATIC is being upgraded, the remaining ATIC is not protected.

—continued—

2-42 Replacing modules in a common-equipment shelf

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Step	Action												
20	Log in to the NE that needs its ATICs upgraded according to information entered in Table 2-3 on page 2-38. (For details, see steps 10 through 13).												
21	At the NEUI (>) prompt: eq tic a ↵ <i>The TIC equipment screen appears for ATIC A.</i>												
22	Look at the State field. <table border="1"><thead><tr><th>If the state is</th><th>Then</th></tr></thead><tbody><tr><td>blank (no state)</td><td>The ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in-service (IS).</td></tr><tr><td>IS Trbl</td><td></td></tr><tr><td>IS Secondary</td><td>Go to step 25 to begin the upgrade.</td></tr><tr><td>IS Primary</td><td>a. Make ATIC A secondary by performing a switch as follows. Type: switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful.</td></tr><tr><td></td><td>b. Go to step 25.</td></tr></tbody></table>	If the state is	Then	blank (no state)	The ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in-service (IS).	IS Trbl		IS Secondary	Go to step 25 to begin the upgrade.	IS Primary	a. Make ATIC A secondary by performing a switch as follows. Type: switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful.		b. Go to step 25.
If the state is	Then												
blank (no state)	The ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in-service (IS).												
IS Trbl													
IS Secondary	Go to step 25 to begin the upgrade.												
IS Primary	a. Make ATIC A secondary by performing a switch as follows. Type: switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful.												
	b. Go to step 25.												
23	At the NEUI (>) prompt, type: eq tic b ↵ <i>The TIC equipment screen appears for ATIC B.</i>												
24	Look at the State field. <table border="1"><thead><tr><th>If state is</th><th>Then</th></tr></thead><tbody><tr><td>blank (no state)</td><td>the ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in service (IS). Then go to step 25.</td></tr><tr><td>IS Trbl</td><td></td></tr><tr><td>IS Secondary</td><td>go to step 25.</td></tr></tbody></table>	If state is	Then	blank (no state)	the ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in service (IS). Then go to step 25.	IS Trbl		IS Secondary	go to step 25.				
If state is	Then												
blank (no state)	the ATIC needs to be replaced. Insert a new ATIC and wait approximately one minute until it comes in service (IS). Then go to step 25.												
IS Trbl													
IS Secondary	go to step 25.												

—continued—

 Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Step	Action
25	At the NEUI (>) prompt, check that you are upgrading the secondary ATIC by typing: chgstate oos ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No"):
26	Type: y ↵ <i>The following message appears:</i> The ChgState command has been received. It will be processed.
27	At the CI (>) prompt: anxupgci ↵ <i>The following message appears:</i> ANXUPGCI : ANXUPGCI is used to upgrade the Loopback AIC, TIC and the Shelf Processor. Please type HELP for more information. Or, if you are already in the tool: Already in ANXUPGCI. Note: If the tool is in use by another user, a message similar to the following appears: User count exceeded; ANXUPGCI in use by OPERATOR. Reset the tool: toolsup ↵ reset anxupgci ↵ quit ↵ and start step 27 again.
28	At the CI (>) prompt, type: ticupgrade tic <A/B> fw ↵ <i>where</i> <A/B> is the out-of-service ATIC. <i>The following message appears:</i> Upgrade the firmware - are you sure? Please confirm ("Yes", "Y", "No", or "N"):

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Step	Action												
29	Type: <code>y ↵</code> <i>The following message appears:</i> The TIC upgrade has been initiated. Use the TICSTATUS command to get the status of load request.												
<div style="border: 1px solid black; padding: 5px; display: inline-block;">CAUTION Loss of service/Equipment damage Do not change the state of the ATIC during the upgrade, as it can impact traffic and possibly damage the circuit card.</div>													
30	Wait 2 minutes, and then at the CI (>) prompt: <code>ticstatus ↵</code> <table border="1" style="width: 100%;"><thead><tr><th>If the message displayed is</th><th>Then</th></tr></thead><tbody><tr><td>Loading Status of TIC <A/B> The load server is writing load to TIC.</td><td>the load is not complete. Continue to wait.</td></tr><tr><td>Status: Getting load from server.</td><td>the load is not complete. Continue to wait.</td></tr><tr><td>Status: The load server is writing the load to the TIC.</td><td>the load is not complete. Continue to wait.</td></tr><tr><td>Status: The loading has been completed.</td><td>go to step 31.</td></tr><tr><td>different from above</td><td>the upgrade has failed. For the first attempt to upgrade, wait 5 minutes, and then repeat steps 28 through 30. For the second attempt, note the message displayed and contact your Nortel Networks technical representative.</td></tr></tbody></table>	If the message displayed is	Then	Loading Status of TIC <A/B> The load server is writing load to TIC.	the load is not complete. Continue to wait.	Status: Getting load from server.	the load is not complete. Continue to wait.	Status: The load server is writing the load to the TIC.	the load is not complete. Continue to wait.	Status: The loading has been completed.	go to step 31.	different from above	the upgrade has failed. For the first attempt to upgrade, wait 5 minutes, and then repeat steps 28 through 30. For the second attempt, note the message displayed and contact your Nortel Networks technical representative.
If the message displayed is	Then												
Loading Status of TIC <A/B> The load server is writing load to TIC.	the load is not complete. Continue to wait.												
Status: Getting load from server.	the load is not complete. Continue to wait.												
Status: The load server is writing the load to the TIC.	the load is not complete. Continue to wait.												
Status: The loading has been completed.	go to step 31.												
different from above	the upgrade has failed. For the first attempt to upgrade, wait 5 minutes, and then repeat steps 28 through 30. For the second attempt, note the message displayed and contact your Nortel Networks technical representative.												
31	At the NEUI (>) prompt: <code>chgstate is ↵</code> <i>The following message displays:</i> The ChgState command has been received. It will be processed.												

—continued—

Procedure 2-12 (continued)

NT4K56CA: Asynchronous transport interface card firmware

Step	Action						
32	Wait while diagnostic test runs, and then look at the State field.						
	<table border="1"> <thead> <tr> <th>If the state is</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>IS</td> <td>the upgrade has completed successfully. Wait 5 minutes and then go to step 33.</td> </tr> <tr> <td>IS Trbl</td> <td>this ATIC cannot be upgraded. Interrupt the upgrade process and replace the ATIC before resuming this procedure. Go to step 21 to restart the upgrade of the new ATIC.</td> </tr> </tbody> </table>	If the state is	Then	IS	the upgrade has completed successfully. Wait 5 minutes and then go to step 33.	IS Trbl	this ATIC cannot be upgraded. Interrupt the upgrade process and replace the ATIC before resuming this procedure. Go to step 21 to restart the upgrade of the new ATIC.
If the state is	Then						
IS	the upgrade has completed successfully. Wait 5 minutes and then go to step 33.						
IS Trbl	this ATIC cannot be upgraded. Interrupt the upgrade process and replace the ATIC before resuming this procedure. Go to step 21 to restart the upgrade of the new ATIC.						
33	Did you complete the upgrade for ATIC A or ATIC B?						
	<table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>you just completed the upgrade for ATIC A</td> <td> upgrade ATIC B as follows: <ol style="list-style-type: none"> a. Make ATIC A primary and ATIC B secondary by performing a switch. Type switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful. b. Repeat steps 23 through 32 for ATIC B. </td> </tr> <tr> <td>you just completed the upgrade for ATIC B</td> <td>the upgrade is complete for both ATIC A and ATIC B. Go to step 34.</td> </tr> </tbody> </table>	If	Then	you just completed the upgrade for ATIC A	upgrade ATIC B as follows: <ol style="list-style-type: none"> a. Make ATIC A primary and ATIC B secondary by performing a switch. Type switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful. b. Repeat steps 23 through 32 for ATIC B. 	you just completed the upgrade for ATIC B	the upgrade is complete for both ATIC A and ATIC B. Go to step 34.
If	Then						
you just completed the upgrade for ATIC A	upgrade ATIC B as follows: <ol style="list-style-type: none"> a. Make ATIC A primary and ATIC B secondary by performing a switch. Type switch ↵ <i>The following message appears:</i> Please confirm ("Yes" or "No") y ↵ <i>The following message appears:</i> Switch command successful. b. Repeat steps 23 through 32 for ATIC B. 						
you just completed the upgrade for ATIC B	the upgrade is complete for both ATIC A and ATIC B. Go to step 34.						
34	Verify that both ATICs successfully upgraded by checking the current load number using steps 16 through 18.						
	<table border="1"> <thead> <tr> <th>If the ANXUPGCI tool</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>displays the upgraded firmware release for each ATIC you upgraded</td> <td>The upgrade is successful.</td> </tr> <tr> <td>does not display the upgraded firmware release for one or more of the ATICs you upgraded</td> <td>Repeat steps 19 through 32 for the ATIC(s) that failed the firmware upgrade. If this action does not clear the problem, please note all error messages and call your Nortel Networks technical representative.</td> </tr> </tbody> </table>	If the ANXUPGCI tool	Then	displays the upgraded firmware release for each ATIC you upgraded	The upgrade is successful.	does not display the upgraded firmware release for one or more of the ATICs you upgraded	Repeat steps 19 through 32 for the ATIC(s) that failed the firmware upgrade. If this action does not clear the problem, please note all error messages and call your Nortel Networks technical representative.
If the ANXUPGCI tool	Then						
displays the upgraded firmware release for each ATIC you upgraded	The upgrade is successful.						
does not display the upgraded firmware release for one or more of the ATICs you upgraded	Repeat steps 19 through 32 for the ATIC(s) that failed the firmware upgrade. If this action does not clear the problem, please note all error messages and call your Nortel Networks technical representative.						

—end—

Procedure 2-13

NT4K57: Integrated remote test unit

Use this procedure to replace the NT4K57 IRTU in an access bandwidth manager shelf at the remote fiber terminal (RFT).



CAUTION

Risk of IRTU damage

The IRTU requires careful handling. When returning the IRTU for repair, observe all handling and transporting precautions described in “Overview of module replacement procedures” on page 1-1 of this document.

Action

Step	Action						
	<table><thead><tr><th>If replacing</th><th>Then</th></tr></thead><tbody><tr><td>an in-service IRTU</td><td>go to step 1</td></tr><tr><td>a failed or out-of-service IRTU</td><td>go to step 4</td></tr></tbody></table>	If replacing	Then	an in-service IRTU	go to step 1	a failed or out-of-service IRTU	go to step 4
If replacing	Then						
an in-service IRTU	go to step 1						
a failed or out-of-service IRTU	go to step 4						
1	From the network element status screen, display the IRTU equipment screen: eq irtu. ↵ <i>The IRTU equipment screen appears.</i>						
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the IRTU to out-of-service (OOS): chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>						
3	Confirm the state change: y. ↵ <i>The state changes to OOS.</i>						

—continued—

Procedure 2-13 (continued)

NT4K57: Integrated remote test unit

Step	Action
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Remove the IRTU from the shelf.
6	Wait at least 10 seconds before installing the replacement card. Insert a replacement IRTU into the shelf.
7	If the automatic-in-service feature is set to on, and the circuit pack state automatically changes to in-service (IS), skip to step 9.
8	From the IRTU equipment screen, change the state of the circuit pack to in-service: chgstate is. <i>The IRTU returns to service.</i>
9	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—end—

Procedure 2-14

NT4K58CA: Test bypass pair input/output

Use this procedure to replace a test bypass pair input/output card (TBP) in an access bandwidth manager (ABM) shelf.

Action

Step	Action
1	From the network element status screen, display the TAC equipment screen: eq tac. ↵ <i>The TAC equipment screen appears.</i>
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the TAC group, which includes the TBP, to out-of-service: chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>
3	Confirm the state change: y. ↵ <i>The state changes to out-of-service (OOS).</i>
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Loosen the hold-down screw on the faceplate and remove the card from the shelf, as shown in Figure 2-5.
6	Insert a replacement TBP card in the shelf, and secure it in place by fastening the hold-down screw.
7	From the TAC equipment screen, change the state of the card to in-service: chgstate is. ↵
8	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

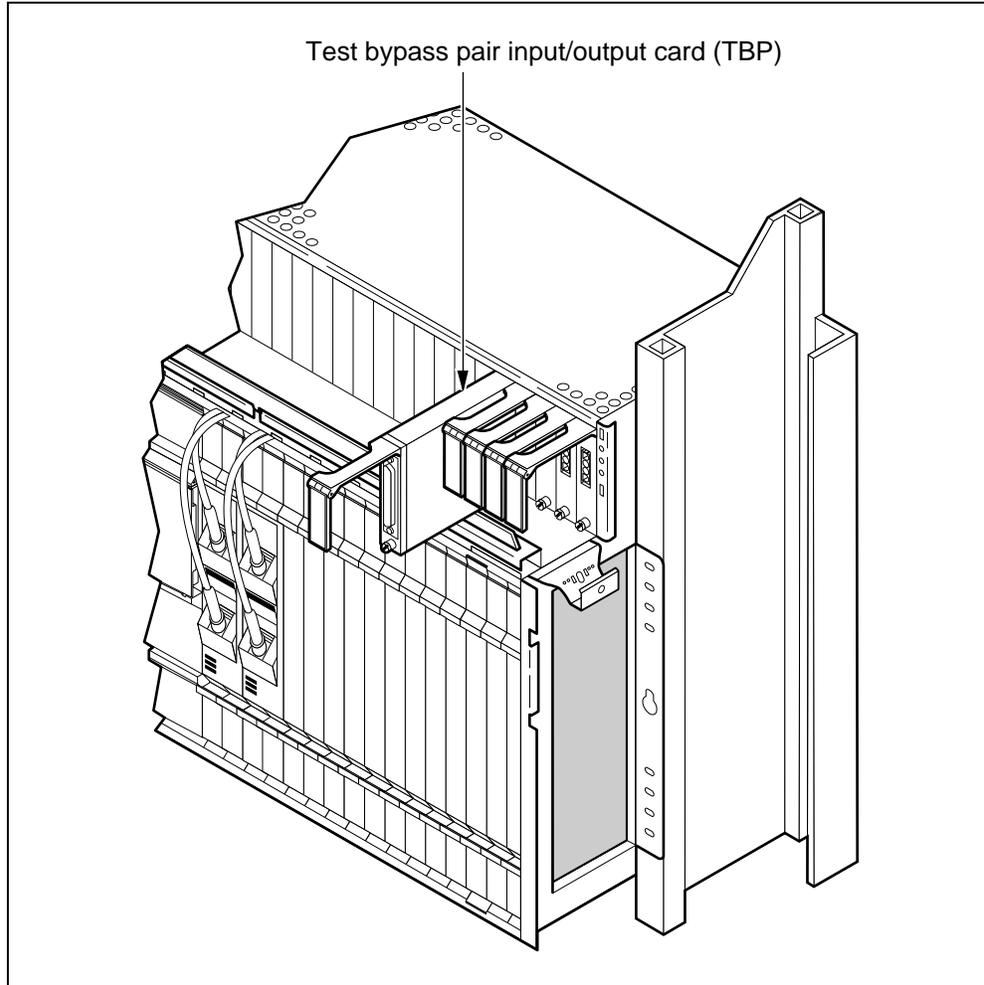
—continued—

Procedure 2-14 (continued)

NT4K58CA: Test bypass pair input/output

Figure 2-5
Replacing a TBP

PC-10713



—end—

Procedure 2-15 NT4K58DA: PGTC/MTA input/output

Use this procedure to replace pair gain test controller (PGTC)/metallic test access (MTA) input/output card in an access bandwidth manager (ABM) shelf.

Action

Step	Action
1	From the network element status screen, display the TAC equipment screen: eq tac. ↵ <i>The TAC equipment screen appears.</i>
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the TAC group, which includes the PGTC, to out-of-service: chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>
3	Confirm the state change: y. ↵ <i>The state changes to out-of-service (OOS).</i>
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Loosen the hold-down screw on the faceplate and remove the card from the shelf, as shown in Figure 2-6.
6	Insert a replacement PGTC card in the shelf, and secure it in place by fastening the hold-down screw.
7	From the TAC equipment screen, change the state of the card to in-service: chgstate is. ↵
8	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

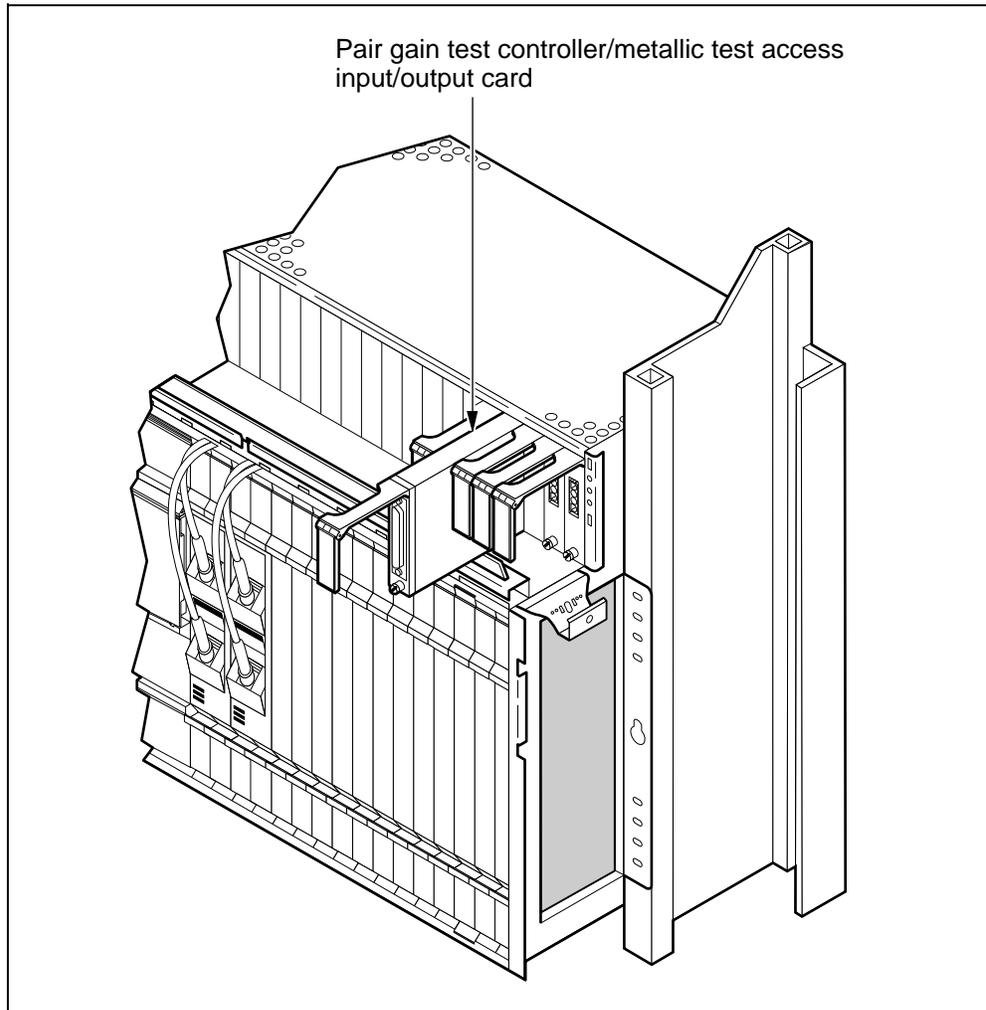
—continued—

Procedure 2-15 (continued)
NT4K58DA: PGTC/MTA input/output

Step Action

Figure 2-6
Replacing the PGTC

PC-10714



—end—

Procedure 2-16

NT4K58KA: Test access path card

Use this procedure to replace a test access path (TAP) card in an access bandwidth manager (ABM) shelf.

Action

Step	Action
1	From the network element status screen, display the TAC equipment screen: eq tac. ↵ <i>The TAC equipment screen appears.</i>
2	To prevent alarms from being raised when the circuit pack is removed, change the state of the TAC group, which includes the TAP, to out-of-service: chgstate oos. ↵ <i>The system prompts for confirmation of the state change.</i>
3	Confirm the state change: y. ↵ <i>The state changes to out-of-service (OOS).</i>
4	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
5	Loosen the hold-down screw on the faceplate and remove the card from the shelf, as shown in Figure 2-7.
6	Insert a replacement TAP card in the shelf, and secure it in place by fastening the hold-down screw.
7	From the TAC equipment screen, change the state of the card to in-service: chgstate is. ↵
8	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

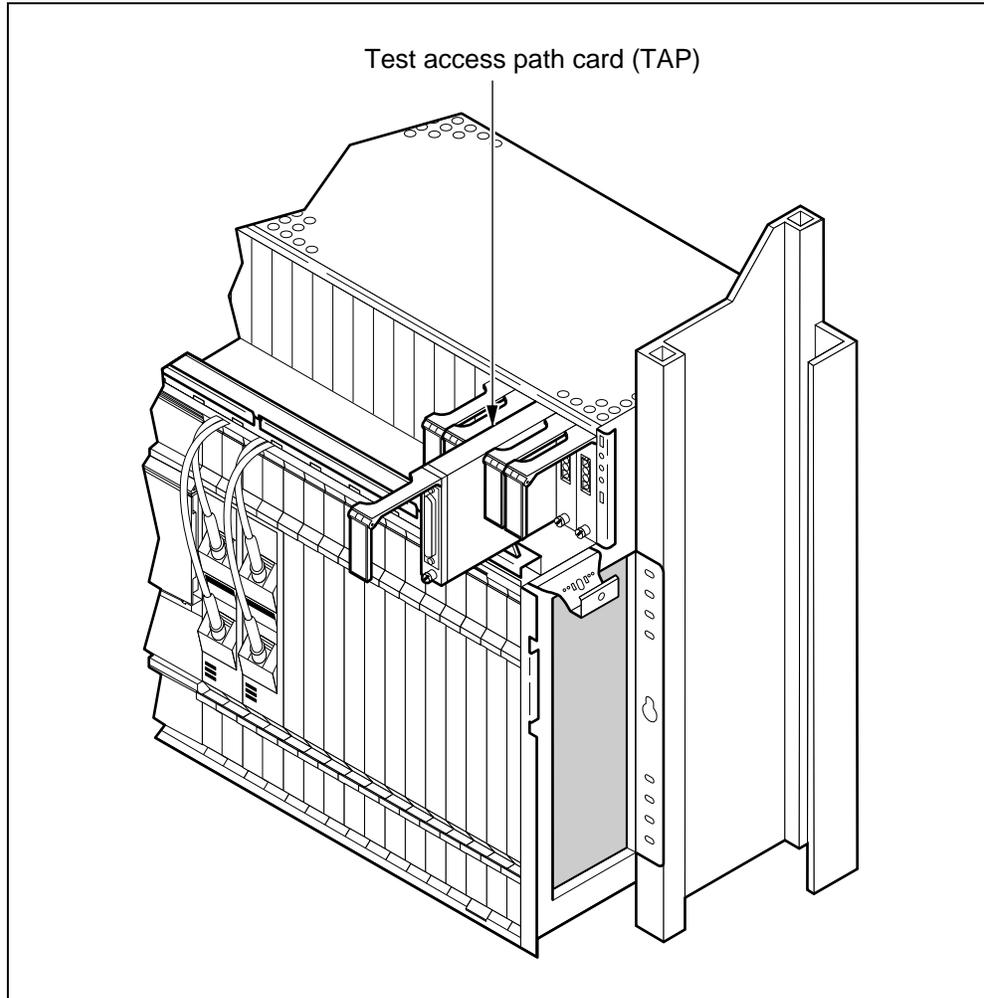
—continued—

Procedure 2-16 (continued)
NT4K58KA: Test access path card

Step Action

Figure 2-7
Replacing the TAP

PC-10712



—end—

Procedure 2-17

NT4K58LA: Serial I/O card

Use this procedure to replace a serial I/O card in an access bandwidth manager (ABM) shelf.

Serial I/O cards provide connectors for serial ports 2 and 3 of an operations controller (OPC) located in the ABM of an fiber central office terminal (FCOT). If the OPC is located in slot 1 of the FCOT ABM, then the serial I/O cards are equipped in slots 30 and 32. If the OPC is in slot 5, then the serial I/O cards are equipped in slots 38 and 40. For details, see *Bay in Central Office Installation Manual-ABM*, 323-3001-201.

Action

Step	Action						
1	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.						
2	Determine if a serial I/O card is currently in the slot. <table><thead><tr><th>If there is a</th><th>Then</th></tr></thead><tbody><tr><td>serial I/O card in the slot</td><td>disconnect the cable from the 25-pin D connector on the serial I/O card, as shown in Figure 2-8 on page 2-55. Go to step 3.</td></tr><tr><td>blank faceplate card</td><td>go to step 3</td></tr></tbody></table>	If there is a	Then	serial I/O card in the slot	disconnect the cable from the 25-pin D connector on the serial I/O card, as shown in Figure 2-8 on page 2-55. Go to step 3.	blank faceplate card	go to step 3
If there is a	Then						
serial I/O card in the slot	disconnect the cable from the 25-pin D connector on the serial I/O card, as shown in Figure 2-8 on page 2-55. Go to step 3.						
blank faceplate card	go to step 3						
3	Unfasten the hold-down screw and remove the card currently in the slot by pulling outward on the hanging tab.						
4	Install the replacement serial I/O card in the shelf and fasten the hold-down screw on the faceplate.						
5	Connect the cable to the 25-pin D connector on the serial I/O card.						
6	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.						

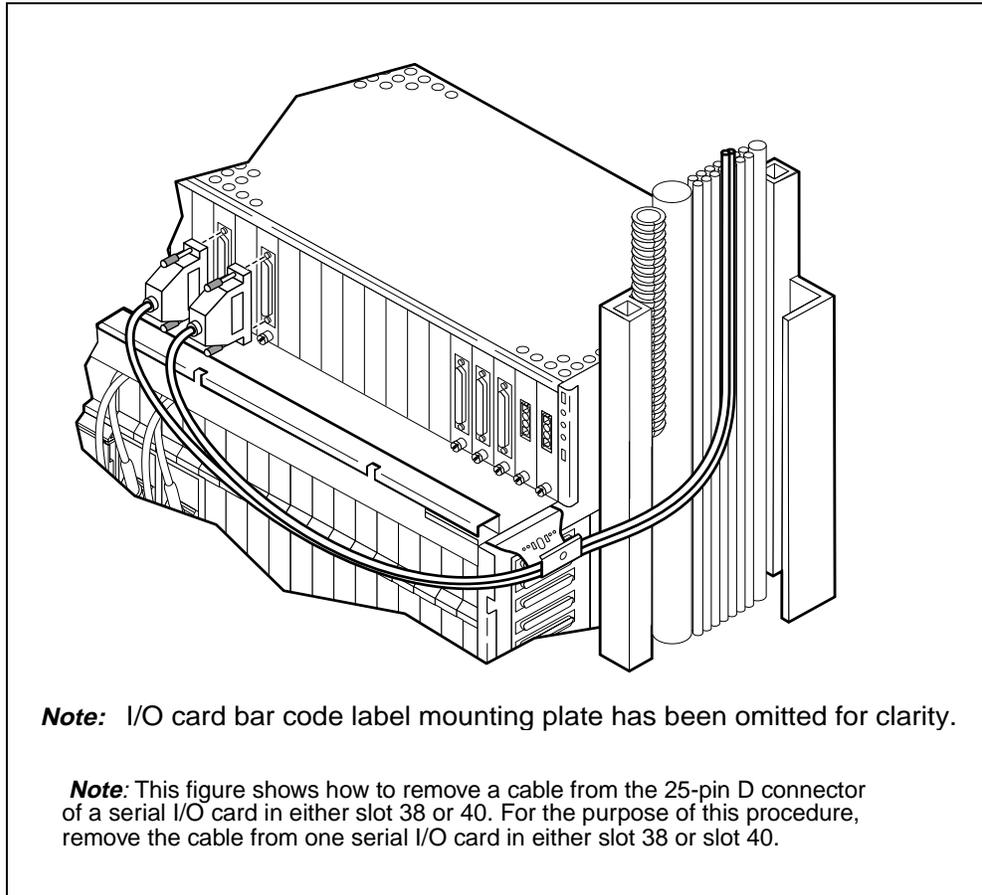
—continued—

Procedure 2-17 (continued)
NT4K58LA: Serial I/O card

Step Action

Figure 2-8
Disconnecting a cable from a serial I/O connector

PC-10090



—end—

Procedure 2-18

NT4K58MA: Common-equipment power card

Use this procedure to replace a common-equipment power (CEP) card in a common equipment shelf.

Action

Step	Action						
1	<p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>						
2	<p>Determine which plane will be affected by the removal of the common-equipment power card.</p> <ul style="list-style-type: none"> The card in slot 54 affects all cards on plane A of the common equipment shelf. The card in slot 55 affects all cards on plane B of the common equipment shelf. <table border="1"> <thead> <tr> <th>If replacing a CEP card in</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>an ABM shelf</td> <td>go to step 3</td> </tr> <tr> <td>a TBM shelf</td> <td>go to step 11</td> </tr> </tbody> </table>	If replacing a CEP card in	Then	an ABM shelf	go to step 3	a TBM shelf	go to step 11
If replacing a CEP card in	Then						
an ABM shelf	go to step 3						
a TBM shelf	go to step 11						
3	<p>From the network element status screen, display the equipment screen for the ATIC in the affected plane:</p> <p>eq tic < plane >↓</p> <p>where</p> <p>< plane > letter of the affected plane: a or b</p> <p><i>The TIC equipment screen appears.</i></p> <table border="1"> <thead> <tr> <th>If the affected plane contains</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>a primary in-service ATIC</td> <td>go to step 4</td> </tr> <tr> <td>a secondary in-service ATIC</td> <td>go to step 5</td> </tr> </tbody> </table>	If the affected plane contains	Then	a primary in-service ATIC	go to step 4	a secondary in-service ATIC	go to step 5
If the affected plane contains	Then						
a primary in-service ATIC	go to step 4						
a secondary in-service ATIC	go to step 5						
4	<p>Switch service from the primary ATIC to the secondary ATIC:</p> <p>switch↓</p> <p>y↓</p>						

—continued—

 Procedure 2-18 (continued)

NT4K58MA: Common-equipment power card

Step	Action
5	To prevent alarms from being raised when the circuit pack is removed, change the state of the affected ATIC to out-of-service (OOS): chgstate oos. ↓ <i>The system prompts for confirmation of the state change.</i>
6	Confirm the state change: y. ↓ <i>The state changes to OOS.</i>
7	From the ATIC equipment screen, display the AIC equipment screen for the AIC in the affected plane: eq aic <plane>. ↓ where <plane> letter of the affected plane: a or b <i>The AIC equipment screen appears.</i>
8	Ensure that the redundant unit state is in-service (IS).
9	If the redundant unit is in-service, change the state of the affected AIC to out-of-service (OOS), to prevent alarms from being raised when the circuit pack is removed: chgstate oos. ↓ <i>The system prompts for confirmation of the state change.</i>
10	Confirm the state change: y. ↓ <i>The state changes to OOS.</i>

—continued—

Procedure 2-18 (continued)

NT4K58MA: Common-equipment power card

Step Action



CAUTION

Loss of power

Ensure that you are turning off the correct breaker. If the wrong breaker is turned off, both planes will lose power and a system outage will occur.

- 11** Turn off the breaker associated with the common-equipment power card that you are replacing. Figure 2-9 shows the breakers for the ABM shelf and Figure 2-10 shows the breakers for the TBM shelf.

Common-equipment power card for	The associated breaker is
--	----------------------------------

ABM shelf, power feed A	CE A
ABM shelf, power feed B	CE B
TBM shelf 1, power feed A	A1
TBM shelf 1, power feed B	B1
TBM shelf 2, power feed A	A3
TBM shelf 2, power feed B	B3
TBM shelf 3, power feed A	A4
TBM shelf 3, power feed B	B4



CAUTION

Loss of Power

Disconnect the correct power cable. If the wrong power cable is disconnected you will lose power and a system outage will occur.

- 12** Disconnect the power cable from the common-equipment power card, as shown in Figure 2-11 on page 2-60.
- 13** Loosen the hold down screw on the bottom of the common-equipment power card, as shown in Figure 2-11.
- 14** Insert a replacement common-equipment power card, and fasten it securely into place with the hold down screw.

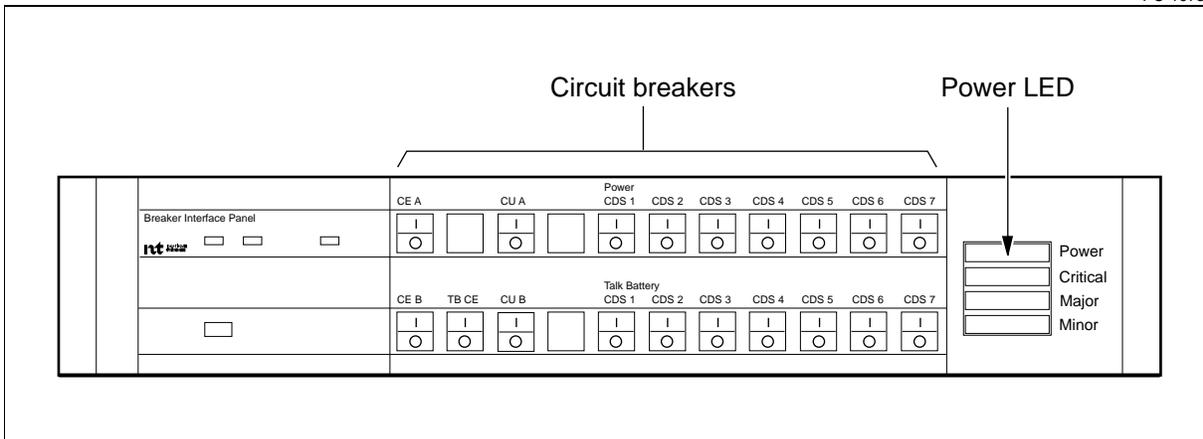
—continued—

Procedure 2-18 (continued)
NT4K58MA: Common-equipment power card

Step Action

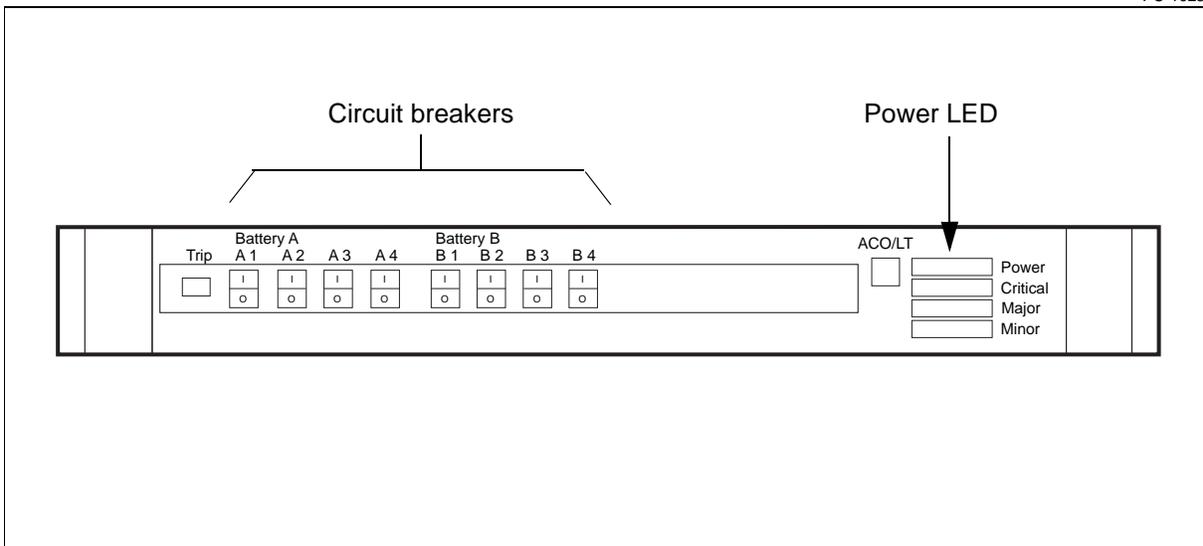
**Figure 2-9
 ABM Breaker interface panel**

PC-10781



**Figure 2-10
 TBM Breaker interface panel**

PC-10255



—continued—

2-60 Replacing modules in a common-equipment shelf

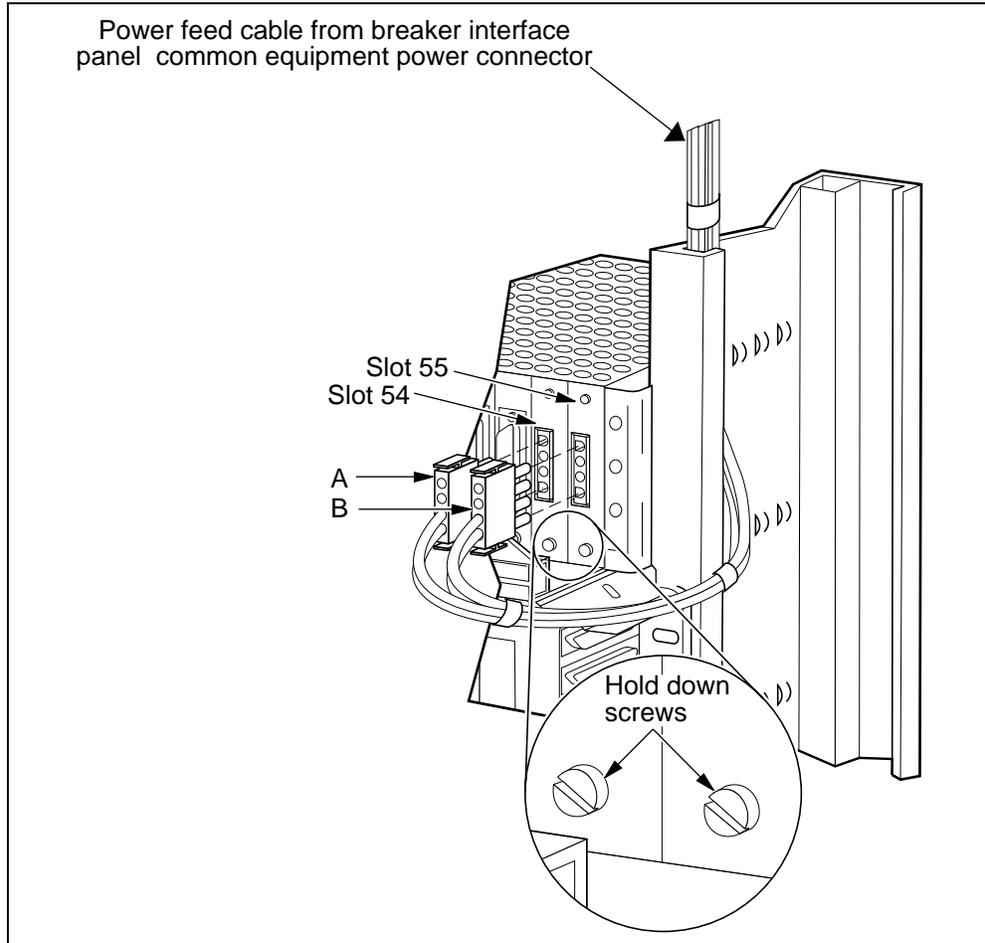
Procedure 2-18 (continued)

NT4K58MA: Common-equipment power card

Step Action

Figure 2-11
Common-equipment power card replacement

PC-10078



—continued—

Procedure 2-18 (continued)

NT4K58MA: Common-equipment power card

Step	Action						
15	<p>Reconnect the feed cable to the common-equipment power card, as shown in Figure 2-11.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If this is</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>a TBM shelf</td> <td>end the procedure</td> </tr> <tr> <td>an ABM shelf</td> <td>continue to step 16</td> </tr> </tbody> </table>	If this is	Then	a TBM shelf	end the procedure	an ABM shelf	continue to step 16
If this is	Then						
a TBM shelf	end the procedure						
an ABM shelf	continue to step 16						
16	<p>From any screen, select, the AIC on the affected plane: eq aic <plane>↵</p> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><plane> letter of the affected plane: a or b</p> <p><i>The AIC equipment screen appears.</i></p>						
17	<p>Change the state of the AIC to in-service (IS): chgstate is↵</p> <p><i>The state changes to in-service.</i></p>						
18	<p>From the AIC equipment screen, select the ATIC on the affected plane: eq tic <plane>↵</p> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><plane> letter of the affected plane: a or b</p> <p><i>The TIC equipment screen appears.</i></p>						
19	<p>Change the state of the ATIC to in-service (IS): chgstate is↵</p> <p><i>The state changes to in-service.</i></p> <p style="text-align: center;">—end—</p>						

Procedure 2-19

NT4K60: DS3 or STS-1 protection switch circuit pack

Use this procedure to replace the NT4K60 DS3 or STS-1 protection switch circuit pack in the access bandwidth manager (ABM) or transport bandwidth manager (TBM) shelf.

Action

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



CAUTION

Loss of protection switching

Removing the DS3 or STS-1 protection switcher card will cause protection to be inoperative for all DS3/STS mappers or STS-1 interface cards.

- 1 Remove the shelf cover.
Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.
- 2 Remove the protection switcher card from the shelf.
Note: Do not extract the unit from the shelf while a lamp test is running.
- 3 Install the new protection switcher card in the shelf.
- 4 Replace the shelf cover.
Note: For details, see the procedure for replacing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

—end—

Procedure 2-20

NT4K75: Timing and cross-connect

Use this procedure to replace the NT4K75 timing and cross-connect (TXC) circuit pack in the access bandwidth manager (ABM) shelf or transport bandwidth manager (TBM) shelf.

Action

Step	Action										
1	<p>From the network element status screen, display the equipment screen for the TXC card to be replaced:</p> <pre>eq txc <group>↓</pre> <p>where</p> <p><group> is the number of the TXC card being replaced: g1 (slot 9) or g2 (slot 10)</p> <p><i>The TXC equipment screen appears.</i></p> <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>an active TXC card in a duplex configuration</td> <td>go to step 2</td> </tr> <tr> <td>an active TXC card in a simplex configuration</td> <td>go to step 5</td> </tr> <tr> <td>an inactive TXC card in either a simplex or duplex configuration</td> <td>go to step 5</td> </tr> <tr> <td>a failed TXC card</td> <td>go to step 5</td> </tr> </tbody> </table>	If replacing	Then	an active TXC card in a duplex configuration	go to step 2	an active TXC card in a simplex configuration	go to step 5	an inactive TXC card in either a simplex or duplex configuration	go to step 5	a failed TXC card	go to step 5
If replacing	Then										
an active TXC card in a duplex configuration	go to step 2										
an active TXC card in a simplex configuration	go to step 5										
an inactive TXC card in either a simplex or duplex configuration	go to step 5										
a failed TXC card	go to step 5										
2	<p>Access the TXC detailed protection screen:</p> <pre>dtlprot txc↓</pre> <p><i>The TXC protection screen appears.</i></p>										
3	<p>Switch service to the other TXC:</p> <pre>forced op <group>↓</pre> <p>where</p> <p><group> is the number of the TXC being replaced: g1 (slot 9) or g2 (slot 10)</p> <p><i>When a forced switch is operated, the screen displays an asterisk (*) in the Forced column. The banner line is updated under the ActProt column, and a "Forced switch request" alarm is raised.</i></p>										

—continued—

Procedure 2-20 (continued)

NT4K75: Timing and cross-connect

Step	Action
12	Access the TXC protection screen: dtlprot txc ↵ <i>The TXC protection screen appears.</i>
13	Release the TXC protection switch performed in step 3: forced re <group> ↵ y ↵ where <group> is the number of the TXC that was replaced: g1 (slot 9) or g2 (slot 10)
14	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—end—

Procedure 2-21

NT7E01: OC-3 optical interface

Use this procedure to replace an OC-3 optical interface in an access bandwidth manager (ABM) shelf or transport bandwidth manager (TBM) shelf.

This procedure begins at the Network Element Status screen.

Action

Step	Action						
1	<p>From the Network Element Status screen, display the OC-3 detailed protection screen:</p> <p>pr;dtlprot oc3 <group></p> <p>where</p> <p><group> group number of the OC-3 being replaced: g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8</p>						
2	<p>Display the protection switching.</p> <p>protprov ↵</p> <p><i>The protection screen will display either unidirectional or bidirectional switching.</i></p>						
3	<p>Protection switching must be provisioned for bidirectional switching at both the near-end and the far-end NE.</p> <table><thead><tr><th>If the NE is set for</th><th>Then</th></tr></thead><tbody><tr><td>unidirectional</td><td>go to step 4</td></tr><tr><td>bidirectional</td><td>go to step 6</td></tr></tbody></table>	If the NE is set for	Then	unidirectional	go to step 4	bidirectional	go to step 6
If the NE is set for	Then						
unidirectional	go to step 4						
bidirectional	go to step 6						
4	<p>Set the unidirectional switching to bidirectional at both NEs. Change the protection switching by using the “swmode” command. This command is a toggle. To change bidirectional switching to unidirectional switching, or unidirectional switching to bidirectional, enter the command one time.</p> <p>swmode ↵</p> <p><i>The system prompts for confirmation.</i></p> <p>y ↵</p> <p style="text-align: center;">—continued—</p>						

 Procedure 2-21 (continued)
NT7E01: OC-3 optical interface

- | Step | Action |
|------|--|
| 5 | From the Network Element Status screen, display the OC-3 equipment screen for the card to be replaced: |

eq oc3 <group> ↵

where

<group> group number of the OC-3 being replaced:
**g1, g2,
 g1s, g2s,
 g3, g4, g5,
 g6, g7, or g8**

If replacing

Then

the active OC-3

go to step 6

the standby OC-3

go to step 8

a failed or out-of-service OC-3

go to step 17

- | | |
|---|--|
| 6 | From the Network Element Status screen, display the OC-3 detailed protection screen: |
|---|--|

pr;dtlprot oc3 <group> ↵

where

<group> group number of the OC-3 being replaced:
**g1, g2,
 g1s, g2s,
 g3, g4, g5,
 g6, g7, or g8**

The detailed protection screen appears.

—continued—

Procedure 2-21 (continued)

NT7E01: OC-3 optical interface

Step	Action
7	<p>Switch service from the OC-3 being replaced, to the standby OC-3: manual op <group>.␣</p> <p>where</p> <p><group> group number of the OC-3 being replaced: g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8</p> <p><i>The system prompts for confirmation.</i></p> <p>y.␣</p>
8	<p>Display the facility screen for the OC-3 to be replaced: fa oc3 <group>.␣</p> <p>where</p> <p><group> group number of the OC-3 being replaced: all, g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8</p> <p><i>The OC-3 facility screen appears.</i></p>
9	<p>To prevent alarms from being raised when the circuit pack is removed, change the state of the OC-3 facility to out-of-service (OOS): chgstate oos.␣</p> <p>y.␣</p> <p><i>The state of the OC-3 facility changes to out-of-service (OOS).</i></p> <p>For unidirectional protection switching, also take the corresponding OC-3 out of service at the far-end NE.</p> <p>Note: When the optical facility is taken out of service, the status of the loss of signal (LOS) LED becomes frozen, and will not reflect an actual loss of signal (if one occurs). When the optical facility is placed back in service, the LOS LED correctly indicates the current state of the optical facility.</p>

—continued—

 Procedure 2-21 (continued)
NT7E01: OC-3 optical interface

Step	Action
10	Display the equipment screen. eq OC3 <group> ↵ where <group> group number of the OC-3 being replaced: g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8
11	Change the state of the OC3 equipment to out-of-service. chgstate oos ↵ y ↵ <i>The state of the OC-3 equipment changes to out-of-service (OOS).</i>
12	Remove the shelf cover. Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—continued—

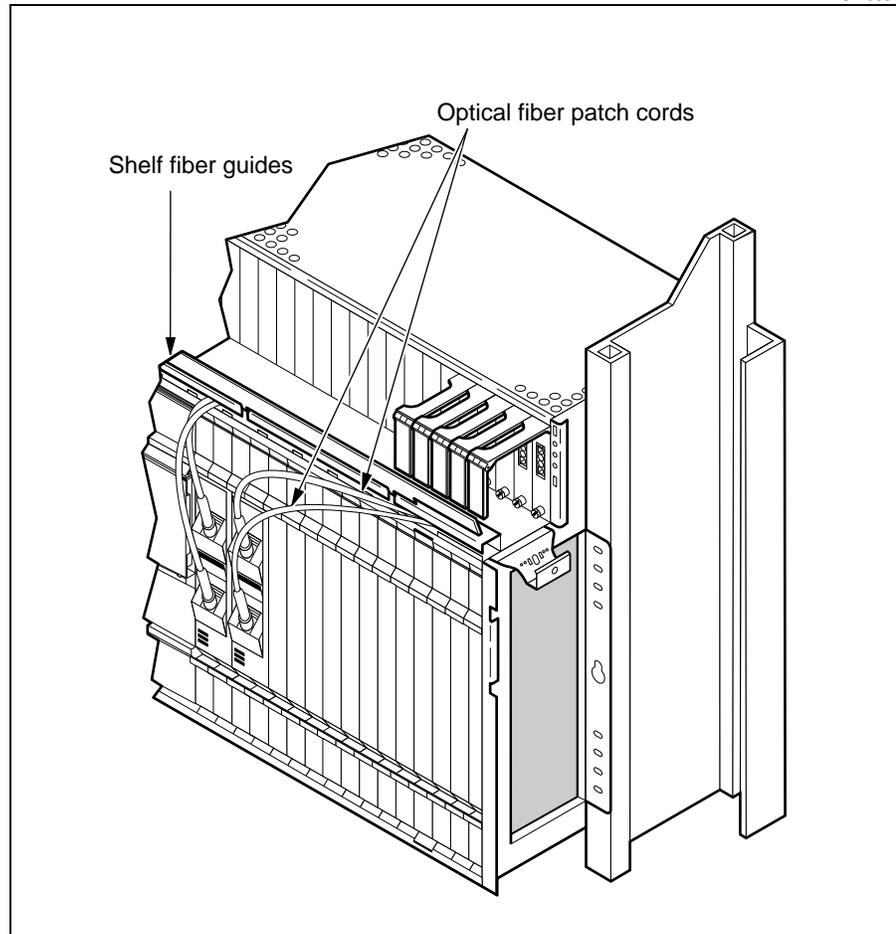
2-70 Replacing modules in a common-equipment shelf

Procedure 2-21 (continued)

NT7E01: OC-3 optical interface

- | Step | Action |
|------|--|
| 13 | Remove the optical patch cords from the shelf fiber guides to provide sufficient slack for removing the circuit pack (as shown in the following illustration). |

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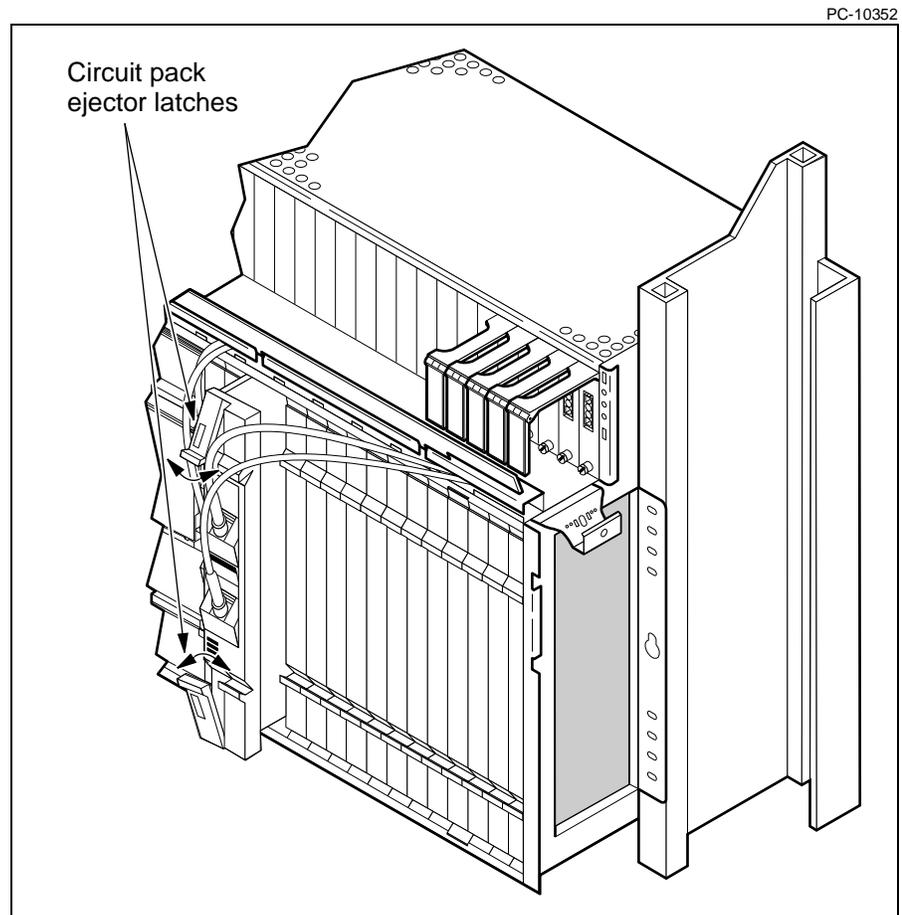
—continued—

Procedure 2-21 (continued)
NT7E01: OC-3 optical interface

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

- | | |
|----|--|
| 14 | Pull on the circuit pack ejector latches to slightly withdraw the circuit pack to the extent necessary to disconnect it from the backplane connector (as shown in the following illustration). |
|----|--|

Note: Take care when withdrawing the circuit pack to prevent straining the optical patch cords or pigtails.



—continued—

Procedure 2-21 (continued)
NT7E01: OC-3 optical interface

Step Action



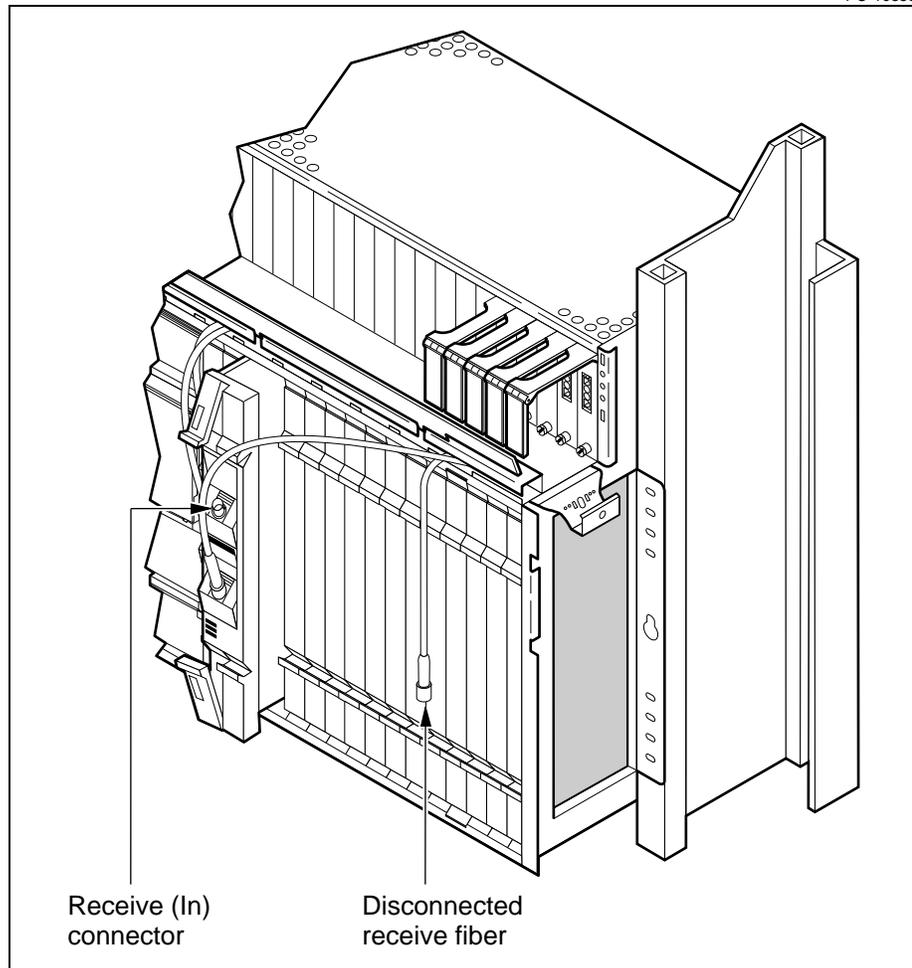
CAUTION

Possible damage to biconic connectors

If you are reconnecting biconic connectors in step 15 and step 16, prevent friction between optical lenses by gently lifting up on the fiber during the last half turn of the connector.

- 15 Disconnect the optical patch cord or pigtail from the receive biconic connector.

PC-10353

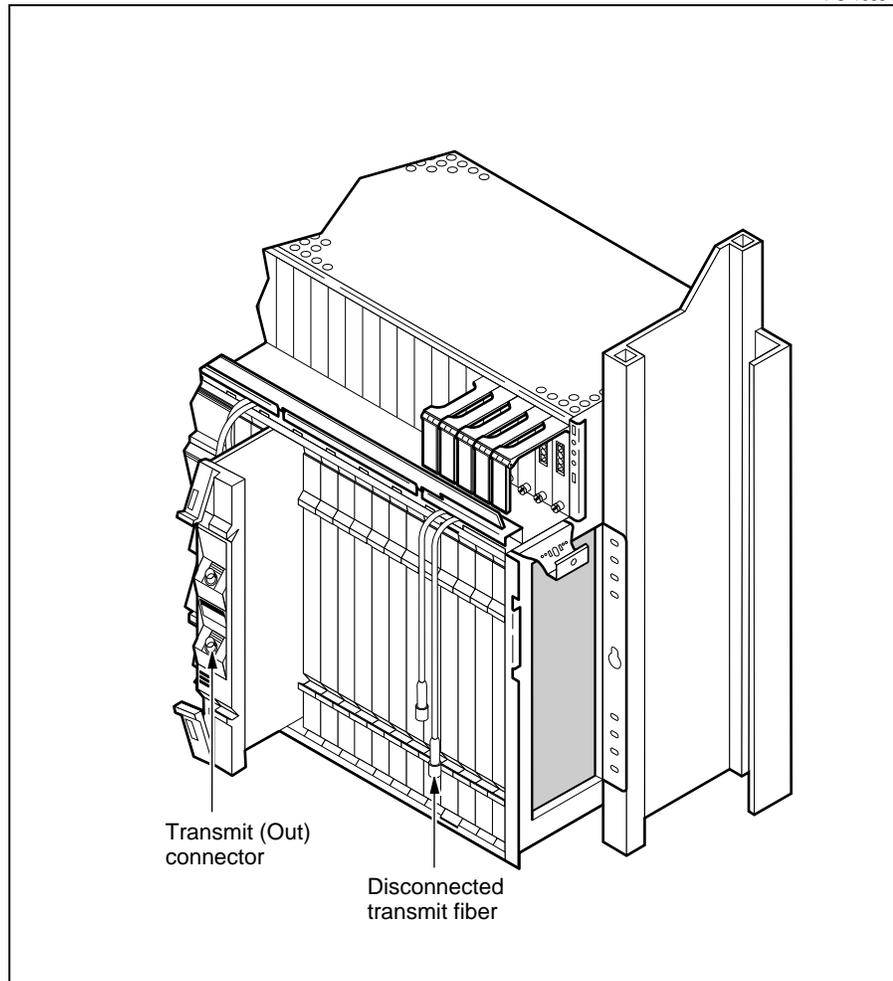


—continued—

Procedure 2-21 (continued)
NT7E01: OC-3 optical interface

- | Step | Action |
|------|---|
| 16 | Disconnect the optical patchcord or pigtail from the transmit biconic connector (as shown following). |

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—continued—

2-74 Replacing modules in a common-equipment shelf

Procedure 2-21 (continued),
NT7E01: OC-3 optical interface

- | Step | Action |
|------|---|
| 17 | Remove the circuit pack from the shelf. |
| 18 | Wait at least 10 seconds before installing the replacement card. Without engaging the replacement OC-3 optical interface circuit pack with the backplane connector, install the circuit pack in the shelf. Ensure that there is no power to the circuit pack (no LEDs lit). |



CAUTION

Possible damage to biconic connectors

If you are reconnecting biconic connectors in step 19 and step 20, prevent friction between optical lenses by gently lifting up on the fiber during the last half turn of the connector.

- | | |
|----|---|
| 19 | Reconnect the optical patchcord or pigtail to the transmit connector on the replacement circuit pack. |
| 20 | Reconnect the optical patchcord or pigtail to the receive connector on the replacement circuit pack. |
| 21 | Gently push the replacement circuit pack until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
<i>The circuit pack automatically comes in-service.</i> |
| 22 | Carefully dress the cables in the shelf fiber guides. |
| 23 | Replace the shelf cover. |

Note: For details, see the procedure for replacing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.

- | | |
|----|---|
| 24 | Verify that the OC-3 equipment is in-service: |
|----|---|

eq oc3 <group> ↵

where

<group> group number of the OC-3 that was replaced:
all, g1, g2,
g1s, g2s,
g3, g4, g5,
g6, g7, or g8

—continued—

 Procedure 2-21 (continued)
 NT7E01: OC-3 optical interface

Step	Action
25	Verify that the OC-3 facility is in-service: fa oc3 <group> ↵ where <group> group number of the OC-3 that was replaced: all, g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8
26	Return the protection switching at the near-end and the far-end to the original state. From the Network Element Status screen, display the OC-3 detailed protection screen: pr;dtlprot oc3 <group> where <group> group number of the OC-3 being replaced: g1, g2, g1s, g2s, g3, g4, g5, g6, g7, or g8
27	Display the protection switching. protprov ↵ <i>The protection screen will display either unidirectional or bidirectional switching.</i>
28	Change the protection switching by using the “swmode” command. This command is a toggle. To change bidirectional switching to unidirectional switching, or unidirectional switching to bidirectional, enter the command one time. swmode ↵ <i>The system prompts for confirmation.</i> y ↵

—end—

Procedure 2-22

NT7E02: OC-12 optical interface

Use this procedure to replace an OC-12 optical interface in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

Action

Step	Action								
	<table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>active OC-12</td> <td>go to step 1</td> </tr> <tr> <td>standby OC-12</td> <td>go to step 4</td> </tr> <tr> <td>a failed or out-of-service OC-12</td> <td>go to step 6</td> </tr> </tbody> </table>	If replacing	Then	active OC-12	go to step 1	standby OC-12	go to step 4	a failed or out-of-service OC-12	go to step 6
If replacing	Then								
active OC-12	go to step 1								
standby OC-12	go to step 4								
a failed or out-of-service OC-12	go to step 6								
1	<p>From the Network Element Status screen, display the OC-12 detailed protection screen:</p> <p>pr;dtlprot oc12.↵</p> <p><i>The detailed protection screen appears.</i></p> <p>Note: For a VTBM ring refer to Procedure 2-24, “NT7E05: OC-12 VTBM optical interface” on page 2-89.</p>								
2	<p>Switch service from the OC-12 being replaced.</p> <p>manual op <group>↵</p> <p>y↵</p> <p>where</p> <p><group> group number of the OC-12 being replaced: g1 or g2</p> <p><i>The system prompts for confirmation.</i></p> <table border="1"> <thead> <tr> <th>If protection switching is set for</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>bidirectional</td> <td>go to step 4</td> </tr> <tr> <td>unidirectional</td> <td>go to step 3</td> </tr> </tbody> </table>	If protection switching is set for	Then	bidirectional	go to step 4	unidirectional	go to step 3		
If protection switching is set for	Then								
bidirectional	go to step 4								
unidirectional	go to step 3								

—continued—

 Procedure 2-22 (continued)
 NT7E02: OC-12 optical interface

- | Step | Action |
|------|--|
| 3 | When unidirectional protection switching is provisioned, traffic must also be switched at the far-end NE. Log in to the far-end NE and perform a protection switch as was performed in steps 1 and 2. After traffic has been switched at the far-end NE, proceed to step 4. |
| 4 | <p>Display the facility screen for the OC-12 to be replaced:</p> <pre>fa oc12 <group>.</pre> <p>where</p> <p><group> group number of the OC-12 being replaced: g1 or g2</p> <p><i>The OC-12 facility screen appears.</i></p> |
| 5 | <p>To prevent alarms from being raised when the circuit pack is removed, change the state of the OC-12 facility to out-of-service (OOS):</p> <pre>chgstate oos.</pre> <pre>y.</pre> <p><i>The state of the OC-12 facility changes to out-of-service (OOS).</i></p> <p>For unidirectional protection switching, also take the corresponding OC-12 out of service at the far-end NE.</p> |
| 6 | <p>Display the equipment screen for the OC-12 to be replaced:</p> <pre>eq oc12 <group>.</pre> <p>where</p> <p><group> group number of the OC-12 being replaced: g1 or g2</p> <p><i>The OC-12 equipment screen appears.</i></p> |
| 7 | <p>To prevent alarms from being raised when the circuit pack is removed, change the state of the OC-12 equipment to out-of-service (OOS):</p> <pre>chgstate oos.</pre> <pre>y.</pre> <p><i>The state of the OC-12 equipment changes to out-of-service (OOS).</i></p> <p>For unidirectional protection switching, also take the corresponding OC-12 out of service at the far-end NE.</p> |
| 8 | <p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p> |

—continued—

Procedure 2-22 (continued)
NT7E02: OC-12 optical interface

Step Action



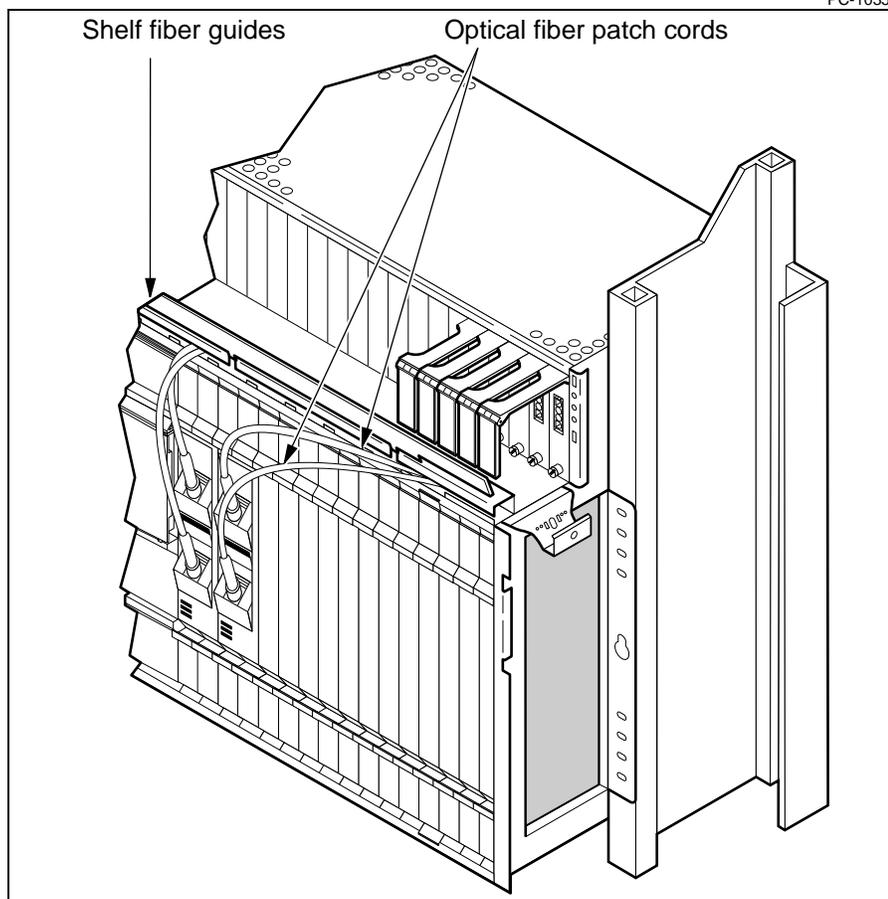
CAUTION

Possible damage to biconic connectors

If you are reconnecting biconic connectors in step 9 and step 10, prevent friction between optical lenses by gently lifting up on the fiber during the last half turn of the connector.

- 9 Remove the optical patch cords from the shelf fiber guides to provide sufficient slack for removing the circuit pack (as shown following).

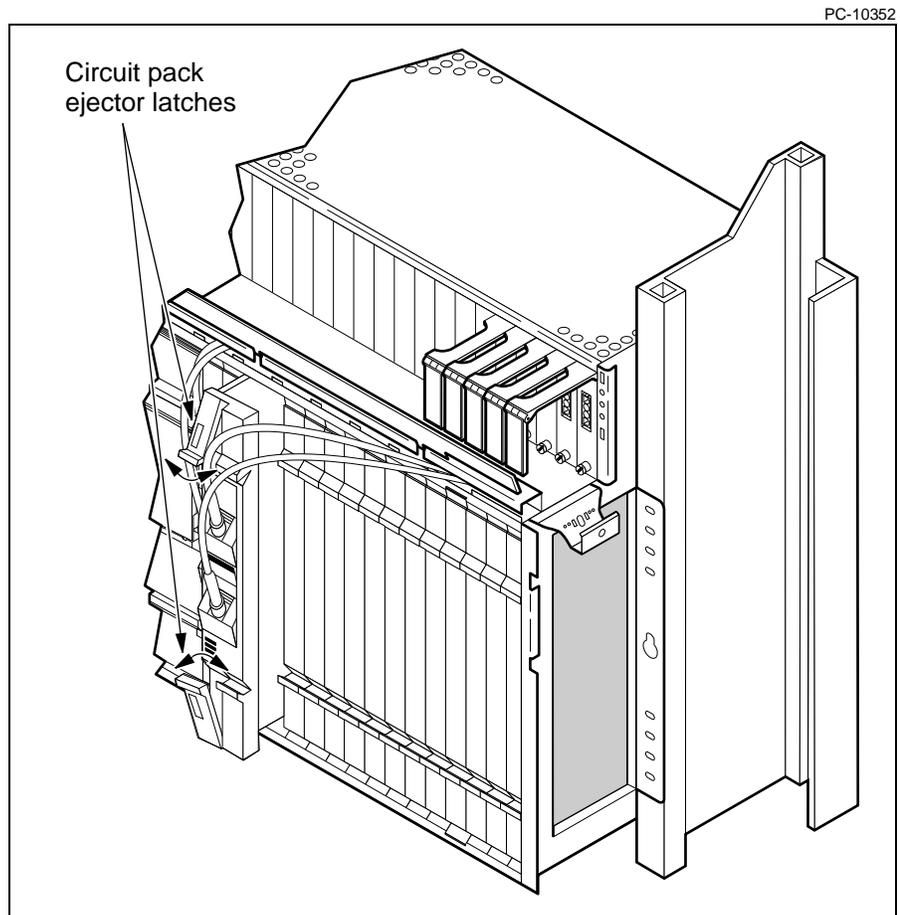
PC-10351



—continued—

Procedure 2-22 (continued)
NT7E02: OC-12 optical interface

- | Step | Action |
|------|---|
| 10 | <p>Pull on the circuit pack ejector latches to slightly withdraw the circuit pack to the extent necessary to disconnect it from the backplane connector (as shown following).</p> <p>Note: Take care when withdrawing the circuit pack to prevent straining the optical patch cords or pigtails.</p> |



—continued—

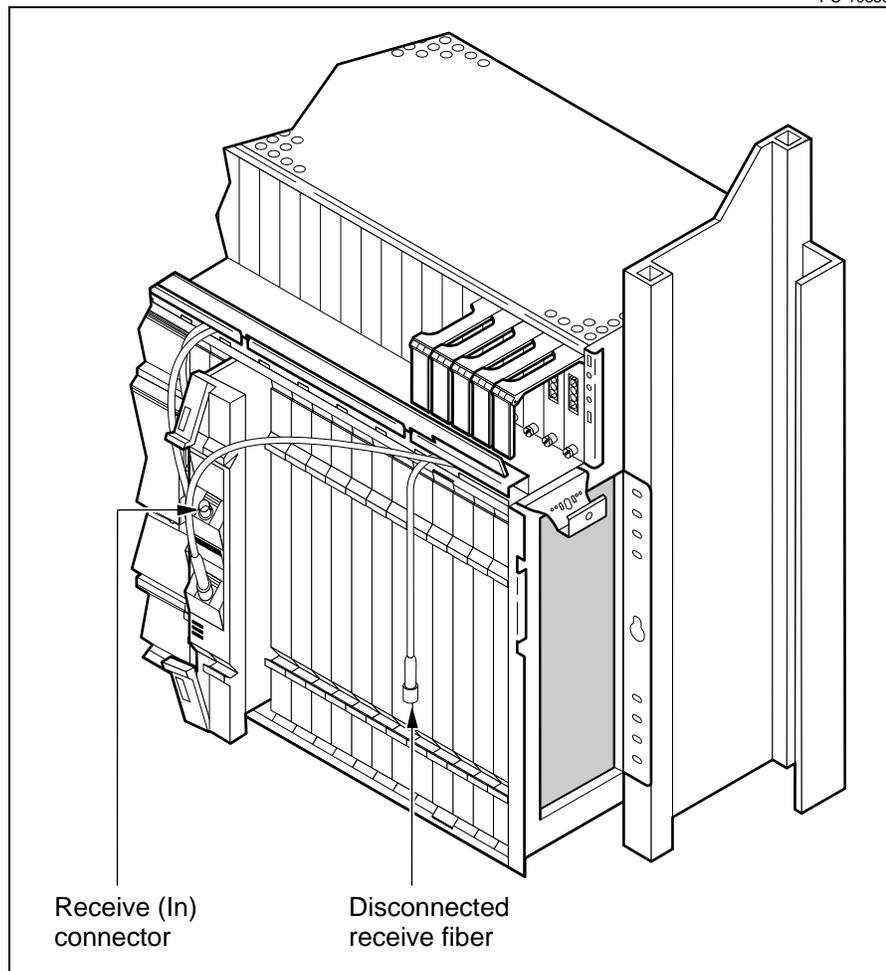
2-80 Replacing modules in a common-equipment shelf

Procedure 2-22 (continued)

NT7E02: OC-12 optical interface

Step	Action
11	Disconnect the optical patch cord or pigtail from the receive biconic connector.

PC-10353

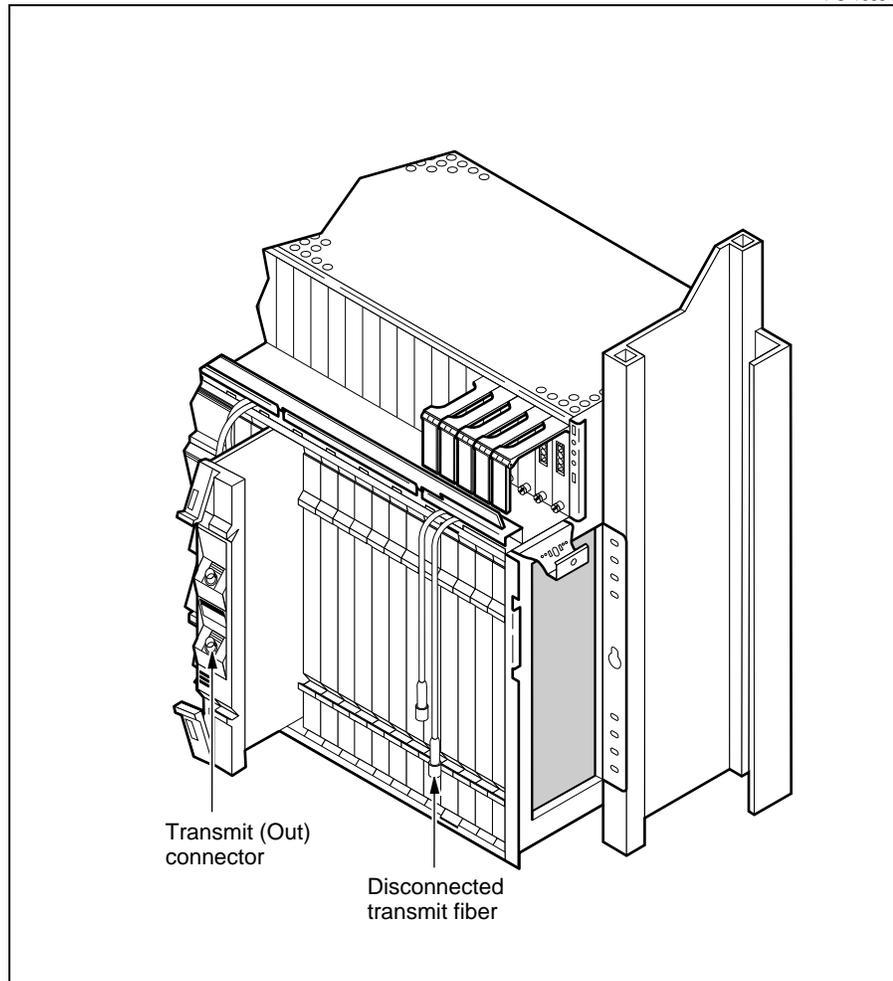


—continued—

Procedure 2-22 (continued)
NT7E02: OC-12 optical interface

- | Step | Action |
|------|---|
| 12 | Disconnect the optical patchcord or pigtail from the transmit biconic connector (as shown following). |

PC-10354



—continued—

Procedure 2-22 (continued),
NT7E02: OC-12 optical interface

Step	Action
13	Remove the circuit pack from the shelf.
14	Wait at least 10 seconds before installing the replacement card. Without engaging the replacement circuit pack with the backplane connector, install the circuit pack in the shelf. Ensure that there is no power to the circuit pack (no LEDs lit).



CAUTION

Possible damage to biconic connectors

If you are reconnecting biconic connectors in step 15 and step 16, prevent friction between optical lenses by gently lifting up on the fiber during the last half turn of the connector.

- 15 Reconnect the optical patchcord or pigtail to the transmit connector on the replacement circuit pack.
- 16 Reconnect the optical patchcord or pigtail to the receive connector on the replacement circuit pack.
- 17 Gently push the replacement circuit pack until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
- 18 Carefully dress the cables in the shelf fiber guides.
- 19 Change the state of the OC-12 circuit pack to in-service:
eq oc12 <group>.␣
chgstate is.␣
- where**
- <group> group number of the OC-12 that was replaced: **g1** or **g2**

The state changes to in-service (IS).

- 20 Change the state of the OC-12 facility to in-service (IS):
fa oc12 <group>.␣
chgstate is.␣
- For unidirectional protection switching, change the state of the OC-12 facility to in-service at the far-end NE.

—continued—

Procedure 2-22 (continued)
NT7E02: OC-12 optical interface

Step	Action						
21	<p>What type of protection activity was performed before the card was replaced?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: none;">If before replacing the OC-12</th> <th style="text-align: left; border-bottom: none;">Then</th> </tr> </thead> <tbody> <tr> <td style="border-top: none;">a manual protection switch was performed</td> <td style="border-top: none;">go to step 22</td> </tr> <tr> <td style="border-top: none;">no protection switch was performed</td> <td style="border-top: none;">go to step 24</td> </tr> </tbody> </table>	If before replacing the OC-12	Then	a manual protection switch was performed	go to step 22	no protection switch was performed	go to step 24
If before replacing the OC-12	Then						
a manual protection switch was performed	go to step 22						
no protection switch was performed	go to step 24						
22	<p>From the OC-12 facility screen, display the detailed protection screen: dtlprot↵</p>						
23	<p>From the detailed protection screen, release the protection switch: manual re <group>↵ y↵</p> <p style="margin-left: 40px;">where</p> <p style="margin-left: 80px;"><group> OC-12 group from which service was switched (in step 2): g1 or g2</p> <p style="margin-left: 40px;"><i>When a protection switch is released, the screen displays a period (.) in the manual column.</i></p>						
24	<p>Replace the shelf cover.</p> <p>Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>						

—end—

Procedure 2-23

NT7E04: DS1/VT mapper

Use this procedure to replace a DS1/VT mapper circuit pack in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.



CAUTION

Loss of service

If a DS1 is carrying TR-08 traffic, it must be provisioned on an NT7E04CA DS1/VT mapper. The protection DS1/VT mapper must also be an NT7E04CA circuit pack if any of the working mappers on a common equipment shelf are carrying TR-08 traffic. Otherwise, TR-08 traffic will be lost if a protection switch occurs.

Action

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

- 1 From the Network Element Status screen, display the DS1 protection screen:

pr;dtlprot ds1 ↵

The detailed DS1 protection screen appears.

If replacing

Then

protection DS1/VT mapper

go to step 2

an active DS1/VT mapper

go to step 3

a failed or out-of-service
DS1/VT mapper

go to step 6

—continued—

 Procedure 2-23 (continued)
NT7E04: DS1/VT mapper

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

**CAUTION****Loss of service**

Ensure that there is no protection switching in effect before locking out the protection DS1/VT mapper. Lockout of an active protection DS1/VT mapper can result in loss of service if traffic from the protection DS1/VT mapper is switched back to an out-of-service working DS1/VT mapper.

At the NEUI detailed DS1 protection screen, ensure that there is no protection switching in effect.

Note: An asterisk (*) under the *Forced*, *Auto* or *Manual* heading indicates if protection switching is in effect and indicates if the protection DS1/VT mapper is currently taking over the function of one of the working DS1/VT mappers.

- 2** Lockout the protection mapper:

lockout op p↵

y↵

When a lockout is operated, the screen displays an asterisk () in the Lockout column.*

Skip to step 6.

- 3** Switch service to the protection DS1/VT mapper:

manual op <group>↵

y↵

where

<group> group number of the DS1/VT mapper being replaced:
 see "Group and slot associations for DS1, DS3, STS-1,
 OC-3, and OC-12" on page 1-9 for values

Service is switched to the protection DS1/VT mapper circuit pack.

—continued—

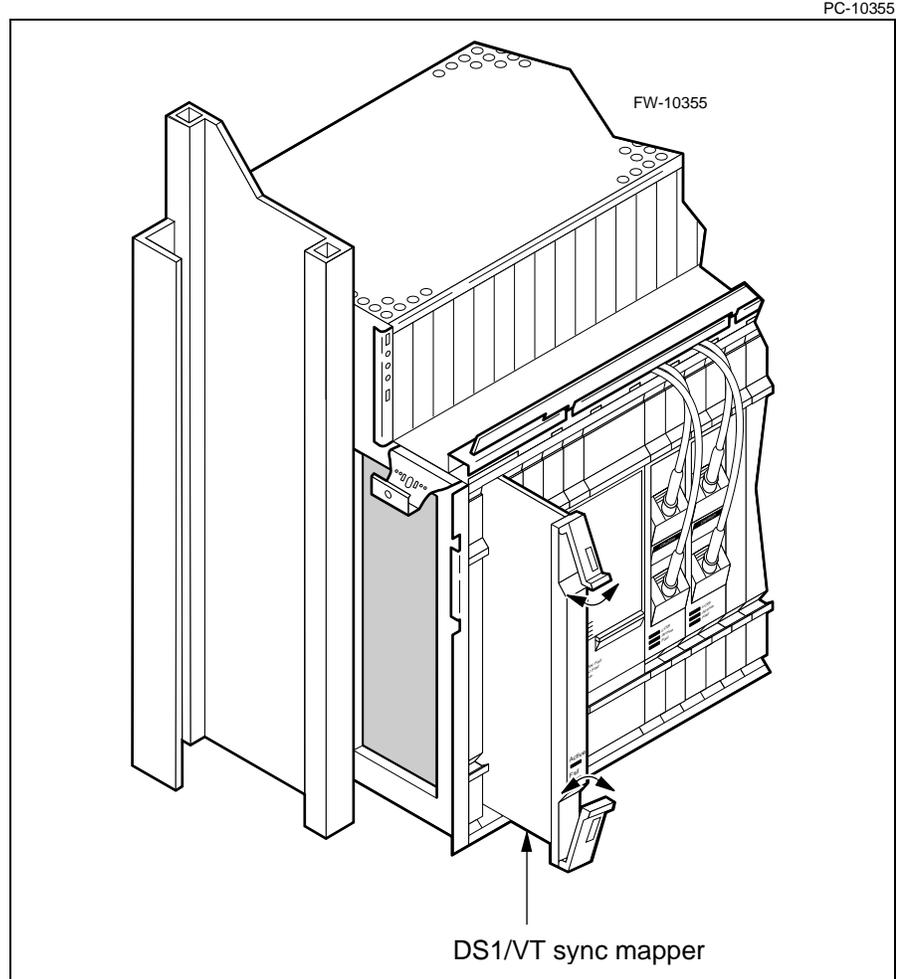
Procedure 2-23 (continued)
NT7E04: DS1/VT mapper

Step	Action
4	<p>Display the equipment screen for the circuit pack to be replaced: eq ds1 <group>↵</p> <p>where</p> <p><group> group number of the DS1/VT mapper being replaced: see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values</p> <p><i>The DS1 equipment screen appears.</i></p>
5	<p>Change the state of the circuit pack to out-of-service (OOS): chgstate oos↵ y↵</p> <p><i>The state changes to OOS.</i></p>
6	<p>Remove the shelf cover.</p> <p>Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>
7	<p>Pull the circuit pack ejector latches (as shown following) to remove the circuit pack from the shelf.</p> <p>Note: The position of the circuit pack varies with shelf type and configuration.</p>

—continued—

Procedure 2-23 (continued)
NT7E04: DS1/VT mapper

Step Action



- 8 Wait at least 10 seconds before installing the replacement card. Gently push the replacement circuit pack in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.
- 9 If you put a mapper out of service in step 5, then from the DS1 equipment screen, change the state of the replacement DS1/VT mapper to in-service (IS):

chgstate is.↓

—continued—

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Procedure 2-23 (continued)
NT7E04: DS1/VT mapper

Step	Action								
10	Determine the type of protection activity that was performed before the card was replaced: <table border="1"><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>a protection lockout was performed</td><td>go to step 11</td></tr><tr><td>a protection switch was performed</td><td>go to step 12</td></tr><tr><td>no protection switch was performed</td><td>go to step 13</td></tr></tbody></table>	If	Then	a protection lockout was performed	go to step 11	a protection switch was performed	go to step 12	no protection switch was performed	go to step 13
If	Then								
a protection lockout was performed	go to step 11								
a protection switch was performed	go to step 12								
no protection switch was performed	go to step 13								
11	From the detailed protection screen, release the protection lockout: lockout re p ↵ y ↵ <i>When the lockout is released, the screen displays a period (.) in the lockout column.</i> Skip to step 13.								
12	From the detailed protection screen, release the protection switch: manual re <group> ↵ y ↵ where <group> group number of the DS1/VT mapper that was switched (in step 3(*) see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values <i>When a protection switch is released, the screen displays a period (.) in the manual column.</i>								
13	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.								

—end—

Procedure 2-24

NT7E05: OC-12 VTBM optical interface

Use this procedure to replace the OC-12 VTBM optical interface circuit pack in an access bandwidth manager (ABM) shelf, or a transport bandwidth manager (TBM) shelf.

Requirements

Before starting this procedure, you must be logged in to the network element user interface and be at the main menu level.

**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.

Tools and materials

You need an optical meter (for example, Photodyne 12XE for 1300 nm) to perform this procedure.

To ensure accurate results, clean the optical connectors and verify the optical meter calibration. Ensure positive mating of fibers in optical connectors.

Action

In a double-fault situation (a protection circuit pack is no longer available), the waiting times are as follows:

- 2 to 3 seconds between inserting the OC-12 optical interface circuit pack and enabling protection
- 5 to 10 seconds between inserting the OC-12 optical interface circuit pack and restoring traffic

Wait 20 seconds after removing the OC-12 optical interface circuit pack before reinserting or replacing it.

—continued—

2-90 Replacing modules in a common-equipment shelf

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

Step	Action
1	Remove the shelf cover by turning the right locking screw 90° clockwise and the left locking screw 90° counterclockwise. Open both latches and pull to remove the cover.
2	Both OC-12 VTM ring optical circuit packs are active and traffic must be looped back (away from the circuit pack being replaced) to avoid service interruptions. Note: When an OC-12 optical interface circuit pack is being replaced in a ring system, a SONET overhead clock loss alarm occurs. This alarm clears when the new circuit pack is in place. Perform a forced switch by entering: pr;dtlprot oc12 ↵ forced op <group> ↵ yes ↵ where <group> the group number being replaces: g1 or g2
3	Verify that the optical unit at the remote end has switched. At the prompt type: rlogin NE <NE number> ↵ pr;dtlprot oc12 ↵ where <NE number> is the number of the NE at the remote end of the span

	<p>CAUTION Risk of traffic loss If the incorrect circuit pack is removed from the shelf, it must be immediately reinserted. The facility that was intended to be removed must be put back in service (IS) to avoid a prolonged service interruption.</p>
---	--

—continued—

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

- | Step | Action |
|------|--|
| 4 | Put the OC-12 facility out of service (OOS) by entering:
facility oc12 <group> ↵
chgstate oos ↵
yes ↵

where

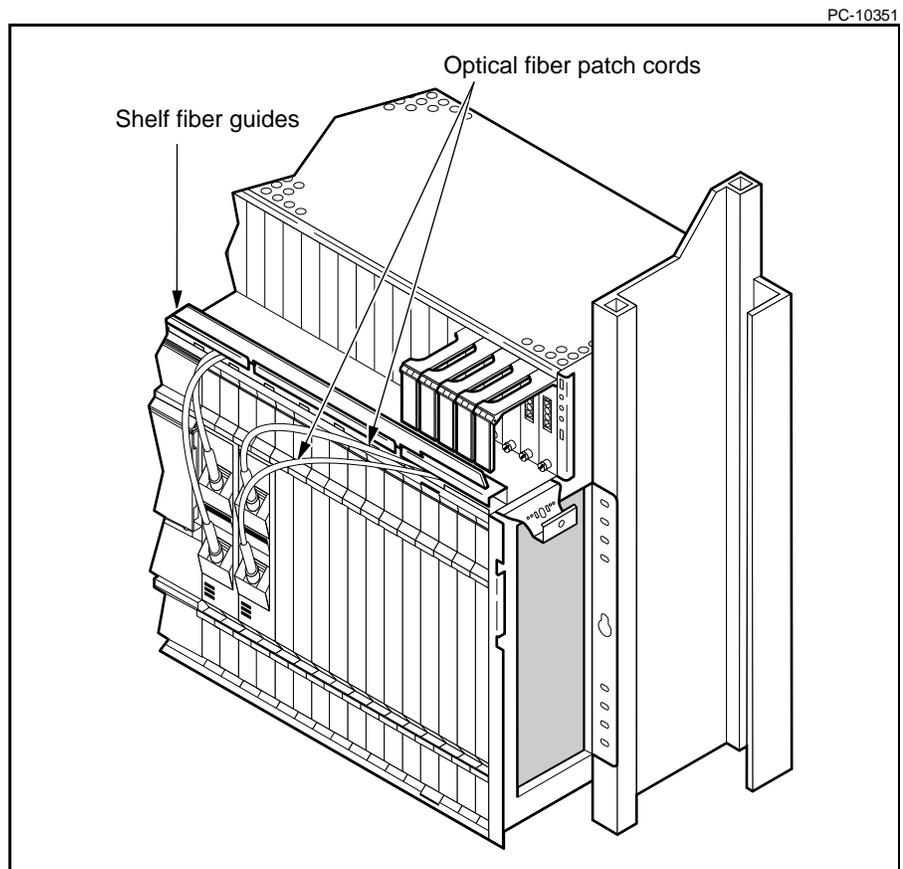
<group> is the circuit pack group entered at step 2 |

As a result of the facility oos operation, the VTM hardware inserts a Line AIS and the state of the circuit pack is set at oos_partial_fail.

A Rx Line AIS alarm is detected at the far end.

If the far end node is line timed, a timing reference interface fail alarm will be raised at the far end.

- 5 Remove the optical patchcord, or pigtail, from the shelf fiber guides to provide sufficient slack.



—continued—

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

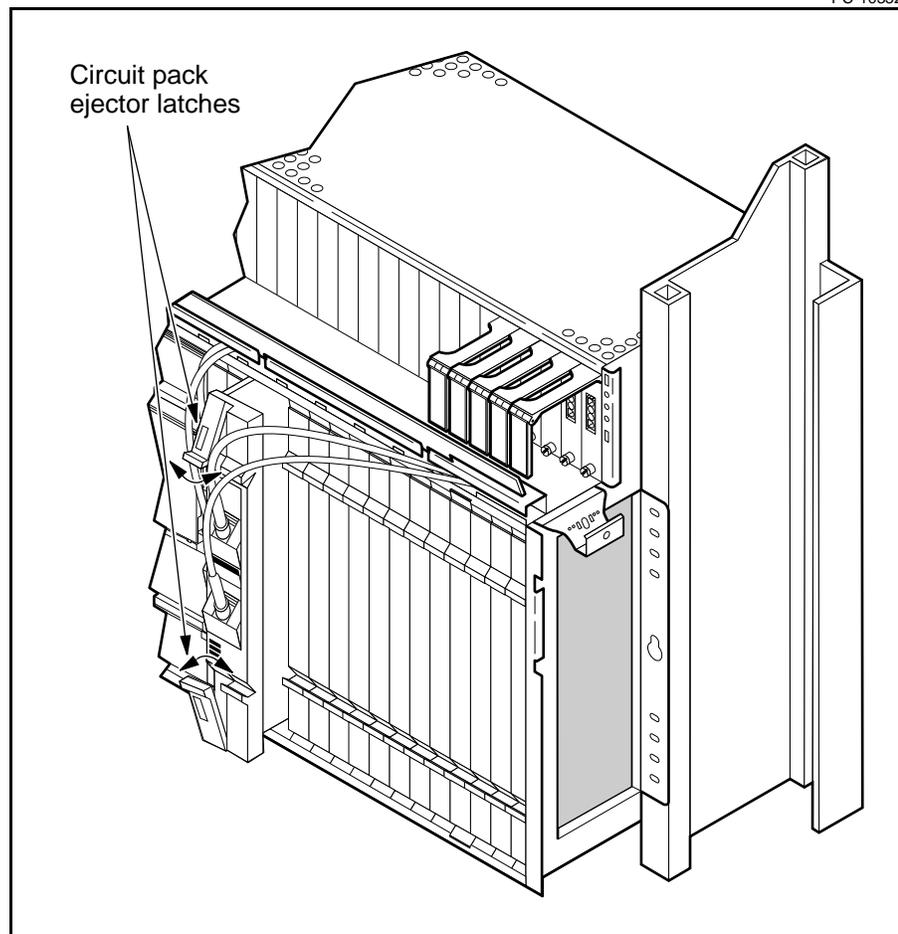
Step Action

- 6 Gently pull out the circuit pack to the extent necessary to disconnect it from the backplane connector.

Note 1: Care must be taken when pulling out the circuit pack to prevent causing stress to the optical patchcord or pigtail.

Note 2: Do not extract the circuit pack from the shelf while a lamp test is running. If a circuit pack is removed during a lamp test and reinserted after the test, another lamp test must be run.

PC-10352



—continued—

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

- | Step | Action |
|------|---|
| 7 | Disconnect the optical patchcord, or pigtail, from the input connector on the circuit pack. Install the connector dust cap. |



DANGER

Risk of laser radiation

When the connector dust cap is removed, laser radiation within the limits of Class IIIb might be present. This level of radiation is sufficient to cause injury to personnel and caution must be exercised to avoid exposure.

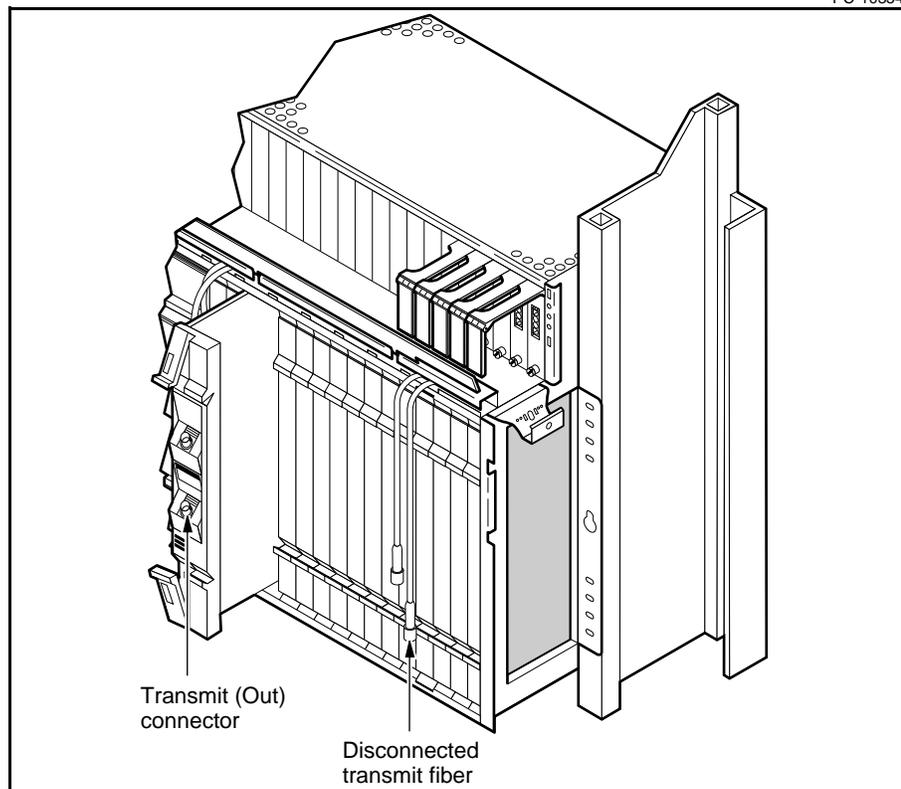
A label similar to the following is located on the optical interface circuit packs near the optical connector.

Caution

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

- | | |
|---|--|
| 8 | Disconnect the optical patchcord, or pigtail, from the output connector on the circuit pack. Install the connector dust cap. |
|---|--|

PC-10354



—continued—

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

Step Action



CAUTION

Risk of damaging equipment

Do not use excessive force when inserting circuit packs into or removing circuit packs from the shelf.

- 9 Remove the circuit pack from the shelf.
- 10 Install the new circuit pack in the shelf without inserting it into the backplane connector (that is, the circuit pack must not be powered). Wait at least 20 seconds before reinserting a removed circuit pack.
- 11 Firmly push the circuit pack all the way into its position and into the backplane connector.
Note: After insertion, the red fail LED and the yellow LOS LED turn on for several seconds until the circuit pack achieves full operation.
- 12 Measure the output power. The measured power should exceed the value specified in the following table.

Module	Requirement
NT7E05BB/BC/BD	-15.0 dBm (intermediate reach)
NT7E05AB/AC/AD	-3.0 dBm (long reach)

- 13 Reconnect the optical patchcord or pigtail to the output connector on the circuit pack.
- 14 Reconnect the optical patchcord or pigtail to the input connector on the circuit pack.
Note: Depending on the signal degrade threshold setting, the Signal degrade alarm may not clear immediately when the optical patchcord is reconnected to the input connector on the circuit pack. For example, for a signal degrade threshold setting of 10 E-9, the system can take up to 30 minutes to declare a good path and clear the alarm.
- 15 Verify that the OC-12 circuit pack has completed diagnostics and that the equipment is in service.

equipmnt oc12 <group> ↵

where

<group> is the circuit pack group entered at step 2

—continued—

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

- | Step | Action |
|------|---|
| 16 | Put the OC-12 facility back in service (IS) by entering:
facility oc12 <group> ↵
chgstate is ↵

where

<group> is the circuit pack group entered at step 2 |
| 17 | Release the forced switch by entering:
pr;dtlprot oc12 ↵
forced re <group> ↵
yes ↵

where

<group> is the circuit pack group entered at step 2 |
| 18 | Verify that the system is free of alarms by entering:
alarms ↵
Note: If alarms exist for the OC-12 optical interface circuit pack, see <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A. |
| 19 | Perform an exerciser test by entering:
equipmnt sh ↵
exercise ↵ |
| 20 | Open the equipment log utility to verify that the exerciser run is successful by entering:
admin nep ↵
logs ↵
open eqp ↵
Note: If the exerciser run fails, see <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543 in <i>Maintenance</i> , Volume 5A. |

—continued—

2-96 Replacing modules in a common-equipment shelf

Procedure 2-24 (continued)

NT7E05: OC-12 VTBM optical interface

Step Action

21



CAUTION

Risk of damaging equipment

Failure to follow the procedures for installing shelf covers in *Routine Maintenance Procedures*, 323-3001-546, in this volume, can result in damaging the shelf cover.

Replace the shelf cover. Turn the right locking screw 90° counterclockwise and the left locking screw 90° clockwise, making sure both latches are closed.

—end—

Procedure 2-25

NT7E08: DS3/STS mapper

Use this procedure to replace a DS3/STS mapper circuit pack in an access bandwidth manager (ABM) shelf, or transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Action

Step	Action								
1	<p>From the Network Element Status screen, display the DS3 protection screen: pr;dtlprot ds3. <i>The detailed DS3 protection screen appears.</i></p> <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>protection DS3/STS mapper</td> <td>go to step 2</td> </tr> <tr> <td>an active DS3/STS mapper</td> <td>go to step 3</td> </tr> <tr> <td>a failed or out-of-service DS3/STS mapper</td> <td>go to step 6</td> </tr> </tbody> </table>	If replacing	Then	protection DS3/STS mapper	go to step 2	an active DS3/STS mapper	go to step 3	a failed or out-of-service DS3/STS mapper	go to step 6
If replacing	Then								
protection DS3/STS mapper	go to step 2								
an active DS3/STS mapper	go to step 3								
a failed or out-of-service DS3/STS mapper	go to step 6								



CAUTION

Loss of service

Ensure that there is no protection switching in effect before locking out the protection DS3/STS mapper. Lockout of an active protection DS3/STS mapper can result in loss of service if traffic from the protection DS3/STS mapper is switched back to an out-of-service working DS3/STS mapper.

From the NEUI detailed DS3 protection screen, ensure that there is no protection switching in effect.

Note: An asterisk (*) under the `Forced`, `AutoSw` or `Manual` heading indicates if protection switching is in effect and indicates if the protection DS3/STS mapper is currently taking over the function of one of the working DS3/STS mappers.

—continued—

Procedure 2-25 (continued)
NT7E08: DS3/STS mapper

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

2	Lockout the protection mapper: lockout op p ↵ y ↵ <i>When a lockout is operated, the screen displays an asterisk (*) in the Lockout column.</i> Skip to step 4.
---	---

3	Switch service to the protection DS3/STS mapper: manual op <group> ↵ y ↵ where <group> group number of the DS3/STS mapper being replaced: see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values
---	---

Service is switched to the protection DS3/STS mapper circuit pack.



CAUTION

Loss of service

Leave the DS3/STS mapper, that you performed a manual protection switch on in step 3, in-service while you are replacing it; otherwise, traffic will be lost.

4	Display the equipment screen for the circuit pack to be replaced: eq ds3 <group> ↵ where <group> group number of the DS3/STS mapper being replaced: see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values
---	---

The DS3 equipment screen appears.

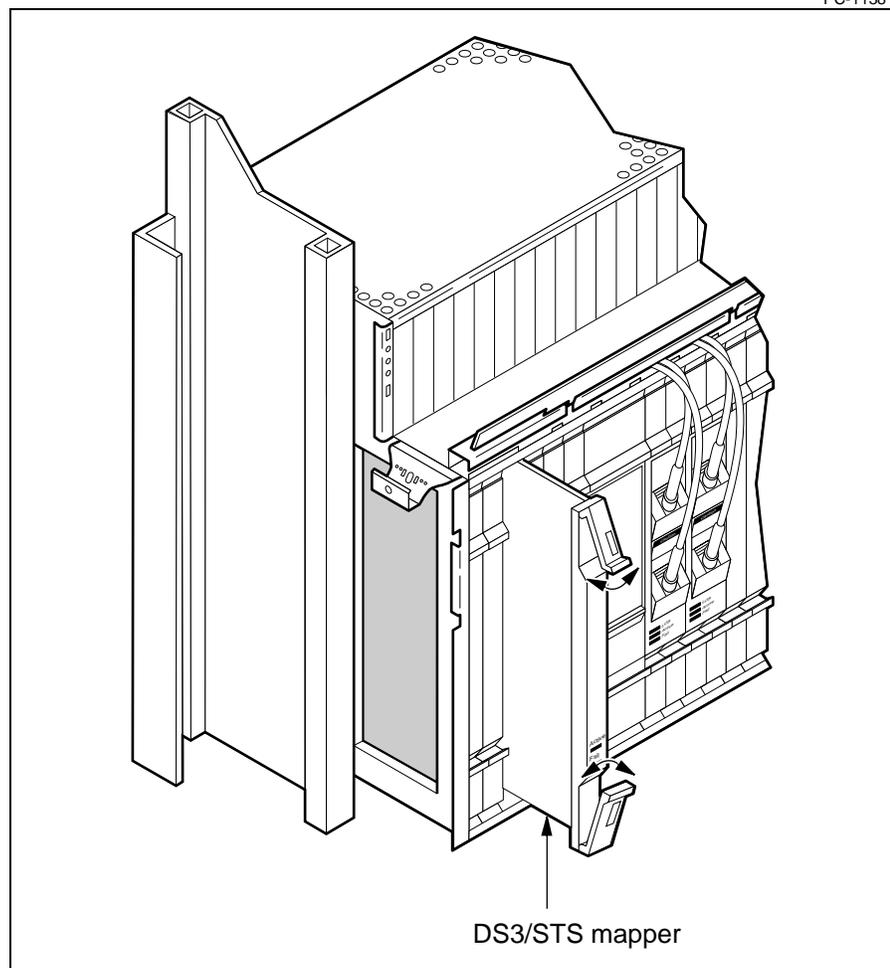
5	Change the state of the circuit pack to out-of-service (OOS): chgstate oos ↵ y ↵ <i>The state changes to OOS.</i>
---	--

—continued—

Procedure 2-25 (continued)
NT7E08: DS3/STS mapper

- | Step | Action |
|------|--|
| 6 | Remove the shelf cover.
Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume. |
| 7 | Pull the circuit pack ejector latches (as shown following) to remove the circuit pack from the shelf.
Note: The position of the circuit pack varies with shelf type and configuration. |

PC-11381



- 8 Wait at least 10 seconds before installing the replacement card. Gently push the replacement circuit pack in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.

—continued—

2-100 Replacing modules in a common-equipment shelf

Procedure 2-25 (continued)

NT7E08: DS3/STS mapper

Step	Action								
9	If you put a mapper out of service in step 5, then from the DS1 equipment screen, change the state of the replacement DS1/VT mapper to in-service (IS): chgstate is ↵								
10	Determine the type of protection activity that was performed before the card was replaced: <table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>a protection lockout was performed</td><td>go to step 11</td></tr><tr><td>a protection switch was performed</td><td>go to step 12</td></tr><tr><td>no protection switch was performed</td><td>go to step 13</td></tr></tbody></table>	If	Then	a protection lockout was performed	go to step 11	a protection switch was performed	go to step 12	no protection switch was performed	go to step 13
If	Then								
a protection lockout was performed	go to step 11								
a protection switch was performed	go to step 12								
no protection switch was performed	go to step 13								
11	From the detailed protection screen, release the protection lockout: lockout re p ↵ y ↵ <i>When the lockout is released, the screen displays a period (.) in the lockout column.</i> Skip to step 15.								
12	From the detailed protection screen, release the protection switch: manual re <group> ↵ y ↵ where <table><tbody><tr><td><group></td><td>group number of the DS3/STS mapper that was switched (in step 3(*) see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values</td></tr></tbody></table> <i>When a protection switch is released, the screen displays a period (.) in the manual column.</i>	<group>	group number of the DS3/STS mapper that was switched (in step 3(*) see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values						
<group>	group number of the DS3/STS mapper that was switched (in step 3(*) see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values								
13	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.								

—end—

Procedure 2-26 NT7E09: STS-1 interface

Use this procedure to replace a STS-1 interface circuit pack in a transport bandwidth manager (TBM) shelf.

For a list of slots occupied by this card, see “Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12” on page 1-9.

Action

Step	Action								
1	<p>From the Network Element Status screen, display the STS1 protection screen:</p> <pre>pr;dtlprot sts1</pre> <p><i>The detailed STS1 protection screen appears.</i></p> <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>protection STS-1 interface circuit pack</td> <td>go to step 2</td> </tr> <tr> <td>an active STS-1 interface circuit pack</td> <td>go to step 3</td> </tr> <tr> <td>a failed or out-of-service STS-1 interface circuit pack</td> <td>go to step 6</td> </tr> </tbody> </table>	If replacing	Then	protection STS-1 interface circuit pack	go to step 2	an active STS-1 interface circuit pack	go to step 3	a failed or out-of-service STS-1 interface circuit pack	go to step 6
If replacing	Then								
protection STS-1 interface circuit pack	go to step 2								
an active STS-1 interface circuit pack	go to step 3								
a failed or out-of-service STS-1 interface circuit pack	go to step 6								



CAUTION
Loss of service

Ensure that there is no protection switching in effect before locking out the protection STS-1 interface circuit pack. Lockout of an active protection STS-1 interface circuit pack can result in loss of service if traffic from the protection STS-1 interface circuit pack is switched back to an out-of-service working STS-1 interface circuit pack.

From the NEUI detailed STS-1 protection screen, ensure that there is no protection switching in effect.

Note: An asterisk (*) under the `Forced`, `AutoSw` or `Manual` heading indicates if protection switching is in effect and indicates if the protection STS-1 interface circuit pack is currently taking over the function of one of the working STS-1 interface circuit packs.

—continued—

Procedure 2-26 (continued)
NT7E09: STS-1 interface

Step Action

2 Lockout the protection mapper:
lockout op p.
y.
When a lockout is operated, the screen displays an asterisk () in the Lockout column.*
Skip to step 4.

3 Switch service to the protection STS-1 interface circuit pack:
manual op <group>.
y.
where
<group> group number of the STS-1 interface circuit pack being replaced: see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values

Service is switched to the protection STS-1 interface circuit pack.



CAUTION

Loss of service

Leave the STS-1 interface circuit pack you performed a manual protection switch on in step 3, in-service while you are replacing it; otherwise, traffic will be lost.

4 Display the equipment screen for the circuit pack to be replaced:
eq sts1 <group>.
where
<group> group number of the STS-1 interface circuit pack being replaced: see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values

The STS-1 equipment screen appears.

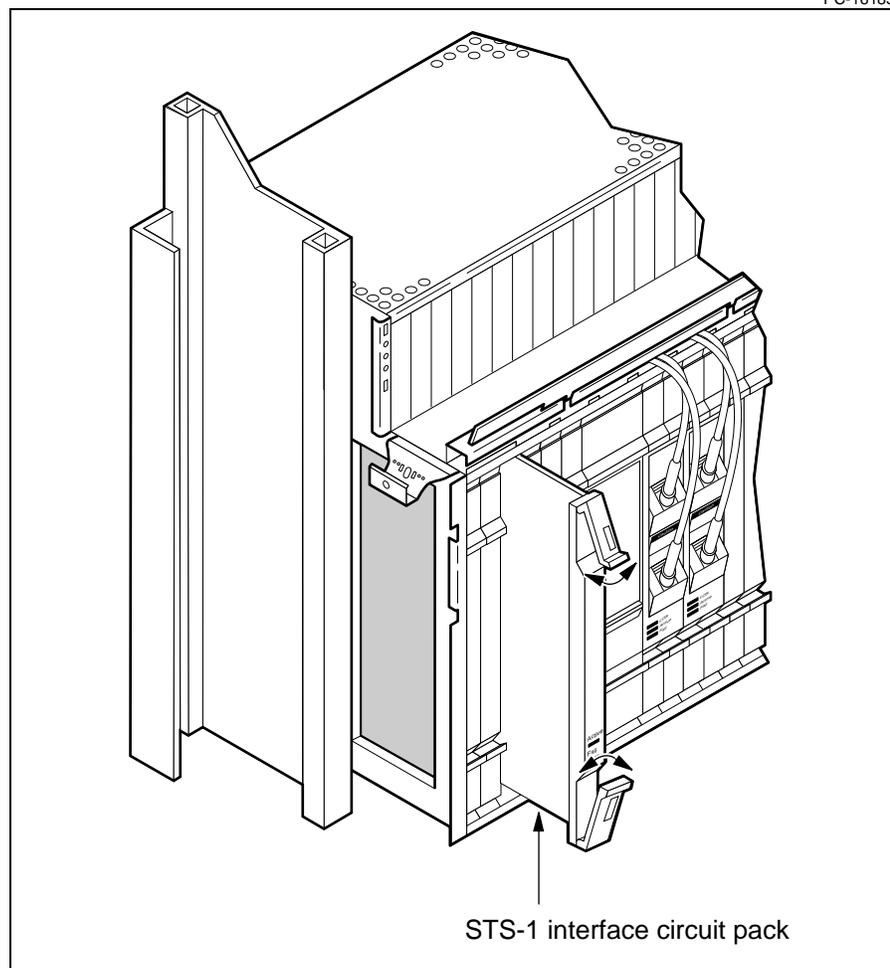
5 Change the state of the circuit pack to out-of-service (OOS):
chgstate oos.
y.
The state changes to OOS.

—continued—

Procedure 2-26 (continued)
NT7E09: STS-1 interface

- | Step | Action |
|------|--|
| 6 | Remove the shelf cover.
Note: For details, see the procedure for removing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume. |
| 7 | Pull the circuit pack ejector latches (as shown following) to remove the circuit pack from the shelf.
Note: The position of the circuit pack varies with shelf type and configuration. |

PC-16185



—continued—

2-104 Replacing modules in a common-equipment shelf

Procedure 2-26 (continued)
NT7E09: STS-1 interface

Step Action

- 8** Wait at least 10 seconds before installing the replacement card. Gently push the replacement circuit pack in until the ejector latches come in contact with the shelf. Then push the latches in toward the circuit pack to engage the circuit pack with the backplane connector.

Important

After inserting the circuit pack, its red LED may light. Do not replace the circuit pack at this point. The red LED may light because the circuit pack's firmware does not meet the baseline required by the network element's software. Step 10 will correct this problem.

- 9** If you put a STS-1 interface circuit pack out-of-service in step 5, then from the STS1 equipment screen, change the state of the replacement STS-1 interface circuit pack to in-service (IS):

chgstate is␣

- 10** Is the red LED on the replacement circuit pack lit?

If	Then
yes	Go to step 11.
no	Go to step 12.

- 11** From the NEUI, check for alarms by entering:
alarms␣

If	Then
a firmware/software incompatible or firmware failure alarm is raised	Clear the alarm using the appropriate alarm clearing procedure in <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A. Go to step 12.
any other type of alarm is raised against the STS-1 interface card just replaced	Clear the alarm using the appropriate alarm clearing procedure in <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A. Go to step 12.
no alarm is raised	Replace the failed circuit pack. Go to step 8.

—continued—

Procedure 2-26 (continued)
NT7E09: STS-1 interface

Step	Action								
12	<p>Determine the type of protection activity that was performed before the card was replaced:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>a protection lockout was performed</td> <td>go to step 13</td> </tr> <tr> <td>a protection switch was performed</td> <td>go to step 14</td> </tr> <tr> <td>no protection switch was performed</td> <td>go to step 15</td> </tr> </tbody> </table>	If	Then	a protection lockout was performed	go to step 13	a protection switch was performed	go to step 14	no protection switch was performed	go to step 15
If	Then								
a protection lockout was performed	go to step 13								
a protection switch was performed	go to step 14								
no protection switch was performed	go to step 15								
13	<p>From the detailed protection screen, release the protection lockout: lockout re p↵ y↵ <i>When the lockout is released, the screen displays a period (.) in the lockout column.</i> Skip to step 15.</p>								
14	<p>From the detailed protection screen, release the protection switch: manual re <group>↵ y↵ where <group> group number of the STS-1 interface circuit pack that was switched (in step 3(*) see "Group and slot associations for DS1, DS3, STS-1, OC-3, and OC-12" on page 1-9 for values <i>When a protection switch is released, the screen displays a period (.) in the manual column.</i></p>								
15	<p>Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>								

—end—

Procedure 2-27

NT7E19: External synchronization interface carrier

Use this procedure to replace an external synchronization interface carrier card for the following:

- slot 19 of a transport bandwidth manager (TBM) commissioned as an FCOT_BLSR
- slot 21 of an access bandwidth manager (ABM) shelf
- slot 23 of a TBM shelf commissioned as a TN_BLSR

The ESI carrier can house up to two external synchronization interfaces (ESI). G1 is the top card in the carrier, and G2 is the bottom card in the carrier.

Action

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



CAUTION

Removal of ESI carrier may affect clock and may affect service

The removal of the external synchronization interface carrier requires both ESI cards to be removed. This may adversely affect the clock distribution scheme of the network and may affect service.

- 1 Remove the shelf cover. For a VTM ring network element, a lockout is not required; go to step 3.
Note: For details, see the procedure for removing the common-equipment shelf cover in *Routine Maintenance Procedures*, 323-3001-546, in this volume.
- 2 Prevent the OC-12 or OC-3 interface circuit packs from performing a protection switch when the ESI carrier is removed:
 - a. From the Network Element Status screen, display the OC-12 or OC-3 detailed protection switching screen:

pr;dtlprot <optical type>↓

where

<optical type> is the type of the interface: **oc3_g1** or **oc12**

The detailed protection screen appears.

—continued—

Procedure 2-27 (continued)

NT7E19: External synchronization interface carrier

Step	Action						
	<p>b. Lockout the OC-12 or OC-3:</p> <p>lockout op. y.</p> <p><i>When a lockout is operated, the screen displays an asterisk (*) in the Lockout column. The banner line is also updated under the lockout column, and a "Lockout request" alarm is raised. The lockout LED on the maintenance interface circuit pack lights up.</i></p>						
3	<p>Display the shelf equipment screen and note the setting of the clock source:</p> <p>eq sh.</p> <p><i>The shelf equipment screen appears, showing all parameters associated with the shelf, including the current setting of the Clock Source.</i></p>						
4	<p>Is the clock source field on the shelf equipment screen set to ESI?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>yes</td> <td>go to step 5</td> </tr> <tr> <td>no</td> <td>go to step 6</td> </tr> </tbody> </table>	If	Then	yes	go to step 5	no	go to step 6
If	Then						
yes	go to step 5						
no	go to step 6						
5	<p>From the shelf equipment screen change the setting of the clock source from ESI to Freerun:</p> <p>edit. clocksrc freerun. y.</p> <p><i>The clock source changes from ESI to Freerun. (Freerun appears in reverse video).</i></p>						
6	<p>Display the equipment screen for one of the ESI cards housed in the ESI carrier:</p> <p>eq esi <group>.</p> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><group> number of the ESI housed in the ESI carrier: g1 (top ESI card) or g2 (bottom ESI card)</p> <p><i>The ESI equipment screen appears.</i></p>						
7	<p>Record the status of the ESI card, either active or standby.</p>						
8	<p>If applicable, repeat steps 6 and 7 for other ESI cards.</p>						

—continued—

Procedure 2-27 (continued)

NT7E19: External synchronization interface carrier

Step	Action
9	Display the facility screen for the ESI BITSA facility: fa esi <facility>. where <facility> is the ESI input facility: bitsa <i>The BITSA input facility screen appears.</i>
10	Change the state of the BITSA facility to out-of-service as follows: chgstate oos. y. <i>The state of the BITSA ESI facility changes to OOS.</i>
11	Repeat step 9 and 10 for the BITSB ESI, G1OUT, and G2OUT, if required, then proceed to step 12.
12	Display the ESI equipment screen for the standby ESI card. eq esi <group>. where <group> number of the standby ESI g1 or g2 <i>The ESI equipment screen appears.</i>
13	Change the state of the ESI card to out of service (OOS): chgstate oos. y. <i>The state changes to out of service.</i>
14	If applicable, repeat steps 12 and 13 for the second ESI card. Note: When both ESI cards are out of service and the output facilities are out of service, proceed to step 15.
15	Remove each ESI card by rotating the locking fastener on the card 45° counterclockwise to unlock the module from the ESI carrier, as shown in Figure 2-12 on page 2-110.
16	Pull the locking latches down, thereby causing each ESI card to partially slide out from the ESI carrier, then slide the card completely out of the ESI carrier.

—continued—

Procedure 2-27 (continued)

NT7E19: External synchronization interface carrier

Step	Action
17	To remove the ESI carrier from the shelf, insert a small slot screwdriver into the slots on the upper and lower locking latches of the carrier, as shown in Figure 2-12. Unlock the latches and slide out the ESI carrier.
18	Install the new ESI carrier by sliding the card into the appropriate shelf slot, and push inward on the locking latches to lock the ESI carrier into place.
19	Insert the ESI cards into the ESI carrier, and lock them into place by rotating the fasteners clockwise 45°.
20	Display the ESI equipment screen: eq esi <group> ↵ <div style="margin-left: 40px;">where</div> <div style="margin-left: 80px;"><group> number of the ESI housed in the ESI carrier: g1 (top card) or g2 (bottom card)</div> <div style="margin-left: 40px;"><i>The ESI equipment screen appears.</i></div>
21	Change the state of the ESI to in service (IS): chgstate is ↵
22	If applicable, repeat step 21 for other ESI.
23	Change the state of the ESI BITSA facility to in-service as follows: <div style="margin-left: 20px;">a. Access the ESI facility screen: <div style="margin-left: 40px;">fa esi <facility>↵ <div style="margin-left: 40px;">where</div> <div style="margin-left: 80px;"><facility> is the BITSA ESI facility: bitsa</div> <div style="margin-left: 40px;"><i>The ESI facility screen appears.</i></div> </div> </div> <div style="margin-left: 20px;">b. Change the state of the ESI facility to in-service: <div style="margin-left: 40px;">chgstate is↵ <div style="margin-left: 40px;"><i>The state of the ESI facility changes to IS.</i></div> </div> </div>
24	Repeat step 23 for the BITSB, G1OUT, and G2OUT facilities if required. Note: When both ESI cards and all facilities are in-service, proceed to step 25.

—continued—

2-110 Replacing modules in a common-equipment shelf

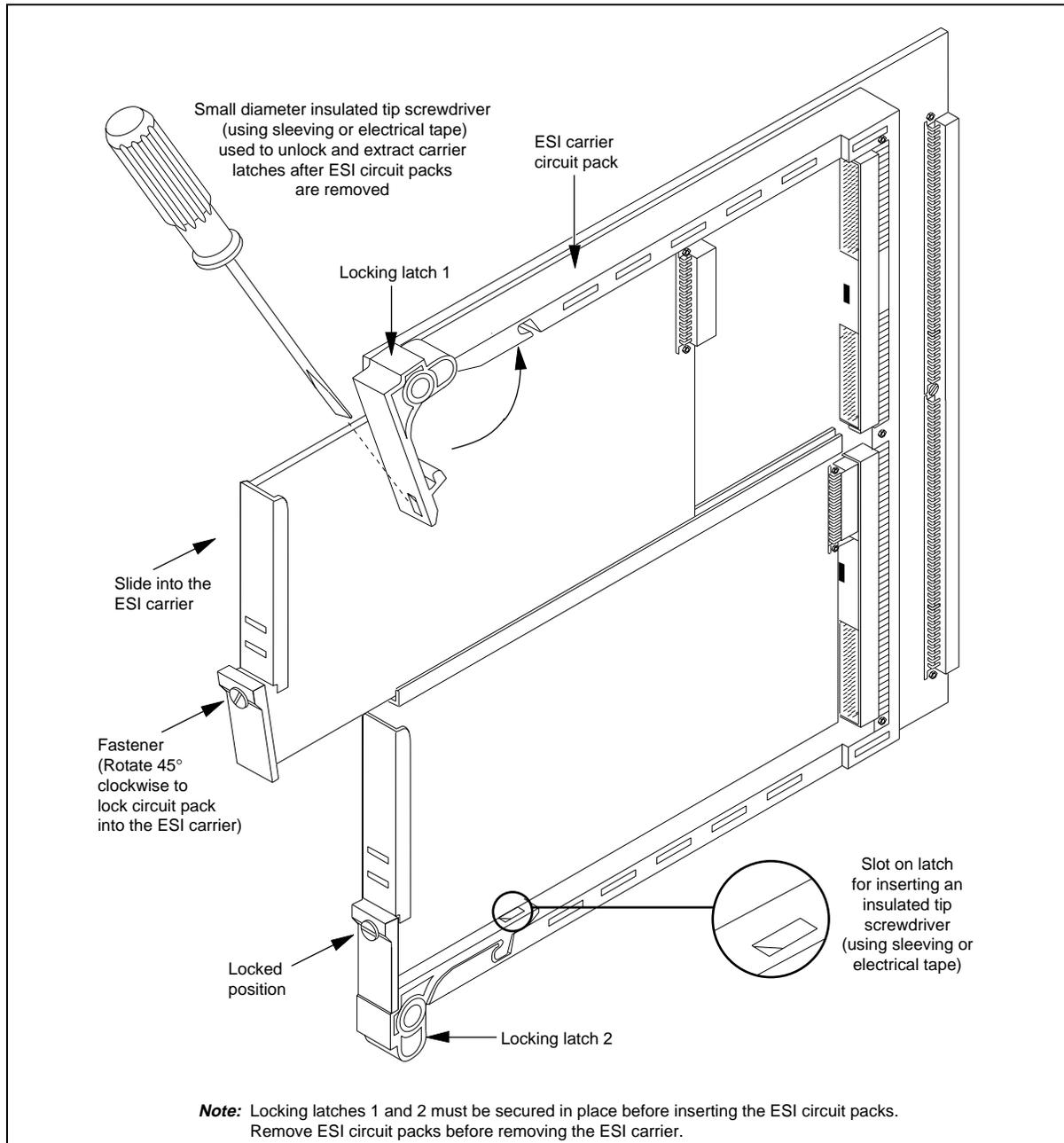
Procedure 2-27 (continued)

NT7E19: External synchronization interface carrier

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

Figure 2-12
ESI cards in an ESI carrier

PC-1972



—continued—

Procedure 2-27 (continued)

NT7E19: External synchronization interface carrier

Step	Action						
25	<p>Was the clock source changed from ESI to Freerun in step 5?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>yes</td> <td>go to step 26</td> </tr> <tr> <td>no</td> <td>go to step 28</td> </tr> </tbody> </table>	If	Then	yes	go to step 26	no	go to step 28
If	Then						
yes	go to step 26						
no	go to step 28						
26	<p>Display the shelf equipment screen: eq sh ↵ <i>The shelf equipment screen appears.</i></p>						
27	<p>Change the setting of the clock source from Freerun to ESI: edit ↵ clocksrc esi ↵ y ↵ <i>The clock source changes from Freerun to ESI (ESI appears in reverse video).</i></p>						
28	<p>Display the alarms screen, and wait until the ESI cards have re-acquired timing. Enter: alarms ↵ <i>The alarms screen appears. As the ESI cards re-acquire timing, you will see an alarm such as, "Entry to Acquire," or "Entry to Freerun." Wait until such alarms clear.</i></p> <p>For a VTM ring network element, go to step 31.</p>						
29	<p>Display the detailed protection screen OC-12 or OC-3 interface circuit packs: pr;dtlprot <optical type> ↵</p> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><optical type> is the type of the interface: oc3 g1 or oc12</p>						
30	<p>Release the lockout that you imposed in step 2: lockout re ↵ y ↵ <i>When a lockout is released, 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></p>						
31	<p>Replace the shelf cover.</p> <p>Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i>, 323-3001-546, in this volume.</p>						

—end—

Procedure 2-28 NT7E27: External synchronization interface

Use this procedure to replace an external synchronization interface (ESI) card in the following:

- an external synchronization carrier in slot 21 of an access bandwidth manager (ABM) shelf
- slot 19 of a transport bandwidth manager (TBM) shelf in an NE that is commissioned as an FCOT_BLSR
- slot 23 of a TBM shelf in an NE that is commissioned as a TN_BLSR

Action

Step	Action								
1	<p>Determine the status of the ESI card you are replacing.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If replacing</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the active ESI</td> <td>go to step 2</td> </tr> <tr> <td>the standby ESI</td> <td>go to step 2</td> </tr> <tr> <td>a failed ESI</td> <td>go to step 4</td> </tr> </tbody> </table>	If replacing	Then	the active ESI	go to step 2	the standby ESI	go to step 2	a failed ESI	go to step 4
If replacing	Then								
the active ESI	go to step 2								
the standby ESI	go to step 2								
a failed ESI	go to step 4								
2	<p>For a VTM ring network element, a lockout is not required; go to step 4.</p> <p>From the Network Element Status screen, display the OC-3/OC-12 detailed protection switching screen:</p> <pre>pr;dtlprot <optical type>↵</pre> <p style="margin-left: 40px;">where</p> <p style="margin-left: 80px;"><optical type> is the type of the interface: oc3_g1 or oc12</p> <p><i>The detailed protection screen appears.</i></p>								
3	<p>Lockout the OC-3 or OC-12:</p> <pre>lockout op.↵</pre> <pre>y.↵</pre> <p><i>When a lockout is operated, the screen displays an asterisk (*) in the Lockout column. The banner line is also updated under the lockout column, and a "Lockout request" alarm is raised. The lockout LED on the maintenance interface circuit pack lights up.</i></p> <p style="text-align: center;">—continued—</p>								

Procedure 2-28 (continued)

NT7E27: External synchronization interface

Step	Action								
4	<p>Display the equipment screen for the ESI equipment to be replaced: eq esi <group> ↵</p> <p>where</p> <p><group> is the number of the ESI being replaced: g1 (top ESI card) or g2 (bottom ESI card)</p> <p><i>The ESI equipment screen appears.</i></p> <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>an active ESI in a duplex configuration</td> <td>go to step 5</td> </tr> <tr> <td>an ESI in a simplex configuration</td> <td>go to step 12</td> </tr> <tr> <td>an inactive ESI in duplex configuration</td> <td>go to step 7</td> </tr> </tbody> </table>	If replacing	Then	an active ESI in a duplex configuration	go to step 5	an ESI in a simplex configuration	go to step 12	an inactive ESI in duplex configuration	go to step 7
If replacing	Then								
an active ESI in a duplex configuration	go to step 5								
an ESI in a simplex configuration	go to step 12								
an inactive ESI in duplex configuration	go to step 7								
5	<p>Go to the ESI detailed protection screen. pr;dtlprot esi ↵</p>								
6	<p>Switch service to the other ESI: forced op <group> ↵</p> <p>where</p> <p><group> is the number of the ESI being replaced: g1 or g2</p> <p><i>When a forced switch is operated, the screen displays an asterisk (*) in the Forced column and a "Forced switch request" alarm is raised.</i></p>								
7	<p>Change the state of the ESI output facility to out of service as follows:</p> <p>a. Access the ESI facility screen: fa esi <facility> ↵</p> <p>where</p> <p><facility> is the ESI output facility: g1out or g2out</p> <p><i>The ESI facility screen appears.</i></p> <p>b. Change the state of the output facility to out of service: chgstate oos ↵ y ↵</p> <p>c. Go to step 13.</p>								

—continued—

Procedure 2-28 (continued)

NT7E27: External synchronization interface

Step	Action
8	Display the facility screen for the BITSA ESI facility: fa esi <facility> ↵ where <facility> is the BITSA ESI input facility: bitsa <i>The BITSA input facility screen appears.</i>
9	Change the state of the BITSA ESI facility to out-of-service as follows: chgstate oos ↵ y ↵ <i>The state of the BITSA ESI facility changes to OOS.</i>
10	Repeat step 8 and 9 for the BITSB ESI, G1OUT, and G2OUT, if required, then proceed to step 12.
11	Display the ESI equipment screen for the standby ESI card. eq esi <group> ↵ where <group> number of the standby ESI. <i>The ESI equipment screen appears.</i>
12	Change the state of the ESI facility to out-of-service as follows: chgstate oos ↵ y ↵ <i>The state of the ESI facility changes to OOS.</i>
13	Repeat step 12 for BITSB, G1OUT, and G2OUT facility, if required, then proceed to step 14.
14	Display the ESI equipment screen for the top ESI card being replaced. eq esi <group > where <group> is the number of the top ESI card being replaced: g1 or g2 <i>The ESI equipment screen appears.</i>

—continued—

 Procedure 2-28 (continued)

NT7E27: External synchronization interface

Step	Action
15	Change the state of the ESI card being replaced, to out-of-service (OOS): chgstate oos. ↵ y. ↵ <i>The state changes to out-of-service</i>
16	If applicable, repeat steps 11 and 12 for the bottom ESI card (g2). Note: When both ESI cards are out of service and all facilities are out of service, proceed to step 17.
17	Remove the shelf cover. Note: For details, see <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.
18	Unlock the ESI locking fastener, and pull the circuit pack ejector latches to remove the ESI circuit pack from the external synchronization carrier. Note: The ESI equipment screen may not show a secondary state of Ueq when the ESI circuit pack is removed from the external synchronization carrier. The secondary ESI state can be updated on the ESI screen, if required, by entering the command: <code>eq esi <group></code> as was done in step 4.
19	Wait at least 10 seconds before installing the replacement card. Insert the replacement ESI circuit pack into the external synchronization carrier and lock the circuit pack into place with the locking fastener.
20	Change the state of the replacement ESI to in-service (IS): chgstate is. ↵ <i>The state changes to IS.</i>
21	Change the state of the ESI BITSA facility to in-service as follows: <ol style="list-style-type: none"> a. Access the ESI facility screen: fa esi <facility>↵ where <facility> is the ESI facility: bitsa <i>The ESI facility screen appears.</i> b. Change the state of the facility to in-service: chgstate is.↵ <i>The state of the ESI facility changes to IS.</i>
22	Repeat step 21 for the BITSB, G1OUT, and G2OUT facilities, if required, then proceed to step 23.

—continued—

Procedure 2-28 (continued)

NT7E27: External synchronization interface

Step	Action						
23	<p>Did you replace a working or a failed ESI card in steps 18 and 19?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If you replaced a</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>working ESI card</td> <td>go to step 24</td> </tr> <tr> <td>failed ESI card</td> <td>go to step 29</td> </tr> </tbody> </table>	If you replaced a	Then	working ESI card	go to step 24	failed ESI card	go to step 29
If you replaced a	Then						
working ESI card	go to step 24						
failed ESI card	go to step 29						
24	<p>Was an ESI protection switch performed (in step 6) before replacing the ESI card?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>yes</td> <td>go to step 25</td> </tr> <tr> <td>no</td> <td>go to step 27</td> </tr> </tbody> </table> <p>For a VTBM ring go to step 28.</p>	If	Then	yes	go to step 25	no	go to step 27
If	Then						
yes	go to step 25						
no	go to step 27						
25	<p>Go to the ESI detailed protection screen.</p> <p>pr;dtlprot esi↵</p>						
26	<p>Release the ESI protection switch performed in step 6:</p> <p>forced re <group>↵</p> <p>y↵</p> <p style="margin-left: 40px;">where</p> <p style="margin-left: 80px;"><group> is the ESI group from which service was switched: g1 (top ESI card) or g2 (bottom ESI card)</p> <p style="margin-left: 40px;"><i>When a forced switch is released, the screen displays a period (.) in the Forced column. The banner line is updated under the ActProt column, and the "Forced switch request" alarm is cleared.</i></p> <p>For a VTM ring network element, go to step 28.</p>						
27	<p>Display the detailed protection switching screen for the OC-12 or OC-3 interface circuit packs:</p> <p>pr;dtlprot <optical type>↵</p> <p style="margin-left: 40px;">where</p> <p style="margin-left: 80px;"><optical type> is the type of the interface: oc3_g1 or oc12</p>						

—continued—

Procedure 2-28 (continued)

NT7E27: External synchronization interface

Step	Action
28	Release the lockout you imposed in step 3: lockout re ↵ y ↵ <i>When a lockout is released, the screen displays a period (.) in the <i>Lockout</i> column. The banner line is also updated under the lockout column, and the "Lockout request" alarm is cleared.</i>
29	Replace the shelf cover. Note: For details, see the procedure for replacing the common-equipment shelf cover in <i>Routine Maintenance Procedures</i> , 323-3001-546, in this volume.

—end—

Replacing modules in a copper-distribution shelf

This chapter has procedures for replacing circuit packs, cards, and modules in an AccessNode copper-distribution shelf (CDS). Observe and follow all safety precautions listed in Chapter 1 of this document when handling circuit packs.

Chapter contents

In the following table look up the circuit pack, card, or module to be replaced, and proceed to the specified page. The following table lists items alphanumerically, by product engineering code (PEC).

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

PEC	Module description	See
NT4K62AA	Copper-distribution shelf power	page 3-2
NT4K65AB	Epsilon 2-wire station line card	page 3-4
NT4K67AB	Omega 2-wire station line card	page 3-4
NT4K68AA	Omega 2-wire office line card	page 3-4
NT4K69AA	Omega 4-wire line card	page 3-4
NT4K70AA	Narrowband line interface card	page 3-10
NT4K73AA or NT4K73CA	Metallic test access card	page 3-13
NT4K77AA	Omega 6/8-wire line card	page 3-4
NT4K78AA	Manual ringdown line card	page 3-4
NT4K79AA	Universal voice grade line card	page 3-4

Procedure 3-1

NT4K62AA: Copper-distribution shelf power

Use this procedure to replace the copper-distribution shelf power (CDSP) card, also known as the power converter.

Action

Step	Action
1	<p>From the network element status screen, display the CDSP screen for the CDSP being replaced:</p> <pre>eq cdsp;dtlcdsp <CDS#> <group>.</pre> <p>where</p> <p><CDS#> number of the copper-distribution shelf: 1 to 7</p> <p><group> the group number of the CDSP being replaced: a or b</p> <p><i>The CDSP equipment screen appears.</i></p>
2	<p>Change the state of the CDSP to out-of-service (OOS):</p> <pre>chgstate oos.</pre> <p><i>The system prompts for confirmation of the state change.</i></p>
3	<p>Confirm the state change:</p> <pre>y.</pre> <p><i>The state changes to OOS.</i></p>
4	<p>Remove the CDSP by pulling the ejector latch as shown in Figure 3-1.</p>
5	<p>Wait at least 50 seconds before installing the replacement card. Insert a replacement CDSP in the shelf. Gently push the replacement circuit pack in until the ejector latch comes in contact with the shelf. Then push the latch in to engage the circuit pack with the midplane connector.</p>
6	<p>Change the state of the CDSP to in-service (IS):</p> <pre>chgstate is.</pre> <p><i>The state changes to IS.</i></p> <p>Note: If the automatic-in-service feature is set to on, the state changes to IS automatically.</p>

—continued—

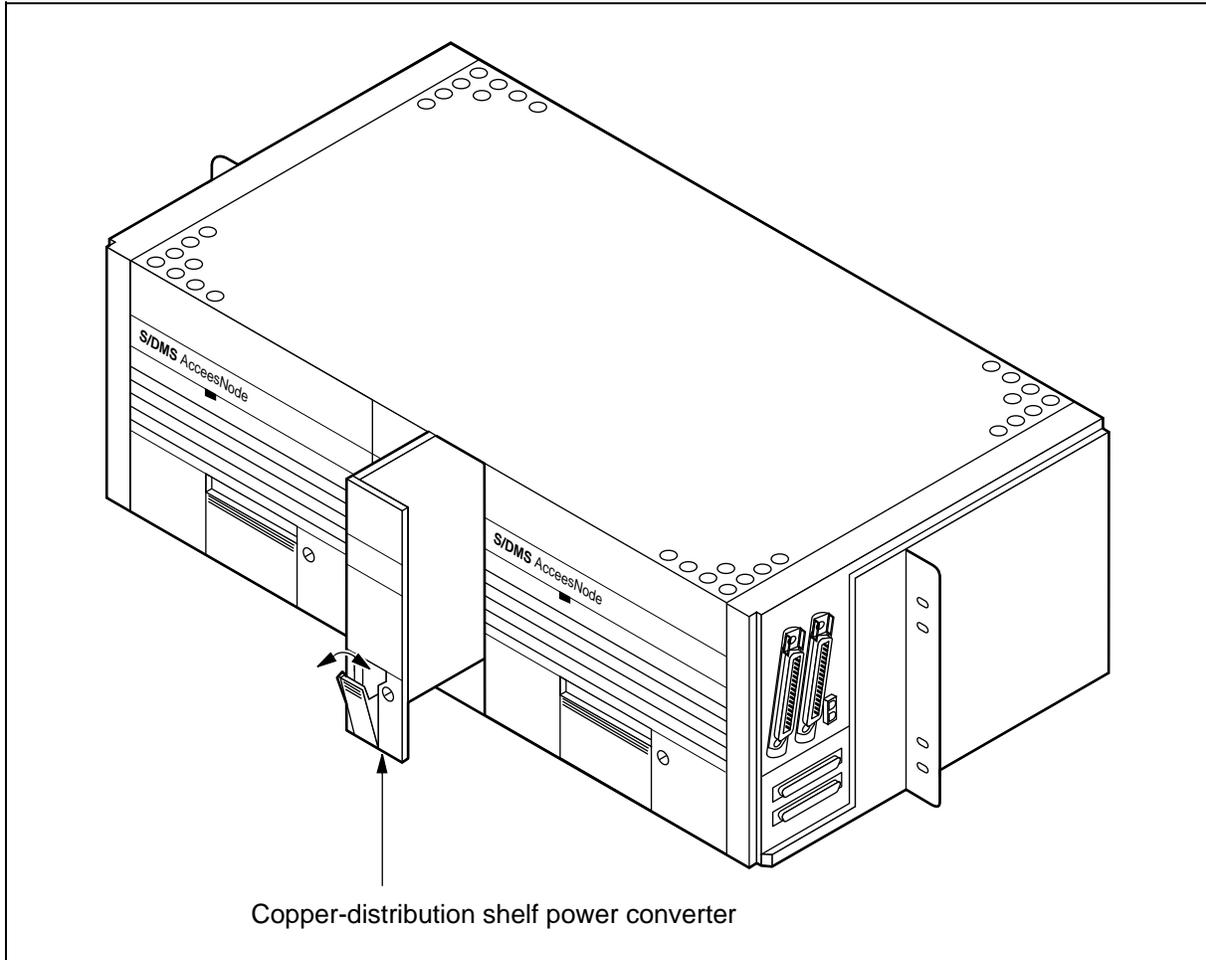
Procedure 3-1 (continued)

NT4K62AA: Copper-distribution shelf power

Step Action

Figure 3-1
Removing a CDSP

PC-10716



—end—

Procedure 3-2

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

Use this procedure to replace the following line cards in a copper-distribution shelf line drawer:

- NT4K65AA: Epsilon 2-wire station line card (E2WS)
- NT4K67AB: Omega 2-wire station line card (O2WS)
- NT4K68AA: Omega 2-wire office line card (O2WO)
- NT4K69AA: Omega 4-wire line card (O4W)
- NT4K77AA: Omega 6/8-wire line card (O68W)
- NT4K78AA: Manual ringdown line card (MRD)

Note: Release 20 of the MRD line card requires AN16 to perform line card diagnostics. Contact your next level of support for further assistance.

- NT4K79AA: Universal voice grade line card (UVG)

Action

Step	Action				
1	<p>From the network element status screen, display the line card equipment screen for the line card being replaced:</p> <pre>eq lc <CDS#> <LC#>.␣</pre> <p>where</p> <table><tr><td><CDS#></td><td>number of the copper-distribution shelf: 1 to 7</td></tr><tr><td><LC#></td><td>line card number: 1 to 96</td></tr></table> <p><i>Note:</i> For Omega 4-wire and Omega 6/8-wire line cards, use the lowest even slot number occupied by the card.</p> <p><i>The line card equipment screen appears.</i></p>	<CDS#>	number of the copper-distribution shelf: 1 to 7	<LC#>	line card number: 1 to 96
<CDS#>	number of the copper-distribution shelf: 1 to 7				
<LC#>	line card number: 1 to 96				
2	<p>At the host switch, busy the line that is associated with the line card you are replacing.</p>				
3	<p>From the network element equipment screen, change the state of the line card to out-of-service (OOS):</p> <pre>chgstate oos.␣</pre> <pre>y.␣</pre> <p><i>The state changes to OOS.</i></p>				

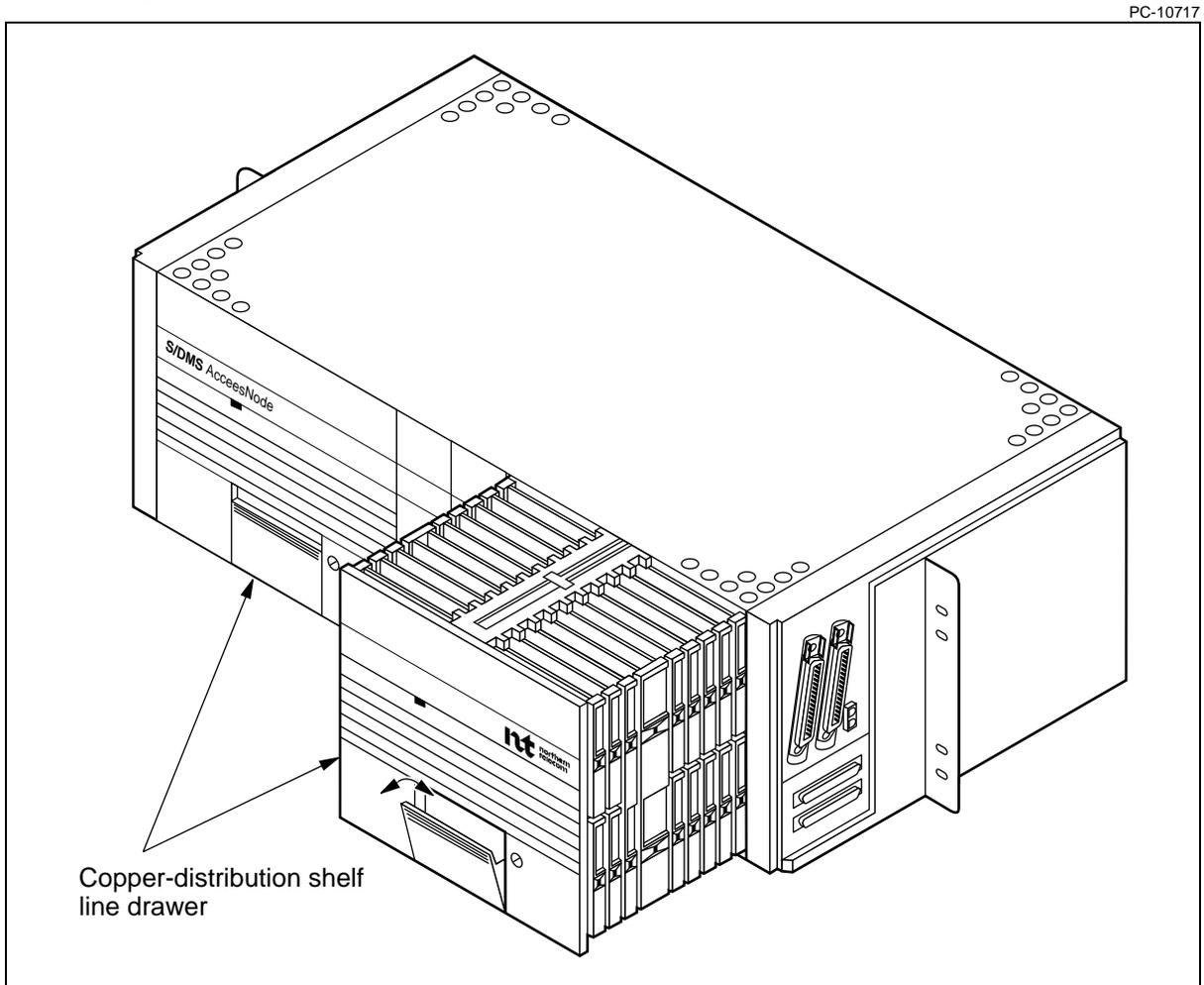
—continued—

Procedure 3-2 (continued)

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

Step	Action
4	Turn the left and right locking screws so the dots are no longer aligned, then withdraw the line drawer from the copper-distribution shelf by pulling the drawer handle as shown in Figure 3-2.
5	Remove the line card from its slot by grasping the tab on the line card faceplate with your thumb and forefinger, and pulling outward. Figure 3-3 on page 3-6 shows a 2-wire Omega or Epsilon line card. Figure 3-4 on page 3-7 shows an Omega 4-wire line card. Figure 3-5 on page 3-8 shows an Omega 6/8-wire line card.

Figure 3-2
Withdrawing a line drawer



—continued—

3-6 Replacing modules in a copper-distribution shelf

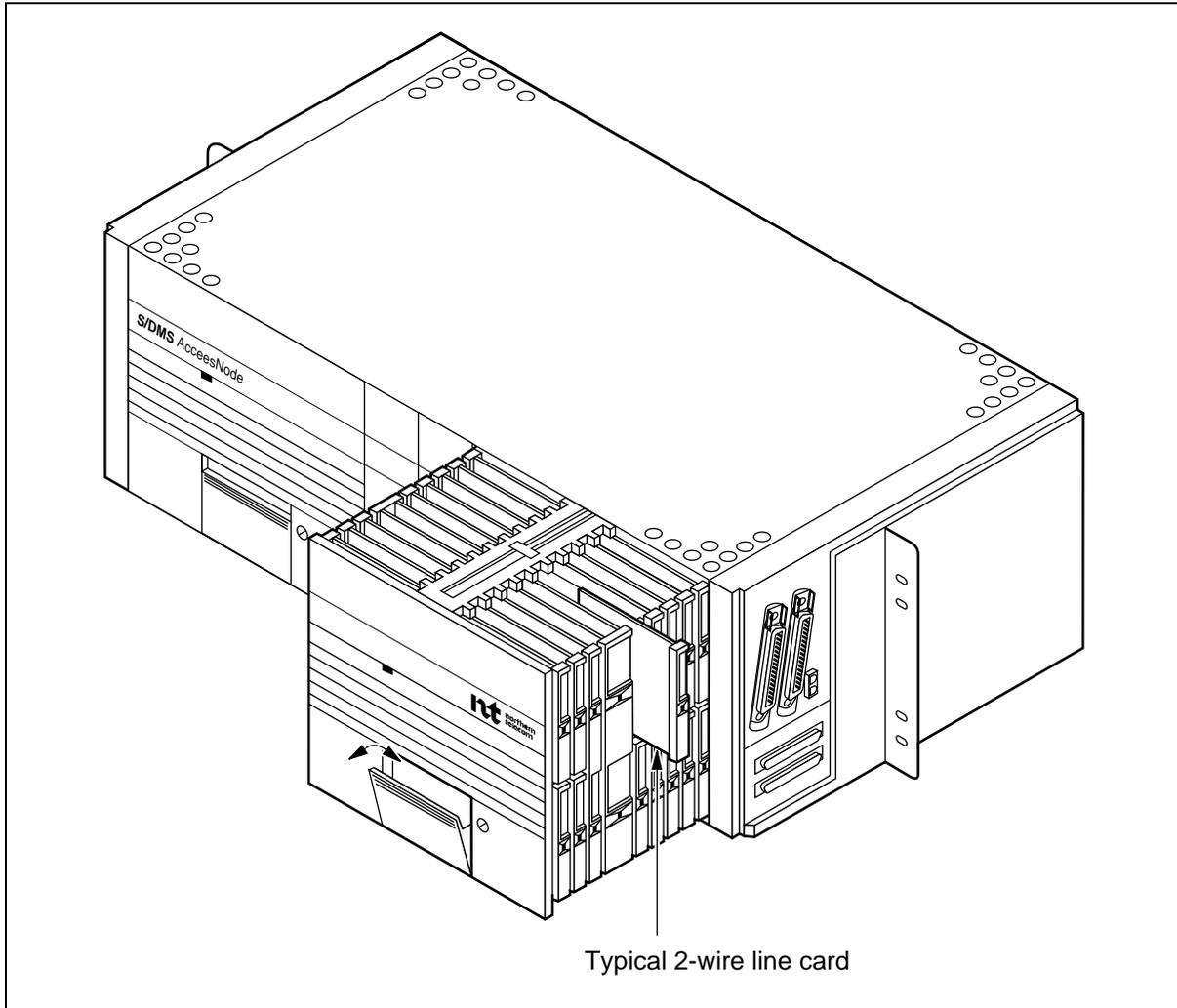
Procedure 3-2 (continued)

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

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

Figure 3-3
Removing a Omega 2-wire or Epsilon line card

PC-10771



—continued—

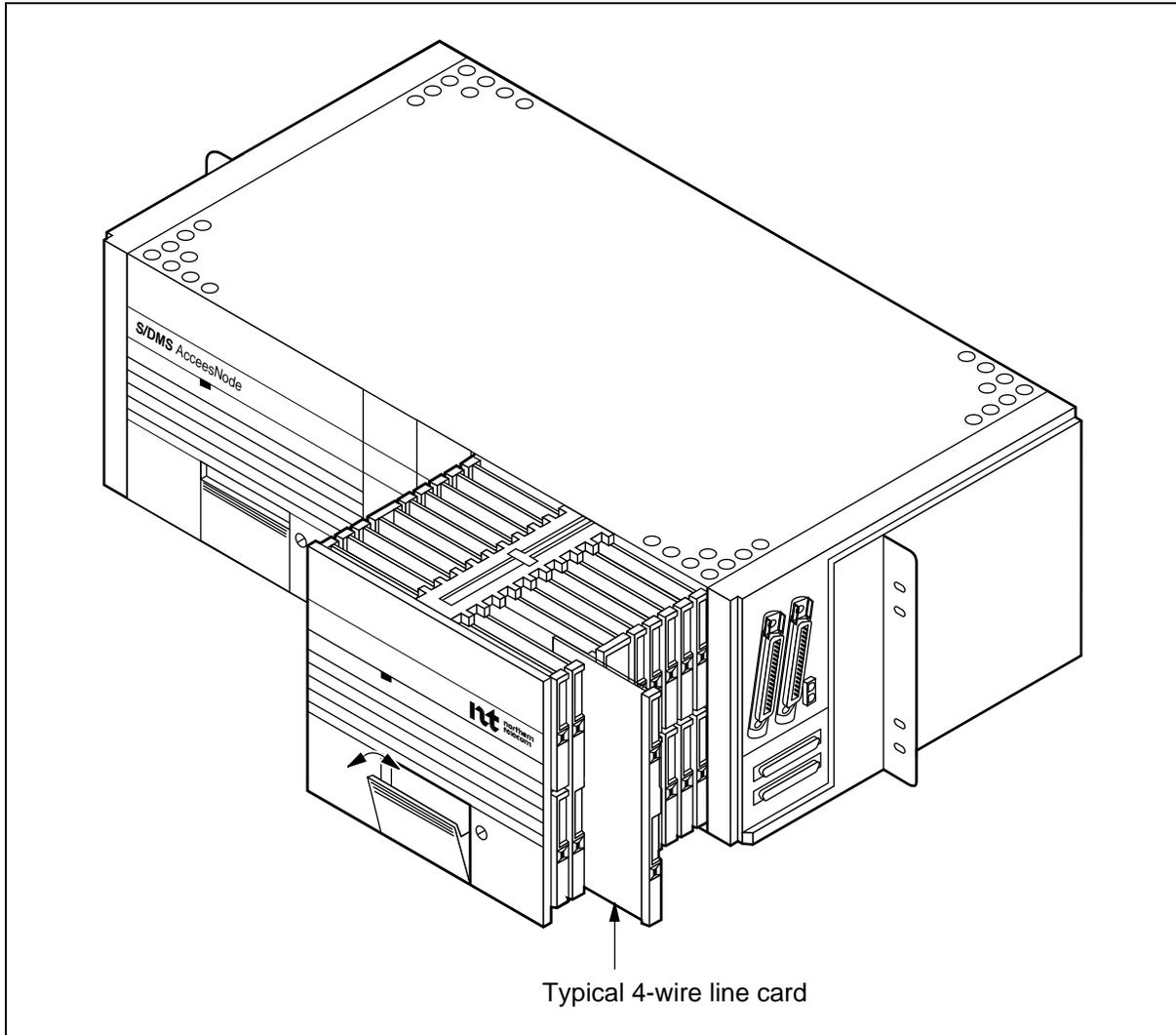
Procedure 3-2 (continued)

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

Step Action

Figure 3-4
Removing an Omega 4-wire line card

PC-10719



—continued—

3-8 Replacing modules in a copper-distribution shelf

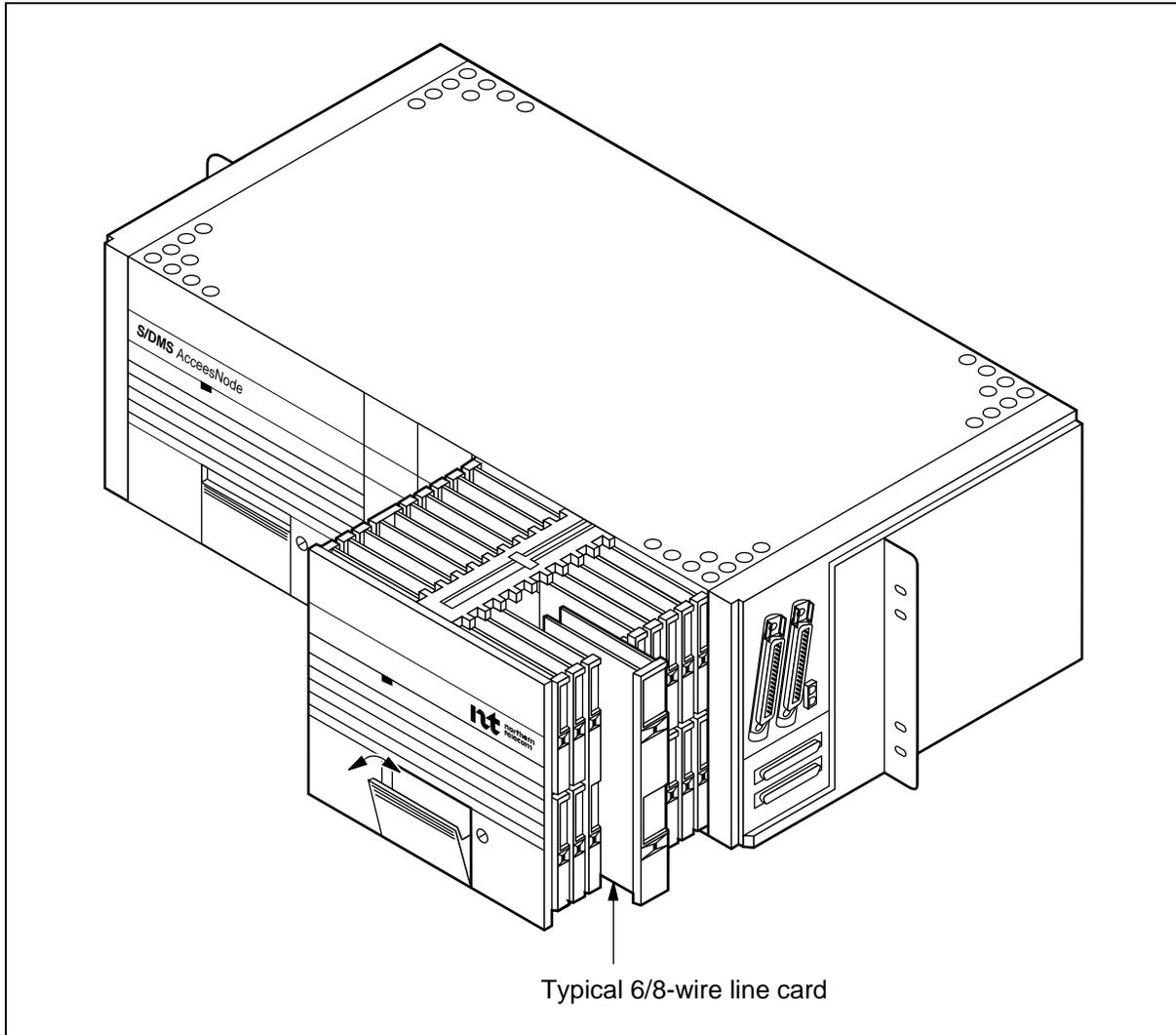
Procedure 3-2 (continued)

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

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

Figure 3-5
Removing an Omega 6/8-wire line card

PC-10772



—continued—

Procedure 3-2 (continued)

NT4K65AA, 67AB, 68AA, 69AA, 77AA, 78AA, 79AA line cards

Step	Action
6	Wait at least 12 seconds before installing the replacement card. Insert a replacement line card into the slot in the line drawer.
7	From the network element equipment screen, change the state of the line card to in-service (IS): chgstate is ↵ y ↵ <i>The state changes to IS.</i>
8	Push the line drawer back into the shelf, and secure it by lining up the dots on the left and right locking screws.
9	At the host switch, return the line to service that is associated with the line card you have replaced.

—end—

Procedure 3-3 NT4K70AA: Narrowband line interface

Use this procedure to replace the narrowband line interface (NLIC) card in the copper-distribution shelf line drawer.

Action

Step	Action								
	<table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>a primary in-service LIC</td> <td>go to step 1</td> </tr> <tr> <td>a secondary in-service LIC</td> <td>go to step 3</td> </tr> <tr> <td>a failed or out-of-service LIC</td> <td>go to step 5</td> </tr> </tbody> </table>	If replacing	Then	a primary in-service LIC	go to step 1	a secondary in-service LIC	go to step 3	a failed or out-of-service LIC	go to step 5
If replacing	Then								
a primary in-service LIC	go to step 1								
a secondary in-service LIC	go to step 3								
a failed or out-of-service LIC	go to step 5								
1	<p>From the network element status screen, display the screen for the LIC being replaced:</p> <p>eq lic;dtllc <CDS#> <group>.</p> <p>where</p> <p><CDS#> number of the copper-distribution shelf: 1 to 7</p> <p><group> the group number of the LIC being replaced: a b, c, or d</p> <p><i>The LIC equipment screen appears.</i></p> <table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>a primary in-service LIC</td> <td>go to step 2</td> </tr> <tr> <td>a secondary in-service LIC</td> <td>go to step 3</td> </tr> </tbody> </table>	If replacing	Then	a primary in-service LIC	go to step 2	a secondary in-service LIC	go to step 3		
If replacing	Then								
a primary in-service LIC	go to step 2								
a secondary in-service LIC	go to step 3								
2	<p>Switch from the primary to the secondary LIC:</p> <p>switch.</p> <p>y.</p>								
3	<p>Change the state of the LIC to out-of-service (OOS):</p> <p>chgstate oos.</p> <p><i>The system prompts for confirmation of the state change.</i></p>								
4	<p>Confirm the state change:</p> <p>y.</p> <p><i>The state changes to OOS.</i></p> <p style="text-align: center;">—continued—</p>								

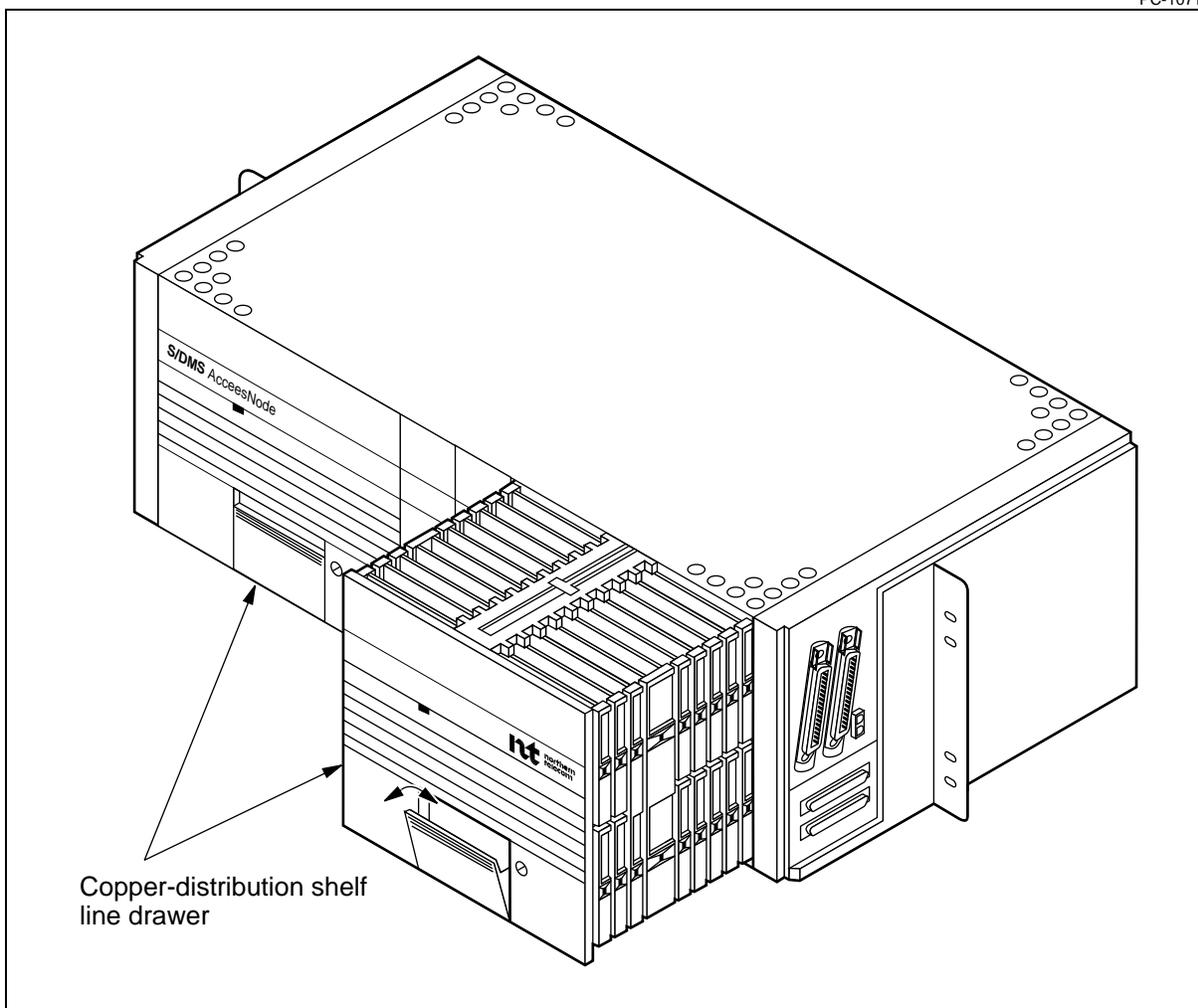
Procedure 3-3 (continued)

NT4K70AA: Narrowband line interface

Step	Action
5	Turn the left and right locking screws so the dots are no longer aligned, then withdraw the line drawer from the copper-distribution shelf by pulling the drawer handle as shown in Figure 3-6.

Figure 3-6
Withdrawing a line drawer

PC-10717



- 6 Remove the LIC by pulling the ejector latches as shown in Figure 3-7 on page 3-12.
- 7 Wait at least 20 seconds before installing the replacement card. Insert a replacement LIC in the drawer. Gently push the replacement circuit pack in until the ejector latches comes in contact with the drawer. Then push the latches in to engage the circuit pack with the midplane connector.

—continued—

3-12 Replacing modules in a copper-distribution shelf

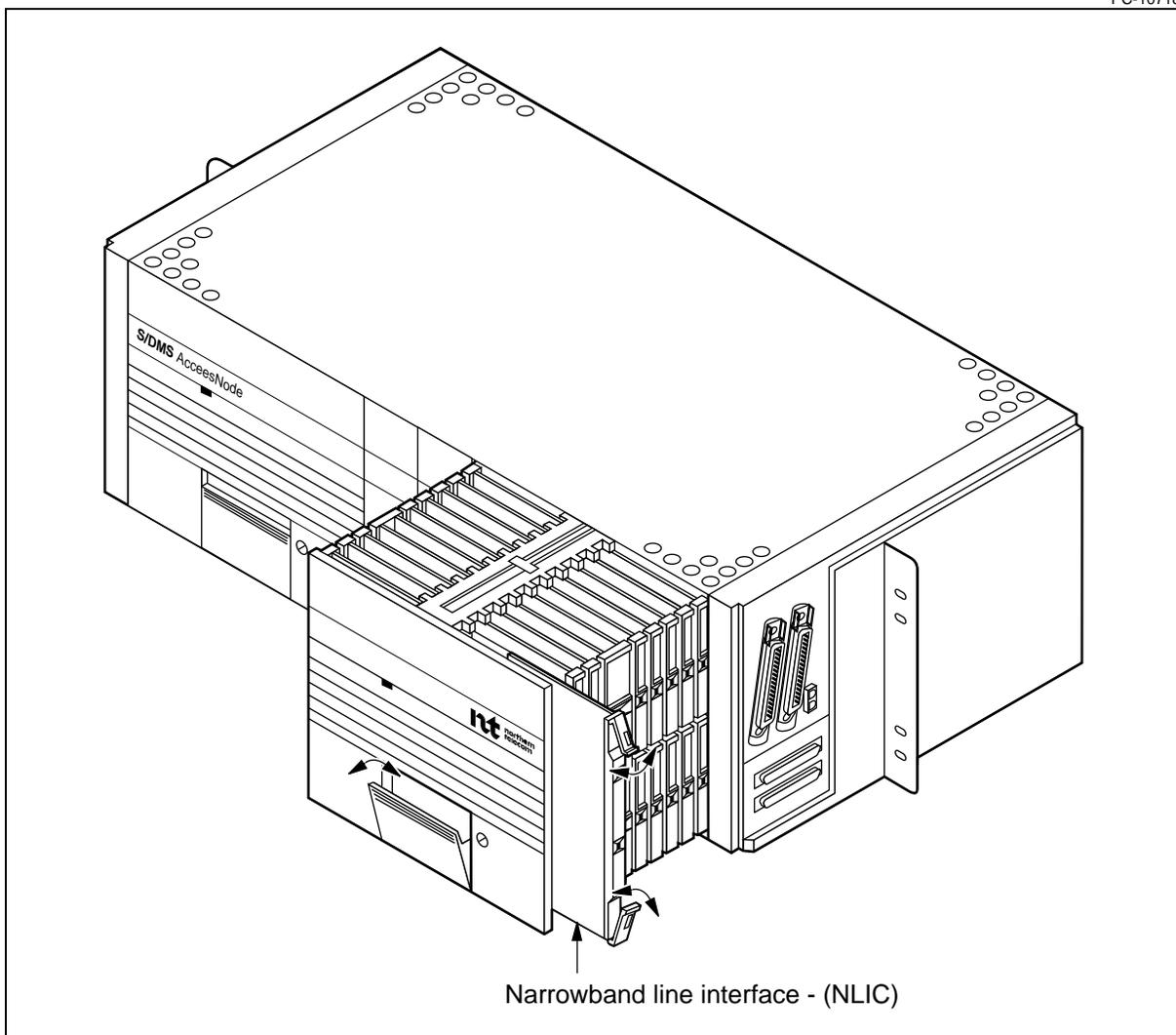
Procedure 3-3 (continued)

NT4K70AA: Narrowband line interface

Step	Action
8	Change the state of the LIC to in-service (IS): chgstate is ␣ <i>The state changes to IS.</i> Note: If the automatic-in-service feature is set to on, the state changes to IS automatically.

Figure 3-7
Withdrawing a LIC

PC-10718



—end—

Procedure 3-4

NT4K73AA or NT4K73CA: Metallic test access card

Use this procedure to replace the metallic test access card (MTAC) in the copper-distribution shelf line drawer.

Action

Step	Action						
	<table border="1"> <thead> <tr> <th>If replacing</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>an in-service MTAC</td> <td>go to step 1</td> </tr> <tr> <td>a failed or out-of-service MTAC</td> <td>go to step 4</td> </tr> </tbody> </table>	If replacing	Then	an in-service MTAC	go to step 1	a failed or out-of-service MTAC	go to step 4
If replacing	Then						
an in-service MTAC	go to step 1						
a failed or out-of-service MTAC	go to step 4						
1	<p>From the network element status screen, display the screen for the MTAC being replaced:</p> <pre>eq mtac;dtlmtac <CDS#> <group> ↵</pre> <p>where</p> <p><CDS#> number of the copper-distribution shelf: 1 to 7</p> <p><group> the group number of the MTAC being replaced: a or b</p> <p><i>The MTAC equipment screen appears.</i></p>						
2	<p>Change the state of the MTAC to out-of-service (OOS):</p> <pre>chgstate oos ↵</pre> <pre>y ↵</pre> <p><i>The state changes to OOS.</i></p>						
3	<p>Turn the left and right locking screws so the dots are no longer aligned, then withdraw the line drawer from the copper-distribution shelf by pulling the drawer handle as shown in Figure 3-8 on page 3-14.</p>						
4	<p>Remove the MTAC by pulling the ejector latches as shown in Figure 3-9 on page 3-15.</p> <p>Note: Before proceeding to step 5, wait at least 20 seconds for the system to detect removal of the MTAC. This can be verified by checking for an unequipped slot, which appears as "Slot: Ueq" in reverse video on the MTAC equipment screen.</p>						
5	<p>Insert a replacement MTAC in the drawer. Gently push the replacement circuit pack in until the ejector latches comes in contact with the drawer. Then push the latches in to engage the circuit pack with the midplane connector.</p>						

—continued—

3-14 Replacing modules in a copper-distribution shelf

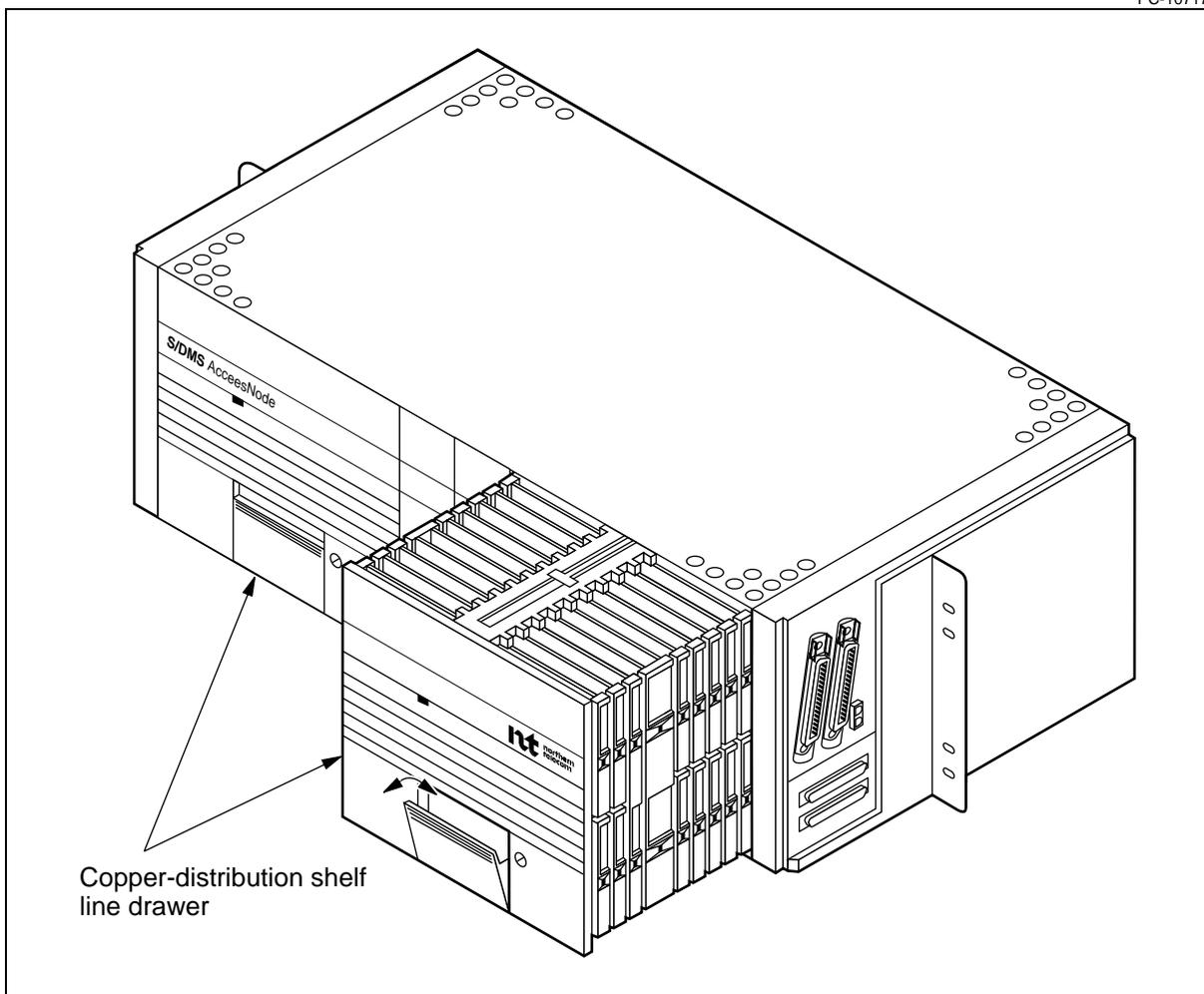
Procedure 3-4 (continued)

NT4K73AA or NT4K73CA: Metallic test access card

Step	Action
6	Change the state of the MTAC to in-service (IS): chgstate is ␣ <i>The state changes to IS.</i> Note: If the automatic-in-service feature is set to on, the state changes to IS automatically.

Figure 3-8
Withdrawing a line drawer

PC-10717



—continued—

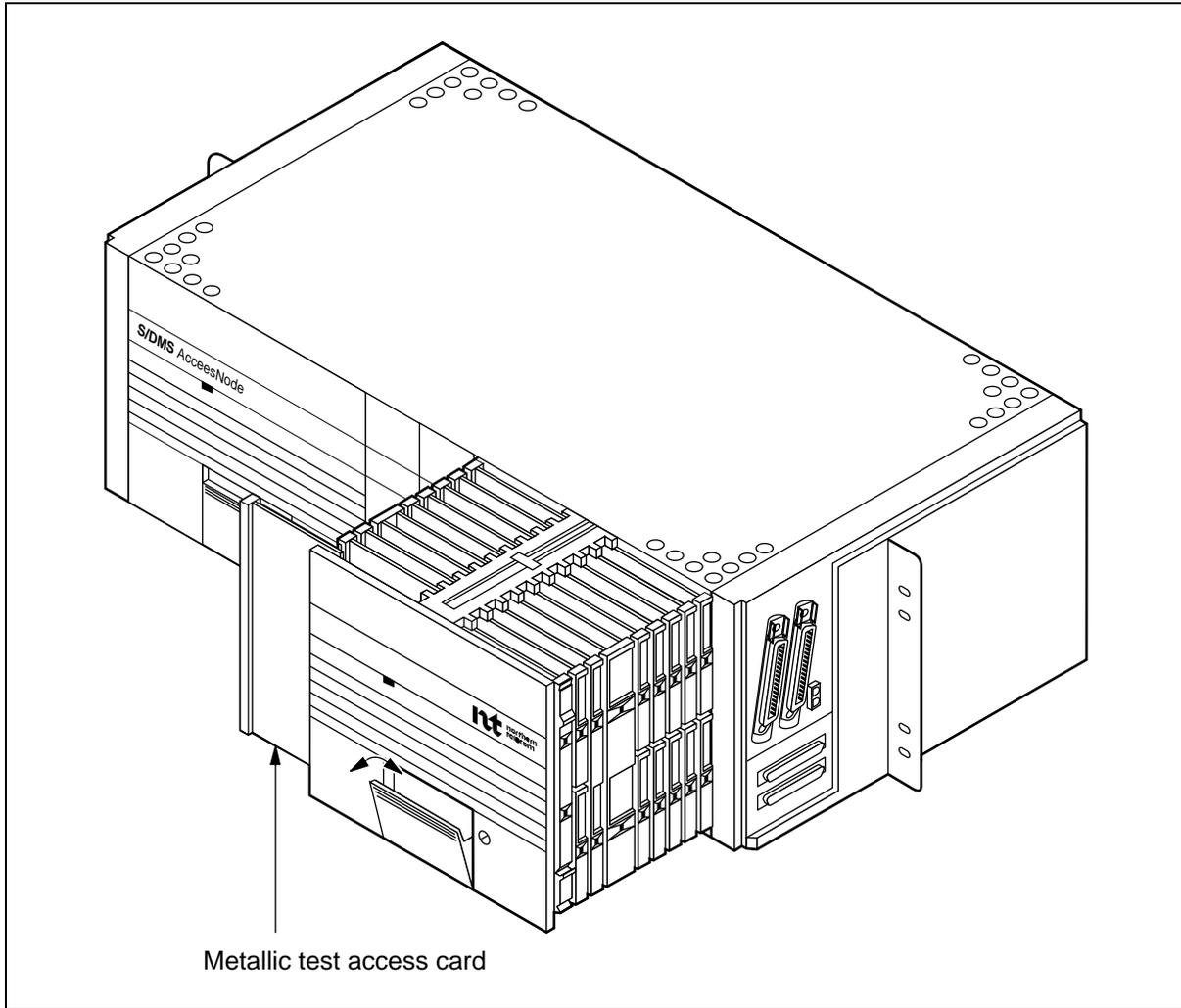
Procedure 3-4 (continued)

NT4K73AA or NT4K73CA: Metallic test access card

Step Action

Figure 3-9
Withdrawing an MTAC

PC-10720



—end—

Replacing a copper-distribution shelf

This chapter explains how to replace a copper-distribution shelf (CDS) in an AccessNode.

Chapter contents

This chapter includes the following topic.

Topic	See
Before you begin	page 4-2

This chapter includes the following task.

Procedure	Task	See
4-1	NT4K12: Copper-distribution shelf	page 4-3

This chapter includes the following worksheets. These worksheets are used with the procedure.

Worksheet	See
Copper-distribution shelf line card state worksheet	page 4-20
Copper-distribution shelf voice frequency cable position worksheet	page 4-22

Before you begin

This section outlines what is required to begin this procedure.

Requirements

Replacing one CDS in an AccessNode requires at least two people and will take approximately one hour to complete.

CDS replacement process

Table 4-1 lists the process you must follow to replace a CDS.

Perform all actions in Table 4-1 in order. Do not skip any steps, unless you are offered this option by the procedure.

Table 4-1
CDS replacement

Action	Steps
1 Backup the network element database	1 to 2
2 Identify faulty line cards in the CDS	3 to 4
3 Determine the CDS type	5 to 9
4 Remove the CDS	10 to 22
5 Transfer circuit packs and line cards to the new CDS	23 to 24
6 Install the new CDS	25 to 35
7 Troubleshoot the new CDS	36 to 37

Procedure 4-1

NT4K12: Copper-distribution shelf

Use this procedure to replace an NT4K12 copper-distribution shelf (CDS) in an AccessNode.

This procedure assumes that all cards in the faulty CDS will be transferred to the new CDS.

Observe and follow all safety precautions listed in “Overview of module replacement procedures” on page 1-1 of this document when handling circuit packs.

Action

Step	Action
	<div> </div> <div> <p>CAUTION</p> </div> <div> <p>Extended service interruption</p> </div> <div> <p>This procedure removes all functionality from a CDS for approximately one hour. Contact your Nortel Networks technical support representative before attempting this procedure.</p> </div>
	<div> </div> <div> <p>CAUTION</p> </div> <div> <p>Loss of service</p> </div> <div> <p>This procedure causes a loss of service to all line cards in a CDS. Follow standard office procedures for notifying customers of a disruption of service. Perform this procedure during a low traffic period.</p> </div>
	<div> </div> <div> <p>CAUTION</p> </div> <div> <p>Equipment damage</p> </div> <div> <p>Nortel Networks recommends that CDSs be powered up when voice frequency (VF) cables are connected to the subscriber loops. Nortel Networks also recommends that you disconnect the VF cables from unpowered CDSs.</p> </div>
	<p>Backup the network element database</p> <p>1 Back up the network element (NE) database to the primary operations controller (OPC). For details, see <i>Data Administration Procedures</i>, 323-3001-304, in the <i>Operations, Administration, and Provisioning</i>, Volume 4A.</p>



CAUTION

Extended service interruption

This procedure removes all functionality from a CDS for approximately one hour. Contact your Nortel Networks technical support representative before attempting this procedure.



CAUTION

Loss of service

This procedure causes a loss of service to all line cards in a CDS. Follow standard office procedures for notifying customers of a disruption of service. Perform this procedure during a low traffic period.



CAUTION

Equipment damage

Nortel Networks recommends that CDSs be powered up when voice frequency (VF) cables are connected to the subscriber loops. Nortel Networks also recommends that you disconnect the VF cables from unpowered CDSs.

Backup the network element database

- 1 Back up the network element (NE) database to the primary operations controller (OPC). For details, see *Data Administration Procedures*, 323-3001-304, in the *Operations, Administration, and Provisioning*, Volume 4A.

—continued—

4-4 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

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

2 Save the primary OPC data to tape.

Note: For details, see the procedure for saving OPC data to tape in *Data Administration Procedures*, 323-3001-304, in *Operations, Administration, and Provisioning*, Volume 4A.

Identify faulty line cards in the CDS

3 From the Network Element Status screen, determine if there are any faulty or mismatched cards on the CDS you are replacing by entering:

```
eq sh;inventory cds <CDS#>↵
```

where

<CDS#> the number of the CDS: 1 to 7

The Shelf Inventory screen appears.

4 On the Shelf Inventory screen, the circuit pack states of a CDS appear under the CpkState heading. The CpkState values give the physical state of the line cards. Table 4-2 lists the CpkState values.

Table 4-2
CDS circuit pack states on an inventory screen

CpkState value	Line card state
blank	ok
Trbl	trouble condition
Ueq	A provisioned line card has been removed.
Mism	A line card is installed that does not support the service provisioned for the slot.

If there are

Then

faulty or mismatched cards Record this information in Table 4-6 on page 4-21, then go to step 5.

no faulty or mismatched cards Go to step 5.

—continued—

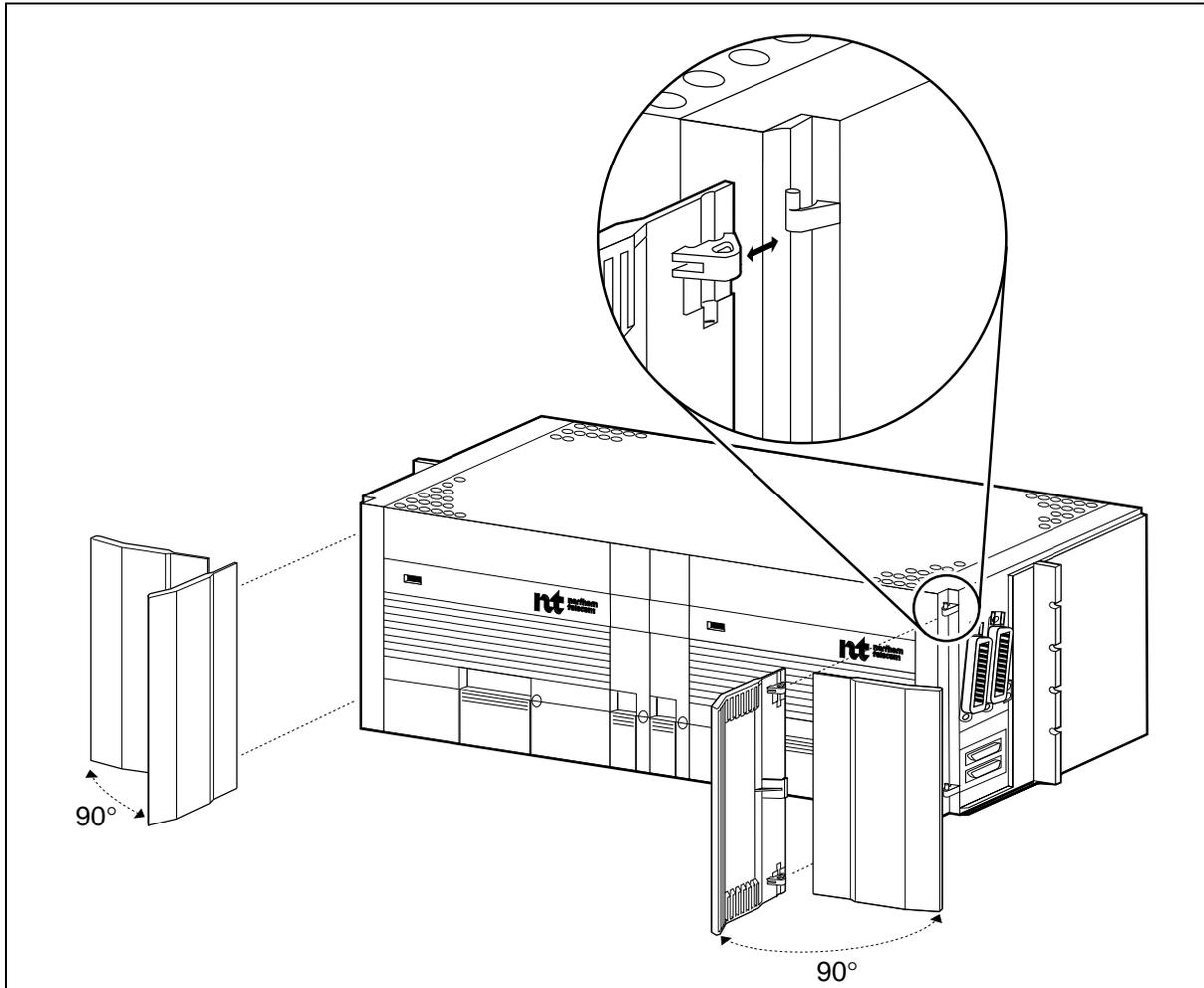
Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf**Step Action****Determine the CDS type**

- 5 If the CDS is in an MBP cabinet or an outside-plant cabinet, remove the cabinet covers or open the doors, as appropriate.
- 6 Remove the left and right side cable covers from the CDS as follows:
 - a. Grasp the cover at the top and pull out while rotating the cover 90 degrees to disengage the cover from the latched position, as shown in Figure 4-1.
 - b. Pull the cover straight out from the shelf to disengage the cover from the hinge pins on the CDS.

Figure 4-1
Removing cable covers from a copper-distribution shelf

PC-10042



—continued—

4-6 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

Step Action



CAUTION

Risk of service interruption

The NT4K12AA and NT4K12AB versions of the CDS are not interchangeable. Interchanging CDS versions will extend the service interruption for this procedure.

- 7 Determine the shelf type by inspecting the VF connectors on the ends of the shelf. If the connectors are vertical, then the shelf is an NT4K12AA. If the connectors are slanted, with the tops of the connectors closer to the rear of the shelf, then the shelf is an NT4K12AB.

Important

The NT4K12AA is no longer available and must be replaced with the later version NT4K12AB. If you are replacing the NT4K12AA shelf, then you also must replace the VF cables to the shelf.

The shelf shown in Figure 4-1 on page 4-5 is an NT4K12AB. In that figure the slanted VF connectors are visible on the right end of the shelf.

- 8 What version of the CDS are you replacing?

If you are replacing version

Then

NT4K12AA

VF cable changes are required. Go to step 9.

NT4K12AB

No cable changes are required. Go to step 10.

- 9 What is the AccessNode housed in?

If the AccessNode is housed in

Then use

an AccessNode bay frame

Table 4-3 to replace the VF cabling

a Modular business package cabinet

Table 4-4 to replace the VF cabling

a Series 800A outside-plant cabinet

Table 4-5 to replace the VF cabling

—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

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

Use Table 4-3 to replace the VF cabling associated with an NT4K12AA CDS, which is also being replaced, in an AccessNode housed in a bay frame.

Table 4-3
Bay frame VF cable replacement

Length requirement (in feet)	VF cable type
50'	NT4K85PA
100'	NT4K85PB
150'	NT4K85PC
200'	NT4K85PD
250'	NT4K85PE
300'	NT4K85PF
Note: Provide each system with two VF cables for each replacement CDS.	

Use Table 4-4 to replace the VF cabling associated with an NT4K12AA CDS, which is also being replaced, in an AccessNode housed in a Modular business package (MBP) cabinet.

Table 4-4
Modular business package cabinet VF cable replacement

Length requirement (in feet)	VF cable type
50'	NT4K85FL
100'	NT4K85FH
150'	NT4K85FM
200'	NT4K85FJ
250'	NT4K85FN
300'	NT4K85FK
Note: Provide each system with two VF cables per replacement CDS.	

—continued—

4-8 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

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

Use Table 4-5 to replace the VF cabling associated with an NT4K12AA CDS, which is also being replaced in an AccessNode housed in a Series 800A outside-plant cabinet.

Table 4-5
Series 800A outside-plant cabinet VF cable replacement

CDS shelf	VF cable type
CDS 1 to 5	NT1W87BG
CDS 6	NT1W87BH
CDS 7	NT1W87BJ

Note: Provide one NT1W87BG cable for each CDS up to CDS 5. For example, if you have two CDSs, you will need two NT1W87BG cables.

Remove the CDS



DANGER

Risk of injury or equipment damage

Hazardous voltages may exist on the VF cables and connectors. Handle this equipment with care.

- 10 Identify the VF cables using their labels and record this information with the cable positions in Table 4-7 on page 4-23.
- 11 Disconnect the two VF cables from the CDS as follows:
 - a. Press and unlatch the spring clip around the cable entry end of each connector.
 - b. Disconnect the VF cables from the CDS.

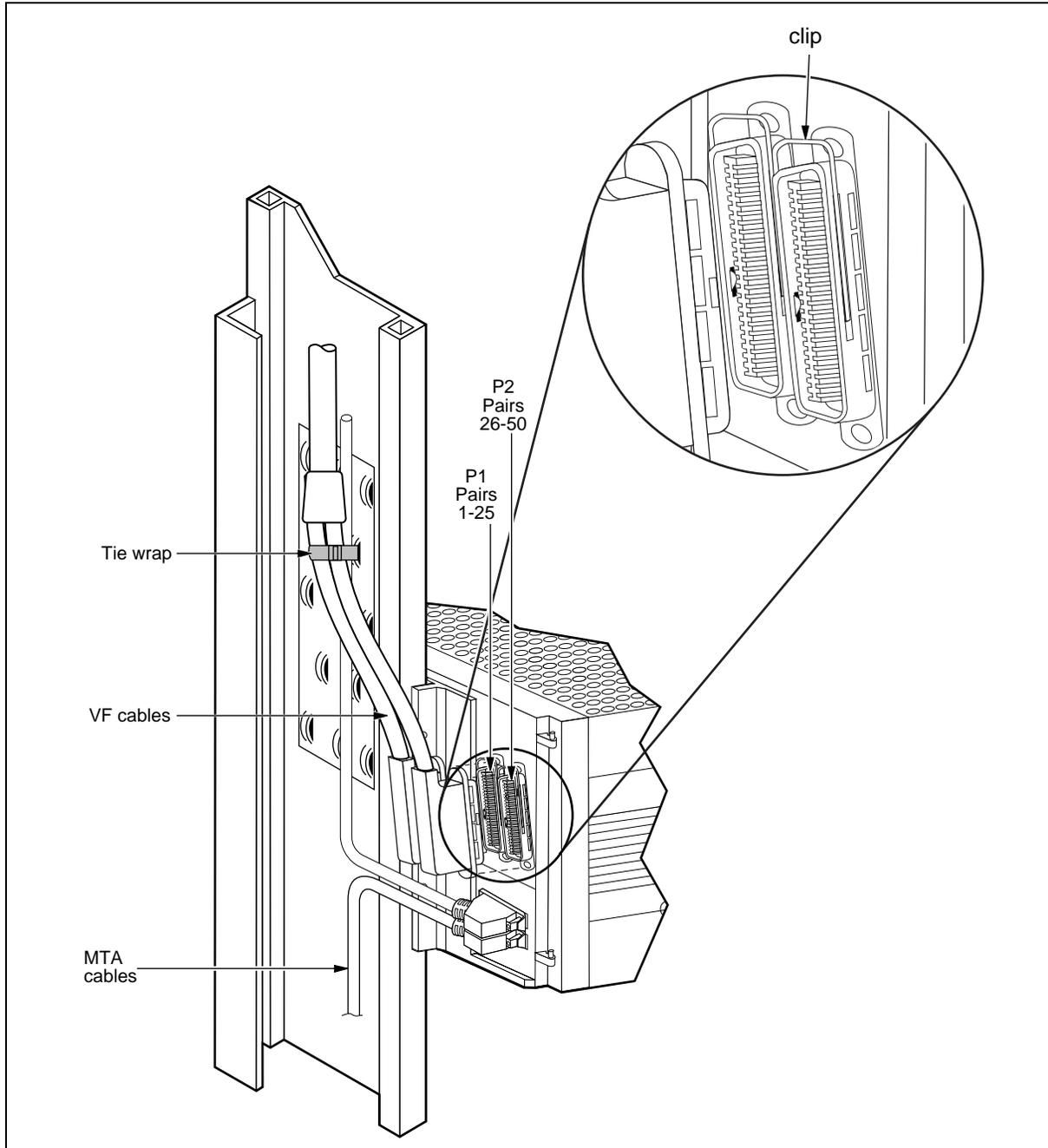
—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

Step Action

Figure 4-2
Disconnecting VF pairs from the left side of the copper-distribution shelf

AN-1086



—continued—

4-10 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

Step Action



DANGER

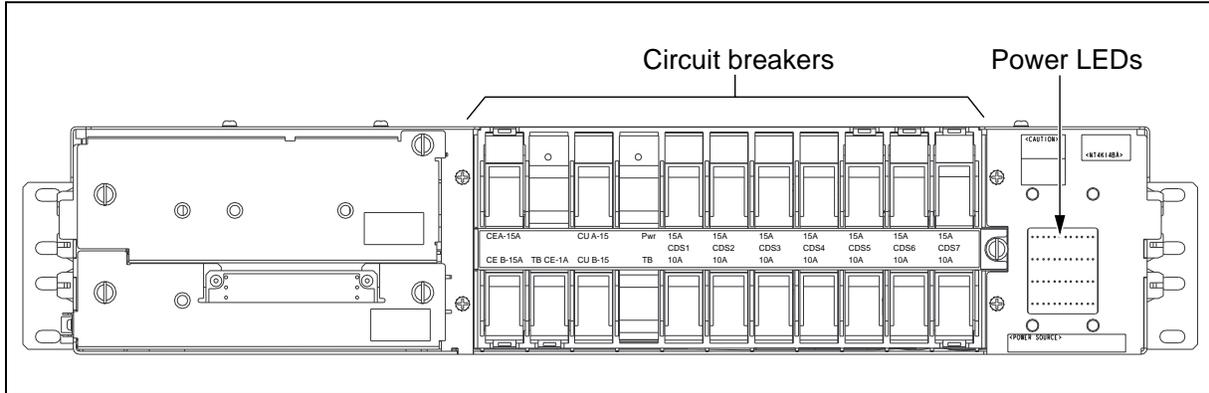
Risk of serious injury and equipment damage

Verify that the CDS breaker pairs are turned off at the breaker interface panel (BIP) before disconnecting the CDS cables.

- 12 Power down the CDS by moving the Power and the Talk Battery circuit breaker pair for the CDS on the BIP to the closed position. See Figure 4-3. Disregard alarms that are generated while the CDS that you are replacing is powered down.

Figure 4-3
BIP for the access bandwidth manager shelf

PC-16498



CAUTION

Risk of equipment damage

Pull the metallic test access (MTA) cables and D/VT link access cables straight out from the connectors on the CDS. Pulling these cables at an angle can cause damage to the connectors.

- 13 Disconnect the 2 MTA cables from the connectors on the left side of the CDS. Figure 4-4 on page 4-11 shows these connectors.
- 14 Disconnect the dc talk battery cable from the left side of the CDS and disconnect the dc power battery cable from the right side. Figure 4-5 on page 4-12 shows these connectors.
- 15 Disconnect the 2 D/VT link access cables from the connectors on the right side of the CDS. Figure 4-6 on page 4-13 shows these connectors.

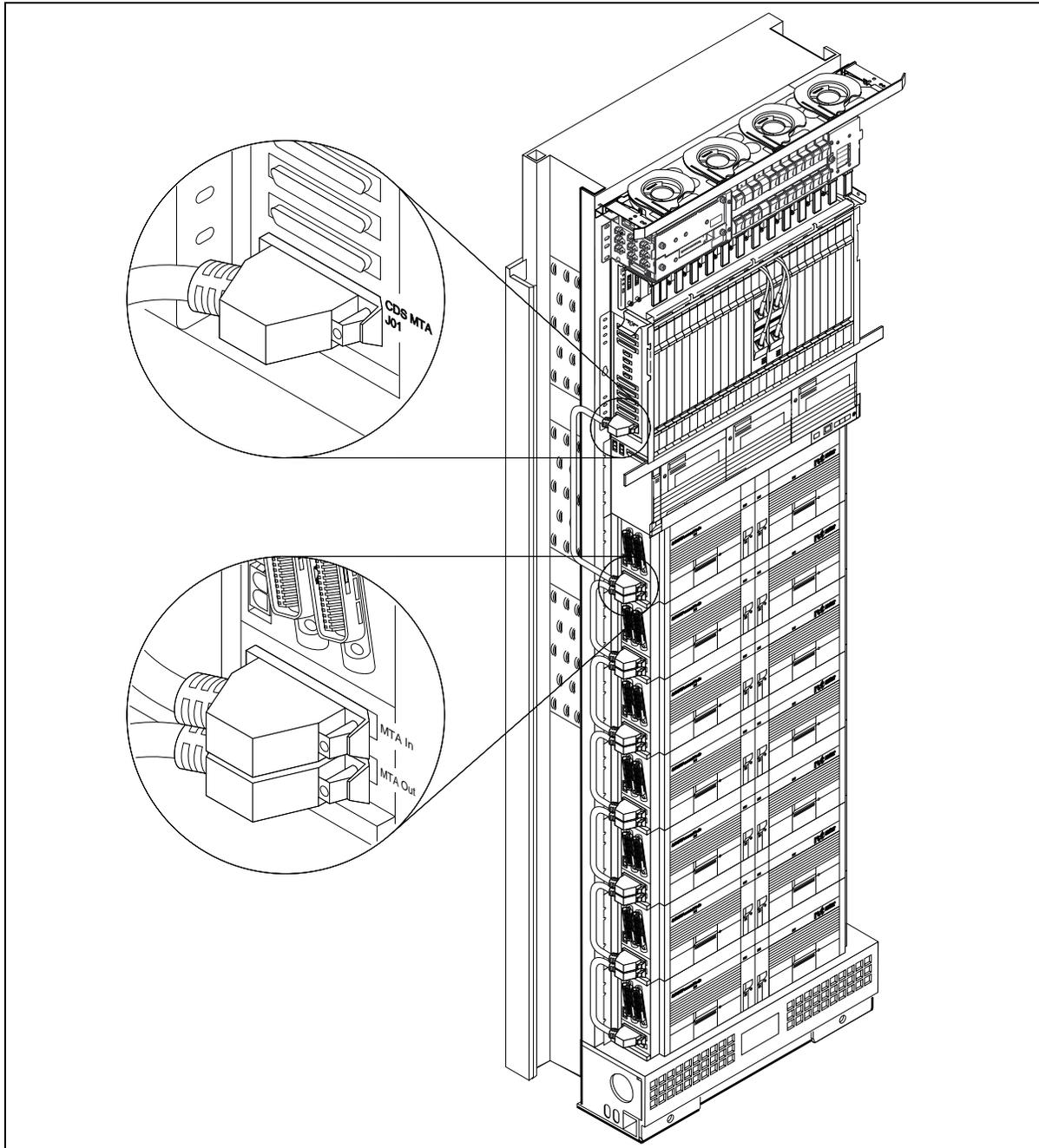
—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

Step Action

Figure 4-4
Connections for the MTA cables

PC-16521



—continued—

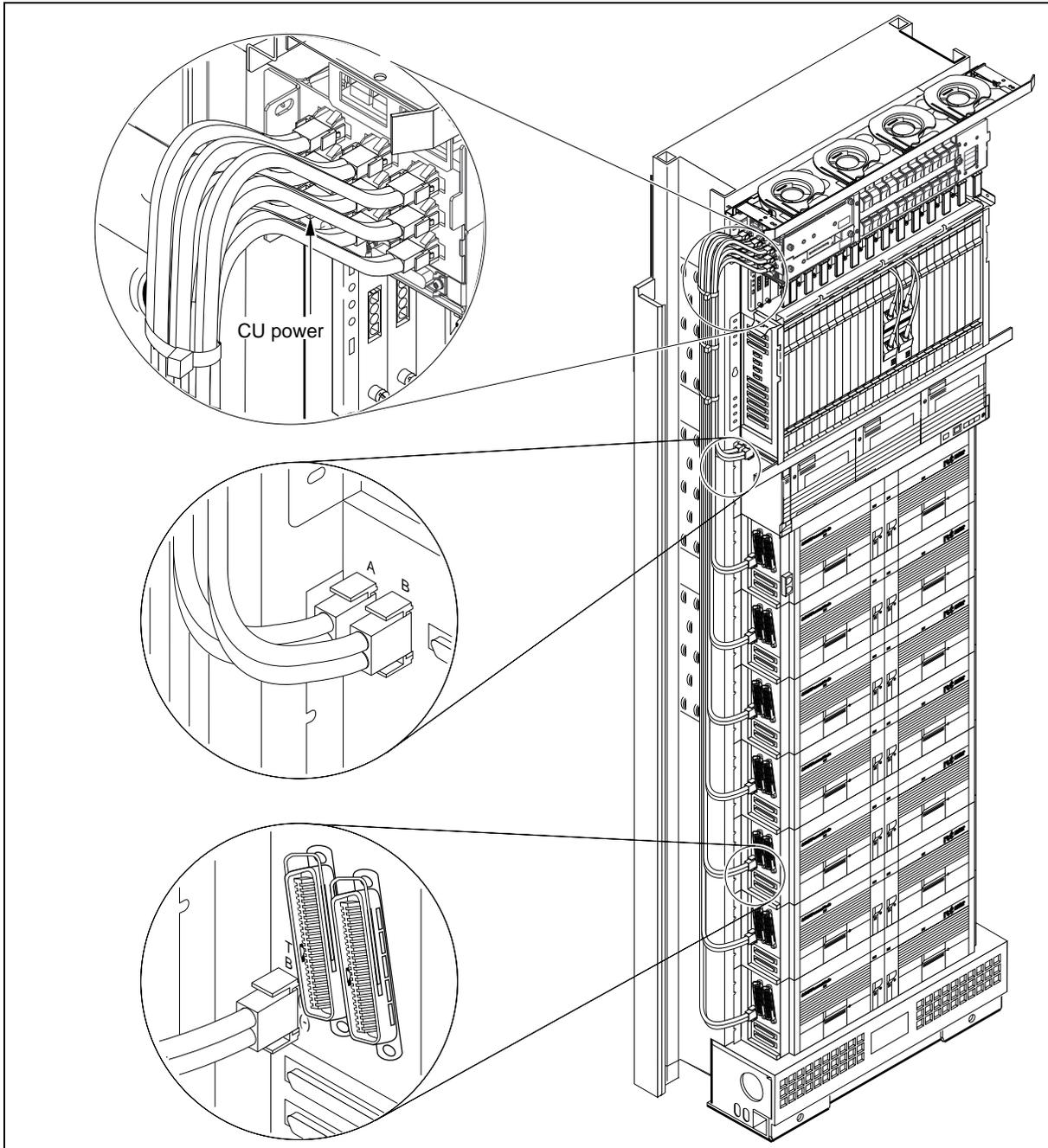
4-12 Replacing a copper-distribution shelf

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

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

Figure 4-5
Connections for dc talk battery cables

PC-16520



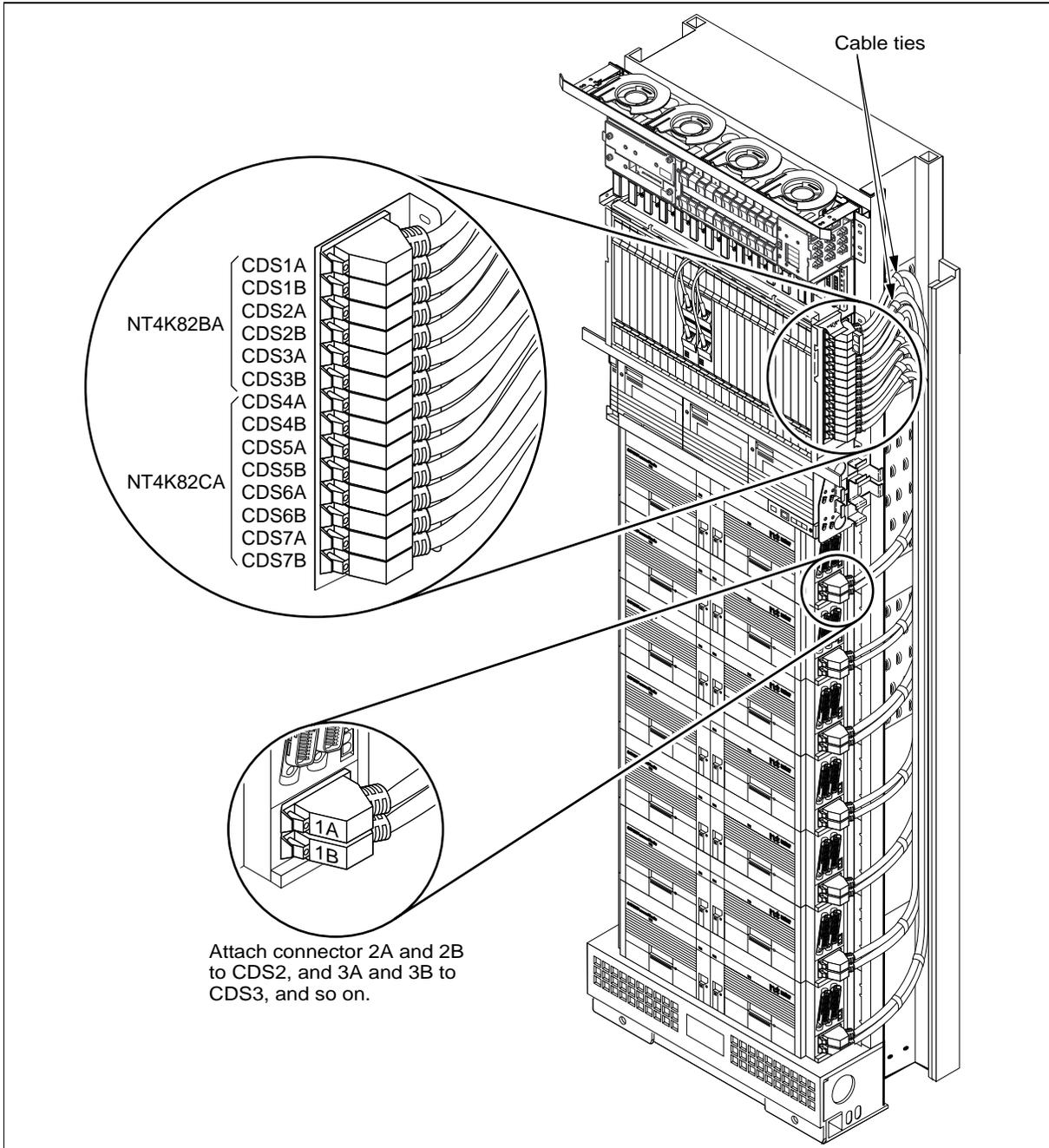
—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

Step Action

Figure 4-6
Connections for the D/VT link access cables on the copper-distribution shelf

PC-16502



—continued—

4-14 Replacing a copper-distribution shelf

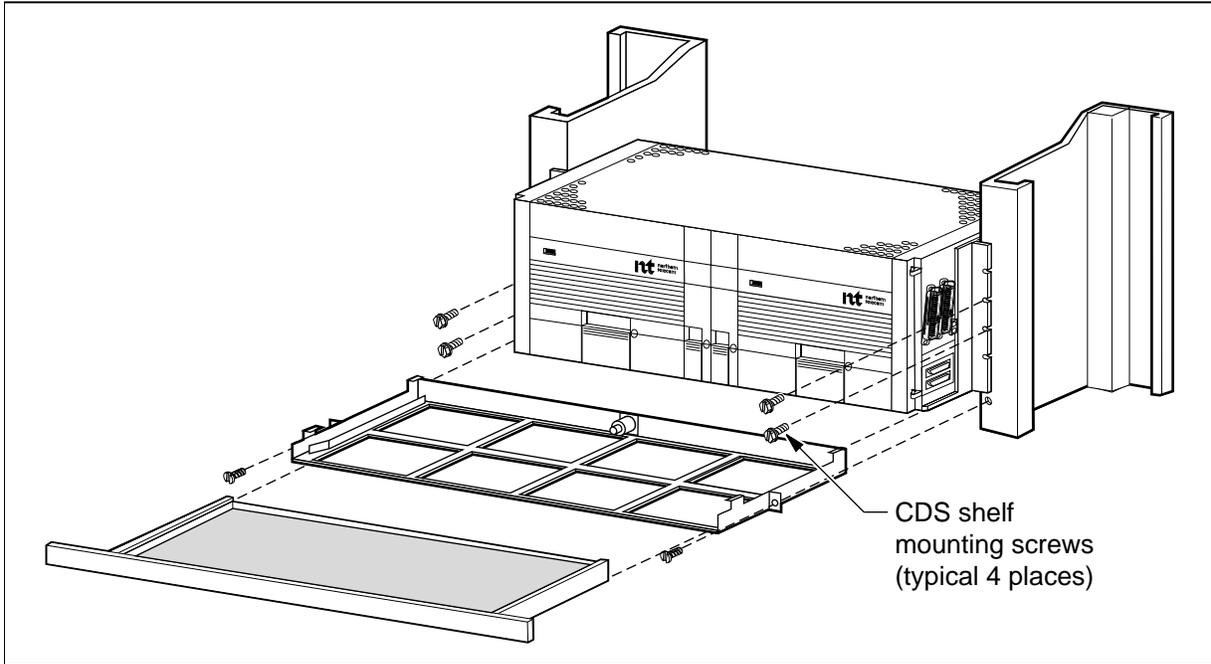
Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

Step	Action	
16	Are you replacing the lowest CDS in a bay frame (located immediately above the air filter unit)?	
	If	Then
	yes	go to step 17
	no	go to step 18
17	Unscrew the 2 retaining screws holding the air filter unit in position, and slide the unit out from the grooves of the CDS as shown in Figure 4-7. Set the air filter unit aside until the new CDS has been installed. Go to step 22.	

Figure 4-7
Removing the air filter unit from a copper-distribution shelf

PC-10031



18	Are you replacing a CDS in a Series 800A outside-plant cabinet?
If	Then
yes	go to step 19
no	go to step 22

—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

Step	Action
19	Immediately below the CDS, is there a fan shelf or a shelf spacer? (The fan shelf has a red LED on the front panel. A shelf spacer does not have an LED.)

If the item below the CDS is	Then
a fan shelf	go to step 20
a shelf spacer	go to step 21

- 20 Unplug the fan cable from the fan shelf.
- 21 Remove the fan shelf or the shelf spacer.
- Remove the 4 mounting screws that secure the fan shelf or the shelf spacer, ensuring that the screws do not fall down into the shelf below.
 - Remove the fan shelf or the shelf spacer and place it aside until the new CDS has been installed.



DANGER
Heavy load
 A CDS weighs approximately 18 kg (40 lb). Use 2 people to remove or install the CDS.

- 22 Remove the CDS from the frame or cabinet as follows:
- While ensuring that the shelf does not fall, remove the 4 mounting screws that secure it to the bay frame or cabinet. See Figure 4-7 on page 4-14 for the location of the mounting screws.
 - Remove the shelf and place it on a bench beside the new shelf.

Transfer circuit packs and line cards to the new CDS

- 23 Transfer circuit packs, one at a time, from the old to the new CDS. (For details see the procedures in Chapter 3.)
- Transfer the 4 narrowband line interface cards. See Figure 4-9 on page 4-17.
 - Transfer the 2 metallic test access cards.
 - Transfer the 2 CDS power converters.
 - Transfer the line cards.

Note: Ensure that each drawer in the new CDS contains one power filter (NT4K63). The power filter plugs into the midplane at the back of the drawer on the side of the drawer closest to the center of the shelf. See Figure 4-8 on page 4-16.

—continued—

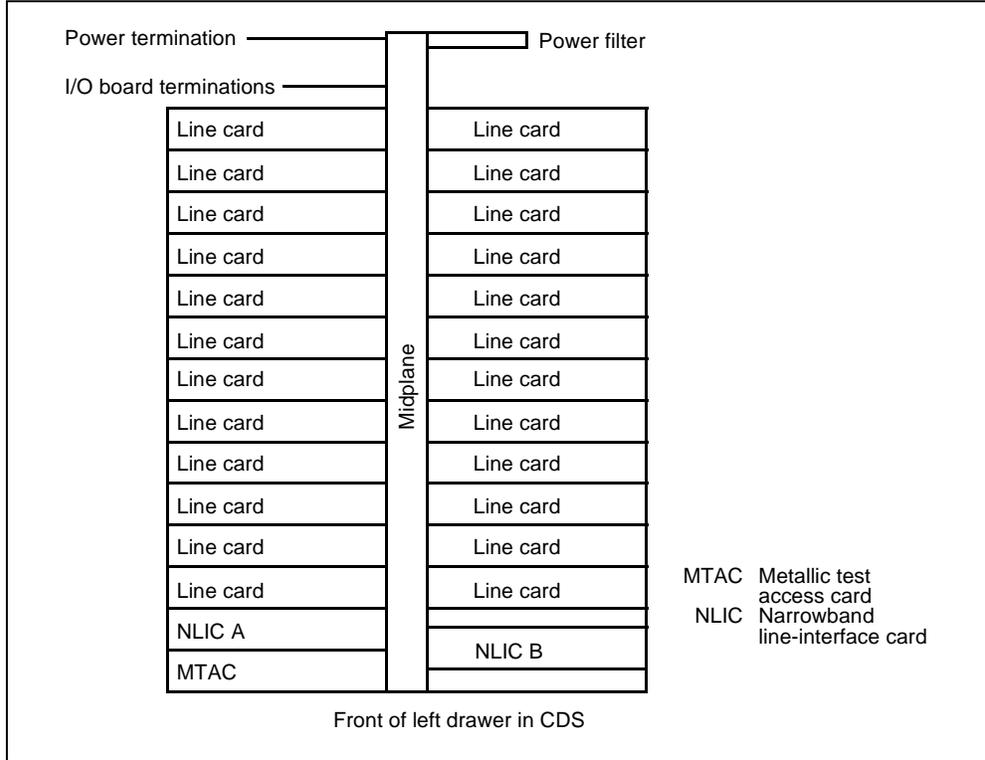
4-16 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

Step Action

Figure 4-8
Power filter (NT4K63) location in the left drawer of a copper-distribution shelf



24 Install the shelf labels on the two drawers.

Install the new CDS



DANGER
Heavy load
 A CDS weighs approximately 18 kg (40 lb). Use 2 people to remove or install the CDS.

- 25** Install the new CDS as follows:
- a.** Move the shelf into the frame or cabinet and ensure that it is positioned so that you can insert the mounting screws.
 - b.** Secure the CDS to the bay frame or cabinet with the 4 mounting screws. Insert the mounting screws into the 2 inner holes on the left and right side of the CDS. See Figure 4-7 on page 4-14.

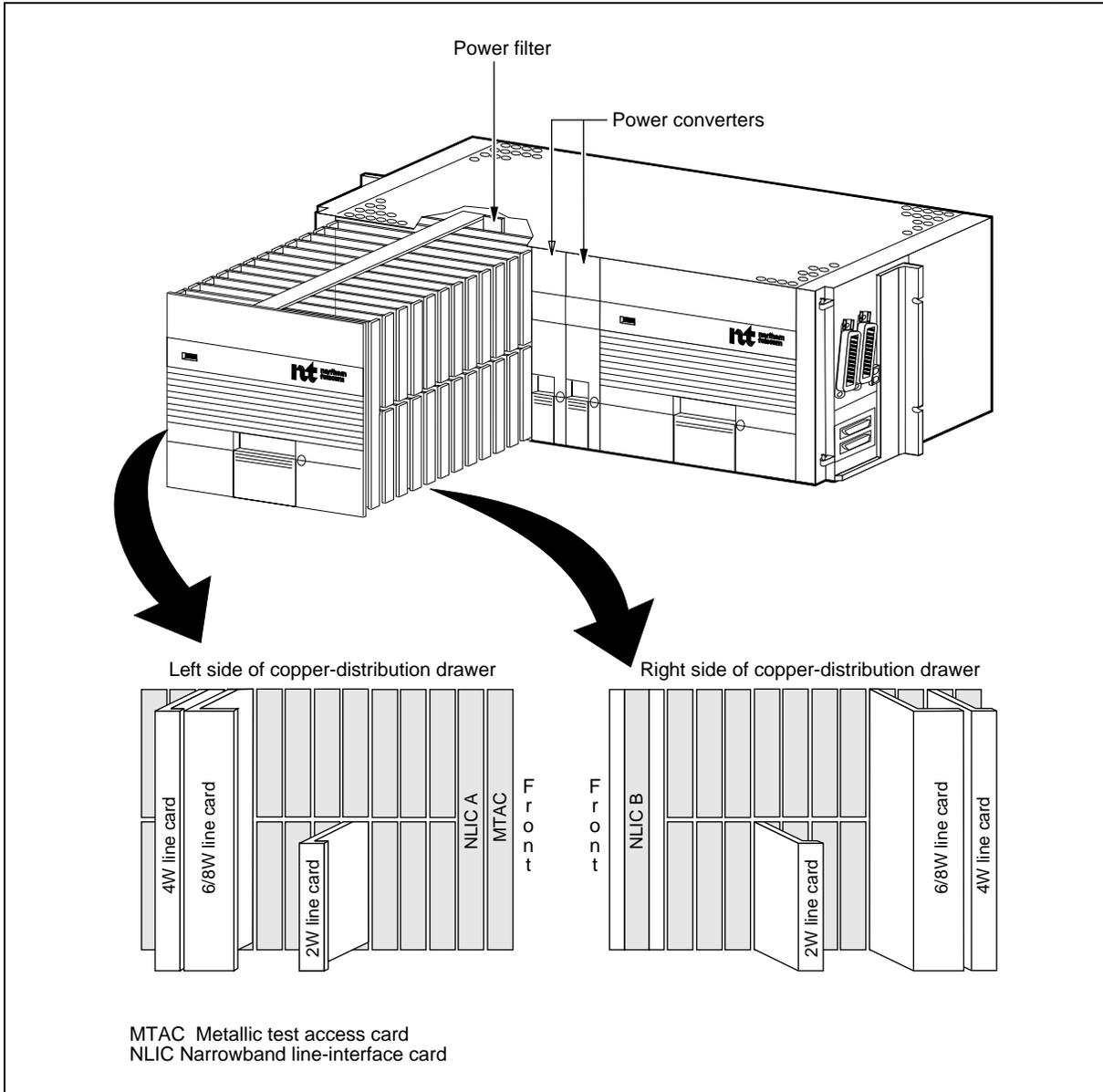
—continued—

Procedure 4-1 (continued)
NT4K12: Copper-distribution shelf

Step Action

Figure 4-9
Copper-distribution shelf circuit pack locations

PC-10431



—continued—

4-18 Replacing a copper-distribution shelf

Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

Step	Action						
26	Have you just replaced the lowest CDS in a bay frame? <table border="1"><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>yes</td><td>Slide the air filter (NT4K15BA) unit, that was removed in step 17, beneath the CDS. Engage the grooves of the shelf and secure the unit to the rack with the 2 screws. See Figure 4-7 on page 4-14. Next, slide the air filter into the unit, and press the center of the faceplate to engage the rear latching mechanism. Go to step 30.</td></tr><tr><td>no</td><td>Go to step 27.</td></tr></tbody></table>	If	Then	yes	Slide the air filter (NT4K15BA) unit, that was removed in step 17, beneath the CDS. Engage the grooves of the shelf and secure the unit to the rack with the 2 screws. See Figure 4-7 on page 4-14. Next, slide the air filter into the unit, and press the center of the faceplate to engage the rear latching mechanism. Go to step 30.	no	Go to step 27.
If	Then						
yes	Slide the air filter (NT4K15BA) unit, that was removed in step 17, beneath the CDS. Engage the grooves of the shelf and secure the unit to the rack with the 2 screws. See Figure 4-7 on page 4-14. Next, slide the air filter into the unit, and press the center of the faceplate to engage the rear latching mechanism. Go to step 30.						
no	Go to step 27.						
27	Have you just replaced a CDS in a Series 800A outside-plant cabinet? <table border="1"><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>yes</td><td>Go to step 28.</td></tr><tr><td>no</td><td>Go to step 30.</td></tr></tbody></table>	If	Then	yes	Go to step 28.	no	Go to step 30.
If	Then						
yes	Go to step 28.						
no	Go to step 30.						
28	Did you remove a fan shelf or a shelf spacer? <table border="1"><thead><tr><th>If you removed</th><th>Then</th></tr></thead><tbody><tr><td>a fan shelf</td><td>Reinstall the fan shelf using the four screws that you removed in step 21. Reconnect the fan cable to the fan shelf. Go to step 30.</td></tr><tr><td>a shelf spacer</td><td>Go to step 29.</td></tr></tbody></table>	If you removed	Then	a fan shelf	Reinstall the fan shelf using the four screws that you removed in step 21. Reconnect the fan cable to the fan shelf. Go to step 30.	a shelf spacer	Go to step 29.
If you removed	Then						
a fan shelf	Reinstall the fan shelf using the four screws that you removed in step 21. Reconnect the fan cable to the fan shelf. Go to step 30.						
a shelf spacer	Go to step 29.						
29	Reinstall the shelf spacer using the 4 screws that you removed in step 21.						
<div style="border: 1px solid black; padding: 10px;"><p>CAUTION Risk of equipment damage Align the D/VT link access and MTA cables with their connectors as you re-attach them to the CDS. Improper alignment can cause faulty connections or damage to the connectors.</p></div>							
30	Connect the D/VT link access cables to CDS A and CDS B connectors on the CDS as shown in Figure 4-6 on page 4-13. Ensure that you connect the "A" D/VT link access cable to the CDS A connector.						

—continued—

 Procedure 4-1 (continued)

NT4K12: Copper-distribution shelf

- | Step | Action |
|------|--|
| 31 | Connect the dc distribution harness to the right and left side of the CDS as shown in Figure 4-5 on page 4-12. |
| 32 | Connect the 2 MTA cables to the connectors on the left side of the CDS as shown in Figure 4-4 on page 4-11. |
| 33 | Power up the CDS by moving the Power and Talk Battery circuit breaker pair on the BIP to the closed position, which is indicated by the number one (1) at the top of the breaker. See Figure 4-2 on page 4-9. |
| 34 | Connect the two VF cables to the CDS as follows: <ol style="list-style-type: none"> a. Use Table 4-6 on page 4-21 to identify the proper connection point on the CDS for each VF cable. b. Latch the spring clip around the cable entry end of the connector.
<i>The spring clip should click into place.</i> c. Pull gently on the connector to make sure it is properly seated and locked into place. |
| 35 | If the CDS is in an MBP cabinet or an outside-plant cabinet, re-install the cabinet covers or close the doors, as appropriate. |

Troubleshoot the new CDS

- | | |
|----|---|
| 36 | At the Network Element Status screen, display any current alarms by entering:
alarms↵
<i>A list of alarms appears on the screen.</i> |
| 37 | Note the alarms associated with the replacement CDS. To diagnose the faults and clear the alarms, use the appropriate procedures in <i>Alarm and Trouble Clearing Procedures</i> , 323-3001-543, in <i>Maintenance</i> , Volume 5A. |
| 38 | If you cannot successfully complete this procedure, contact your next level of support. |

—end—

Worksheets

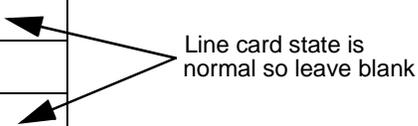
Copy the following worksheets and use them to record the information required by the procedure as you replace a CDS on an AccessNode.

Copper-distribution shelf line card state worksheet

In Table 4-6 on page 4-21, note the state of any faulty, mismatched, or removed line cards.

For example, if the line card in slot 50 has a state of Ueq, you write Ueq in the Line card state column next to slot 50. The line cards in slots 49 and 51 are in a normal state, so the Line card state column is left blank for slots 49 and 51.

Slot	Line card state
49	
50	Ueq
51	



Line card state is normal so leave blank

Table 4-6
CDS line card state worksheet

Slot	Line card state						
1		25		49		73	
2		26		50		74	
3		27		51		75	
4		28		52		76	
5		29		53		77	
6		30		54		78	
7		31		55		79	
8		32		56		80	
9		33		57		81	
10		34		58		82	
11		35		59		83	
12		36		60		84	
13		37		61		85	
14		38		62		86	
15		39		63		87	
16		40		64		88	
17		41		65		89	
18		42		66		90	
19		43		67		91	
20		44		68		92	
21		45		69		93	
22		46		70		94	
23		47		71		95	
24		48		72		96	

Copper-distribution shelf voice frequency cable position worksheet

Use Table 4-7 on page 4-23 to record the VF cable positions on a CDS shelf.

Determine what position each VF cable is attached to and write the VF cable's label information in the VF cable label column next to the cable's position.

Example

There is a VF cable labeled A attached to position Pairs 01-25 and a VF cable labeled C attached to position Pairs 51-75 on the third CDS shelf. To record the VF cable positions, you write A in the VF cable label column next to Pairs 01 - 25 and C in the VF cable label column next to Pairs 51-75.

Pairs 76 - 96	
CDS 3	
VF cable position	VF cable label
Pairs 01 - 25	A
Pairs 26 - 50	
Pairs 51 - 75	C
Pairs 76 - 96	

Table 4-7
CDS VF cable position worksheet

CDS 1	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
CDS 2	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
CDS 3	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
CDS 4	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
—continued—	

Table 4-7 (continued)
CDS VF cable position worksheet

CDS 5	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
CDS 6	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
CDS 7	
VF cable position	VF cable label
Pairs 01 - 25	
Pairs 26 - 50	
Pairs 51 - 75	
Pairs 76 - 96	
—end—	

Replacing modules in a BIP

Use this procedure to replace modules in the breaker interface panel (BIP).

Note: Maintenance procedures for replacing AccessNode Express modules are documented in the *AccessNode Express Maintenance Guide*, 323-3051-211.

Chapter contents

In the following table look up the module to be replaced, and proceed to the specified page.

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

PEC	Module description	See
A0378090	TBM BIP circuit breaker	page 5-2
A0381919	ABM BIP circuit breaker	page 5-5
A0381920	ABM BIP circuit breaker	page 5-5
A0381921	ABM BIP circuit breaker	page 5-5
A0627317	ABM BIP circuit breaker	page 5-5
A0622542	ABM BIP circuit breaker	page 5-5
NT4K1472	LED card (for NT4K14AB BIP)	page 5-11
NT4K61AA	Talk battery filter card	page 5-19
NT4K61BA	Talk battery filter card	page 5-21
NT4K64AA	Alarm relay card	page 5-23
NT4K64BA	Alarm relay card	page 5-24
NT7E90AA	Modem for NT7E56AB/BA TBM BIP	page 5-25
NT7E90BA	Modem for NT7E56CA TBM BIP	page 5-28
NT7E5604	Display circuit pack	page 5-31

Procedure 5-1

A0378090: TBM BIP circuit breaker

Use this procedure to replace the A0378090 15 Amp circuit breaker in the NT7E56 TBM breaker interface panel (BIP). This procedure can be performed on equipment in service without the need to power down the shelves. However, it is recommended that this procedure be performed during periods of low traffic.



CAUTION

If replacing an A and B circuit breaker, perform steps 2 to 18 for each circuit breaker separately.

Action

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

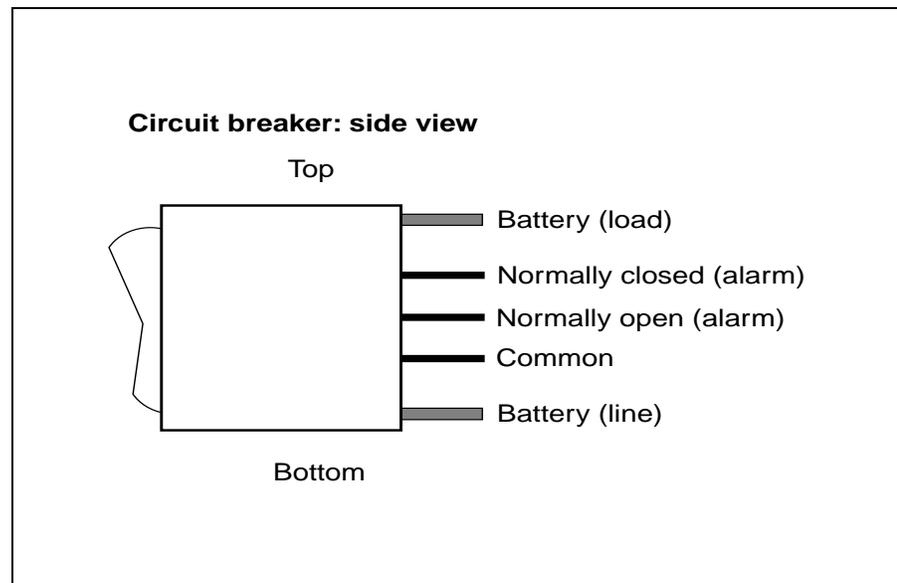
- 1 Ensure the S/DMS Transport bay is redundantly powered from live feeds.
- 2 Record the positions (on or off) of the circuit breakers to be replaced (A1 to A4 if replacing an A circuit breaker, or B1 to B4 if replacing a B circuit breaker).
- 3 At the BIP, turn off the circuit breakers A1 to A4, or B1 to B4, (depending on the circuit breaker being replaced).
Note: Turning off the circuit breakers generates a minor alarm due to the fact that the circuit breaker and A or B power failure alarm points are enabled. If an audible alarm is generated, press the ACO alarm cut-off button.
- 4 At the battery distribution frame board (BDFB), remove the fuse for the battery feed (A or B, depending on the designation of the circuit breaker being replaced).

—continued—

Procedure 5-1 (continued)

A0378090: TBM BIP circuit breaker

- | Step | Action |
|------|--|
| 5 | Remove the BIP front cover by pulling it towards you. Locate the locking screw in the center of the front section of the BIP and release the screw by turning it counterclockwise. Pull open the right door of the BIP panel. Loosen the holding screw located at the end of the left bracket. Pull open the left door of the panel. |
| 6 | To ensure that the correct fuse has been removed from the BDFB, use a volt meter and carefully measure for zero volts between the battery (line) and common (battery return), as shown in the following illustration. |



—continued—

5-4 Replacing modules in a BIP

Procedure 5-1 (continued)

A0378090: TBM BIP circuit breaker

Step	Action
7	If necessary, cut tie wraps to ease removal of the wires. Using needle-nose pliers, carefully transfer wires from the old circuit breaker to the replacement circuit breaker. Connect the wires to the corresponding terminations on the replacement circuit breaker.
8	Using a slot screwdriver, loosen the circuit breaker screws located at the front face of the circuit breaker. For easier removal of the circuit breaker, remove the bottom screw first.
9	Remove the old circuit breaker from the BIP.
10	Install the replacement circuit breaker in the BIP.
11	Using the slot screwdriver and the two screws, secure the circuit breaker to the BIP. For easier installation, replace the top screw first.
12	Verify that breakers A1 to A4, or B1 to B4 are turned off.
13	At the BDFB, replace the fuse (A or B) for the battery feed.
14	Use the voltmeter between the battery (line) and common (battery return), and verify that the voltage is within the specified operating range (for example, -40 to -60 Vdc).
15	Turn on the circuit breakers recorded in step 2.
16	Use a voltmeter to measure the voltage between the battery and battery return at the appropriate shelf terminal blocks. Verify that the voltage is within the specified operating range.
17	Verify that the alarm generated in step 3 clears.
18	After completing the changes to the circuit breakers, check the trip lamp on the left side of the BIP. If the lamp is on, recheck the alarm wiring on the circuit breaker. If the lamp is off, the alarm wiring is correct.
19	Close and fasten the BIP doors, then replace and lock the BIP cover.

—end—

Procedure 5-2

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

Use this procedure to replace any of the following breakers on the NT4K14AB/BA ABM breaker interface panel (BIP):

- CE A, or CE B 15 Amp circuit breakers (code A0381920)
- CU A, or CU B 10 Amp circuit breakers NT4K14AB (code A0381919)
- CU A, or CU B 15 Amp circuit breakers NT4K14BA (code A0381920)
- CDS1 to CDS7 15 Amp circuit breakers NT4K14AB (code A0381920)
- CDS1 to CDS7 15 Amp short delay circuit breakers NT4K14BA (code A0627317)
- CDS1 to CDS7 Talk Battery 10 Amp circuit breakers NT4K14AB only (code A0381919)
- TBF CE 1 Amp circuit breaker (code A0381921)
- CDS1 to CDS7 5 Amp short delay circuit breaker (code A0622542). Install this breaker only on engineered systems when adding accessory shelves into a partially filled AccessNode bay.

Figure 5-1 on page 5-10 shows a schematic of the breakers.

Action

Step	Action						
	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If replacing</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>a CE breaker (A0381920)</td> <td>go to step 1</td> </tr> <tr> <td>any breaker other than a CE breaker</td> <td>go to step 10</td> </tr> </tbody> </table>	If replacing	Then	a CE breaker (A0381920)	go to step 1	any breaker other than a CE breaker	go to step 10
If replacing	Then						
a CE breaker (A0381920)	go to step 1						
any breaker other than a CE breaker	go to step 10						
1	<p>Determine which common equipment plane will be affected by the feed maintenance:</p> <ul style="list-style-type: none"> • breaker CE A affects cards on plane A of the common equipment shelf • breaker CE B affects cards on plane B of the common equipment shelf <p style="text-align: center;">—continued—</p>						

5-6 Replacing modules in a BIP

Procedure 5-2 (continued)

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

Step	Action						
2	From the network element status screen, display the equipment screen for the affected TIC: eq tic <plane> ↵ where <plane> number of the affected plane: a or b <i>The TIC equipment screen appears.</i> <table><thead><tr><th>If the affected plane contains</th><th>Then</th></tr></thead><tbody><tr><td>the primary in-service TIC</td><td>go to step 3</td></tr><tr><td>the secondary in-service TIC</td><td>go to step 4</td></tr></tbody></table>	If the affected plane contains	Then	the primary in-service TIC	go to step 3	the secondary in-service TIC	go to step 4
If the affected plane contains	Then						
the primary in-service TIC	go to step 3						
the secondary in-service TIC	go to step 4						
3	Switch service from the primary TIC to the secondary TIC: switch ↵ y ↵						
4	Change the state of the TIC in the affected plane to out-of-service (OOS): chgstate oos ↵ <i>The system prompts for confirmation of the state change.</i>						
5	Confirm the state change: y ↵ <i>The state changes to OOS.</i>						
6	From the TIC equipment screen, display the AIC equipment screen for the affected AIC: eq aic <plane> ↵ where <plane> number of the affected plane: a or b <i>The AIC equipment screen appears.</i>						
7	Ensure that the redundant unit state is (in-service) IS.						

—continued—

Procedure 5-2 (continued)

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

Step	Action
8	<p>If the redundant unit is in service, change the state of the AIC (in the affected plane) to out-of-service (OOS):</p> <p>chgstate oos ↓</p> <p><i>The system prompts for confirmation of the state change.</i></p>
9	<p>Confirm the state change:</p> <p>y ↓</p> <p><i>The state changes to OOS.</i></p>
<div style="border: 1px solid black; padding: 10px;"> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 2;"> <p>CAUTION</p> <p>Risk of service interruption</p> <p>The BIP has been designed to allow replacement of circuit breakers with power on.</p> <p>If local safety procedures require removal of the fuse from the battery distribution fuse bay, service interruption will occur.</p> <ul style="list-style-type: none"> • Feed 1 affects cards on Plane A of the ABM common-equipment shelf, and CDS 1, 3, 5 and 7 • Feed 2 affects cards on Plane B of the ABM common-equipment shelf, and CDS 2, 4, and 6. • Refer to Figure 5-1 on page 5-10 for equipment affected by feeds 3 and 4. </div> </div> </div>	
10	Switch the breaker to be replaced to the off position.
11	Remove the BIP cover as shown in common procedures.
12	Remove the breaker retaining bar that runs between the two rows of breakers, by loosening the captive screw on the right side of the bar. Swing the bar up from the right side until the left side disengages.
13	<p>Insert a slot screwdriver into the retaining tab that holds the breaker in place, and lift upward.</p> <p>Note: For breakers in the top row, this tab is located above the breaker. For breakers in the bottom row, this tab is located below the breaker.</p> <p>With the screwdriver lifting the retaining tab out of the way, pull the breaker out until you can gain access to the wire connectors.</p>

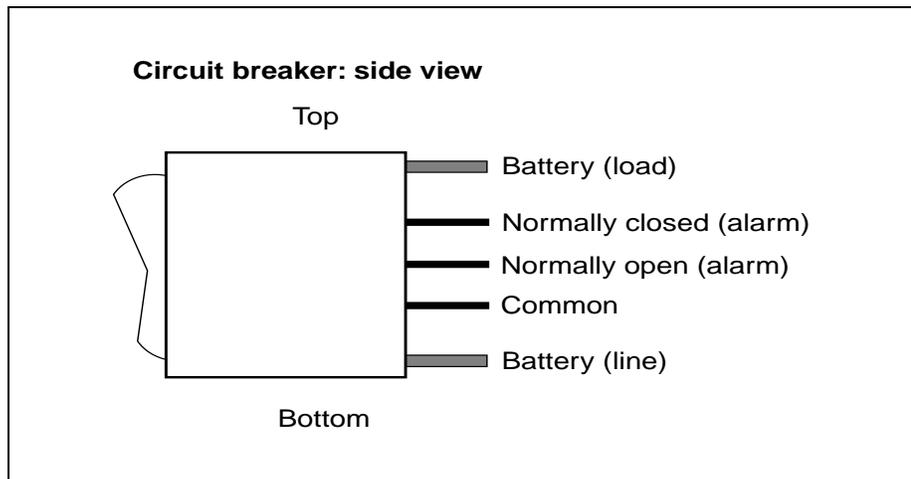
—continued—

5-8 Replacing modules in a BIP

Procedure 5-2 (continued)

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

- | Step | Action |
|------|--|
| 14 | Hold a replacement breaker beside the old breaker oriented in the same position. Make sure the replacement breaker is in the off position. |
| 15 | Using electrician's insulated needle-nose pliers, carefully transfer the Battery (line) connector from the old circuit breaker to the replacement circuit breaker. After transferring the Battery (line) connector, continue transferring the remaining connectors from the old breaker to the replacement breaker. The following figure shows the orientation of the wires. |



- | | |
|----|---|
| 16 | Insert the circuit breaker into its slot until it snaps into place under the retaining tab. |
| 17 | Replace the breaker retaining bar by hooking the left side of the bar into place, then swinging the right side down until the captive screw aligns with the screw hole. |
| 18 | Use a slot screwdriver to fasten the captive screw on the retaining bar into place. |
| 19 | Switch the circuit breaker to the on position. |
| 20 | Replace the BIP cover as shown in common procedures.
If you replaced a CE A or CE B breaker, follow the remaining steps to return the TIC and AIC to service. |

—continued—

Procedure 5-2 (continued)

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

- | Step | Action |
|-------------|---|
| 21 | From any screen, select, the AIC on the affected plane:
eq aic <plane> ↵
where
<plane> number of the affected plane: a or b

<i>The AIC equipment screen appears.</i> |
| 22 | Change the state of the AIC to in-service (IS):
chgstate is ↵
<i>The state changes to in-service.</i> |
| 23 | From the TIC equipment screen, select the TIC on the affected plane:
eq tic <plane> ↵
where
<plane> number of the affected plane: a or b

<i>The TIC equipment screen appears.</i> |
| 24 | Change the state of the TIC to in-service (IS):
chgstate is ↵
<i>The state changes to in-service.</i> |

—continued—

5-10 Replacing modules in a BIP

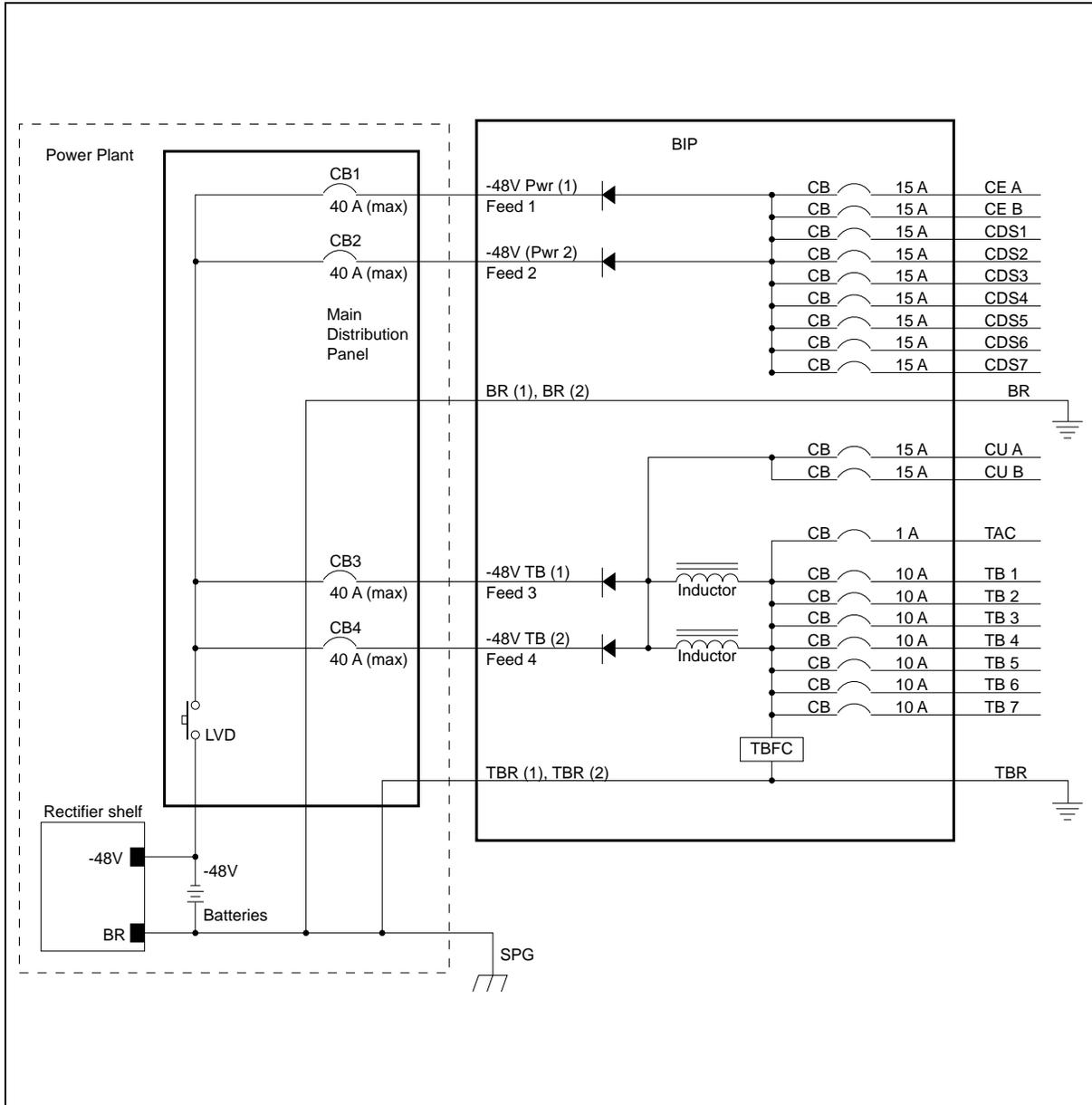
Procedure 5-2 (continued)

A0381919, A0381920, A0381921, A0627317, A0622542: ABM BIP circuit breaker

Step Action

Figure 5-1
Power feed schematic NT4K14BA BIP

PC-16495



—end—

Procedure 5-3

NT4K1472: LED card (for NT4K14AB BIP)

Use this procedure to replace the NT4K1472 LED card in the NT4K14AB breaker interface panel (BIP). The LED card is used to provide visual indication of BIP power, and system-level critical, major and minor alarms.

Note: The NT4K1446 LED card used on the NT4K14BA BIP is not field replaceable.

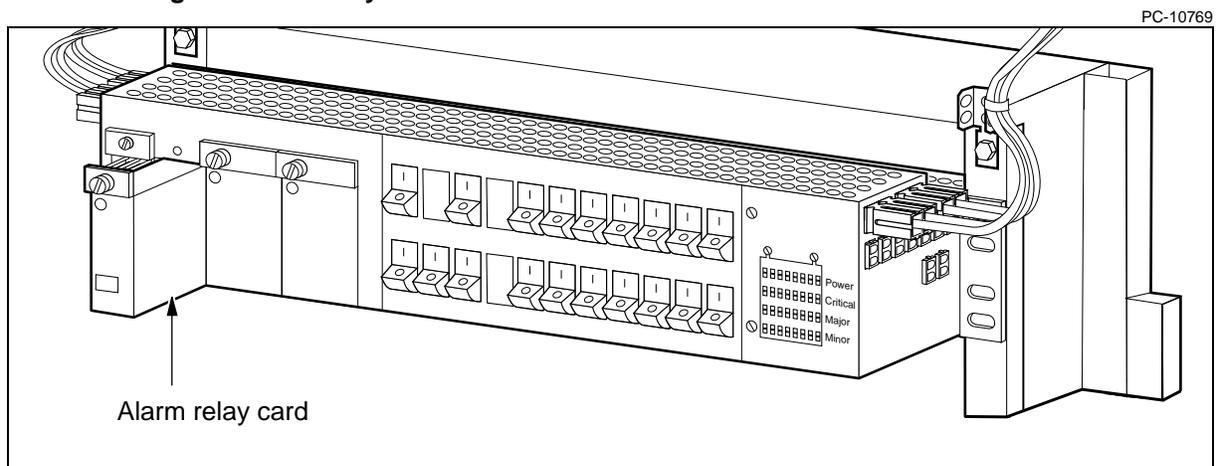
Requirements

- small step ladder or stool is required to elevate you to comfortable working position in front of the BIP
- 3/8-inch slot screwdriver

Action

Step	Action
1	Remove the BIP cover as shown in common procedures.
2	Disable power to all BIP indicator lamps by following steps 2a. and 2b.: <ol style="list-style-type: none"> Loosen the captive retaining screw on the faceplate of the NT4K64 Alarm Relay Card, as shown in Figure 5-2. Pull the card forward to disconnect the card from the backplane. When disconnected, all BIP lamps turn off. <p>Note: Do not completely remove the card from the BIP. Leave it in its slot for the duration of this procedure.</p>

Figure 5-2
Disconnecting the alarm relay card



—continued—

5-12 Replacing modules in a BIP

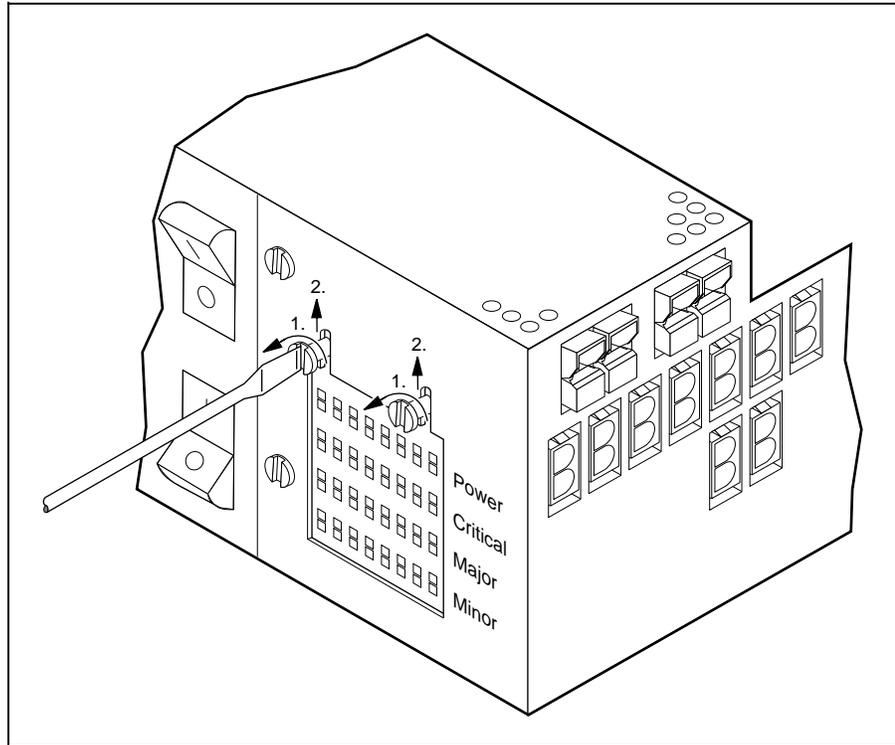
Procedure 5-3 (continued)

NT4K1472: LED card (for NT4K14AB BIP)

Step	Action
3	<p>Using a slot screwdriver, loosen the two screws on the face of the LED card so they extend about 0.5 of an inch (13 mm) from the front of the BIP, as shown in Figure 5-3.</p> <p>Note: Do not completely remove the two screws from the LED card. The two screws must remain in place so they can be used as handles to grasp the LED card during removal.</p> <p>Grasp the two screws on the LED card and lift the card upward as high as it will go (about 0.4 of an inch (10 mm), as shown in Figure 5-3.</p>

Figure 5-3
Lifting the screws on the LED card

PC-11170



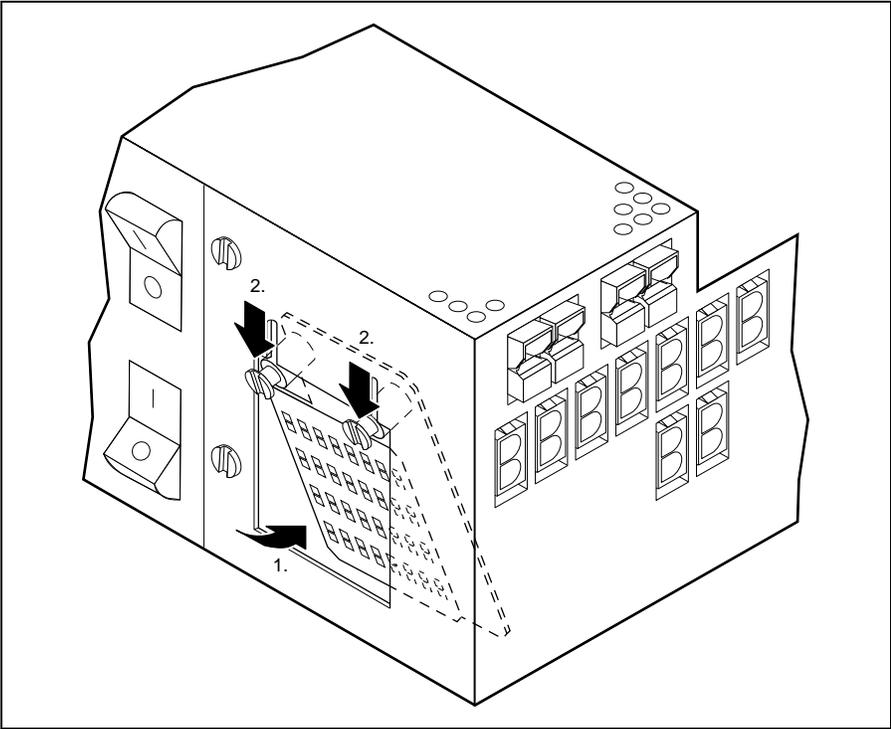
—continued—

Procedure 5-3 (continued)
NT4K1472: LED card (for NT4K14AB BIP)

Step	Action
4	Using the screws on the LED card as handles, push the bottom of the card inward (1.) and lower the screws from their retaining slots (2.), as shown in Figure 5-4.

Figure 5-4
Pushing the LED card inward

PC-11171



—continued—

5-14 Replacing modules in a BIP

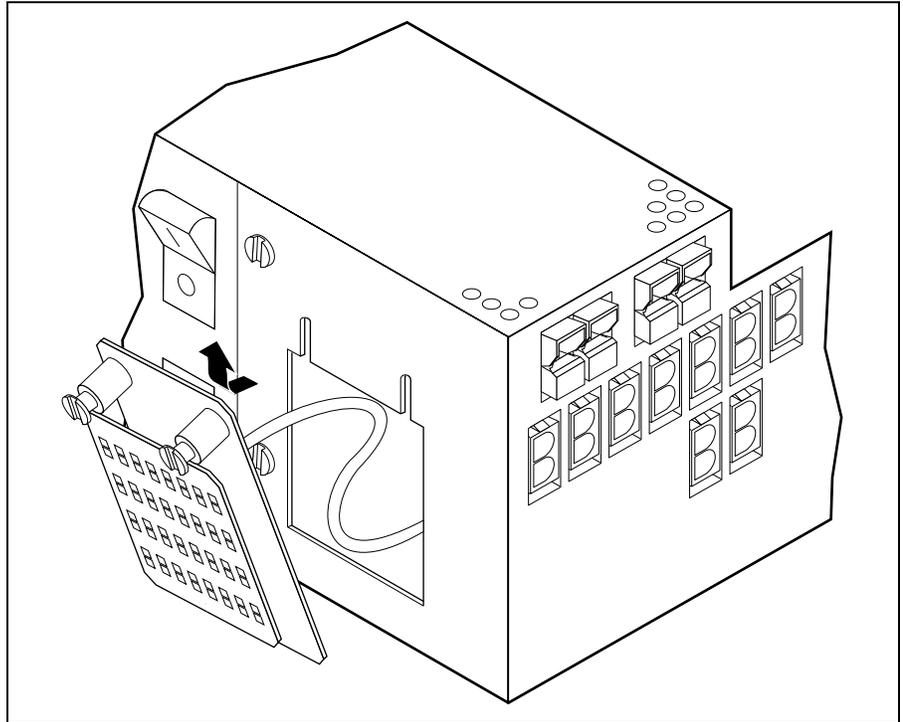
Procedure 5-3 (continued)

NT4K1472: LED card (for NT4K14AB BIP)

- | Step | Action |
|------|--|
| 5 | Carefully pull the card up and out of the BIP, as shown in Figure 5-5. If necessary, use the screws on the LED card as handles.

Note: Avoid putting excessive strain on the cable attached to the back of the LED card. The cable must maintain its “S” shape to help hold and center the card in the opening of the BIP during replacement. |

Figure 5-5
Pulling LED card up and out of BIP



PC-11172

- 6 Disconnect the cable from the connector on the back of the LED card.
- 7 Remove the two screws from the LED card, so they can be used on the replacement card.
- 8 Screw the two screws part way into the binding posts on the replacement LED card. Leave about 0.5 of an inch (13 mm) of the screw extended from the binding post so they can be used as handles during the installation of the replacement card.
- 9 Reconnect the cable to the connector on the back of the replacement LED card. (The connector is keyed to fit only one way.)

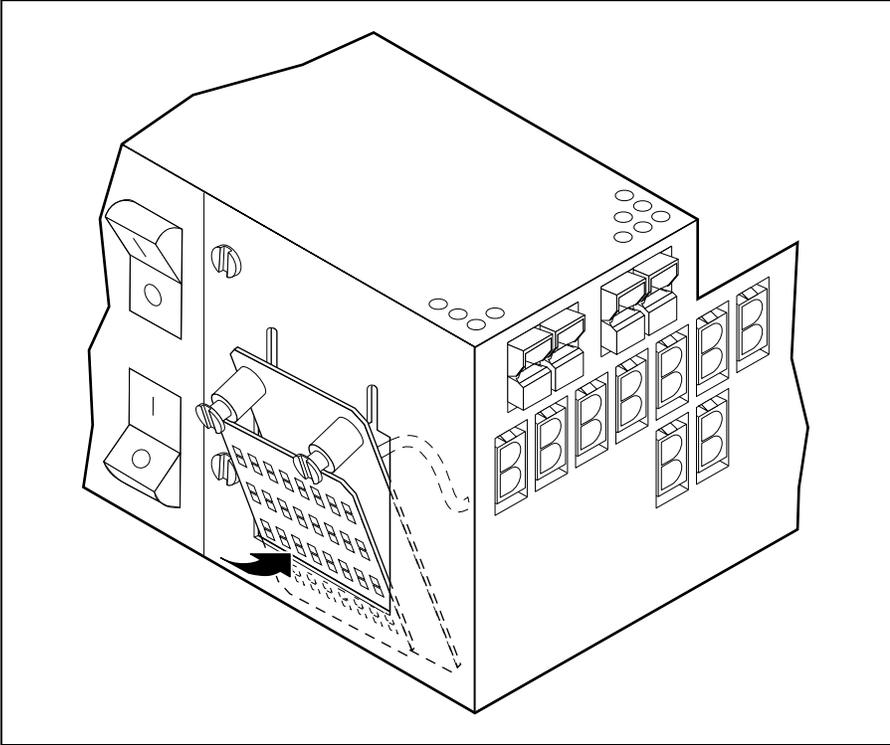
—continued—

Procedure 5-3 (continued)
NT4K1472: LED card (for NT4K14AB BIP)

Step	Action
10	Hold the replacement LED card on an angle and insert the bottom of the card down into the BIP opening, and continue inserting until the top of the card is completely inside the BIP opening. See Figure 5-6. Note: Ensure the cable maintains its “S” shape to help hold and center the card in the opening of the BIP during replacement.

Figure 5-6
Inserting replacement LED card into opening

PC-11173



—continued—

5-16 Replacing modules in a BIP

Procedure 5-3 (continued)

NT4K1472: LED card (for NT4K14AB BIP)

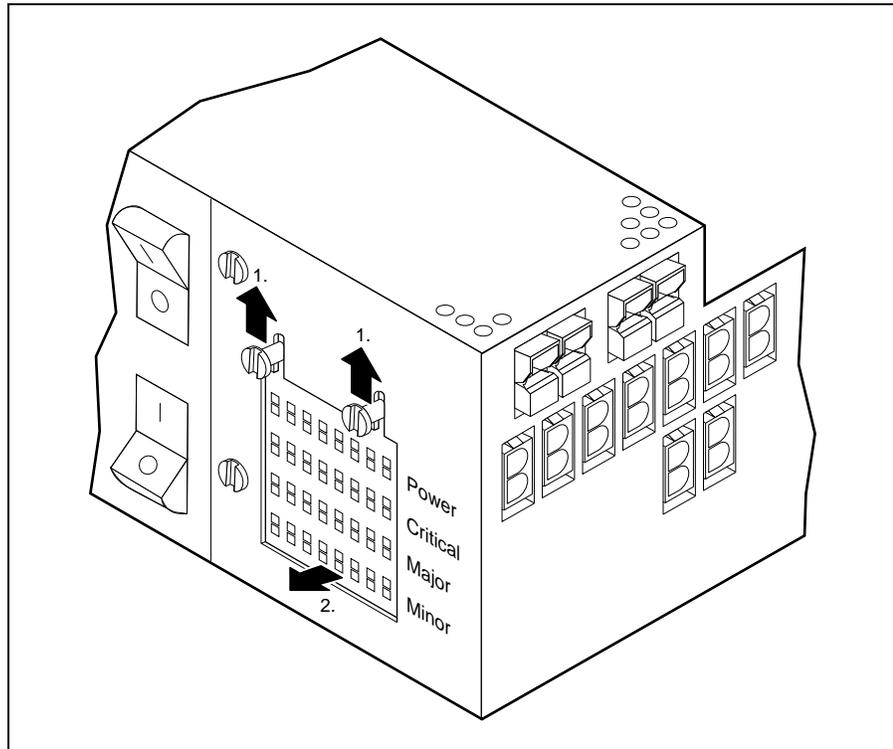
Step	Action
------	--------

- | | |
|----|---|
| 11 | Using the two retaining screws as handles, lift the LED card up and forward to engage the two screws with the slots on the top of the BIP opening (1.), as shown in Figure 5-7. |
|----|---|

Using the two screws, lever the bottom of the LED card forward until it is parallel to the faceplate of the BIP (2.), as shown following.

Figure 5-7
Engaging LED card into slots on BIP

PC-11174

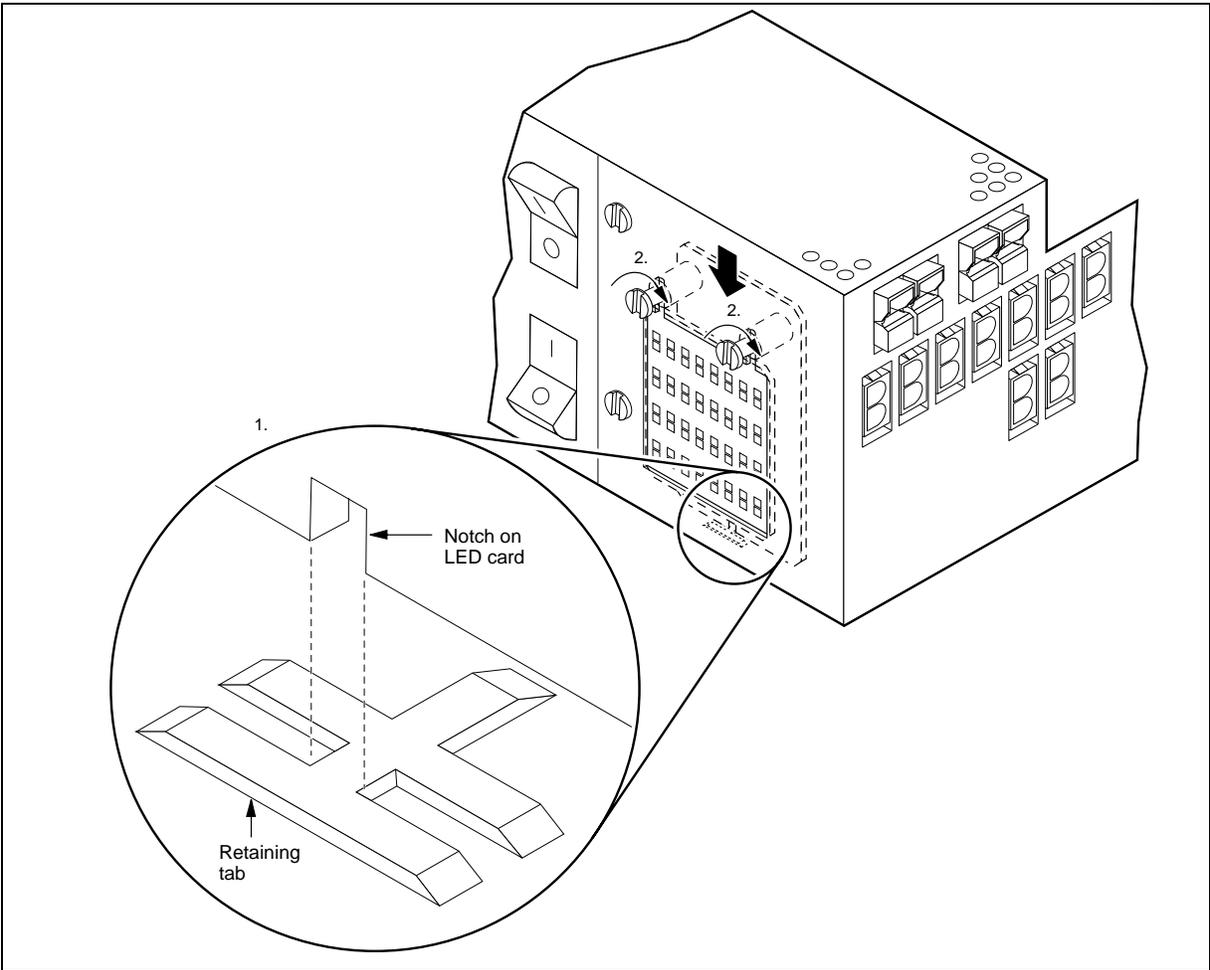


—continued—

Procedure 5-3 (continued)
NT4K1472: LED card (for NT4K14AB BIP)

Step	Action
	Note: There is a small retaining tab on the inside of the BIP, at the bottom, just behind the opening, as shown in Figure 5-8. This retaining tab mates with the notch on the bottom edge of the LED card to hold it securely in place.
12	Gently move the bottom part of the LED card around until the notch on the bottom of the card mates with the retaining tab (1.). To check that it is properly in place in the retaining tab, press inward on the bottom of the card and make sure the card does not move. The LED card is properly positioned when the front of the LED card is parallel to, and just behind, the front of the BIP.

Figure 5-8
Small retaining tab inside the BIP



PC-11175

—continued—

5-18 Replacing modules in a BIP

Procedure 5-3 (continued)

NT4K1472: LED card (for NT4K14AB BIP)

Step	Action
13	With the card properly seated in the retaining tab, use a slot screwdriver to tighten the retaining screws (shown as 2. in Figure 5-8).
14	Reinsert the NT4K64 alarm relay card, ensure that it engages with the BIP backplane, and fasten the retaining screw.
15	Test the BIP lamps by pressing the ACO/Lamp test button on the local craft access panel (LCAP). All BIP indicators and the LEDs on all shelf circuit packs should light for 30 seconds.
16	Replace the BIP cover as shown in common procedures.

—end—

Procedure 5-4

NT4K61AA: Talk battery filter card

Use this procedure to replace the talk battery filter card in the NT4K14AB BIP.

Action

Step	Action
1	Remove the BIP cover as shown in common procedures.
2	Loosen the hold-down screw on the faceplate of the talk battery filter card.
	<div style="border: 1px solid black; padding: 5px;">  <p>DANGER Risk of electric shock To avoid possible shock hazard when removing the talk battery filter card, handle the card only by the faceplate. Risk of electrical shock is no longer present after 3 minutes, at which time the internal capacitor has fully discharged.</p> </div>
	<div style="border: 1px solid black; padding: 5px;">  <p>CAUTION Risk of equipment damage Do not place the talk battery filter card on a conductive surface, as it contains a large capacitor that can discharge. Place the card on a nonconductive surface for 3 minutes until the capacitor has had a chance to fully discharge internally.</p> <p>Do not reinsert the same card until it has had a chance to fully discharge, which takes approximately 3 minutes. Reinserting a card that has not fully discharged may cause voltage transients on the talk battery leads.</p> </div>
3	Hold the talk battery filter card by its faceplate and carefully remove the card from the BIP, as shown in Figure 5-9 on page 5-20. Do not place the talk battery filter card on a conductive surface.

—continued—

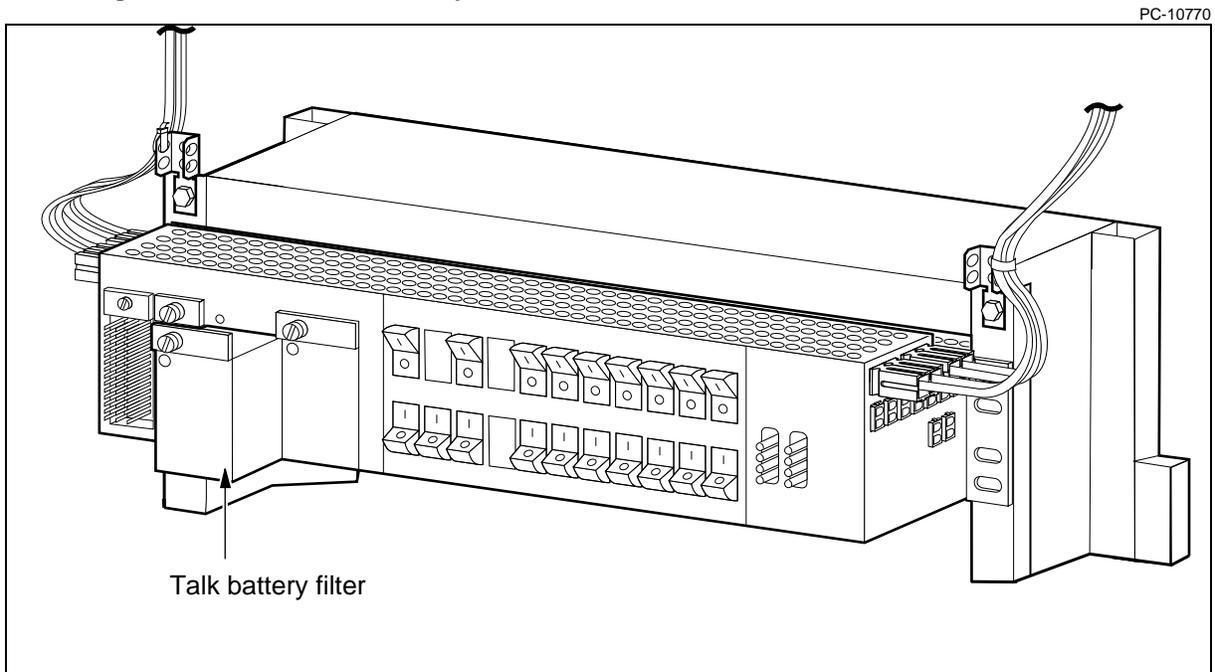
5-20 Replacing modules in a BIP

Procedure 5-4 (continued)

NT4K61AA: Talk battery filter card

Step	Action
4	Insert a replacement talk battery filter card in the BIP and fasten the card into place with hold-down screw.
5	Replace the BIP cover as shown in common procedures.

Figure 5-9
Removing the NT4K61AB talk battery filter card



—end—

Procedure 5-5

NT4K61BA: Talk battery filter card

Use this procedure to replace the talk battery filter card in the NT4K14BA BIP.

Action

Step	Action
1	Remove the BIP cover as shown in common procedures.
2	Loosen the hold-down screws on the faceplate of the talk battery filter card.
	<div style="border: 1px solid black; padding: 10px;">  <p>DANGER Risk of electric shock</p> <p>To avoid possible shock hazard when removing the talk battery filter card, handle the card only by the faceplate. Risk of electrical shock is no longer present after 10 seconds, at which time the internal capacitor has fully discharged.</p> </div>
	<div style="border: 1px solid black; padding: 10px;">  <p>CAUTION Risk of equipment damage</p> <p>Do not place the talk battery filter card on a conductive surface, as it contains a large capacitor that can discharge. Place the card on a nonconductive surface for 30 seconds until the capacitor has had a chance to fully discharge internally.</p> <p>Do not reinsert the same card until it has had a chance to fully discharge, which takes approximately 30 seconds. Reinserting a card that has not fully discharged may cause voltage transients on the talk battery leads.</p> </div>
3	Hold the talk battery filter card by its faceplate and carefully remove the card from the BIP, as shown in Figure 5-10 on page 5-22.

—continued—

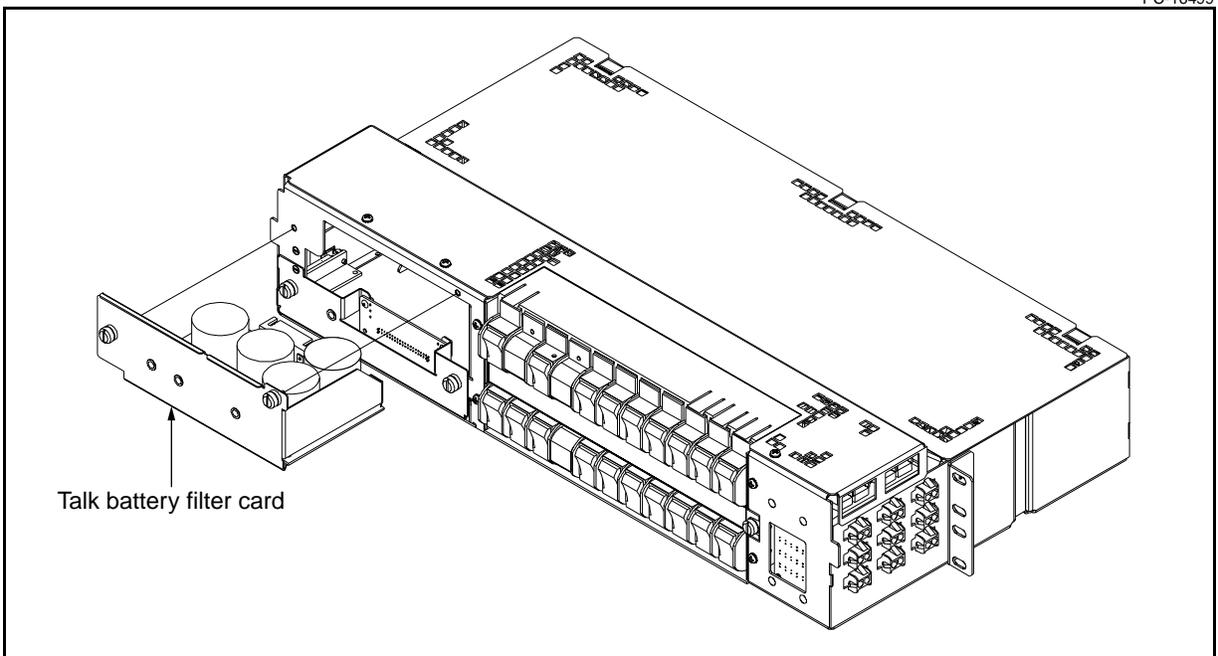
5-22 Replacing modules in a BIP

Procedure 5-5 (continued)

NT4K61BA: Talk battery filter card

Step	Action
4	Insert a replacement talk battery filter card in the BIP and fasten the card into place with the hold-down screws.
5	Replace the BIP cover as shown in common procedures.

Figure 5-10
Removing the NT4K61BA talk battery filter card



—end—

Procedure 5-6

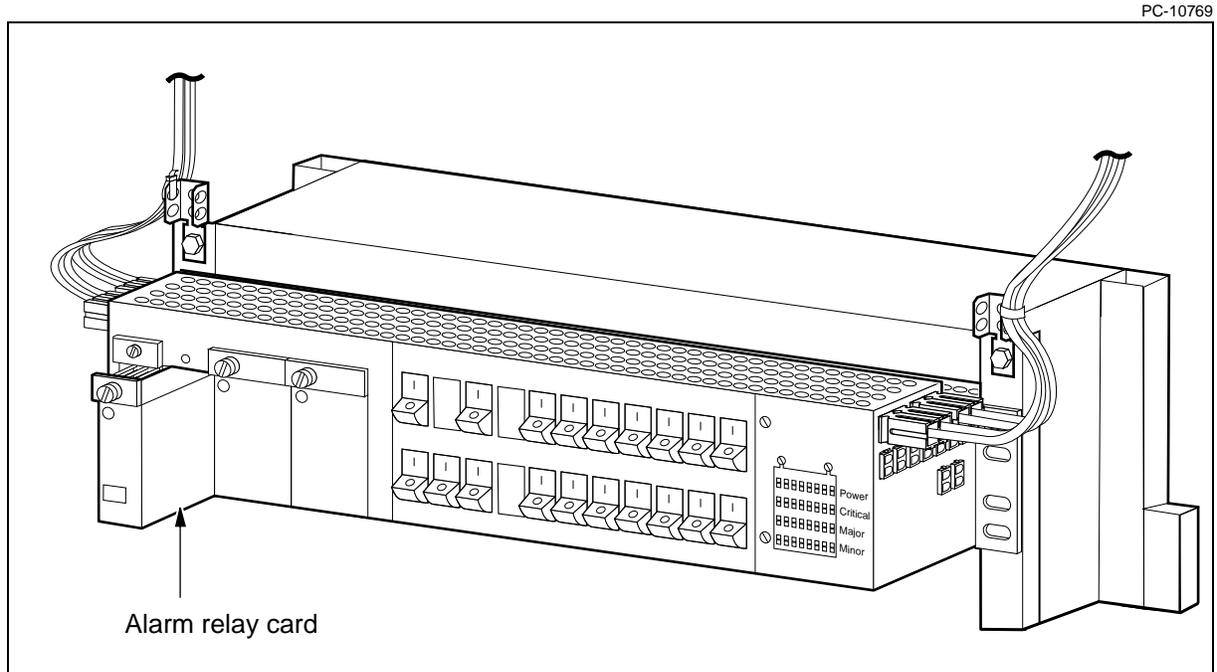
NT4K64AA: Alarm relay card

Use this procedure to replace the alarm relay card in the NT4K14AB BIP.

Action

Step	Action
1	Remove the BIP cover as shown in common procedures.
2	Loosen the hold-down screw on the faceplate of the alarm relay card.
3	Remove the card from the BIP, as shown in Figure 5-11.

Figure 5-11
Removing the NT4K14AB Alarm relay card



- 4 Insert a replacement alarm relay card in the BIP and fasten the card into place with hold-down screw.
- 5 Replace the BIP cover as shown in common procedures.

—end—

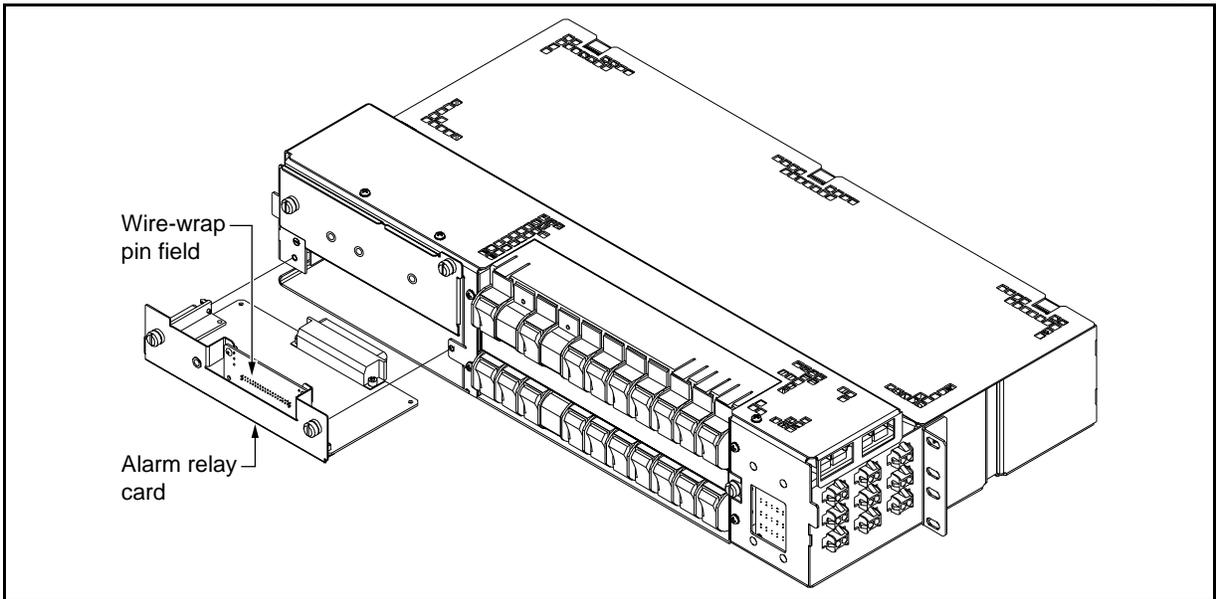
Procedure 5-7 NT4K64BA: Alarm relay card

Use this procedure to replace the alarm relay card in the NT4K14BA BIP.

Action

Step	Action
1	Remove the BIP cover as shown in common procedures.
2	Disconnect any wiring to the wire-wrap pin field inside the alarm relay card. Note: Mark each wire with its destination so proper reconnection can be made after installing the replacement alarm relay card.
3	Disconnect control cable on the left side of the BIP.
4	Loosen the hold-down screws on the faceplate of the alarm relay card.
5	Remove the card from the BIP, as shown in Figure 5-12.

Figure 5-12
Removing the NT4K64BA alarm relay card



PC-16500

- 6 Insert a replacement alarm relay card in the BIP and fasten the card into place with hold-down screws.
- 7 Reconnect all wire-wrap connections removed in step 2.
- 8 Reconnect BIP control cable disconnected in step 3.
- 9 Replace the BIP cover as shown in common procedures.

—end—

Procedure 5-8

NT7E90AA: Replacing the breaker interface panel modem

Use this procedure to replace the NT7E90AA breaker interface panel (BIP) modem as used on the NT7E56AB/BA transport bandwidth manager shelf (TBM) BIP.

Use Procedure 5-9 to replace the NT7E90BA BIP modem as used on the NT7E56CA TBM BIP.

Requirements

Before starting this procedure, you must have the following tools and materials.

Tools and materials

- 1 slotted screwdriver, 1/4 inch

Action

Step	Action
1	Remove the BIP cover, as shown in <i>Routine Maintenance Procedures</i> , 323-3001-546, in <i>Maintenance</i> , in this volume.
2	Set the modem circuit breaker to the open (up) position. Figure 5-13 on page 5-27 shows the opened and closed position for the circuit breakers.
3	Using the 1/4-inch slotted screwdriver, release the locking screw located in the center of the front section of the BIP (see Figure 5-13 on page 5-27) by turning it 90 degrees counterclockwise. Swing open the right BIP door.
4	Using the 1/4-inch slotted screwdriver, release the locking screw that secures the left BIP door, by turning it 90 degrees counterclockwise. Swing open the left BIP door.
5	Disconnect the Molex power cable, BIP modem cable, and telephone cable from the modem faceplate. See Figure 5-13 on page 5-27 for cable positions.
6	Using the 1/4-inch slotted screwdriver, release the fastening screw that secures the modem to the bracket in the BIP by turning it 90 degrees counterclockwise. Slide the modem out from the BIP.
7	Insert the replacement modem into the BIP and secure it by turning the modem fastening screw 90 degrees clockwise.

—continued—

5-26 Replacing modules in a BIP

Procedure 5-8 (continued)

NT7E90AA: Replacing the breaker interface panel modem

Step	Action
8	Reconnect the BIP modem cable, telephone cable, and Molex power cable to the modem faceplate.
9	Close the left BIP door and fasten the locking screw by turning it 90 degrees clockwise.
10	Close the right BIP door and fasten the locking screw by turning it 90 degrees clockwise.
11	Reset the modem circuit breaker to the closed (down) position.
12	Replace the BIP cover, as shown in <i>Routine Maintenance Procedures</i> , 323-3001-546, in <i>Maintenance</i> , in this volume.

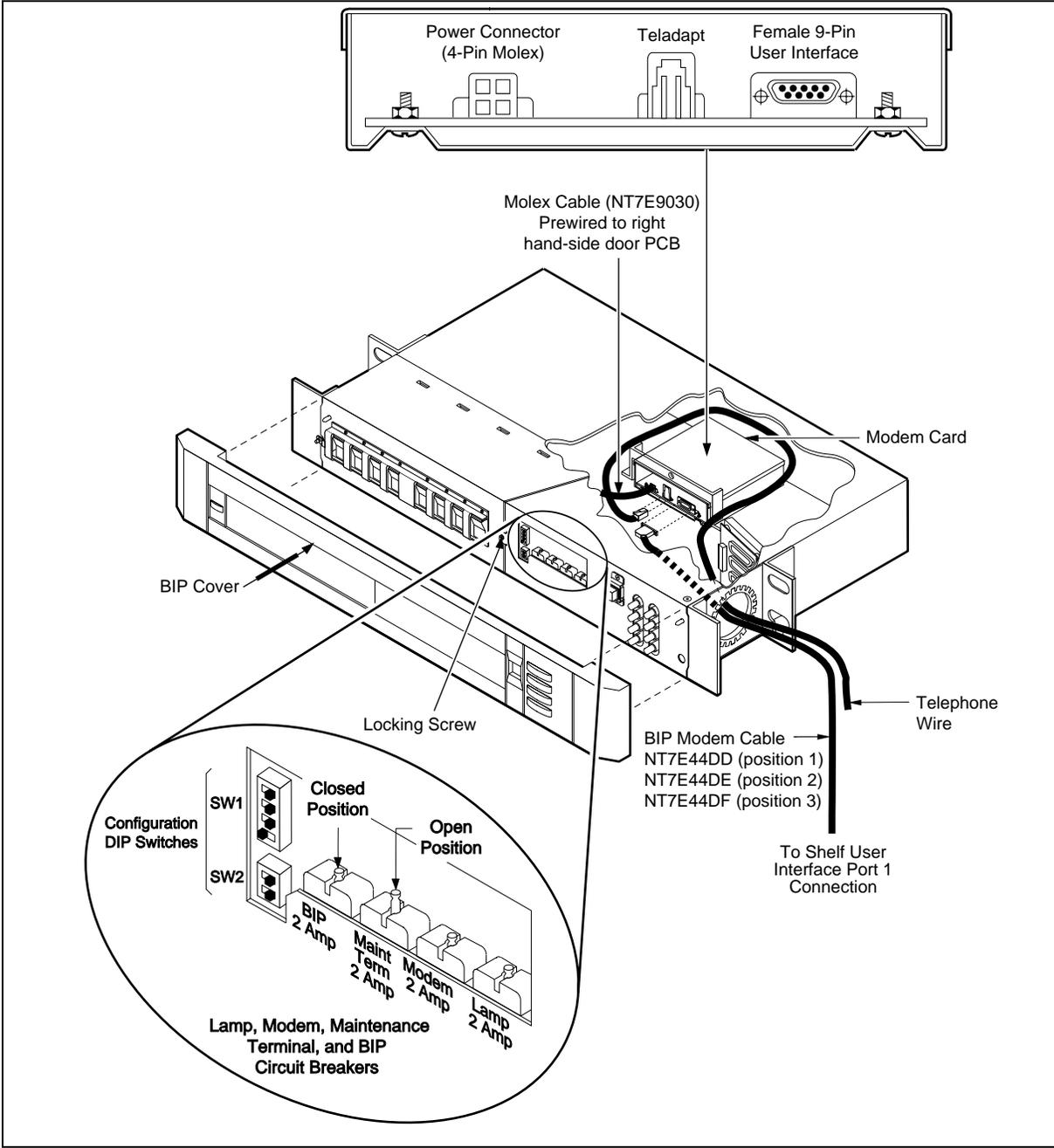
—continued—

Procedure 5-8 (continued)
NT7E90AA: Replacing the breaker interface panel modem

Step Action

Figure 5-13
Replacing and reconnecting the modem mounted inside the NT7E56AB/BA TBM BIP

PC-10642



—end—

Procedure 5-9

NT7E90BA: Replacing the breaker interface panel modem

Use this procedure to replace the NT7E90BA breaker interface panel (BIP) modem as used on the NT7E56CA transport bandwidth manager shelf (TBM) BIP.

Use Procedure 5-8 to replace the NT7E90AA BIP modem as used on the NT7E56AB/BA TBM BIP.

Requirements

Before starting this procedure, you must have the following tools and materials.

Tools and materials

- 1 slotted screwdriver, 1/4 inch
- 1 nut driver, 3/16 inch
- 1 #2 Phillips screwdriver
- 1 work surface

Action

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



CAUTION

Risk of electrostatic discharge (ESD) and equipment damage

Before touching a shelf, ground yourself with an antistatic wrist strap.

- 1 Remove the snap-on BIP cover, as shown in *Routine Maintenance Procedures*, 323-3001-546, in *Maintenance*, in this volume.
- 2 Disconnect the BIP modem cable, telephone (Teladapt) cable, and shelf alarms cable connections on the right side of the BIP.
- 3 Using the 1/4-in. slotted screwdriver, release the locking screw located in the center of the front section of the BIP by turning it 90 degrees counterclockwise. Swing open the right BIP door. (See Figure 5-14 on page 5-30.)
- 4 Remove fuses BIPA and BIPB located in the center front section of the BIP.
- 5 Disconnect the flat ribbon cable that runs between the display card and the logic pack on the logic pack face plate.

—continued—

 Procedure 5-9 (continued)

NT7E90BA: Replacing the breaker interface panel modem

Step	Action
6	Using a 1/4 in. slotted screwdriver, release the mounting screws that secure the logic pack to the BIP chassis. See Figure 5-14 on page 5-30.
7	Pull the logic pack forward approximately 2 inches.
8	Remove both cable harness connections on the logic pack.
9	Remove the logic pack from the BIP and place it on the work surface.
10	Use a 3/16 in. nut driver to remove the two mounting nuts from the 9-pin modem connector.
11	Use a #2 Phillips screwdriver to remove the mounting screws that hold the modem pack to the logic pack.
12	Disconnect the power cable between the packs.
13	Mount the new modem pack to the logic card with mounting screws.
14	Connect the power cable between the packs.
15	Fasten the two mounting nuts to the 9-pin modem connector.
16	Slide the logic pack into the BIP chassis, leaving a 2-inch space.
17	Replace both cable harness connections on the logic pack.
18	Push the logic pack completely into the BIP chassis.
19	Turn and finger tighten the logic pack mounting screws. See Figure 5-14 on page 5-30.
20	Replace the ribbon cable connections on the logic pack.
21	Replace fuses BIPA and BIPB.
22	Replace the BIP modem cable, shelf alarms cable, and telephone (Teladapt) cable.
23	Close the right BIP door and fasten the locking screw by turning it 90 degrees clockwise.
24	Replace the snap-on BIP cover, as shown in <i>Routine Maintenance Procedures</i> , 323-3001-546, in <i>Maintenance</i> , in this volume.

—continued—

5-30 Replacing modules in a BIP

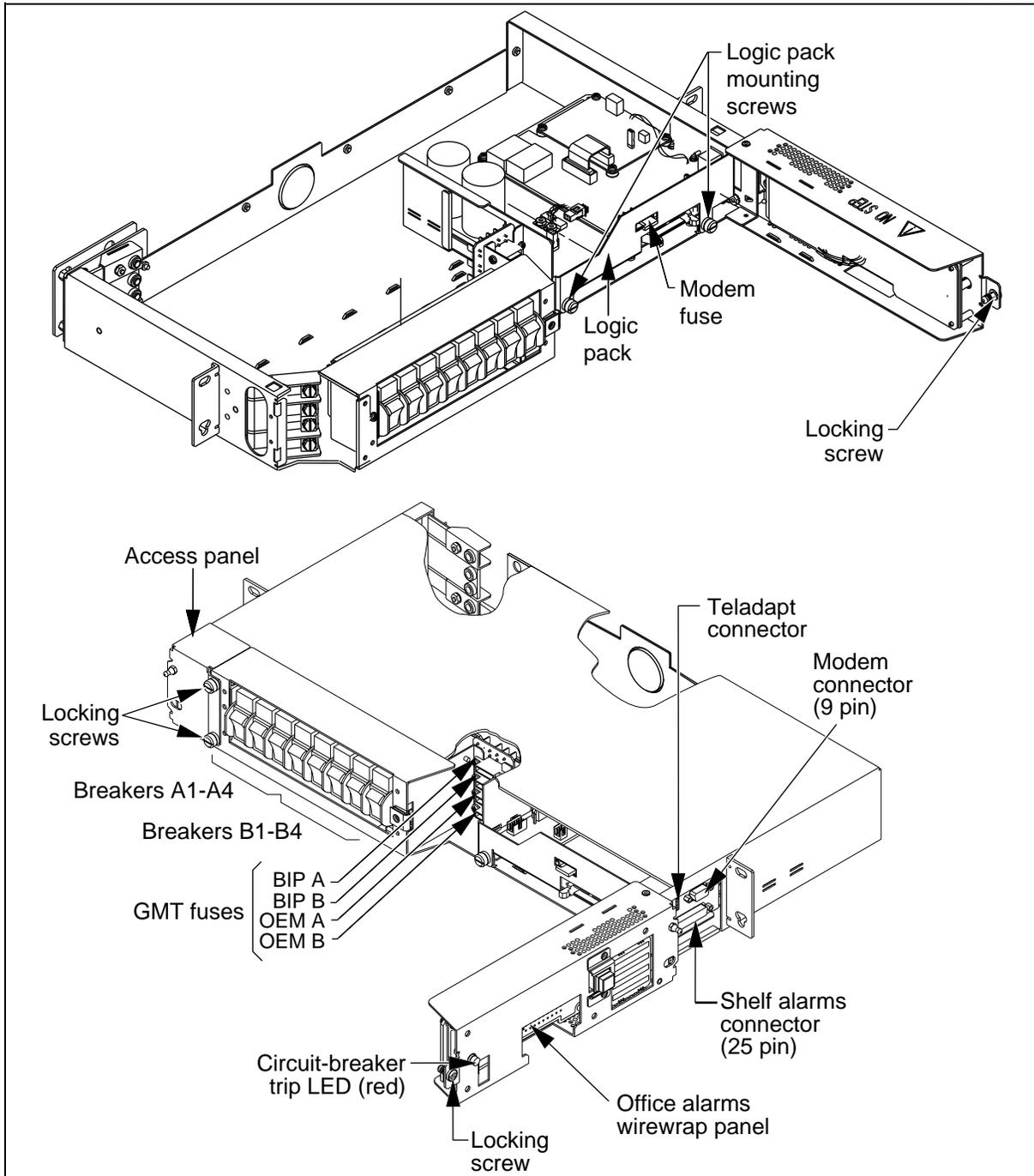
Procedure 5-9 (continued)

NT7E90BA: Replacing the breaker interface panel modem

Figure 5-14

Replacing and reconnecting the modem mounted inside the NT7E56CA TBM BIP

PC-16266



—end—

Procedure 5-10

NT7E5604: TBM BIP display circuit pack

Use this procedure to replace the NT7E5604 display circuit pack in a TBM breaker interface panel (BIP).

Note: The NT7E5604 circuit pack consists of two subassemblies, the BIP lamp circuit pack, NT7E5606 Rel 01, and the BIP control circuit pack NT7E5608 Rel 01.



CAUTION

Risk of bulb damage

Do not replace the ACO lamps with the alarm lamps. They work on different voltages.



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.

Requirements

- small step ladder or stool is required to elevate you to a comfortable working position in front of the BIP
- 3/8-inch slot screwdriver

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

- | | |
|---|---|
| 1 | Perform a lamp test, and verify that the network element has no alarms. Alarm points include: <ul style="list-style-type: none"> • all alarms on the display circuit pack • the ACO lamp • the circuit breaker LED • all alarm points that are connected to the office alarm system |
|---|---|

—continued—

5-32 Replacing modules in a BIP

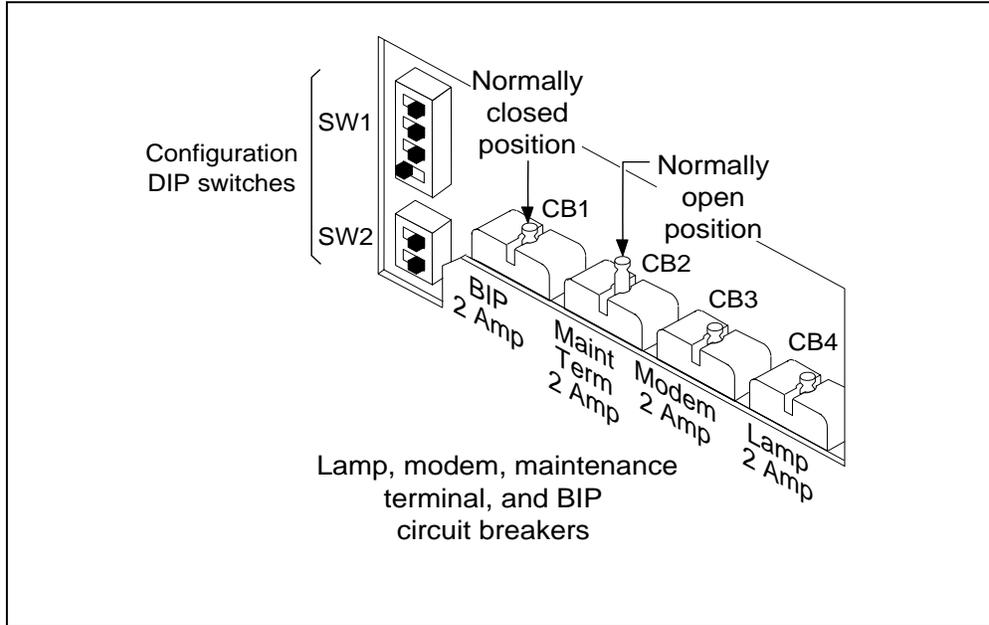
Procedure 5-10 (continued)

NT7E5604: TBM BIP display circuit pack

Step	Action
2	Remove the snap-on cover from the BIP panel.
3	Record the switch settings on the DIP switches SW1 and SW2, as shown in Figure 5-15 and Figure 5-16 on page 5-33. These settings are used to set up the new circuit packs. For additional information, see <i>Bay in Central Office Installation Manual—TBM</i> , 323-3001-202.

Figure 5-15
BIP display circuit pack switches

PC-2289



- 4 Disable the switch settings for CB1 (BIP), CB2 (Maint Term), CB3 (Modem), and CB4 (Lamp) on DIP switch SW1 by pulling up the red plungers.
- 5 Locate the locking screw in the center of the front section of the BIP and release it by turning it counterclockwise.
- 6 Open the right-hand door.

—continued—

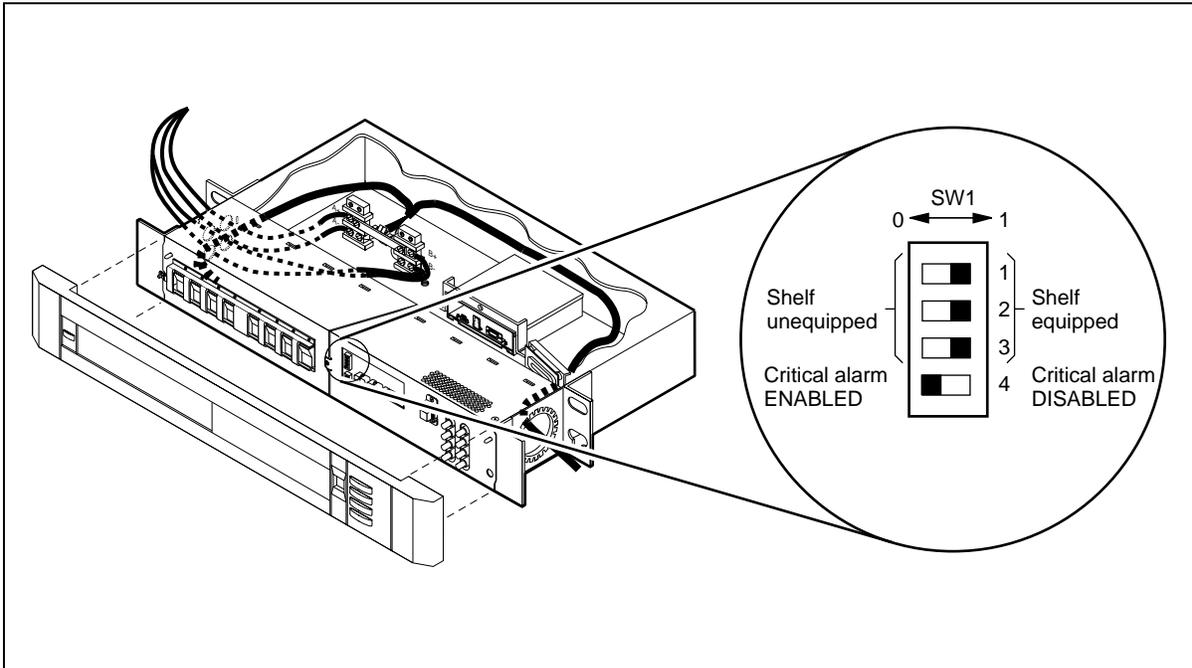
Procedure 5-10 (continued)

NT7E5604: TBM BIP display circuit pack

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

Figure 5-16
DIP switch settings for SW1

PC-11337



- 7 Locate the display circuit pack that is mounted on the back of the panel (see Figure 5-17 on page 5-34 and Figure 5-18 on page 5-36).
- 8 Remove the power cable from connector P4.
- 9 Remove the ribbon cable from connector P1.
- 10 Remove the cable assembly from connector P3.
- 11 Disconnect the electrical connector from the ACO switch.

Note: Do not remove the ribbon cable that terminates at P2. This cable is used to interconnect the BIP control circuit pack and the BIP lamp circuit pack on the new NT7E5604 circuit pack.

—continued—

5-34 Replacing modules in a BIP

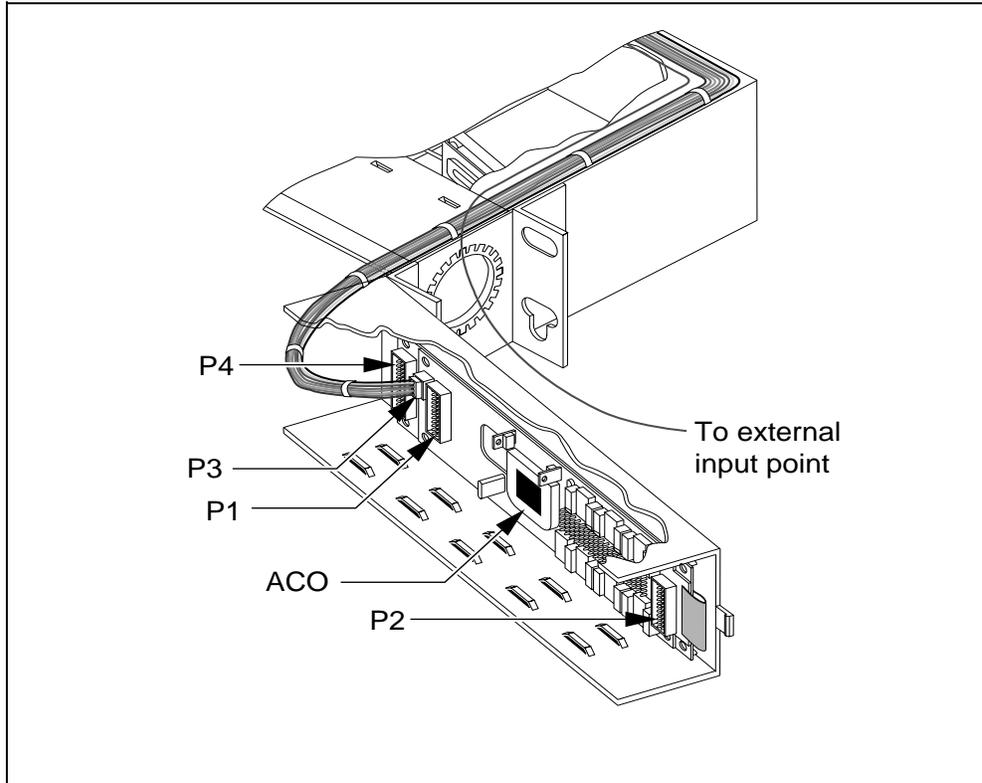
Procedure 5-10 (continued)

NT7E5604: TBM BIP display circuit pack

Step Action

Figure 5-17
Location of connectors on the BIP display circuit pack

PC-2288



—continued—

 Procedure 5-10 (continued)

NT7E5604: TBM BIP display circuit pack

Step	Action
12	Unclip the ACO switch wire harness from within the right-hand door compartment.
13	From the front panel side of the door, use a screwdriver to compress the ACO switch fastening clips between the switch mounting bracket and the door, as shown in Figure 5-17 on page 5-34 and Figure 5-18 on page 5-36.
14	Ease the ACO switch from the bracket.
15	Record the wire-wrap connections to the office alarm wire-wrap board on the display circuit pack.
16	Disconnect the office alarm wiring harness from the wire-wrap board.
17	Remove the display circuit pack by removing the four screws that secure the display circuit pack to the door. Then, slide the display circuit pack out of the right-hand door compartment.
18	Install the new circuit pack by sliding it in the right-hand door compartment and secure it using the four mounting screws.
19	Close the CB1, CB3, and CB4 switches by pushing in the red plungers (see Figure 5-15 on page 5-32). If you are using the modem, ensure that its plunger (CB3) is pushed in all the way.
20	Install the office alarm wire-wrap connections to the display circuit pack by connecting the office alarm wiring harness to the circuit pack.
21	Fasten the cable ties to the upper and lower lances on the door compartment.
22	Connect the electrical plugs to the new display circuit pack in the following order (see Figure 5-17 on page 5-34). <ol style="list-style-type: none"> a. Insert the power connector to P4. b. Connect the cable assembly to P3. c. Connect the ribbon cable to P1. d. Connect the ACO wire harness.
23	Configure the DIP switch settings on SW1 and SW2 on the new display circuit pack as recorded in step 3.
24	Close the BIP door and fasten it by turning the locking screw clockwise.
25	Replace the BIP snap-on cover.

—continued—

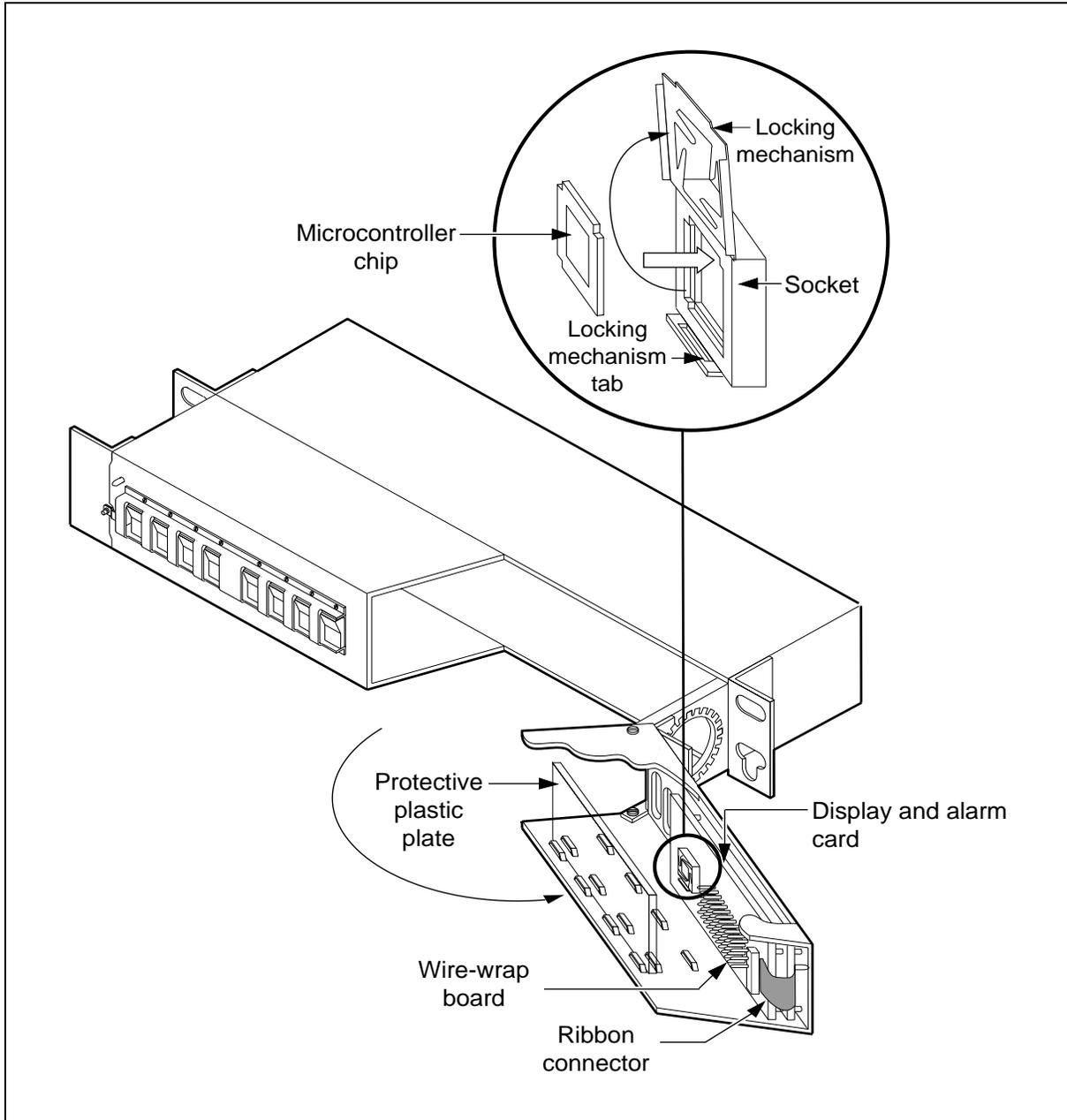
5-36 Replacing modules in a BIP

Procedure 5-10 (continued)
NT7E5604: TBM BIP display circuit pack

Step Action

Figure 5-18
BIP and alarm circuit pack rear view

PC-2287



—end—

Replacing an ABM cooling unit

This chapter provides procedures for replacing the NT4K17 cooling module, the air filter in the NT4K18AA cooling unit, the 8-fan cooling unit NT4K18CA, and the NT4K1740 fan unit.

Note: Maintenance procedures for replacing AccessNode Express cooling units are documented in the *AccessNode Express Maintenance Guide*, 323-3051-211.

Chapter contents

In the following table look up the item to be replaced, and proceed to the specified page. The following table lists items by procedure number.

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

Procedure	Description	See
6-1	Replacing an NT4K17 cooling module	page 6-2
6-2	Replacing an NT4K18AA air filter	page 6-6
6-3	Replacing an NT4K18CA 8-fan cooling unit	page 6-7
6-4	Replacing an NT4K1740 fan unit	page 6-11

Procedure 6-1 Replacing an NT4K17 cooling module

Use this procedure to replace an NT4K17 cooling module in the NT4K18AA or NT4K18BA cooling unit.

Action

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



CAUTION

Damage to locking screws and the finish of the equipment covers

Do not use a coin to turn the locking screws on the equipment covers, as it may damage the locking screws and the finish on the covers. Only use a 1/4 in. slot screwdriver to turn the locking screws.

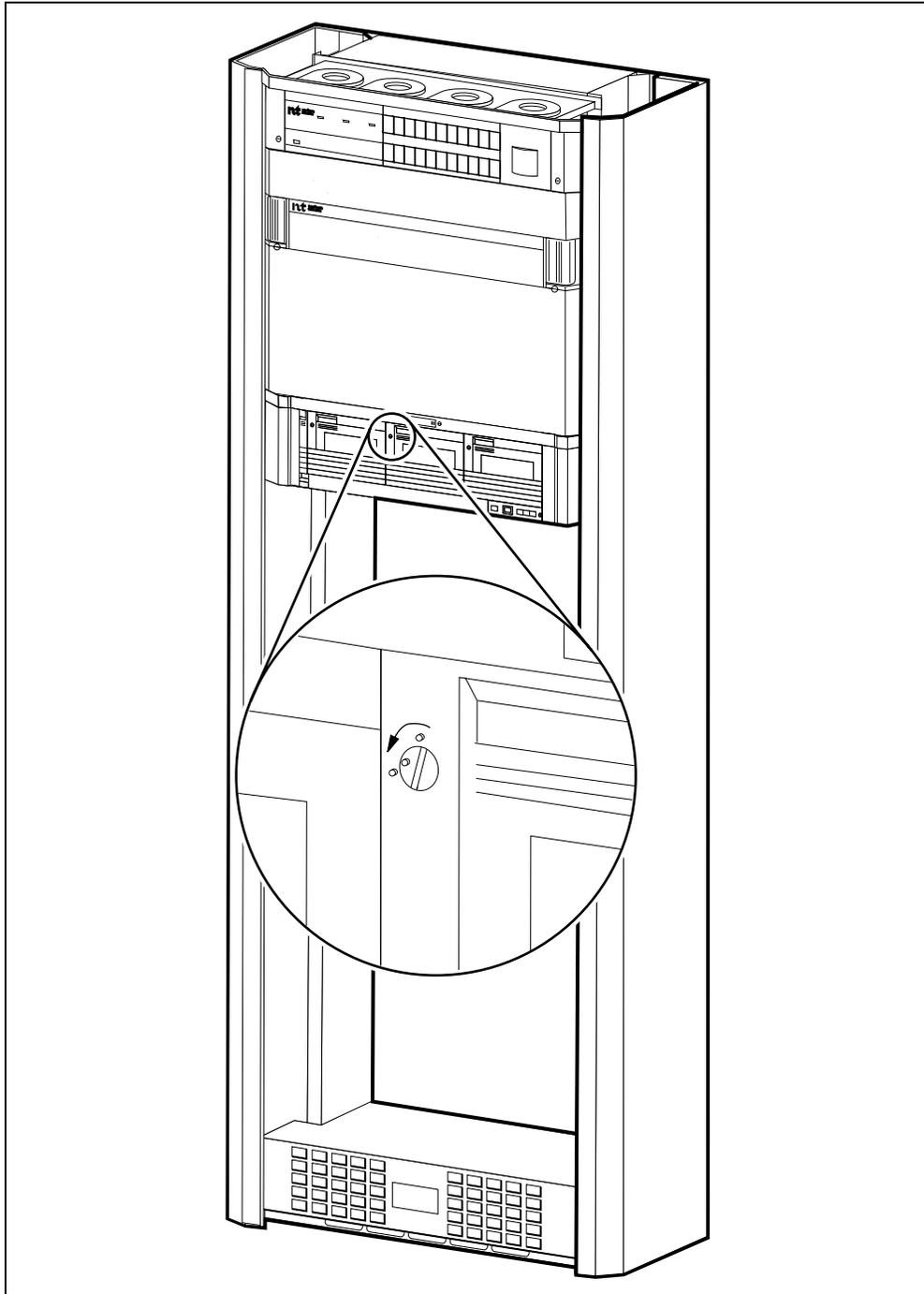
- 1 Use a 1/4-inch slot screwdriver to unlock the cooling module handle by rotating the locking screw until the raised dots are no longer aligned. The location of the locking screw is shown in Figure 6-1.

—continued—

Procedure 6-1 (continued)
Replacing an NT4K17 cooling module

Figure 6-1
Cooling module locking screw (shown in locked position)

PC-10361



—continued—

6-4 Replacing an ABM cooling unit

Procedure 6-1 (continued)

Replacing an NT4K17 cooling module

Step Action



DANGER

Risk of personal injury

Keep your fingers away from the fan blades. The fan blades may still be rotating and can cause bodily harm. Wait until the fan blades have stopped rotating before proceeding.



DANGER

Heavy equipment

The cooling module is heavy. Support the module with one hand while pulling with the other.

- 2 Grasp the handle on the front of the cooling module and pull straight out until the module just disengages from the backplane, shown in Figure 6-2.
- 3 Use both hands to carefully pull the module all the way out of the cooling unit, as shown in Figure 6-2.
- 4 Insert a replacement cooling module into the cooling unit and press firmly to engage the module into the cooling unit backplane. Rotate the locking screw to the locked position.

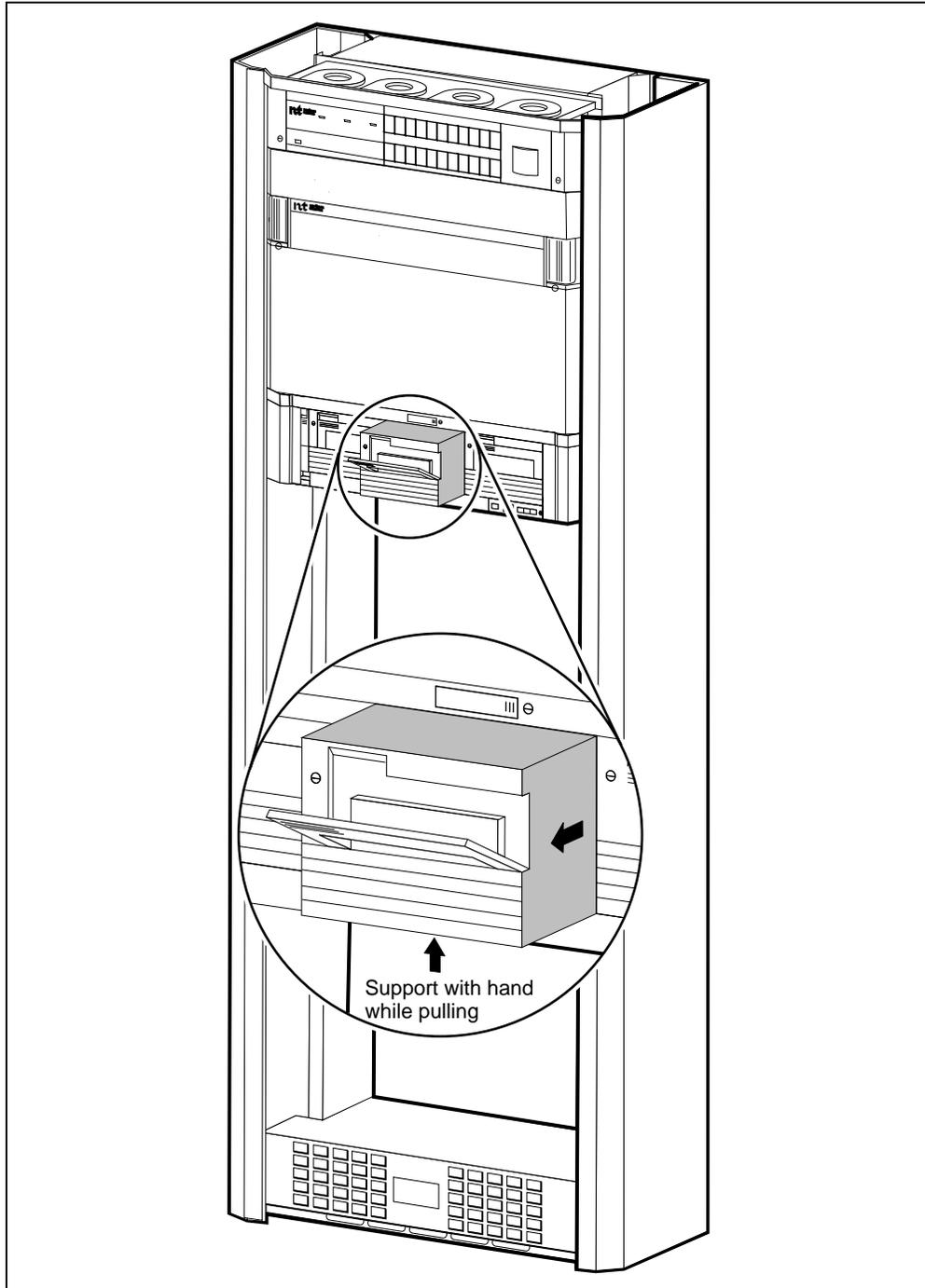
As the module engages the backplane, the red LED lights very briefly to indicate connection.

—continued—

Procedure 6-1 (continued)
Replacing an NT4K17 cooling module

Figure 6-2
Removing a cooling module

PC-10388



—end—

Procedure 6-2 Replacing an NT4K18AA air filter

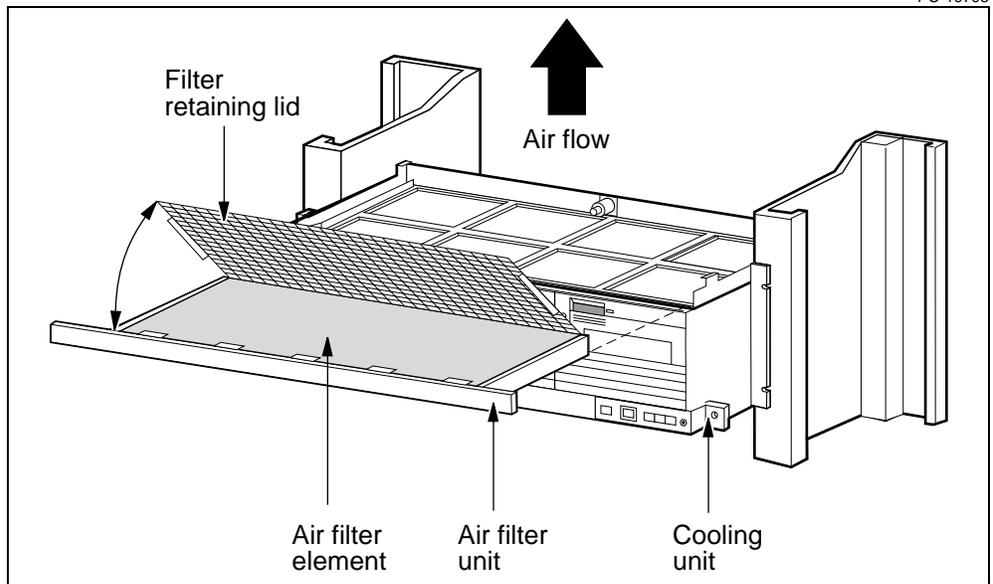
Use this procedure to change the air filter every 6 months, or sooner if required. The air filter unit is located at the top of the cooling unit, and under the bottom-most shelf in the frame. The frequency of replacement depends on the environmental conditions in the equipment location. It is up to the customer to determine the frequency.

Note: Although the illustration in this procedure shows the air filter located at the top of the NT4K18AA cooling unit, the procedure is the same for the air filter located under the bottom-most shelf in the frame.

Action

Step	Action
1	Disengage the air filter unit from its locking mechanism by quickly pushing and releasing the front face of the air filter unit.
2	Remove the air filter unit by pulling it outwards.
3	Lift the filter retaining lid, remove the old air filter element, and replace it with a new air filter element. Note: Make sure the new air filter element is positioned correctly for the air flow (per air filter manufacturers' instructions).
4	Close the filter retaining lid, and reinsert the air filter unit into the shelf until it locks into place, as shown in Figure 6-3.

Figure 6-3
Replacing the air filter



—end—

Procedure 6-3

Replacing an NT4K18CA 8-fan cooling unit

Use this procedure to replace the NT4K18CA 8-fan cooling unit.

Action

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

**CAUTION****Risk of overheating**

Prolonged use of the system while replacing the 8-fan cooling unit may cause the equipment in the bay to overheat.

Perform replacement of cooling unit in a timely manner. Review the steps of this procedure to insure all tools and parts necessary to complete this task are available before beginning the procedure.

- 1 Use a Phillips head screwdriver to remove the four mounting screws on the Local craft access panel (LCAP) located directly below the cooling unit (CU). Pull LCAP straight out of the bay. Position the LCAP on the side of the bay with the cables still secured for support.
- 2 Open circuit breakers CU-1 and CU-2 located on the Breaker Interface Panel (BIP) located at the top of the bay.
- 3 Remove the two cable covers from each side of the CU to gain access to the mounting screws as shown in Figure 6-4 on page 6-8.

—continued—

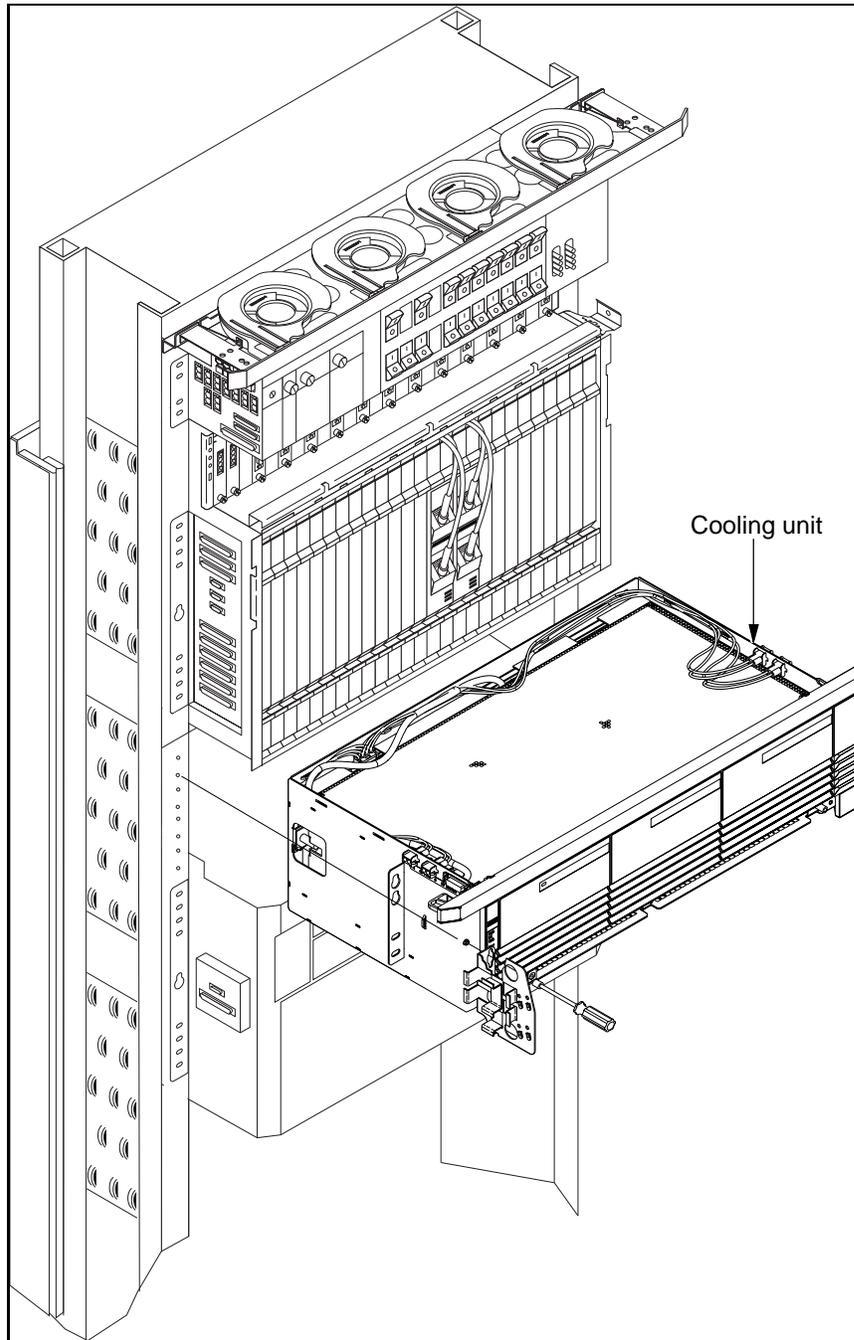
6-8 Replacing an ABM cooling unit

Procedure 6-3 (continued)

Replacing an NT4K18CA 8-fan cooling unit

Figure 6-4
Replacing the 8-fan cooling unit

PC-16452



—continued—

Procedure 6-3 (continued)

Replacing an NT4K18CA 8-fan cooling unit

- | Step | Action |
|------|---|
| 4 | Remove the two power connectors (CU A and CU B) and the interface connector (CU IF) from the left side of the CU. |



DANGER

Heavy equipment

The CU is heavy. Support the CU with one hand while performing step 5 with the other.

- Note:** If the removed CU has two NT4K13CA mini-variable optical attenuator (MVOA) storage assemblies installed remove them for installation on the replacement CU. See Figure 6-5 for MVOA removal steps.
- | | |
|---|---|
| 5 | Use a flat blade screwdriver or 7/16 nutdriver to remove the four #12 slotted hex-head mounting screws securing the CU to the bay. Pull the CU straight out of the bay. |
| 6 | Install replacement CU into the bay using the four mounting screws. Install the MVOA storage assemblies over the mounting screws and push downward. Fully tighten the four mounting screws. |
| 7 | Install the three connectors (CU A, CU B, and CU IF) on the left side of the CU. |

—continued—

6-10 Replacing an ABM cooling unit

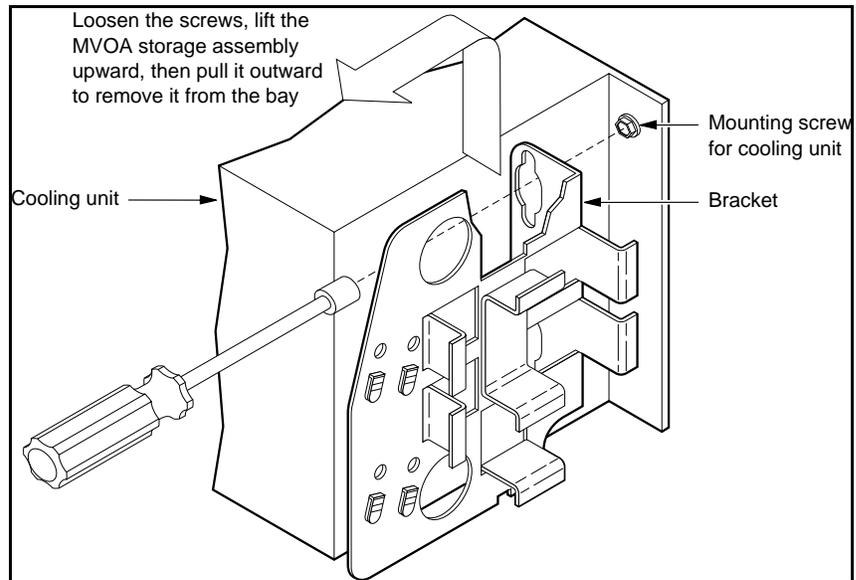
Procedure 6-3 (continued)

Replacing an NT4K18CA 8-fan cooling unit

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

Figure 6-5
MVOA storage assembly removal

PC-11015



- 8** Install the LCPD below the CU and secure with the four Phillips head screws.
- 9** Close circuit breakers CU-1 and CU-2 on the BIP at the top of the bay. The red LED on the CU lights briefly indicating proper connection.
- 10** Remove the Quick Reference Guide (QRG) from the carrier on the left side of the removed CU and install in the replacement CU carrier.

—end—

Procedure 6-4

Replacing an NT4K1740 fan unit

Use this procedure to replace an NT4K1740 fan unit used in an NT4K17CA Cooling Unit.

Note: The NT4K17CA Cooling Unit is only used on the multiple ABMs in a bay configuration NT4K03CA.

Action

Step	Action
1	Open circuit breaker CU-2 located on the Breaker Interface Panel (BIP) located at the top of the bay.
2	Remove the baffle from the front of the cooling unit by pulling it straight out.
3	Remove the three phillips-head screws from the fan unit. See Figure 6-6.
<div style="border: 1px solid black; padding: 10px; display: inline-block;">  <p>DANGER Risk of personal injury Keep your fingers away from the fan blades. The fan blades may still be rotating and can cause bodily harm. Wait until the fan blades have stopped rotating before proceeding.</p> </div>	
4	Slowly pull fan unit forward far enough to remove the cable assembly on the right side of the fan unit.
5	Pull the fan unit out of the cooling unit chassis.
6	Install the new NT4K1740 fan unit into the cooling unit chassis.
7	Secure the fan unit with the three phillips-head screws removed in step 3.
8	Connect the cable assembly to the right side of the fan unit.
9	Install the baffle on the front of the cooling unit.
10	Close the circuit breaker CU-2 on the BIP.

—continued—

6-12 Replacing an ABM cooling unit

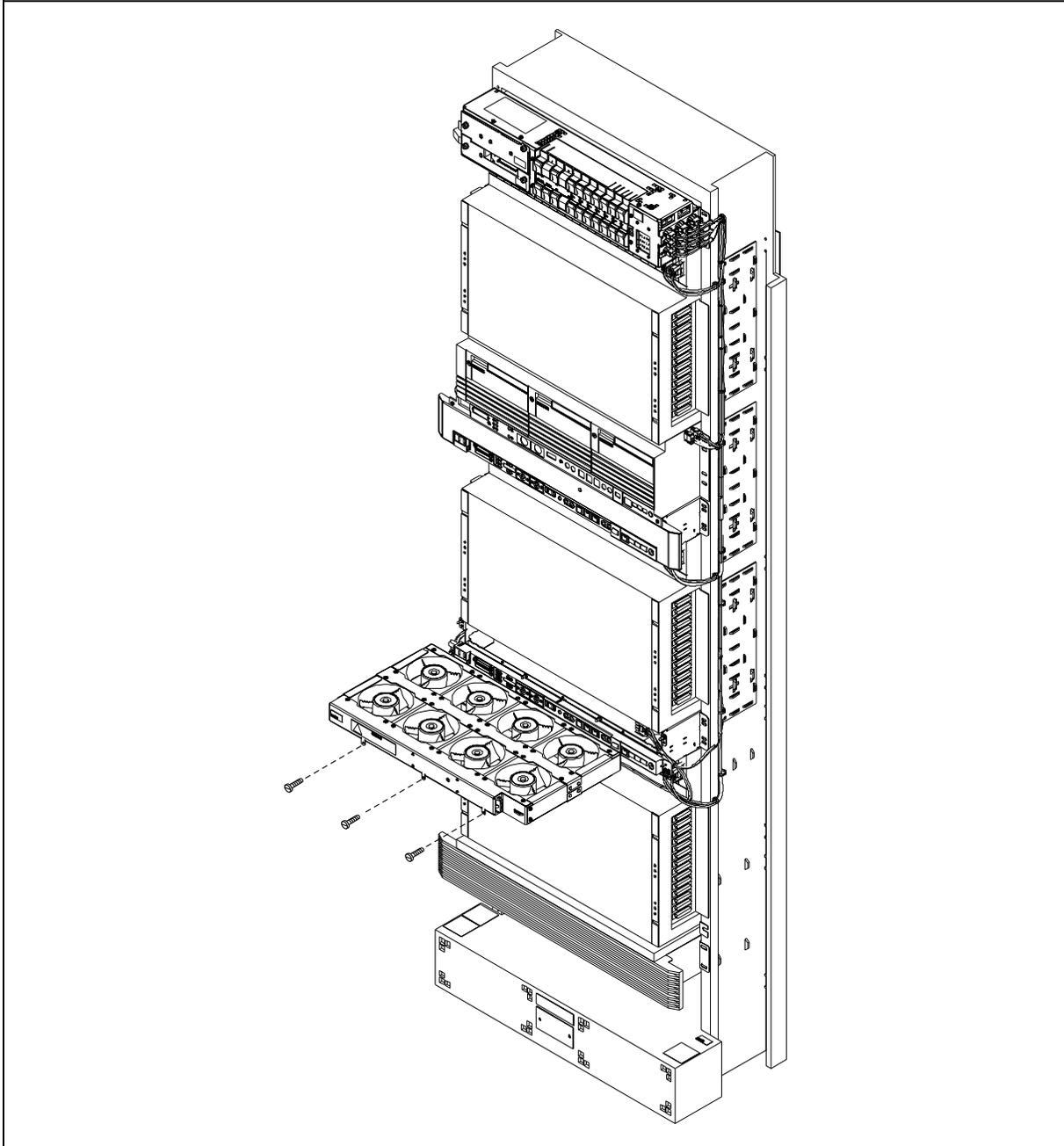
Procedure 6-4 (continued)

Replacing an NT4K1740 fan unit

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

Figure 6-6
Replacing the NT4K1740 fan unit

AN-1054



—end—

Replacing an OPC module

This chapter provides procedures for replacing the primary or backup operations controller (OPC) module. Replacement is done only when a module fails. It is a procedure with the potential to destroy data, so make sure that the data on the OPC has been backed up to tape.

Chapter contents

In the following table, look up the task you are required to perform, and then proceed to the page specified.

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

Task	See
Verification of an OPC's software release	page 7-2
Replacing the primary OPC (operational backup OPC present)	page 7-4
Replacing the primary OPC (without a backup OPC)	page 7-13
Replacing the backup OPC (with a spare equipped with a tape drive)	page 7-21
Initializing the replacement OPC hard disk	page 7-30

Procedure 7-1

Verification of an OPC's software release

Use this procedure to determine if the load currently running on your system can be installed on the spare OPC.

Action

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

The following steps determine the OPC software version which is running in this span of control and on the spare OPC. If you are certain that you know the software version that is running on the span of control of the current system (for example, from your records), you may skip to step 12.

Determine OPC software version on current system

- 1 Connect a VT100-compatible terminal to the user interface port at the NE shelf where the OPC has to be replaced. If you do not know how to do this, see the procedures in *Data Administration Procedures*, 323-3001-304, in *Operations, Administration, and Provisioning*, Volume 4A.
- 2 Log in to the network element with the **admin** userID. If you do not know how to do this, see the procedures in *Data Administration Procedures*, 323-3001-304, in *Operations, Administration, and Provisioning*, Volume 4A.
- 3 When the main menu screen of the NE user interface appears, enter the following command to log in to the active OPC:
rlogin opc↵
The screen will clear and the OPC login prompt (login:) appears.
If the primary is not functional and there is no backup this command will not work. Look up the software version in your records and skip to step 11.
- 4 Log in to the active OPC using the **slat** userID.
The User Session Manager appears.
- 5 Move to the OPC Status tool, and select it by pressing **Ctrl_A** (or Keypad **0**).
The OPC status window appears.
- 6 Record the contents of the **SW Version** field and the **OPC name** field.
- 7 Display the User Session Manager, by pressing **Ctrl_T 0**.
- 8 Tab to the **Logout** button, and select it by pressing **Ctrl_A** (or Keypad **0**).
A confirmation dialog appears.
- 9 Tab to the **Logout** button, and select it by pressing **Ctrl_A** (or Keypad **0**).
The User Session Manager disappears, and the NE user interface prompt (>) appears.

—continued—

Procedure 7-1 (continued)

Verification of an OPC's software release

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

10	Log out from the NE user interface session by entering: logout ↵
-----------	--

The NE user interface login prompt appears.

11	Disconnect the VT100 from the NE user interface port.
-----------	---

Determine that the software is the same load for both the current system and load tape

12	Ensure that the tape software release is the same as the software version of the span of control. This can be found on the back cover of the tape case.
-----------	---

—end—

Procedure 7-2

Replacing the primary OPC (operational backup OPC present)

Use this procedure to remove and replace the primary OPC module in situations where a backup OPC is operational. This procedure cannot be used during a software upgrade. It is assumed that the original primary OPC has failed and needs to be replaced.

Requirements

Before carrying out this procedure, you must do the following:

- Have a replacement (or spare) OPC equipped with a tape drive.
- Obtain the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about halfway back. The serial number is next to the bar code.
- Connect a VT100-compatible terminal to OPC port 1 of the network element at the primary OPC site.
- Have an operational backup OPC.
- Have a tape containing AccessNode software that is the same as the software identified in Procedure 7-1 for the primary OPC.

Note: In some of the following steps, you must execute UNIX commands. Type **bolded** text exactly as shown at the “opc>” prompt. Press the return key when you see the ↵ character.



CAUTION

Electrostatic sensitive devices

Electrostatic sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Action

Step	Action						
1	<p>Attempt to log in to the primary OPC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If you</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>can log in</td> <td>go to step 2</td> </tr> <tr> <td>cannot log in</td> <td>go to step 3</td> </tr> </tbody> </table> <p>Note: Before you remove the OPC module, check to make sure that the disk access LED is not blinking.</p>	If you	Then	can log in	go to step 2	cannot log in	go to step 3
If you	Then						
can log in	go to step 2						
cannot log in	go to step 3						
2	<p>Shut down the primary OPC. If you do not know how to do this, see the procedures in <i>Data Administration Procedures</i>, 323-3001-304, in <i>Operations, Administration, and Provisioning</i>, Volume 4A.</p>						
3	<p>Physically remove the primary OPC from the shelf.</p>						
4	<p>Note the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about halfway back. The serial number is next to the bar code.</p>						
5	<p>Insert the replacement OPC in place of the primary.</p> <p>Note: The replacement OPC may take up to 15 minutes to initialize. When it is ready, the login prompt (login:) appears on the terminal connected to OPC port 1. This OPC will not gain control of any part of the network. The backup OPC will remain active and in control.</p>						
6	<p>Log in to the replacement OPC using the root userID. If you do not know how to do this, see the procedures in <i>Data Administration Procedures</i>, 323-3001-304, in <i>Operations, Administration, and Provisioning</i>, Volume 4A. <i>"TERM=(VT100)"</i> appears.</p> <p>Press the Return key.</p> <p><i>The "opc>" prompt appears.</i></p>						
7	<p>In order to ensure that the data on the replacement OPC does not interfere with the system operations, you must disable communication between the OPC and the shelf by entering:</p> <p>usr/etc/tstatc ↵</p> <p><i>The tstatc menu appears.</i></p>						
8	<p>Select the Network layer statistics screen by pressing N.</p> <p><i>The cnet0 Subnet (where the arrow cursor points) should have "ON" as its value.</i></p>						
9	<p>Press G to toggle this switch to "OFF."</p> <p><i>The communication between the OPC and the shelf is disabled.</i></p>						

—continued—

7-6 Replacing an OPC module

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action						
10	Exit the tstatc utility by pressing Q to return to the main menu and then press Q again to exit.						
11	Check whether the OPC has a software load on it. Enter: opcui ↵						
	<table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>the response is <code>opcui : command not found</code></td><td>no OPC software is loaded. Proceed as follows:<ol style="list-style-type: none">Insert the AccessNode software load tape into the OPC tape drive.Go to step 21.</td></tr><tr><td>the User Session Manager appears</td><td>OPC software is loaded. Proceed as follows:<ol style="list-style-type: none">Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i>Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i>Go to step 12.</td></tr></tbody></table>	If	Then	the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: <ol style="list-style-type: none">Insert the AccessNode software load tape into the OPC tape drive.Go to step 21.	the User Session Manager appears	OPC software is loaded. Proceed as follows: <ol style="list-style-type: none">Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i>Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i>Go to step 12.
If	Then						
the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: <ol style="list-style-type: none">Insert the AccessNode software load tape into the OPC tape drive.Go to step 21.						
the User Session Manager appears	OPC software is loaded. Proceed as follows: <ol style="list-style-type: none">Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i>Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i>Go to step 12.						
12	Log in to the active OPC using the slat userID. <i>The User Session Manager appears.</i>						
13	Move to the OPC Status tool, and select it by pressing Ctrl_A (or Keypad 0). <i>The OPC status window appears.</i>						
14	Look at the contents of the SW Version field. Compare this value with the value you recorded for the span of control, in Procedure 7-1. <table><thead><tr><th>If the software version of the replacement OPC is</th><th>Then</th></tr></thead><tbody><tr><td>the same as the recorded value</td><td>go to step 15</td></tr><tr><td>different from the recorded value</td><td>go to step 16</td></tr></tbody></table>	If the software version of the replacement OPC is	Then	the same as the recorded value	go to step 15	different from the recorded value	go to step 16
If the software version of the replacement OPC is	Then						
the same as the recorded value	go to step 15						
different from the recorded value	go to step 16						
15	Type the following command: opcui ↵ <i>The user session manager appears.</i> Go to step 32.						

—continued—

 Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action
16	Insert the AccessNode software load tape into the OPC tape drive. This tape contains the RMOPCLD script, which is required to remove existing OPC software from an OPC.
17	Extract the RMOPCLD file from tape by typing the following two commands: cd /tmp ↵ <i>The “opc>” prompt appears.</i> dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵ <i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i> 439+4 blocks in 439+4 blocks out <i>The “opc>” prompt appears.</i>
18	Execute the RMOPCLD script by typing the following two commands: cd /tmp/install ↵ <i>The “opc>” prompt appears.</i> rmopcl d ↵ <i>A warning message appears with a prompt to confirm the OPC load:</i> You are about to wipe out the OPC load. Please confirm (Y/N).
19	Type y ↵ to continue. <i>OPC processes are stopped. A message appears which gives you the option of aborting the removal of the OPC load.</i>
20	Type c ↵ to continue. <i>The script removes the existing software load. The OPC reboots.</i>
21	When the OPC has rebooted, log in again, using the root userID. <i>“TERM=(VT100)” appears.</i> Press the Return key. <i>The “opc>” prompt appears.</i>
22	To begin the installation of the AccessNode software of the OPC into the replacement OPC, enter: cd /tmp ↵ <i>The “opc>” prompt appears.</i>

—continued—

7-8 Replacing an OPC module

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action
23	Enter: dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵ <i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i> 439+4 blocks in 439+4 blocks out <i>The "opc>" prompt appears.</i>
24	Enter: cd /tmp/install ↵ <i>The "opc>" prompt appears.</i>
25	Enter: install_release -f ↵ <i>This tool transfers the OPC software and NE software to the OPC. The screen displays a message saying that it is installing the software. As the installation proceeds, the screen displays the percentage of software installation completed. The installation takes approximately one hour.</i> When the application software has been loaded, the OPC automatically reboots.
26	Commission the OPC using the procedures in the document corresponding to your system (see <i>Commissioning and Testing</i> , Volume 3A: <i>Setting up your system: VTBM, 323-3001-230</i> <i>Setting up your system: DFA, 323-3001-235</i> <i>Setting up your system: Point-to-point, 323-3001-240</i> <i>Setting up your system: Single-Ended, 323-3001-245</i>
27	When the login prompt appears, log back in to the replacement OPC using the root userID. <i>"TERM=(VT100)" appears.</i>
28	Press the Return key. <i>The "opc>" prompt appears.</i>
29	Enter the following command from the /tmp directory of the OPC: setmbr ↵
30	Enter: opcui ↵ <i>The User Session Manager appears.</i>
31	Eject the tape from the newly-installed OPC.

—continued—

 Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action
32	Move to the OPC Date tool and open it by pressing Ctrl_A (or Keypad 0). <i>The OPC Date tool main window appears.</i>
33	Set the date and time on the replacement OPC. If you do not know how to do this, refer to <i>System Administration Procedures, 323-3001-302</i> , in <i>Operations, Administration, and Provisioning, Volume 4A</i> . <i>The OPC Date tool automatically shuts down the OPC. Wait until the green Activity LED turns OFF, indicating that the shutdown is complete, before continuing.</i>
34	Disconnect the VT100 from port 1.
35	Reconnect the VT100 to one of the NE user interface ports. If you do not know how to do this, see the procedures in <i>Data Administration Procedures, 323-3001-304</i> , in <i>Operations, Administration, and Provisioning, Volume 4A</i> . This will give you access to the active backup OPC. <i>You will need to use the NE-to-VT100 cable, not the one used to connect to the OPC port 1.</i>
36	Log in to the network element with the admin userID. If you do not know how to do this, see the procedures in <i>Data Administration Procedures, 323-3001-304</i> , in <i>Operations, Administration, and Provisioning, Volume 4A</i> .
37	When the main menu screen of the NE user interface appears, enter the following command to log in to the active OPC: rlogin opc ↵ <i>The screen will clear and the OPC login prompt (login:) appears.</i>
38	Log in to the OPC, using the root userID. You are logging in to the backup OPC. <i>"TERM=(VT100)" appears.</i>
39	Press the Return key. <i>The "opc>" prompt appears.</i>
40	Enter: opcui ↵ <i>The User Session Manager appears.</i>

—continued—

7-10 Replacing an OPC module

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action						
41	Tab to the OPC Status tool, and select it by pressing Ctrl_A (or Keypad 0).						
42	View the OPC status. <table><thead><tr><th>If the OPC status is</th><th>Then</th></tr></thead><tbody><tr><td>backup/active</td><td>go to step 43</td></tr><tr><td>anything else</td><td>call Nortel Networks support</td></tr></tbody></table>	If the OPC status is	Then	backup/active	go to step 43	anything else	call Nortel Networks support
If the OPC status is	Then						
backup/active	go to step 43						
anything else	call Nortel Networks support						
43	Display the User Session Manager by pressing Ctrl_T 0 .						
44	Move to the Commissioning Manager and select it by pressing Ctrl_A (or Keypad 0). <i>The Commissioning Manager main window appears.</i>						
45	Tab to the Edit System Data button and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog appears.</i>						
46	Tab to the Primary OPC serial number field and replace its contents with the replacement OPC's serial number (which you obtained from the OPC circuit board).						
47	You may tab to the Primary OPC alias field and assign a new alias, if desired.						
48	Tab to the OK button, and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog disappears.</i>						
49	Display the commissioning manager utilities menu, by pressing Ctrl_L T .						
50	Move to the Transfer Data to Primary OPC button and select it by pressing Space (or Keypad 0). <i>The dialog appears.</i>						
51	Move to the Primary OPC button, and select it by pressing Ctrl_A (or Keypad 0).						
52	To start data synchronization, tab to the OK button, and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog appears.</i>						
53	To continue the synchronization process, tab to the OK button, and select it by pressing Ctrl_A (or Keypad 0). This action copies current data from the backup OPC to the replacement primary OPC, overwriting any data which the replacement OPC previously contained. Note: The data transfer may take up to 15 minutes. When completed, the new primary OPC will establish associations with network elements in its span of control, and the network will be under dual control until the backup OPC is shut down.						

—continued—

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action				
54	Tab to the Done button and select it by pressing Ctrl_A (or Keypad 0). <i>The dialog disappears.</i>				
55	Close the commissioning manager by doing the following: <ol style="list-style-type: none"> a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i> b. Select the Exit command by pressing Space (or Keypad 0). 				
56	Shut down (and restart) the backup OPC. For additional information, refer to <i>System Administration Procedures, 323-3001-302, Operations, Administrations and Provisioning, Volume 4A</i> . During the restart of the backup OPC, communications are established with the new primary OPC, which remains active. The backup OPC will remain inactive, after restarting.				
57	Upon completion of the shutdown, residual information may remain on the terminal screen. Press Return several times to clear it.				
58	When the main menu screen of the NE user interface appears, enter the following command to login to the active OPC: rlogin opc ↵ <i>The screen will clear and the OPC login prompt (login:) appears.</i>				
59	Log in to the OPC using the slat userID. You are now logging in to the new primary OPC. <i>The User Session Manager appears.</i>				
60	In the User Session Manager screen, display the OPC Status tool and verify the OPC status. If the OPC status is Then				
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">primary/active</td> <td>go to step 61</td> </tr> <tr> <td>anything else</td> <td>call Nortel Networks support</td> </tr> </table>	primary/active	go to step 61	anything else	call Nortel Networks support
primary/active	go to step 61				
anything else	call Nortel Networks support				
61	Display the User Session Manager by pressing Ctrl_T 0 and open the Reboot/Load Manager tool. <i>The Reboot/Load Manager main window appears.</i>				
62	Ensure that this OPC has an association with every network element within its span-of-control, by making sure that no question marks (?) are displayed next to any of the network elements listed. If there are Then				
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">question marks</td> <td>troubleshoot communications with the associated NEs, or call Nortel Networks support</td> </tr> <tr> <td>no question marks</td> <td>go to step 63</td> </tr> </table>	question marks	troubleshoot communications with the associated NEs, or call Nortel Networks support	no question marks	go to step 63
question marks	troubleshoot communications with the associated NEs, or call Nortel Networks support				
no question marks	go to step 63				

—continued—

7-12 Replacing an OPC module

Procedure 7-2 (continued)

Replacing the primary OPC (operational backup OPC present)

Step	Action						
63	Close the tool by doing the following: <ol style="list-style-type: none">Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i>Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears. The User Session screen appears.</i>						
64	From the primary OPC, log in to the NE again, using the NE Login Manager.						
65	Enter the following command to access the equipment shelf screen. eq sh ↵						
66	Enter the following command to create a backup of the database file on the OPC. backupdb ↵ <i>You are asked to confirm the command.</i>						
67	Enter the following to confirm the command. y ↵ <i>The NE file is backed up on the primary OPC.</i>						
68	Enter the following command to terminate the session with the NE. logout ↵						
69	You need to backup the primary OPC from each NE in the span-of control. <table><thead><tr><th>If</th><th>Then</th></tr></thead><tbody><tr><td>There are NEs that you have not backed up on the primary OPC</td><td>go to step 64</td></tr><tr><td>All NEs have been backed up on the primary OPC</td><td>go to step 70</td></tr></tbody></table>	If	Then	There are NEs that you have not backed up on the primary OPC	go to step 64	All NEs have been backed up on the primary OPC	go to step 70
If	Then						
There are NEs that you have not backed up on the primary OPC	go to step 64						
All NEs have been backed up on the primary OPC	go to step 70						
70	Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog appears.</i>						
71	Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the NE user interface prompt (>) appears.</i>						
72	Log out from the NE user interface session by entering: logout ↵ <i>The NE user interface login prompt appears.</i>						

—end—

Procedure 7-3

Replacing the primary OPC (without a backup OPC)

Use this procedure to remove and replace the primary OPC module when no backup OPC is configured.

Requirements

Before carrying out this procedure, you must do the following:

- Determine from your records, if the OPC has failed, which software version was running in the OPC.
- Have a replacement (or spare) OPC equipped with a tape drive.
- Obtain the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about half way back. The serial number is next to the bar code.
- Have a VT100-compatible terminal connected to OPC port 1 at the primary OPC site.
- Have a tape containing AccessNode software that is the same as the software identified in Procedure 7-1 for the primary OPC.
- Obtain the **slat** and **root** passwords.
- Have a backup tape with the commissioning data for this span of control.

Note: In some of the following steps, you must execute UNIX commands. Type **bolded** text exactly as shown at the “opc>” prompt. Press the return key when you see the ↵ character.



CAUTION

Electrostatic sensitive devices

Electrostatic sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)**Action**

Step	Action						
1	<p>Attempt to log in to the primary OPC.</p> <table border="1"> <thead> <tr> <th>If you</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>can log in</td> <td>go to step 2</td> </tr> <tr> <td>cannot log in</td> <td>go to step 4</td> </tr> </tbody> </table> <p>Note: Before you remove the OPC module, check to make sure that the disk access LED is not blinking.</p>	If you	Then	can log in	go to step 2	cannot log in	go to step 4
If you	Then						
can log in	go to step 2						
cannot log in	go to step 4						
2	Perform a tape backup of the OPC data. If you do not know how to do this, see <i>Data Administration Procedures, 323-3001-304, in Operations, Administration, and Provisioning, Volume 4A</i> . When complete, remove the tape from the tape drive.						
3	Shut down the primary OPC. If you do not know how to do this, see the procedures in <i>Data Administration Procedures, 323-3001-304, in Operations, Administration, and Provisioning, Volume 4A</i> .						
4	Physically remove the primary OPC from the shelf.						
5	Note the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about halfway back. The serial number is next to the bar code.						
6	<p>Insert the replacement OPC in place of the primary.</p> <p>Note: The replacement OPC may take up to 15 minutes to initialize. When it is ready, the login prompt (login:) appears on the terminal connected to OPC port 1. This OPC will not gain control of any part of the network.</p>						
7	<p>Log in to the replacement OPC using the root userID. If you do not know how to do this, see the procedures in <i>Data Administration Procedures, 323-3001-304, in Operations, Administration, and Provisioning, Volume 4A</i>. “<i>TERM=(VT100)</i>” appears.</p> <p>Press the Return key.</p> <p>The “<i>opc></i>” prompt appears.</p>						
8	<p>In order to ensure that the data on the spare OPC does not interfere with the system operations, disable communication between the OPC and the shelf.</p> <p>At the OPC prompt (opc>), enter:</p> <pre>usr/etc/tstatc ↵</pre> <p>The <i>tstatc</i> menu appears.</p>						

—continued—

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)

Step	Action						
9	Select the Network layer statistics screen by pressing N . <i>The cnet0 Subnet (where the arrow cursor points) should have "ON" as its value.</i>						
10	Press G to toggle this switch to "OFF." <i>The communication between the OPC and the shelf has now been disabled.</i>						
11	Exit the tstatc utility by pressing Q to return to the main menu and then Q again to exit.						
12	Check whether the OPC has a software load on it. Enter: opcui ↵						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">the response is <code>opcui : command not found</code></td> <td style="vertical-align: top;">no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 20.</td> </tr> <tr> <td style="vertical-align: top;">the User Session Manager appears</td> <td style="vertical-align: top;">OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 13.</td> </tr> </tbody> </table>	If	Then	the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 20.	the User Session Manager appears	OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 13.
If	Then						
the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 20.						
the User Session Manager appears	OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 13.						
13	Type the following command: /iws/swi/swiversion ↵ <i>The current software release version appears, along with other information.</i>						

—continued—

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)

Step	Action						
14	<p>Look at the first line of output. It contains a software version code. Compare this value with the value you recorded for the span of control, in Procedure 7-1.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the software version of the replacement OPC is</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the same as the recorded value</td> <td>go to step 15</td> </tr> <tr> <td>different from the recorded value</td> <td>go to step 16</td> </tr> </tbody> </table>	If the software version of the replacement OPC is	Then	the same as the recorded value	go to step 15	different from the recorded value	go to step 16
If the software version of the replacement OPC is	Then						
the same as the recorded value	go to step 15						
different from the recorded value	go to step 16						
15	<p>Type the following command:</p> <pre>opcui ↵</pre> <p><i>The user session manager appears.</i></p> <p>Go to step 29.</p>						
16	<p>Insert the AccessNode software load tape into the OPC tape drive. This tape contains the RMOPCLD script, which is required to remove existing OPC software from an OPC.</p>						
17	<p>Extract the RMOPCLD file from tape by typing the following two commands:</p> <pre>cd /tmp ↵</pre> <p><i>The "opc>" prompt appears.</i></p> <pre>dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵</pre> <p><i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i></p> <pre>439+4 blocks in 439+4 blocks out</pre> <p><i>The "opc>" prompt appears.</i></p>						
18	<p>Execute the RMOPCLD script by typing the following two commands:</p> <pre>cd /tmp/install ↵</pre> <p><i>The "opc>" prompt appears.</i></p> <pre>rmopcl ↵</pre> <p><i>A warning message appears with a prompt to confirm the removal of the OPC load:</i></p> <pre>You are about to wipe out the OPC load. Please confirm (Y/N) .</pre>						
19	<p>Type y ↵ to continue.</p> <p><i>OPC processes are stopped. A message appears which gives you the option of aborting the removal of the OPC load.</i></p>						

—continued—

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)

Step	Action
20	Type c ↵ to continue. <i>The script removes the existing software load. The OPC reboots automatically.</i>
21	When the OPC has rebooted, log in again, using the root userID. <i>“TERM=(VT100)” appears.</i> Press the Return key. <i>The “opc>” prompt appears.</i>
22	To begin the installation of the AccessNode software into the replacement OPC, enter: cd /tmp ↵ <i>The “opc>” prompt appears.</i>
23	Enter: dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵ <i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i> 439+4 blocks in 439+4 blocks out <i>The “opc>” prompt appears.</i>
24	Enter: cd /tmp/install ↵ <i>The “opc>” prompt appears.</i>
25	Enter: install_release -f ↵ <i>This tool transfers the OPC software and NE software to the OPC. The screen displays a message saying that it is installing the software. As the installation proceeds, the screen displays the percentage of software installation completed. The installation takes approximately one hour.</i> When the application software has been loaded, the OPC automatically reboots.
26	Commission the OPC using the procedures in the document corresponding to your system (see <i>Commissioning and Testing</i> , Volume 3A): <i>Setting up your system: VTBM, 323-3001-230</i> <i>Setting up your system: DFA, 323-3001-235</i> <i>Setting up your system: Point-to-point, 323-3001-240</i> <i>Setting up your system: Single-Ended, 323-3001-245</i>

—continued—

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)

Step	Action
27	Enter the following command from the /tmp directory of the OPC: setmbr ↵
28	When the login prompt appears, log back in to the replacement OPC, using the slat userID. <i>The User Session Manager appears.</i>
29	Move to the OPC Date tool, and select it by pressing Ctrl_A (or Keypad 0). <i>The OPC Date tool main window appears.</i>
30	Set the date and time on the replacement OPC. For additional information, refer to the procedure for changing the OPC date and time in <i>System Administration Procedures</i> , 323-3001-302, in <i>Operations, Administration, and Provisioning</i> , Volume 4A. <i>Depending on the time adjustment required, the OPC may reboot.</i>
31	Log in to the OPC, using the slat userID. <i>The User Session Manager appears.</i> Note: Login may be denied since the OPC may not be active yet. If this happens, wait at least 3 minutes and repeat this step.
32	Remove the software delivery tape. Note: You will reinsert this tape later in this procedure.
33	Insert the backup tape for this system in the replacement OPC tape drive and restore the OPC data from tape using the OPC Save and Restore tool. For additional information, refer to <i>Data Administration Procedures</i> , 323-3001-304, in <i>Operations, Administration, and Provisioning</i> , Volume 4A. <i>At the beginning of the data restore procedure you will be warned to commission the replacement OPC before proceeding. Acknowledge this message and proceed below. Do not commission the OPC at this time. It will be done later in this procedure.</i> If you were unable to perform a data backup to tape earlier in this procedure, use the most recent backup tape available. If no backup tape is available, you must repeat the system commissioning procedure (as described in <i>Commissioning and Testing</i> , Volume 3), as well as reinstall the NE load on the OPC.
34	Close the OPC Save and Restore tool by doing the following: <ul style="list-style-type: none"> a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i> b. Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears.</i>

—continued—

Procedure 7-3 (continued)
Replacing the primary OPC (without a backup OPC)

Step	Action						
35	Move to the Commissioning Manager, and select it by pressing Ctrl_A (or Keypad 0). <i>The Commissioning Manager main window appears.</i>						
36	Tab to the Edit System Data button, and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog appears.</i>						
37	Tab to the Primary OPC serial number field, and replace its contents with the replacement OPC's serial number, which can be seen in the upper right corner of the Commissioning Manager main window.						
38	You may tab to the Primary OPC alias field and assign a new alias, if desired.						
39	Tab to the OK button, and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog disappears.</i>						
40	Close the Commissioning Manager tool by doing the following: <ol style="list-style-type: none"> a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i> b. Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears.</i> 						
41	In the User Session Manager screen, display the OPC Status tool and verify the OPC status.						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the OPC status is</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>primary/active</td> <td>go to step 42</td> </tr> <tr> <td>anything else</td> <td>call Nortel Networks support</td> </tr> </tbody> </table>	If the OPC status is	Then	primary/active	go to step 42	anything else	call Nortel Networks support
If the OPC status is	Then						
primary/active	go to step 42						
anything else	call Nortel Networks support						
42	Display the User Session Manager by pressing Ctrl_T 0 .						
43	Tab to the Logout button, then press Ctrl_A (or Keypad 0). <i>The following confirmation dialog appears:</i>						
44	Tab to the Logout button, then press Ctrl_A (or Keypad 0). <i>The confirmation dialog closes, the User Session Manager window closes, and the OPC login screen appears.</i>						
45	At the <code>opc></code> prompt, enter: login ↵						
46	Log in to the replacement OPC as a root user.						
47	At the password prompt, type your password, then press Return . Reminder: The password field is case sensitive so do not use capital letters unless the capitalization is part of the password.						

—continued—

7-20 Replacing an OPC module

Procedure 7-3 (continued)

Replacing the primary OPC (without a backup OPC)

Step	Action						
48	The following prompt appears: <i>Term = (VT100).</i> Press Return .						
49	Enter the following: opcui ↵ <i>The User Session Manager window appears displaying the available tools.</i>						
50	Open the Reboot/Load Manager tool. <i>The Reboot/Load Manager main window appears.</i>						
51	Ensure that this OPC has an association with every network element within its span of control, by making sure that no question marks (?) are displayed next to any of the network elements listed. Associations may take up to 20 minutes to come up. <table><thead><tr><th>If there are</th><th>Then</th></tr></thead><tbody><tr><td>question marks</td><td>troubleshoot communications with the associated NEs, or call Nortel Networks support</td></tr><tr><td>no question marks</td><td>go to step 52</td></tr></tbody></table>	If there are	Then	question marks	troubleshoot communications with the associated NEs, or call Nortel Networks support	no question marks	go to step 52
If there are	Then						
question marks	troubleshoot communications with the associated NEs, or call Nortel Networks support						
no question marks	go to step 52						
52	Close the tool by doing the following: a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i> b. Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears.</i>						
53	Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog appears.</i>						
54	Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>You are now logged out of the OPC.</i>						
55	Eject the tape from the newly installed OPC.						

—end—

Procedure 7-4

Replacing the backup OPC (with a spare equipped with a tape drive)

Use this procedure to remove and replace the backup OPC module. It assumes that the primary OPC is operational.

Requirements

Before carrying out this procedure, you must

- Have a replacement (or spare) OPC equipped with a tape drive.
- Obtain the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about half way back. The serial number is next to the bar code.
- Connect a VT100-compatible terminal to OPC port 1 at the backup OPC site.
- Have a tape containing AccessNode software.
- Obtain the **slat** and **root** passwords.

Note: In some of the following steps, you must execute UNIX commands. Type **bolded** text exactly as shown at the “opc>” prompt. Press the return key when you see the ↵ character.



CAUTION

Electrostatic sensitive devices

Electrostatic sensitive devices can be damaged by electrostatic discharge. Always ground yourself before handling the circuit pack.

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)**Action**

Step	Action						
1	<p>Attempt to log in to the backup OPC.</p> <table border="1"> <thead> <tr> <th>If you</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>can log in</td> <td>go to step 2</td> </tr> <tr> <td>cannot log in</td> <td>go to step 3</td> </tr> </tbody> </table> <p>Note: Before you remove the OPC module, check to make sure that the disk access LED is not blinking.</p>	If you	Then	can log in	go to step 2	cannot log in	go to step 3
If you	Then						
can log in	go to step 2						
cannot log in	go to step 3						
2	Shut down the backup OPC. If you do not know how to do this, see the procedures in <i>Data Administration Procedures</i> , 323-3001-304, in <i>Operations, Administration, and Provisioning</i> , Volume 4A.						
3	Physically remove the backup OPC from the shelf.						
4	Note the serial number of the replacement OPC. This is located on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about halfway back. The serial number is next to the bar code.						
5	<p>Insert the replacement OPC in place of the backup.</p> <p>Note: The replacement OPC may take up to 15 minutes to initialize. When it is ready, the login prompt (login:) appears on the terminal connected to OPC port 1. This OPC will not gain control of any part of the network. The primary OPC will remain active and in control.</p>						
6	<p>Log in to the replacement OPC, using the root userID.</p> <p><i>"TERM=(VT100)" appears.</i></p> <p>Press the Return key.</p> <p><i>The "opc>" prompt appears.</i></p>						
7	<p>In order to ensure that the data on the spare OPC does not interfere with the system operations, disable communication between the OPC and the shelf.</p> <p>At the OPC prompt (opc>), enter:</p> <p>tstatc ↵</p> <p><i>The tstatc menu appears.</i></p>						
8	<p>Select the Network layer statistics screen by pressing N.</p> <p><i>The cnet0 Subnet (where the arrow cursor points) should have "ON" as its value.</i></p>						
9	<p>Press G to toggle this switch to "OFF."</p> <p><i>The communication between the OPC and the shelf has now been disabled.</i></p>						

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action						
10	Exit the tstatc utility by pressing Q to return to the main menu and then Q again to exit						
11	Check whether the OPC has a software load on it. Enter: opcui ↵						
	<table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>the response is <code>opcui : command not found</code></td> <td>no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 21.</td> </tr> <tr> <td>the User Session Manager appears</td> <td>OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 12.</td> </tr> </tbody> </table>	If	Then	the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 21.	the User Session Manager appears	OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 12.
If	Then						
the response is <code>opcui : command not found</code>	no OPC software is loaded. Proceed as follows: a. Insert the AccessNode software load tape into the OPC tape drive. b. Go to step 21.						
the User Session Manager appears	OPC software is loaded. Proceed as follows: a. Tab to the Logout button and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog box appears.</i> b. Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The User Session Manager disappears, and the "opc>" prompt appears.</i> c. Go to step 12.						
12	Type the following command: /iws/swi/swiversion ↵ <i>The current software release version appears, along with other information.</i>						
13	Look at the first line of output. It contains a software version code. Compare this value with the value you recorded for the span of control, in Procedure 7-1.						
	<table border="1"> <thead> <tr> <th>If the software version of the replacement OPC is</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>the same as the recorded value</td> <td>go to step 14</td> </tr> <tr> <td>different from the recorded value</td> <td>go to step 15</td> </tr> </tbody> </table>	If the software version of the replacement OPC is	Then	the same as the recorded value	go to step 14	different from the recorded value	go to step 15
If the software version of the replacement OPC is	Then						
the same as the recorded value	go to step 14						
different from the recorded value	go to step 15						
14	Type the following command: opcui ↵ <i>The user session manager appears.</i> Go to step 26.						

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action
15	Insert the AccessNode software load tape into the OPC tape drive. This tape contains the RMOPCLD script, which is required to remove existing OPC software from an OPC.
16	Extract the RMOPCLD file from tape by typing the following two commands: cd /tmp ↵ <i>The “opc>” prompt appears.</i> dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵ <i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i> 439+4 blocks in 439+4 blocks out <i>The “opc>” prompt appears.</i>
17	Execute the RMOPCLD script by typing the following two commands: cd /tmp/install ↵ <i>The “opc>” prompt appears.</i> rmopcl d ↵ <i>A warning message appears with a prompt to confirm the OPC load:</i> You are about to wipe out the OPC load. Please confirm (Y/N).
18	Type y ↵ to continue. <i>OPC processes are stopped. A message appears which gives you the option of aborting the removal of the OPC load.</i>
19	Type c ↵ to continue. <i>The script removes the existing software load. The OPC reboots.</i>
20	When the OPC has rebooted, log in again, using the root userID. <i>“TERM=(VT100)” appears.</i> Press the Return key. <i>The “opc>” prompt appears.</i>

—continued—

 Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action
21	<p>To begin the installation of the AccessNode software into the replacement backup OPC, enter the following commands:</p> <pre>cd /tmp ↵</pre> <p><i>The “opc>” prompt appears.</i></p> <pre>dd if=/dev/rdt/tape2 bs=20b tar xvf - ↵</pre> <p><i>Either the message Broken pipe appears or a message similar to the following appears (the numbers may vary).</i></p> <pre>439+4 blocks in 439+4 blocks out</pre> <p><i>The “opc>” prompt appears.</i></p> <pre>cd /tmp/install ↵</pre> <p>The “opc>” prompt appears.</p>
22	<p>Enter:</p> <pre>install_release -f ↵</pre> <p><i>This tool transfers the OPC software and NE software to the OPC. The screen displays a message saying that it is installing the software. As the installation proceeds, the screen displays the percentage of software installation completed. The installation takes approximately one hour.</i></p> <p>When the application software has been loaded, the OPC automatically reboots.</p>
23	<p>Commission the OPC using the procedures in the document corresponding to your system (see <i>Commissioning and Testing</i>, Volume 3A):</p> <p><i>Setting up your system: VTBM, 323-3001-230</i></p> <p><i>Setting up your system: DFA, 323-3001-235</i></p> <p><i>Setting up your system: Point-to-point, 323-3001-240</i></p> <p><i>Setting up your system: Single-Ended, 323-3001-245</i></p>
24	<p>Enter the following command from the /tmp directory of the OPC:</p> <pre>setmbr ↵</pre>

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action
25	When the login prompt appears, log back in to the replacement OPC using the slat userID. <i>The User Session Manager appears.</i>
26	Move to the OPC Date tool, and open it by pressing Ctrl_A (or Keypad 0). <i>The OPC Date tool main window appears.</i>
27	Set the date and time on the replacement OPC. For additional information, refer to <i>System Administration Procedures</i> , 323-3001-302, in <i>Operations, Administration, and Provisioning</i> , Volume 4A. <i>The OPC Date tool automatically shuts down the OPC. Wait until the green Activity LED turns OFF, indicating that the shutdown is complete, before continuing.</i>
28	Disconnect the VT100 from port 1.
29	Reconnect the VT100 to an NE user interface port. If you do not know how to do this, see the procedures in <i>Data Administration Procedures</i> , 323-3001-304, in <i>Operations, Administration, and Provisioning</i> , Volume 4A. This will give you access to the active backup OPC. <i>You will need to use the NE-to-VT00 cable, not the one used to connect to the OPC port 1.</i>
30	Log in to the network element with the admin userID. If you do not know how to do this, see the procedures in <i>Data Administration Procedures</i> , 323-3001-304, in <i>Operations, Administration, and Provisioning</i> , Volume 4A.
31	When the main menu screen of the NE user interface appears, enter the following command to login to the active OPC: rlogin opc ↵ <i>The screen will clear and the OPC login prompt (login:) appears.</i>
32	Log in to the primary OPC using the root userID. <i>"TERM=(VT100)" appears.</i> Press the Return key. <i>The "opc>" prompt appears.</i>
33	Type the following command: opcui ↵ <i>The User Session Manager appears.</i>

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action						
34	In the User Session Manager screen, display the OPC Status tool and verify the OPC status. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">If the OPC status is</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>Primary/active</td> <td>go to step 35</td> </tr> <tr> <td>Anything else</td> <td>call Nortel Networks support</td> </tr> </tbody> </table>	If the OPC status is	Then	Primary/active	go to step 35	Anything else	call Nortel Networks support
If the OPC status is	Then						
Primary/active	go to step 35						
Anything else	call Nortel Networks support						
35	Display the User Session Manager, by pressing Ctrl_T O . <i>The User Session Manager appears.</i>						
36	Move to the Commissioning Manager, and select it by pressing Ctrl_A (or Keypad 0). <i>The Commissioning Manager main window appears.</i>						
37	Tab to the Edit System Data button, and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog appears.</i>						
38	Tab to the Backup OPC serial number field, and replace its contents with the new backup OPC's serial number, which was recorded at the beginning of this procedure.						
39	You may tab to the Backup OPC alias field and assign a new alias, if desired.						
40	Tab to the OK button, and select it by pressing Ctrl_A (or Keypad 0). <i>The System Commissioning Data dialog disappears.</i>						
41	Tab to the Transfer Data to Backup OPC (from Primary OPC) button, and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog appears.</i>						
42	To start the data synchronization, tab to the Yes button, and select it by pressing Ctrl_A (or Keypad 0). Current data is copied from the primary OPC to the replacement backup OPC, overwriting any data in the replacement OPC. The data transfer may take up to 15 minutes.						
43	Tab to the Done button, and select it by pressing Ctrl_A (or Keypad 0). <i>The dialog disappears.</i>						
44	Close the commissioning manager by doing the following: <ul style="list-style-type: none"> a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i> b. Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears.</i> 						

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action						
45	Shut down the primary OPC and reboot it by selecting restart. A reboot of the primary OPC is required to enable the automatic activity switch function associated with warm standby operation.						
46	Upon completion of the shutdown, residual information may remain on the screen. Press Return several times to clear the screen.						
47	Wait 15 minutes and login to the primary OPC by entering: rlogin opc ↵ <i>The screen will clear and the OPC login prompt (login:) appears.</i>						
48	Log in to the primary OPC using the root userID. <i>"TERM=(VT100)" appears.</i> Press the Return key. <i>The "opc>" prompt appears.</i>						
49	Type the following command: opcui ↵ <i>The User Session Manager appears.</i>						
50	Tab to the OPC Status tool, and select it by pressing Ctrl_A (or Keypad 0).						
51	View the OPC status. <table border="1"> <thead> <tr> <th>If the OPC status is</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>primary/active</td> <td>go to step 52</td> </tr> <tr> <td>anything else</td> <td>call Nortel Networks support</td> </tr> </tbody> </table>	If the OPC status is	Then	primary/active	go to step 52	anything else	call Nortel Networks support
If the OPC status is	Then						
primary/active	go to step 52						
anything else	call Nortel Networks support						
52	Open the Event Browser tool. <i>The Event Browser main window appears.</i>						
53	Ensure that communication between the two OPCs has been established by locating the following log: STBY507 OPC to OPC link established. Note: For more information about the Event Browser, see <i>System Administration Procedures</i> , 323-3001-302 in <i>Operations, Administration, and Provisioning</i> , Volume 4A. <table border="1"> <thead> <tr> <th>If this log</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>appears</td> <td>go to step 54</td> </tr> <tr> <td>does not appear</td> <td>call Nortel Networks support</td> </tr> </tbody> </table>	If this log	Then	appears	go to step 54	does not appear	call Nortel Networks support
If this log	Then						
appears	go to step 54						
does not appear	call Nortel Networks support						

—continued—

Procedure 7-4 (continued)

Replacing the backup OPC (with a spare equipped with a tape drive)

Step	Action
54	Close the tool by doing the following: <ul style="list-style-type: none">a. Display the window menu by pressing Ctrl_L W (or Keypad 6). <i>The window menu appears.</i>b. Select the Exit command by pressing Space (or Keypad 0). <i>The tool disappears.</i>
55	Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>A confirmation dialog appears.</i>
56	Tab to the Logout button, and select it by pressing Ctrl_A (or Keypad 0). <i>The "opc>" prompt appears.</i>
57	Log out from the OPC session by typing: logout ↵ <i>The User Session Manager disappears, and the NE user interface prompt (>) appears.</i>
58	Log out from the NE user interface session by typing: logout ↵ <i>The NE user interface login prompt appears.</i>
59	Eject the tape from the newly installed OPC.

—end—

Procedure 7-5 Initializing the replacement OPC hard disk

Use this procedure to initialize the replacement operations controller (OPC) hard disk using a disk initialization tape.

This procedure should only be performed by Nortel Networks personnel.



CAUTION

Risk of destroying data

The disk initialization process completely redefines the contents of the disk. Any information currently on the disk is lost. Before beginning the procedures in this chapter, make sure all OPC data has been backed up to tape.



CAUTION

Risk of damaging circuit packs

Electrostatic-sensitive devices can be damaged by electrostatic discharge. Always ground yourself with an antistatic wrist strap before handling the circuit pack.

Restrictions and limitations

To initialize the OPC disk, you must understand the following restrictions and limitations and follow them to perform this procedure:

- Do not attempt this procedure unless you are familiar with the OPC.
- Inform all OPC users and surveillance personnel about the OPC disk initialization before it is initiated.
- Know the root userID and password for the OPC before starting the installation.
- Enter UNIX commands exactly as shown; UNIX commands are case sensitive (UPPER, lower).
- Do not modify the default SCSI ID. The default SCSI ID is 1.

—continued—

 Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

- Do not attempt to abort the initialization of the OPC disk. Initialization of the OPC disk cannot be aborted once started.
- Apply the disk initialization procedures to all TransportNode OPCs that are equipped with a tape drive and have a minimum firmware release of OPCREL02 (NT8E2460 Rel. 04). The OPCs with the following PEC codes satisfy these criteria:
 - NT7E24BA Rel. 15 and higher
 - NT7E24BC Rel. 1 and higher
 - NT7E24CA Rel. 8 and higher
 - NT7E24CC Rel. 1 and higher

Note: To find the PEC codes and release numbers of the OPC, remove the cover of the OC-48 shelf with the OPC and check the faceplate of the OPC.

Recovery steps

If while performing this procedure, you inadvertently log out or are logged out of the OPC, resolve the problem that caused the log out, then log back in to the OPC following the recovery steps in the following table.

Step at which log out occurred	Step at which to restart procedure	Dependent action
steps 4 through 7	step 4	none
steps 8 through 12a.	step 8	log in using the root userID and password before continuing
steps 12b. through 18	step 12b.	log in using "opc" as the userID and "cpo" as the password before continuing

—continued—

Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

Requirements

Before starting this procedure, you must do the following:

- Have a replacement OPC equipped with a tape drive.
Note: An OPC module already commissioned for another span of control within the same system must be decommissioned before using it as a replacement OPC. If you do not know how to do this, see the procedure in *Commissioning and Testing*, Volume 3.
- Make sure an NT7E44RA or RB cable is connected between a VT100-compatible terminal and the OPC port B (LTE).
- Obtain an NT7E44FA or FB cable.
- Have one copy of the disk initialization tape (DDS tape) NT7E86BT with a minimum software version of 1.0a.
- Obtain root access to the OPC and admin level access to the local network element.
- Know the name of the OPC undergoing the disk initialization.
- Observe the “Restrictions and limitations” section at the beginning of this procedure.
- Read the command conventions for the interface (CMT or graphical) you are using in *OPC User Interface Description*, 323-3001-301, in *Operations, Administration, and Provisioning*, Volume 4A.

Action

Step	Action
1	Record the serial number of the replacement OPC. The serial number is on the large circuit board inside the OPC module. Holding the OPC upright with the faceplate to your left, look along the bottom of the circuit board, about halfway back. The serial number is next to the bar code.
2	Insert the OPC into the shelf that originally had the OPC that is being replaced.
3	Insert the disk initialization tape in the OPC tape drive. The tape must be inserted with the white latch facing you. The latch is located on the upper half of the tape when it is being inserted. <i>The green LED for the tape comes on, indicating that a tape is in the tape drive.</i>

—continued—

 Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

Step	Action								
4	Attempt to log in to the OPC. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the login prompt appears</td> <td>Go to step 5.</td> </tr> <tr> <td>the login prompt is not displayed</td> <td>Make sure the VT100-type terminal is set up correctly. If setup was incorrect and the login prompt is now displayed, go to step 5. If the login prompt is still not displayed, go to step 7.</td> </tr> <tr> <td>an error message appears</td> <td>Go to step 11.</td> </tr> </tbody> </table>	If	Then	the login prompt appears	Go to step 5.	the login prompt is not displayed	Make sure the VT100-type terminal is set up correctly. If setup was incorrect and the login prompt is now displayed, go to step 5. If the login prompt is still not displayed, go to step 7.	an error message appears	Go to step 11.
If	Then								
the login prompt appears	Go to step 5.								
the login prompt is not displayed	Make sure the VT100-type terminal is set up correctly. If setup was incorrect and the login prompt is now displayed, go to step 5. If the login prompt is still not displayed, go to step 7.								
an error message appears	Go to step 11.								
5	Log in to the OPC using the root userID and password. The following prompt appears on the screen: <i>TERM=(vt100)</i>								
6	Press Return and go to step 8. <i>The OPC prompt appears.</i>								
7	Try to access the OPC from the local network element (NE) where the OPC is inserted. <ol style="list-style-type: none"> a. Connect an NT7E44FA or FB cable to the 25-pin RS-232 connector of the local craft access panel (LCAP) at the top of the shelf. b. Connect the other end of the cable directly to the VT100-type terminal to be used for the network element user interface (NEUI). c. Press the Break key. <i>The prompt “?” appears.</i> d. Enter the command: login ↵ e. Log in to the NE using the admin userID and password. <i>The NEUI screen appears.</i> 								

—continued—

Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

Step	Action
f.	Remotely log in to the OPC by entering: rlogin <OPC name> ↵ where <OPC name> the name of the OPC you are initializing

If the remote login attempt	Then go to
is successful and the OPC prompt appears	step 8
is unsuccessful	step 11

8 At the OPC> prompt, open the User Session Manager by entering:
opcui ↵

The User Session Manager appears.

If the User Session Manager does not appear, go to step 11.

9 Perform an OPC shutdown using the Restart option.

The OPC boots from the disk initialization tape. After several minutes, the login prompt appears.

Note: If the red FAIL LED on the OPC lights, ignore it. The LED lights because the OPC is resident in an NE shelf that it cannot communicate with (the NE is not commissioned in the OPC).

10 Go to step 12.

11

	<p>CAUTION Risk of damaging the OPC hard disk If the OPC is not shut down properly, physical damage can occur on the OPC. A physical fault on the hard disk is unrecoverable using the disk initialization process. Do not perform this step if a proper shutdown can be initiated from the User Session Manager.</p>
---	---

Physically remove the OPC from the shelf. Wait 30 seconds, then reinsert the OPC.

The OPC boots from the disk initialization tape. After several minutes, the login prompt appears.

Note: If the red FAIL LED on the OPC lights, ignore it. The LED lights because the OPC is resident in an NE shelf that it cannot communicate with (the network element (NE) is not commissioned in the OPC).

—continued—

 Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

Step	Action
12	At the login prompt (login:), log in to the OPC. <ol style="list-style-type: none"> a. Enter the userID: opc ↵ <i>You are prompted to enter the password.</i> b. Enter the password: cpo ↵ <i>The OPC Disk Initialization menu appears.</i>
13	Initialize the disk by entering: i ↵ <i>The following message appears:</i> About to initialize disk with SCSI ID 1, ok? [y/n] ->
14	Confirm the hard disk initialization by entering: y ↵ <i>Progress messages similar to the following may appear. These messages can be ignored.</i> <pre> Executing: GetTapeID... SCSI 011> Open: Requested device ID - 0 - not available SCSI 011> Open: Requested device is not of expected type SCSI 011> Open: Encountered device type - 0 Executing: GetNoBasesys 2 </pre> <i>After the progress messages, the following message appears. Use this message to determine what UNIX base software load (HP-UX 6.5 or HP-UX 8.0) to install on the OPC.</i> <pre> OC3 5.00 OC12 5.00 OC48 5.00 RNL08 AN07 </pre> Is your software release prior to a release in the above list ? [y/n] -> Note: HP-UX 8.0 UNIX base load is installed for a software release in the preceding list and any later release of the software.
15	Install HP-UX 8.0 UNIX base load by entering: n ↵

—continued—

Procedure 7-5 (continued)

Initializing the replacement OPC hard disk

Step	Action
	<p><i>The following message appears, indicating that the UNIX base load is about to be installed.</i></p> <pre>About to install opc_basesys80.tar</pre> <p><i>The disk initialization process begins and takes about 10 minutes to complete. A long series of initialization messages appear on the screen, describing what is happening in the initialization process. After the final message appears, you are prompted to press Return.</i></p>
16	<p>Press Return.</p> <p><i>The Disk Initialization menu appears.</i></p>
17	<p>Select the Reboot from disk option from the menu by entering:</p> <pre>r ↵</pre> <p><i>The following message appears.</i></p> <pre>About to reboot from disk, ok ? [y/n] -></pre>
18	<p>Confirm that you want to reboot the OPC from the OPC hard disk, by entering:</p> <pre>y ↵</pre> <p><i>The OPC reboot takes approximately 5 minutes to complete. Messages similar to the following appear. The messages can be ignored.</i></p> <pre>Executing: GetTapeID... SCSI 011> open: Requested device ID - 0 - not available SCSI 011> open: Requested device is not of expected type SCSI 011> open: Encountered device type - 0 Ejecting Tape in device number 2. SCSI 011> Tape not ready - medium not present, device 2 SCSI 011> Decode sense - Key 2, Code 3a, Qual 00, dev 2, cmd 01.</pre> <p><i>The OPC disk initialization tape is ejected.</i></p>
19	<p>Store the tape for safekeeping. The disk initialization session is terminated and after a few minutes the login prompt appears.</p>

—end—

Replacing a COP cooling unit in a working TBM bay

This chapter describes how to replace an auxiliary cable organizer panel (COP) cooling unit (CU) in a working TBM bay, without loss of service. The procedure consists of five phases: accessing and clearing the cables, increasing the convection airflow through the bay, removing the COP CU, and replacing it with the new CU, and reassembling the bay.

Chapter contents

The table below lists the procedure that is in this chapter for replacing the COP cooling unit.

Topic	See
Replacing a COP cooling unit in a TBM bay	page 8-2

Tools and materials

You need the following tools and materials to perform this procedure:

- antistatic wrist strap
- ratchet set
- flat-bladed screwdriver
- cutters for tie wraps
- COP cooling unit maintenance kit (NT4K19AT), which consists of:
 - cooling unit (without LCAP) (NT7E7801)
 - bottom shelf temporary (EMC partial) cover
 - thermal chimney unit
 - temporary ground bars
- tie wraps for redressing cables

Effects on service

None, providing all conditions are met.

Procedure 8-1

Replacing a COP cooling unit in a TBM bay

Use this procedure to replace a cable organizer panel (COP) cooling unit in a TBM bay, without interrupting service.

Requirements

Before starting this procedure, you must:

- familiarize yourself with the procedure including the notes
- obtain all the equipment required to perform the upgrade
- ensure two installers are available to keep the DS1 or DS3 cables out of the way

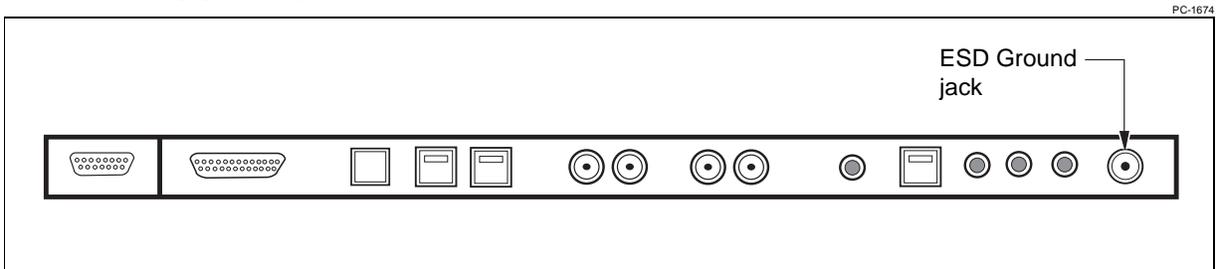


CAUTION
Risk of overheating and loss of service
Complete this procedure within one hour to avoid overheating and traffic loss. The TBM shelf heats up while the cooling unit is out of service.



CAUTION
Risk of electrostatic discharge (ESD) and equipment damage
Before touching a shelf, ground yourself with an antistatic wrist strap connected to the equipment frame ground on the local craft access panel (LCAP). See Figure 8-1.

Figure 8-1
LCAP showing ground jack position



—continued—

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay



CAUTION

Risk of overheating

Do not perform this procedure when ambient temperature exceeds 30°C (86°F). Equipment can overheat while the main cooling unit is taken out of service.

Action

Step Action

Accessing and clearing the cables

- 1 Verify that the ambient temperature does not exceed 30°C (86°F).
- 2 Do the following:

If the bay is	Then
equipped with one or two end guards	remove them as follows: a. Use a flat-bladed screwdriver to pry the protective plastic screw caps off the four mounting screws. b. Unscrew the mounting screws and remove the end guards.
not equipped with end guards	go to step 3
- 3 Do the following:

If the user interface is	Then
present	remove the cable from the LCAP user interface port 2 (see Figure 8-2)
not present	open the orderwire access cover flap by flipping it down (see Figure 8-2)

—continued—

8-4 Replacing a COP cooling unit in a working TBM bay

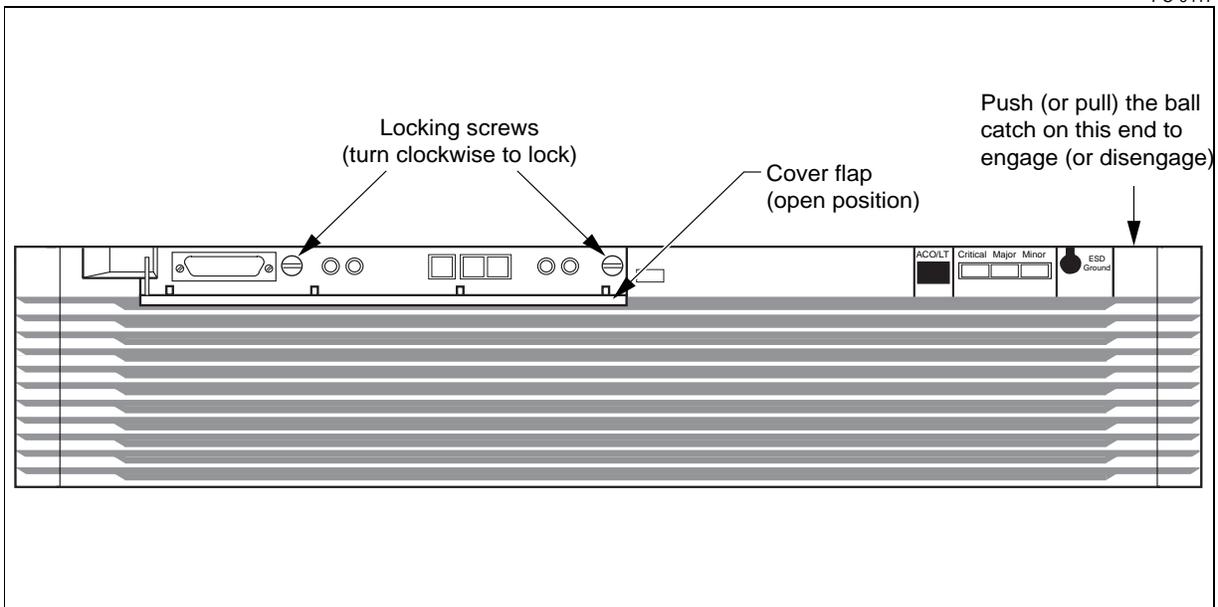
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action
4	Remove the cover in front of the COP cooling unit/LCAP unit above the bottom TBM shelf in position 3 (see Figure 8-3) as follows: <ol style="list-style-type: none">Using the flat-bladed screwdriver, turn the two locking screws counterclockwise to unlock the cover.Grasp the cover by the ends and pull to unsnap the ball catches.Remove the cover.

Figure 8-2
Removing the cable organizer panel (COP) cover

PC-0417



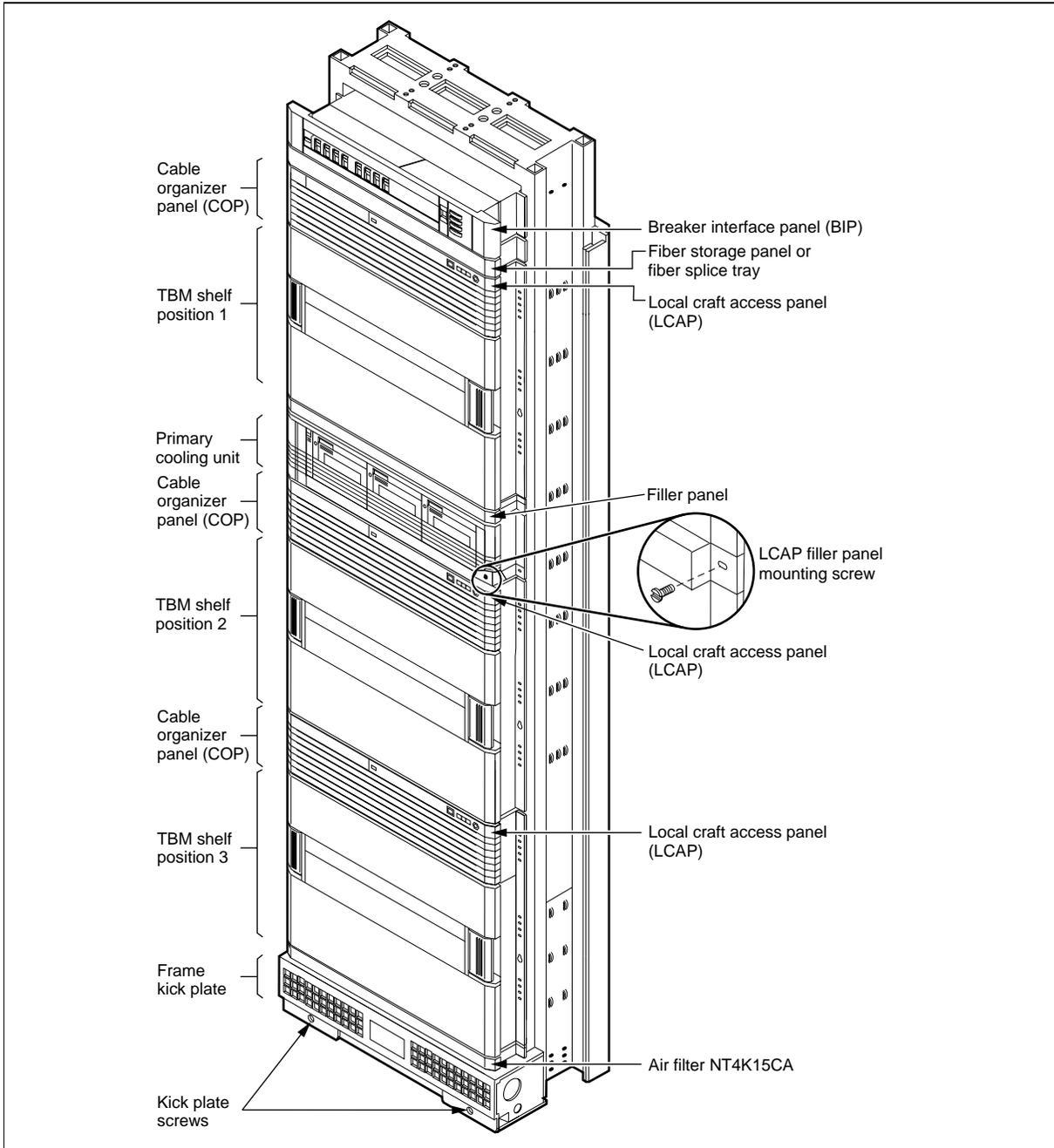
—continued—

Procedure 8-1 (continued)
Replacing a COP cooling unit in a TBM bay

Step Action

Figure 8-3
Location of LCAP/COP in the TBM bay

PC-11535



—continued—

8-6 Replacing a COP cooling unit in a working TBM bay

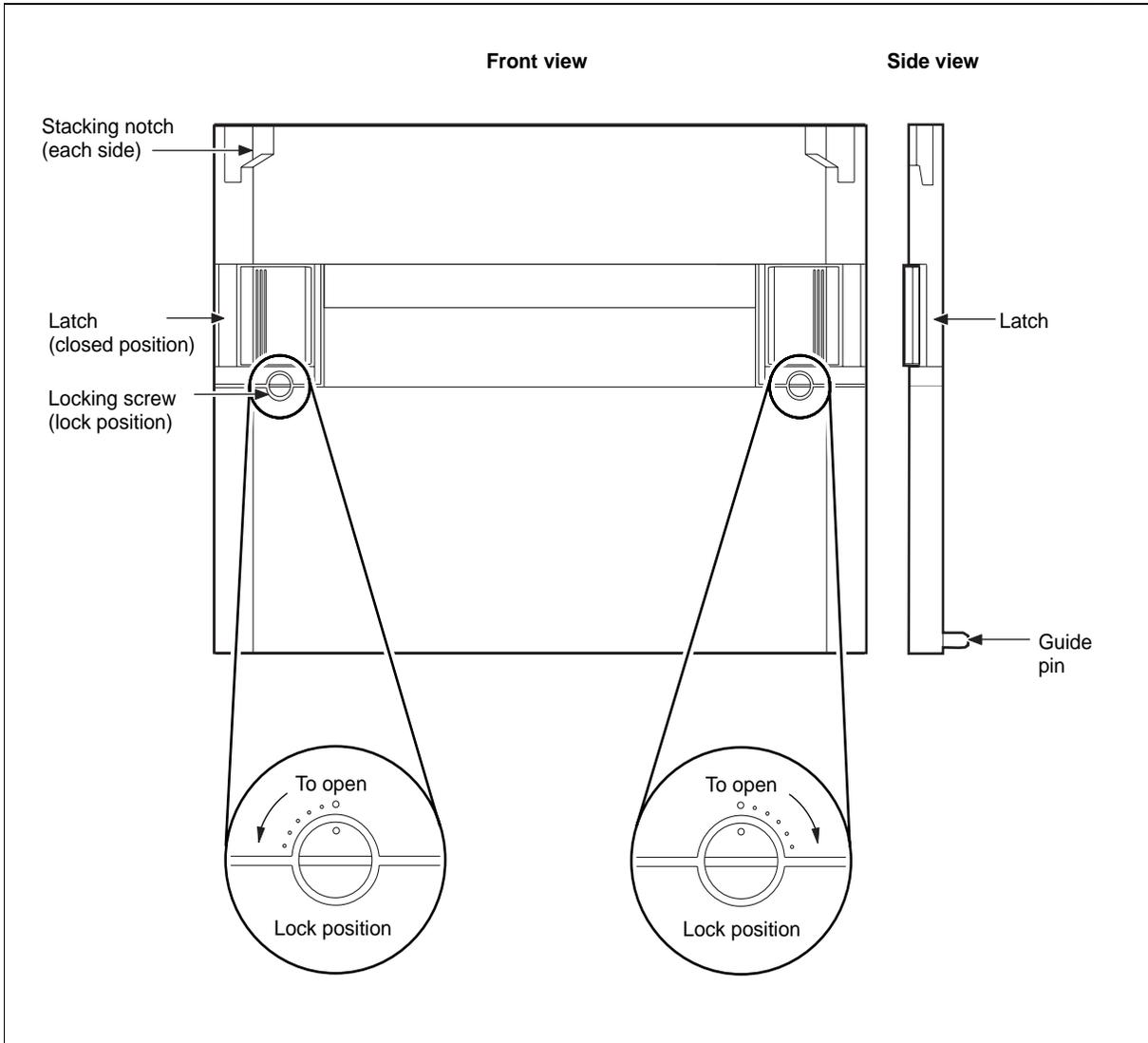
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action
5	Remove the bottom shelf cover. <ol style="list-style-type: none">Using the flat-bladed screwdriver, turn the locking screws 90° to the unlocked (horizontal) position (see Figure 8-4).On the sides of the cover, snap the two latch handles to the open position.Remove the cover.

Figure 8-4
Unlocking the TBM shelf cover

PC-11562



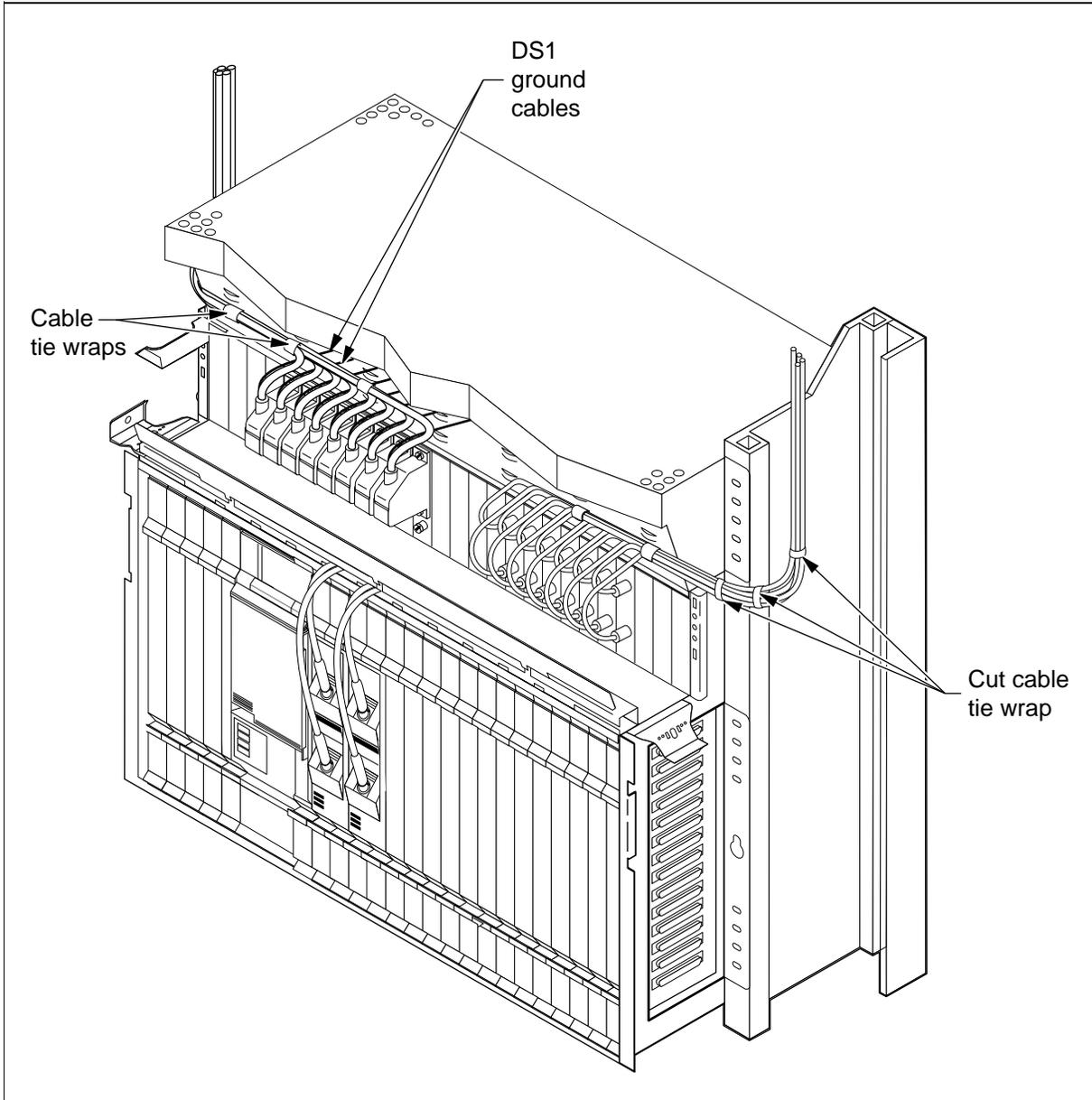
—continued—

Procedure 8-1 (continued)
Replacing a COP cooling unit in a TBM bay

Step Action

Figure 8-5
DS1/DS3 cable tie wraps

PC-15631



—continued—

8-8 Replacing a COP cooling unit in a working TBM bay

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action						
6	<p>Assure that all DS1/DS3 cables are well fastened to the I/O cards.</p> <p>Cut the three permanent DS1 or DS3 cable tie wraps (see Figure 8-5). Doing this provides enough slack so the COP cooling unit can be removed. Pull as much slack as possible from the bay upright. It may be necessary to cut more than three (3) tie wraps to free more cable slack.</p> <p>Do the following:</p> <table><thead><tr><th>If the shelf is equipped with</th><th>Then</th></tr></thead><tbody><tr><td>DS1 cables (or DS1 and DS3 cables)</td><td>go to step 7</td></tr><tr><td>DS3 cables only</td><td>go to step 14</td></tr></tbody></table>	If the shelf is equipped with	Then	DS1 cables (or DS1 and DS3 cables)	go to step 7	DS3 cables only	go to step 14
If the shelf is equipped with	Then						
DS1 cables (or DS1 and DS3 cables)	go to step 7						
DS3 cables only	go to step 14						
7	Connect the cable from the first temporary ground bar to the left side of the bay frame (see Figure 8-6).						
8	Connect the cable from the second temporary ground bar to the right side of the bay frame (see Figure 8-6).						
9	Locate the (green) DS1 ground wires in front of the COP cooling unit (see Figure 8-5).						
10	Starting on the left-hand side, disconnect the first DS1 ground wire from the COP cooling unit and connect it to the left temporary ground bar (see Figure 8-6).						
11	Repeat step 10 for all other DS1 cables routed on the left-hand side.						
12	On the right-hand side, disconnect the first DS1 ground wire from the COP cooling unit and connect it to the right temporary ground bar.						
13	Repeat step 12 for all other DS1 cables routed on the right-hand side.						
14	Carefully flatten all the DS1 or DS3 cables and the ground cables, away from the COP cooling unit, as much as possible.						

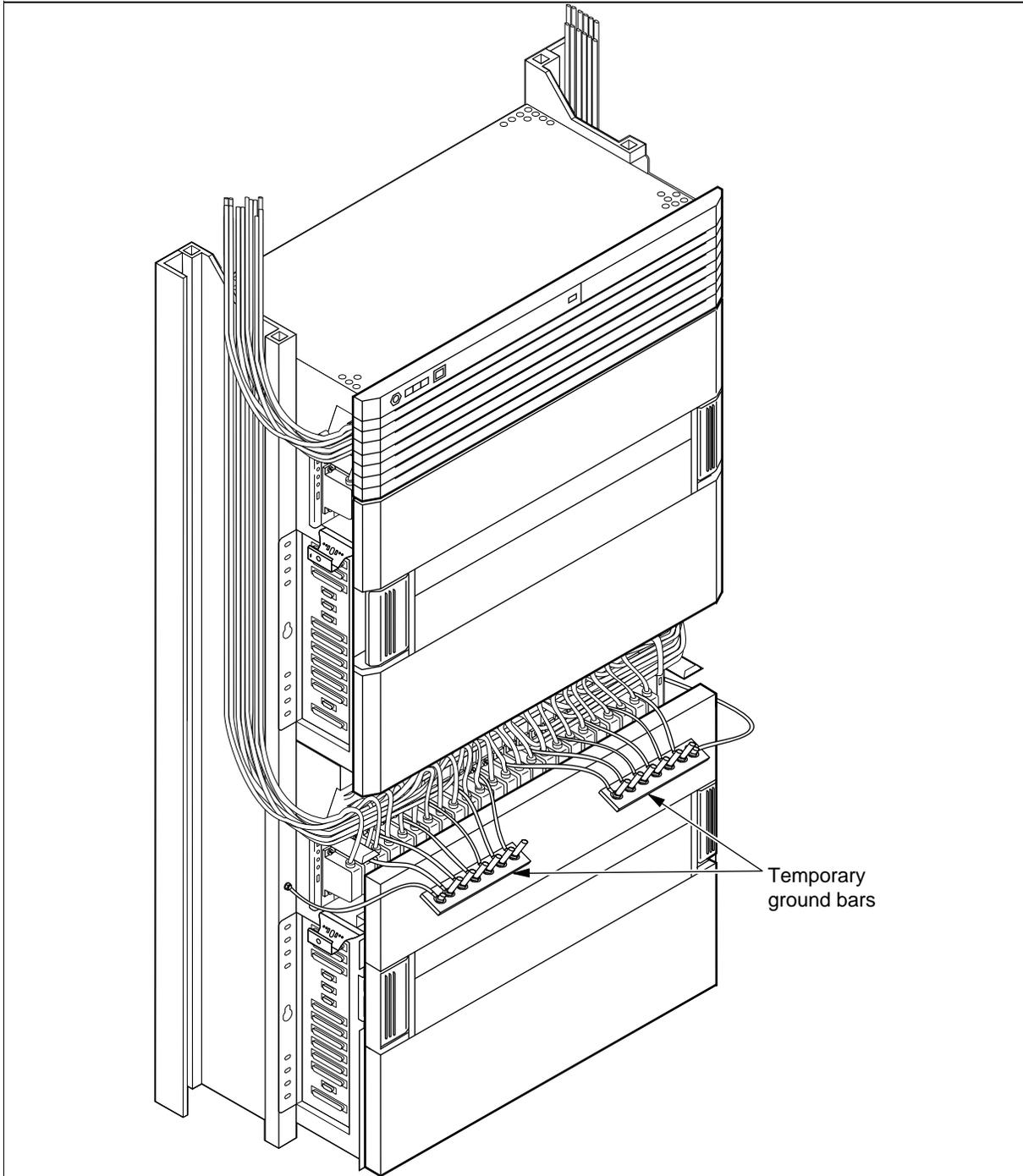
Note: Do not disrupt the interconnect integrity of the cables.

—continued—

Procedure 8-1 (continued)
Replacing a COP cooling unit in a TBM bay

Figure 8-6
Connecting ground cables to the temporary ground bars

PC-11554



—continued—

8-10 Replacing a COP cooling unit in a working TBM bay

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

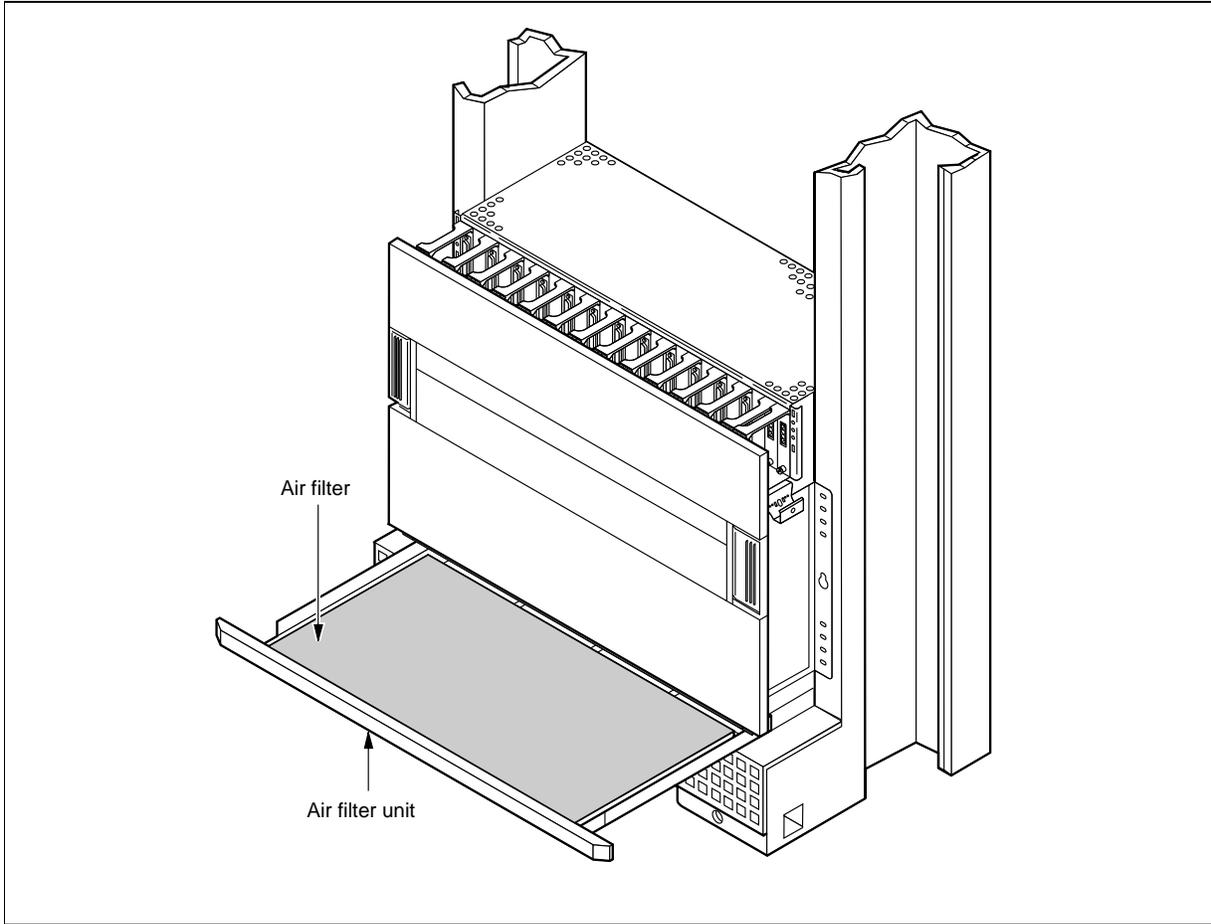
Step Action

Removing the bottom air filter element

- 15** Press the front of the bottom air filter unit (see Figure 8-7) to release the filter frame.
- 16** Pull the air filter frame out of the bay and remove the filter to allow for greater air flow.
- 17** Push the filter frame back into the unit until it snaps into place.

Figure 8-7
Removing the bottom air filter element

PC-3368



—continued—

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

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

Removing the COP cooling unit

- | | |
|----|--|
| 18 | Cut the LCAP cable tie wraps in the COP cooling unit. |
| 19 | Disconnect the LCAP interface cable from the SIL J04 LCAP interface connector and pull it clear of the COP cooling unit (see Figure 8-8 on page 8-12). |
| 20 | Disconnect the cooling unit alarm cable from the left side of the cooling unit (connects to the SIL J03 cooling unit interface connector) (see Figure 8-13 on page 8-18).
<i>This will raise three minor Fan Fail alarms.</i> |
| 21 | Label and unplug the "A" and "B" 48 V power cables (NT7E7804) from the COP cooling unit J1 connectors (see Figure 8-9 on page 8-13). |



DANGER

Risk of serious injury to hands

Fan may still be spinning.

Remove the cooling unit with care.

- | | |
|----|--|
| 22 | Remove the mounting bolts from the COP cooling unit. |
| 23 | Hold all the DS1/DS3 cables located within the COP flat and pull the COP cooling unit from the frame. |
| 24 | Install the temporary thermal duct in the gap created, to maintain the required air flow (see Figure 8-10 on page 8-14). |

—continued—

8-12 Replacing a COP cooling unit in a working TBM bay

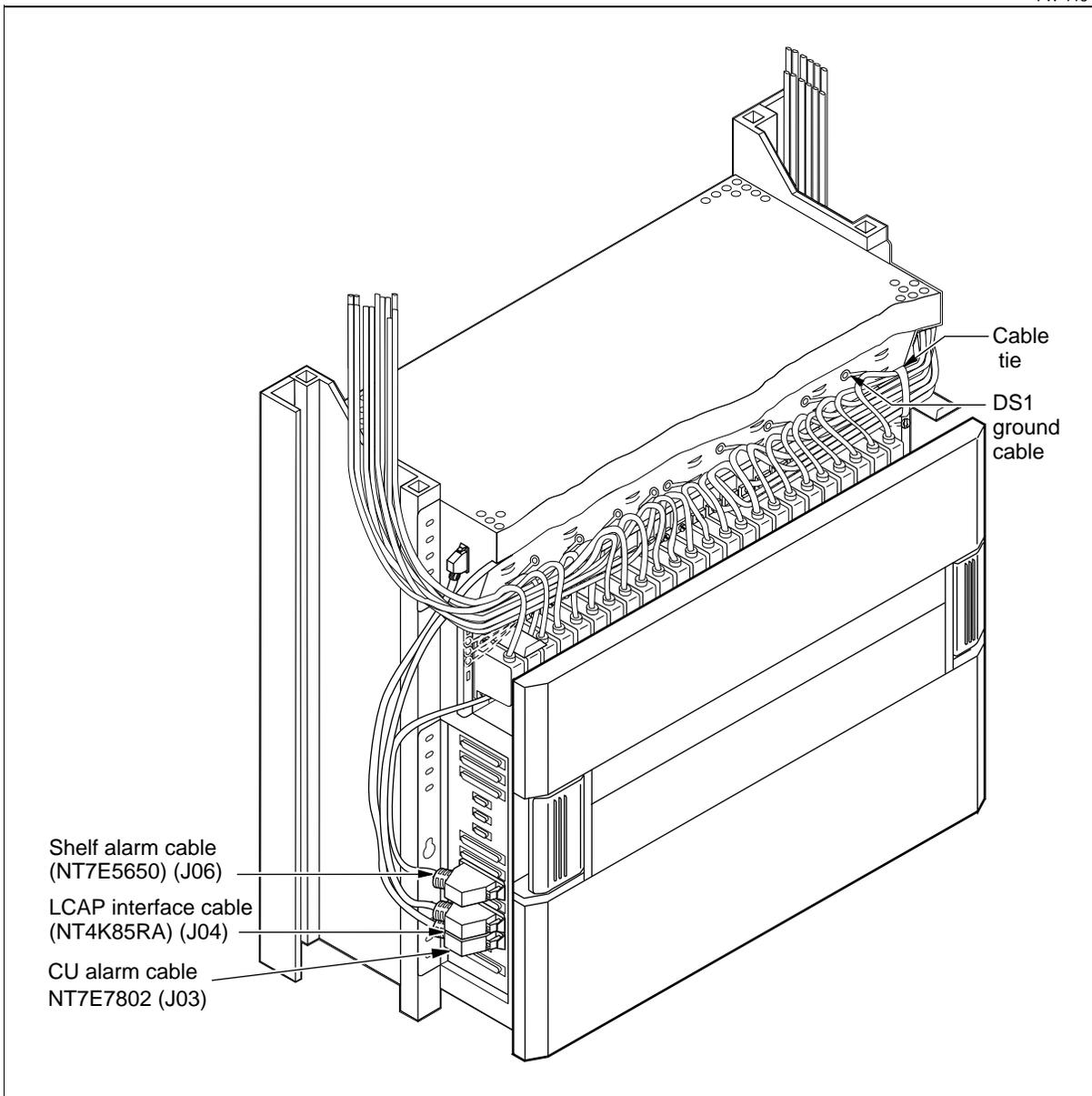
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step Action

Figure 8-8
Location of shelf alarm and LCAP interface cables on the SIL

FW-11547



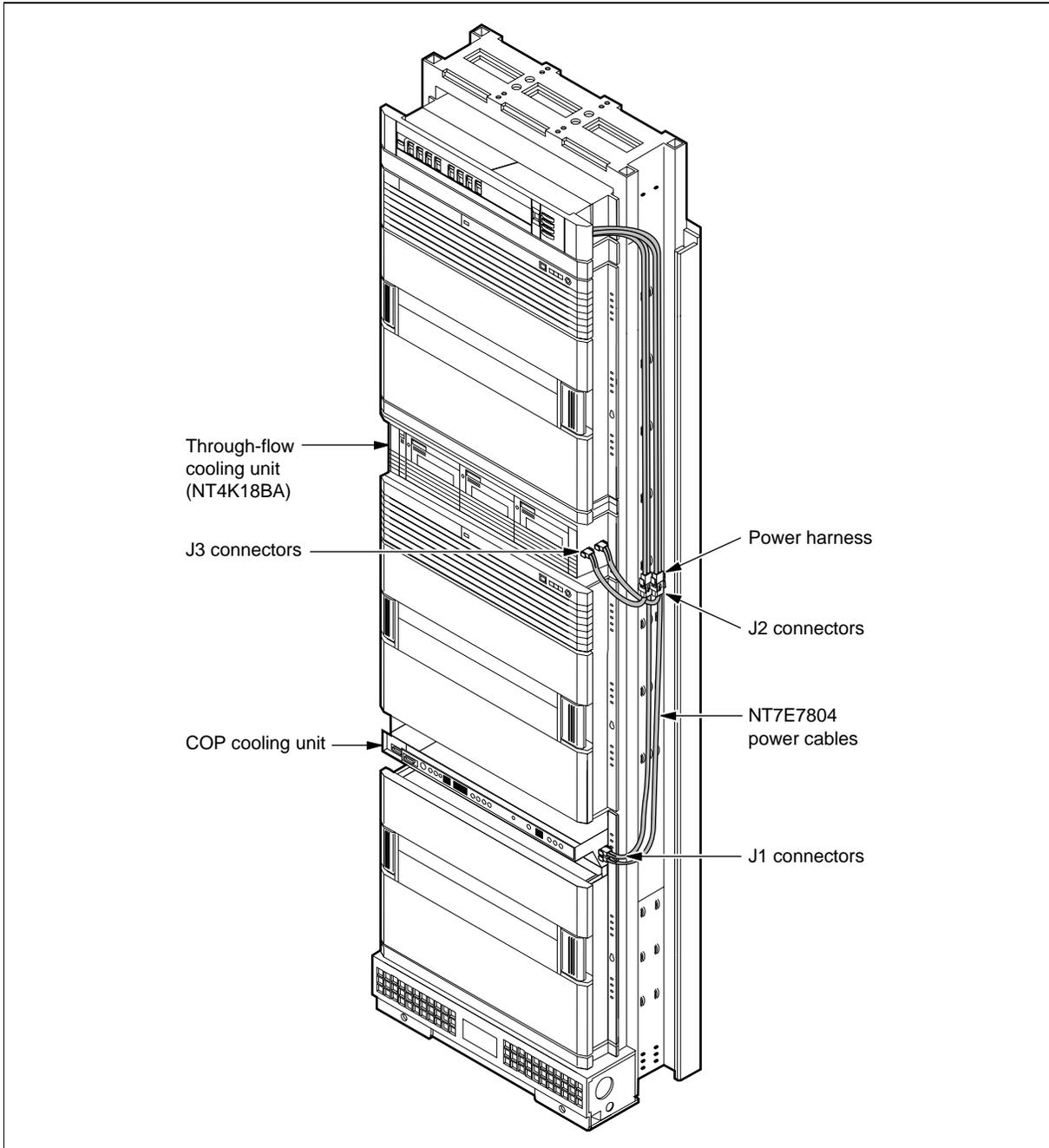
—continued—

Procedure 8-1 (continued)
Replacing a COP cooling unit in a TBM bay

Step Action

Figure 8-9
Unplugging the COP cooling unit power cables

FW-11546



—continued—

8-14 Replacing a COP cooling unit in a working TBM bay

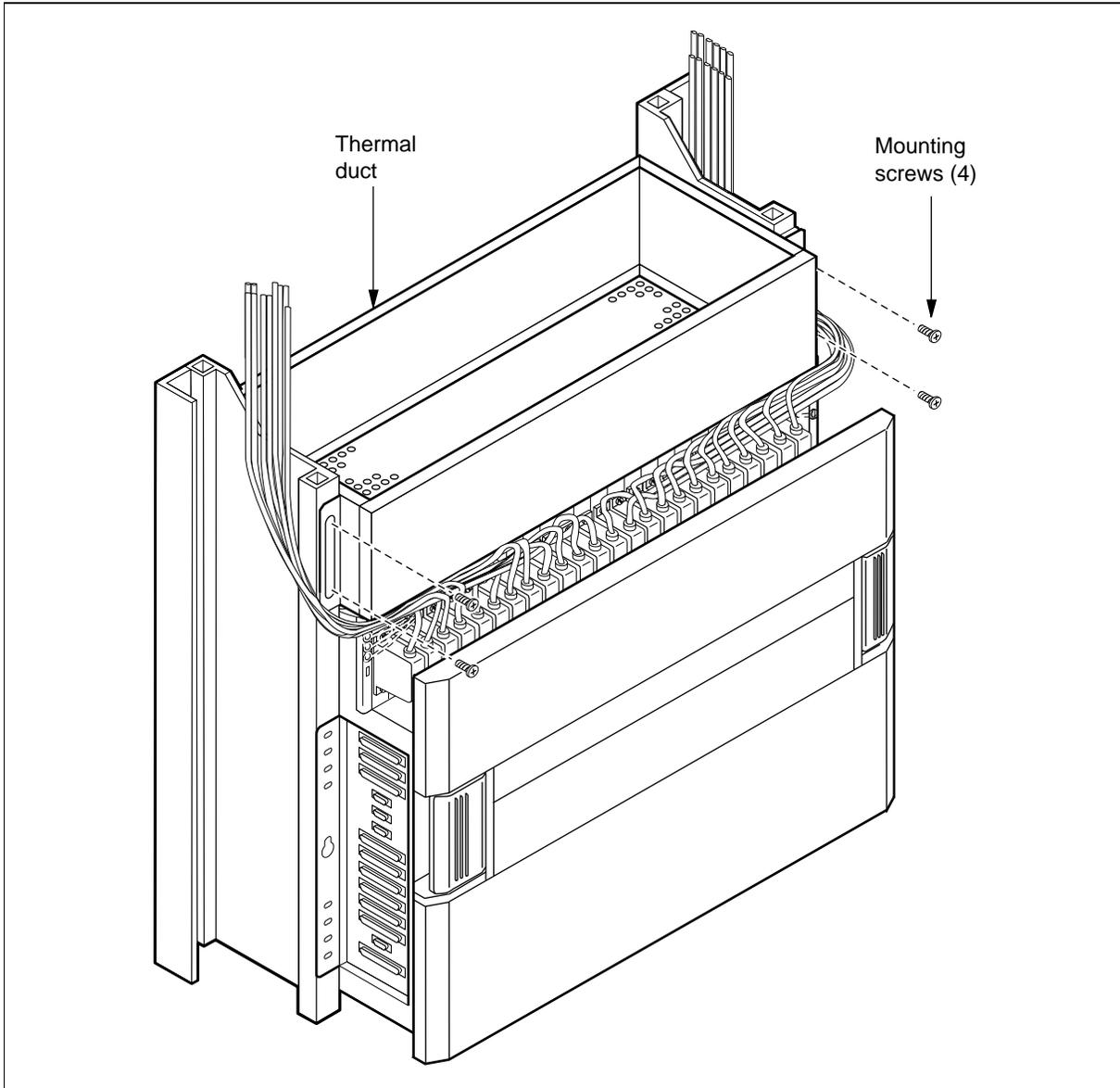
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step Action

Figure 8-10
Installing the thermal duct

FW-11541



—continued—

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step Action

Installing the LCAP in the COP cooling unit

25 Do the following:

If the LCAP is a model	Then go to
NT7E5051 or NT7E5053	step 26
NT7E5047	step 29

LCAP 5051 or 5053

26 Remove the two LCAP mounting screws (see Figure 8-11) from the front of the LCAP.

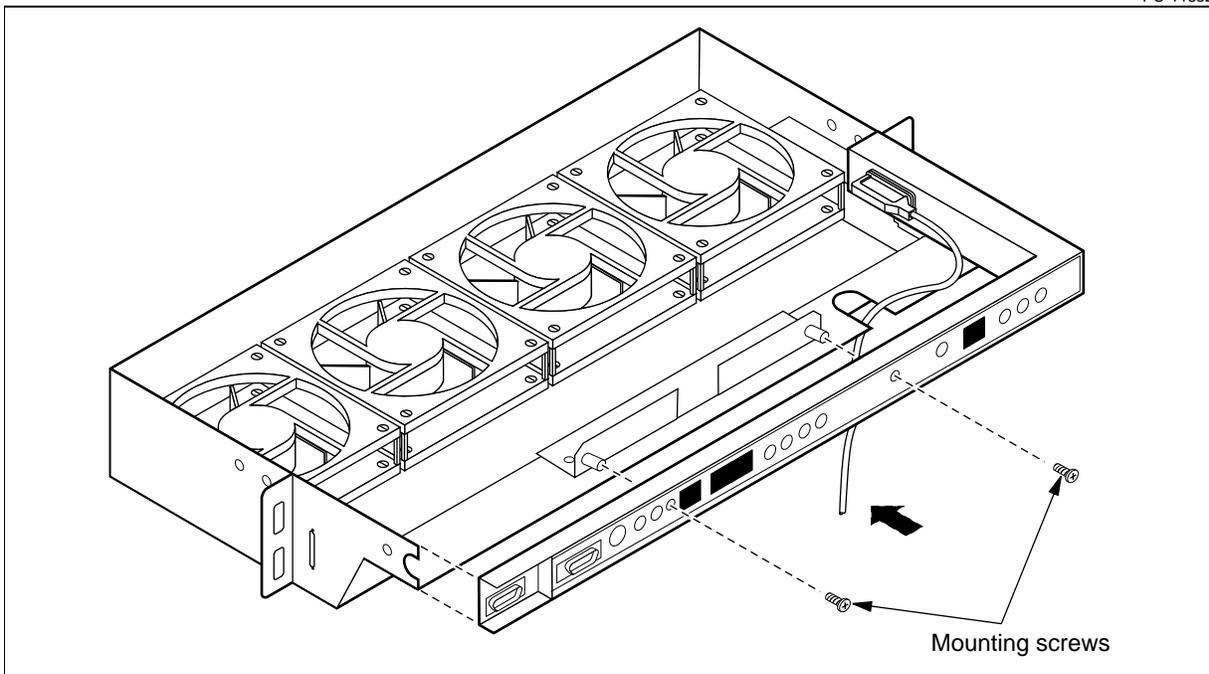
27 Remove the LCAP from the removed COP cooling unit and install it on the replacement COP cooling unit (NT7E7801) (see Figure 8-11) as follows:

- a. Lay the LCAP interface cable so that it exits the cooling unit through the large slot at its front.
- b. Slide the LCAP into place.
- c. Attach with the two mounting screws.

28 Go to step 33.

Figure 8-11
Installing the 5051 or 5053 LCAP in the COP cooling unit

PC-11552



—continued—

8-16 Replacing a COP cooling unit in a working TBM bay

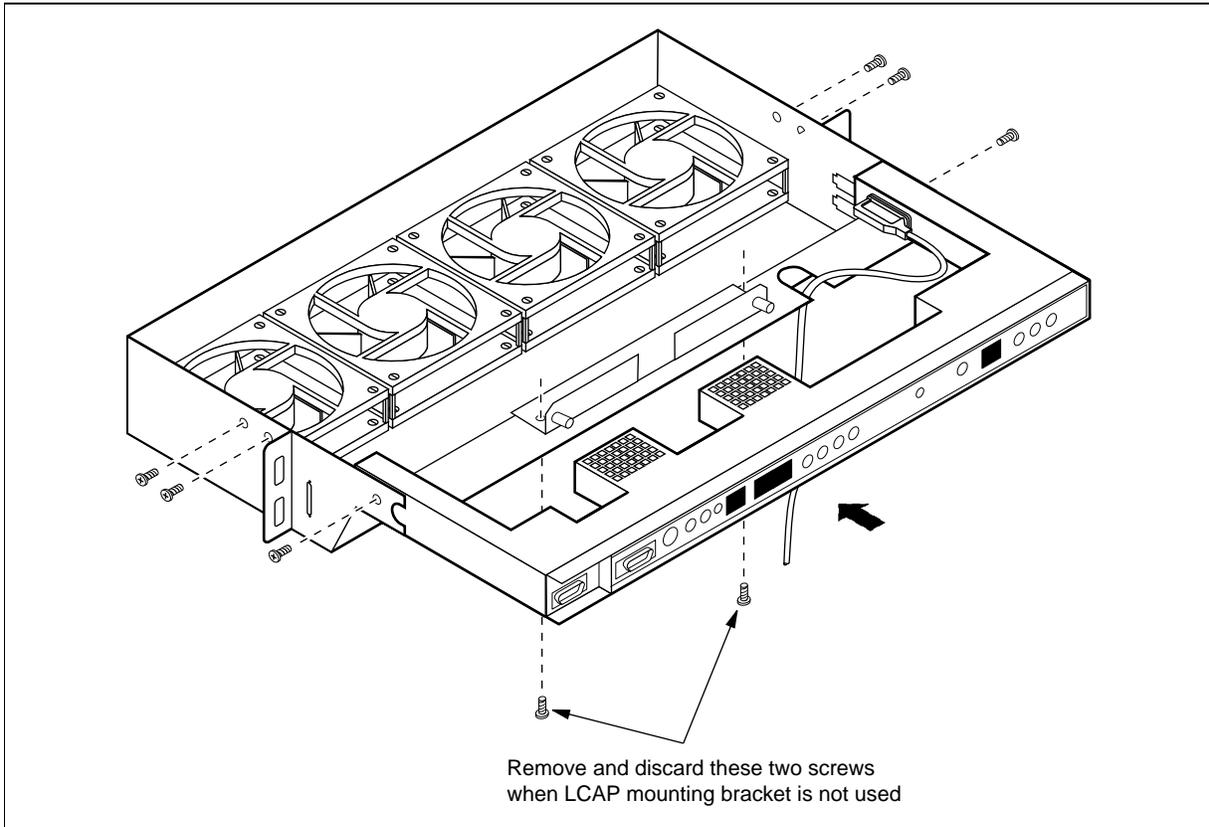
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action
LCAP 5047	
29	Remove the three mounting screws from each side of the LCAP (see Figure 8-12).
30	Remove the 5047 LCAP from the removed COP cooling unit.
31	On the replacement COP cooling unit (NT7E7801), unscrew the mounting screws from the bottom of the LCAP mounting bracket (see Figure 8-12) and remove the mounting bracket. Discard the mounting screws and bracket.
32	Install the 5047 LCAP in the replacement COP cooling unit as follows: <ol style="list-style-type: none">Lay the LCAP interface cable so that it exits the cooling unit through the large slot at its front.Slide the LCAP into place.Attach with the three mounting screws on each side.

Figure 8-12
Installing the 5047 LCAP in the COP cooling unit

PC-11553



—continued—

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action						
33	Remove the thermal duct (see Figure 8-10 on page 8-14).						
34	Install the COP cooling unit (see Figure 8-13 on page 8-18) as follows: <ol style="list-style-type: none"> a. Hold the cables clear and slide the unit into the bay. b. Attach with the four mounting screws. 						
Reassembling the bay							
35	Plug the “A” and “B” power cables in to the cooling unit (see Figure 8-9 on page 8-13).						
36	Reinstall the bottom air filter (see Figure 8-7 on page 8-10).						
37	Reconnect the LCAP interface cable (see Figure 8-8 on page 8-12) to the SIL panel (J04 LCAP interface connector).						
38	Reconnect the cooling unit alarm cable (NT7E7802) from the SIL panel (J03 cooling unit interface connector) to the COP cooling unit (see Figure 8-13 on page 8-18). <i>The three minor Fan Fail alarms will clear.</i>						
39	Redress the LCAP interface cable as before with cable tie wraps.						
40	Do the following: <table border="1" style="margin-left: 20px; width: 100%;"> <thead> <tr> <th style="text-align: left;">If the shelf is equipped with</th> <th style="text-align: left;">Then go to</th> </tr> </thead> <tbody> <tr> <td>DS1 cables (or DS1 and DS3 cables)</td> <td>step 41</td> </tr> <tr> <td>DS3 cables only</td> <td>step 46</td> </tr> </tbody> </table>	If the shelf is equipped with	Then go to	DS1 cables (or DS1 and DS3 cables)	step 41	DS3 cables only	step 46
If the shelf is equipped with	Then go to						
DS1 cables (or DS1 and DS3 cables)	step 41						
DS3 cables only	step 46						
41	Starting on the left-hand side, disconnect the first DS1 ground wire from the left temporary ground bar and reconnect it to the COP cooling unit.						
42	Repeat step 41 to reconnect all other DS1 cables routed on the left-hand side.						
43	On the right-hand side, disconnect the first DS1 ground wire from the right temporary ground bar and reconnect it to the COP cooling unit.						
44	Repeat step 43 to reconnect all other DS1 cables routed on the right-hand side.						
45	Disconnect the temporary ground bar cables from the left and right sides of the bay frame (see Figure 8-6 on page 8-9).						
46	Redress all the DS1 or DS3 cables, in front of the COP cooling unit and in the frame uprights, with cable tie wraps.						

—continued—

8-18 Replacing a COP cooling unit in a working TBM bay

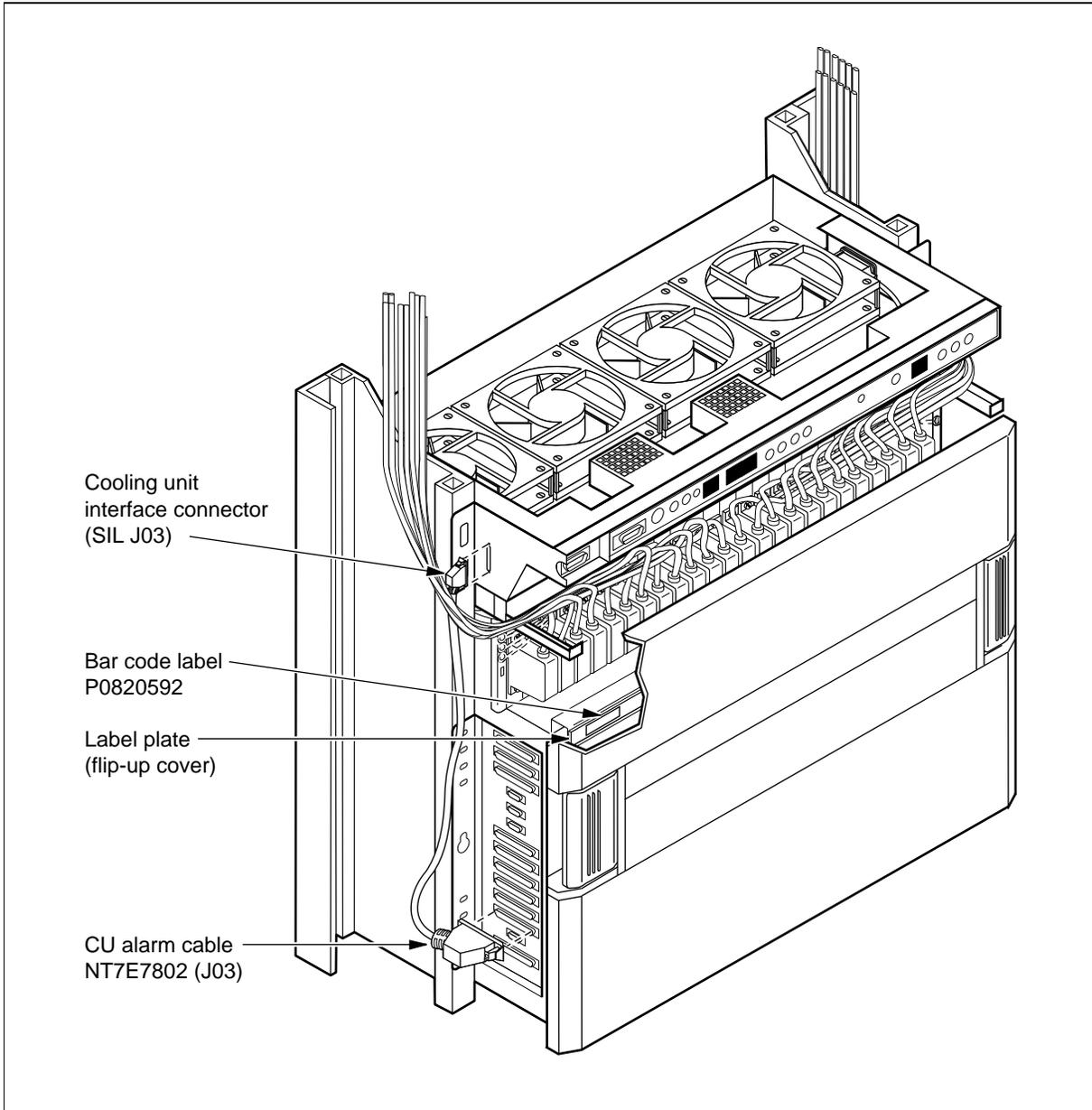
Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

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

Figure 8-13
Installing the COP cooling unit

PC-11545



—continued—

Procedure 8-1 (continued)

Replacing a COP cooling unit in a TBM bay

Step	Action
47	Reinstall the TBM shelf cover (see Figure 8-4 on page 8-6) as follows: <ol style="list-style-type: none">Engage the aligning pins at the bottom of the shelf.Grasp the cover by the handles and push until the handles snap to the closed position.With the flat-bladed screwdriver, rotate the locking screws 90° to the locked (vertical) position.
48	Install the cover on the COP cooling unit (see Figure 8-2 on page 8-4) as follows: <ol style="list-style-type: none">Place the notched plastic guide, which projects from the lower back portion of the cover, onto the corresponding brackets on the side of the shelf.Push the cover onto the mounting brackets until the cover fits tightly.Open the orderwire access cover flap by flipping it down.Secure the cover in place by turning the two locking screws clockwise.Close the orderwire access cover flap.
49	Reconnect the LCAP user interface cable to port 2 on the front of the LCAP (if disconnected in step 3).
50	Reinstall the end guards (if removed in step 2) as follows: <ol style="list-style-type: none">Place the end guard on the mounting bracket.Fasten with the four mounting screws.Snap the protective plastic screw caps onto the four mounting screws.

—end—

Common procedures

This chapter contains procedures that are common to other procedures in this document.

Chapter contents

In the following table look up the task you are required to perform, then proceed to the page specified.

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

Topic	See
Locating a module in a common-equipment shelf	page 9-2
Removing the breaker interface panel cover	page 9-3
Replacing the breaker interface panel cover	page 9-5

Procedure 9-1

Locating a module in a common-equipment shelf

Use this procedure to determine from the network element user interface the physical location of a module in a common-equipment shelf.

Requirements

You must be logged in to a network element user interface from either a VT100-type terminal or from an operations controller user interface.

Action

Step	Action
1	From the network element status screen, display the shelf inventory: eq sh;inventory ↵ <i>The common-equipment shelf inventory appears. The shelf inventory does not include the side interconnect left or the side interconnect right.</i>
2	From the information displayed on screen, note the location of the circuit pack, specifically the slot number within the common-equipment shelf.
3	Go to that location and replace the circuit pack, as outlined in the procedures in this document.

—end—

Procedure 9-2

Removing the breaker interface panel cover

Use this procedure to remove the cover from the NT4K14 BIP. Other procedures in this document will call upon this procedure.

Action

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

**CAUTION****Damage to locking screws and the finish of the equipment covers**

Do not use a coin to turn the locking screws on the equipment covers, as it may damage the locking screws and the finish on the covers. Only use a 1/4 in. slot screwdriver to turn the locking screws.

- 1 Use a 1/4-inch slot screwdriver to turn the left and right locking screws, until the dots are no longer aligned, then pull on the cover latches to remove the cover. See Figure 9-1 on page 9-4.

—continued—

9-4 Common procedures

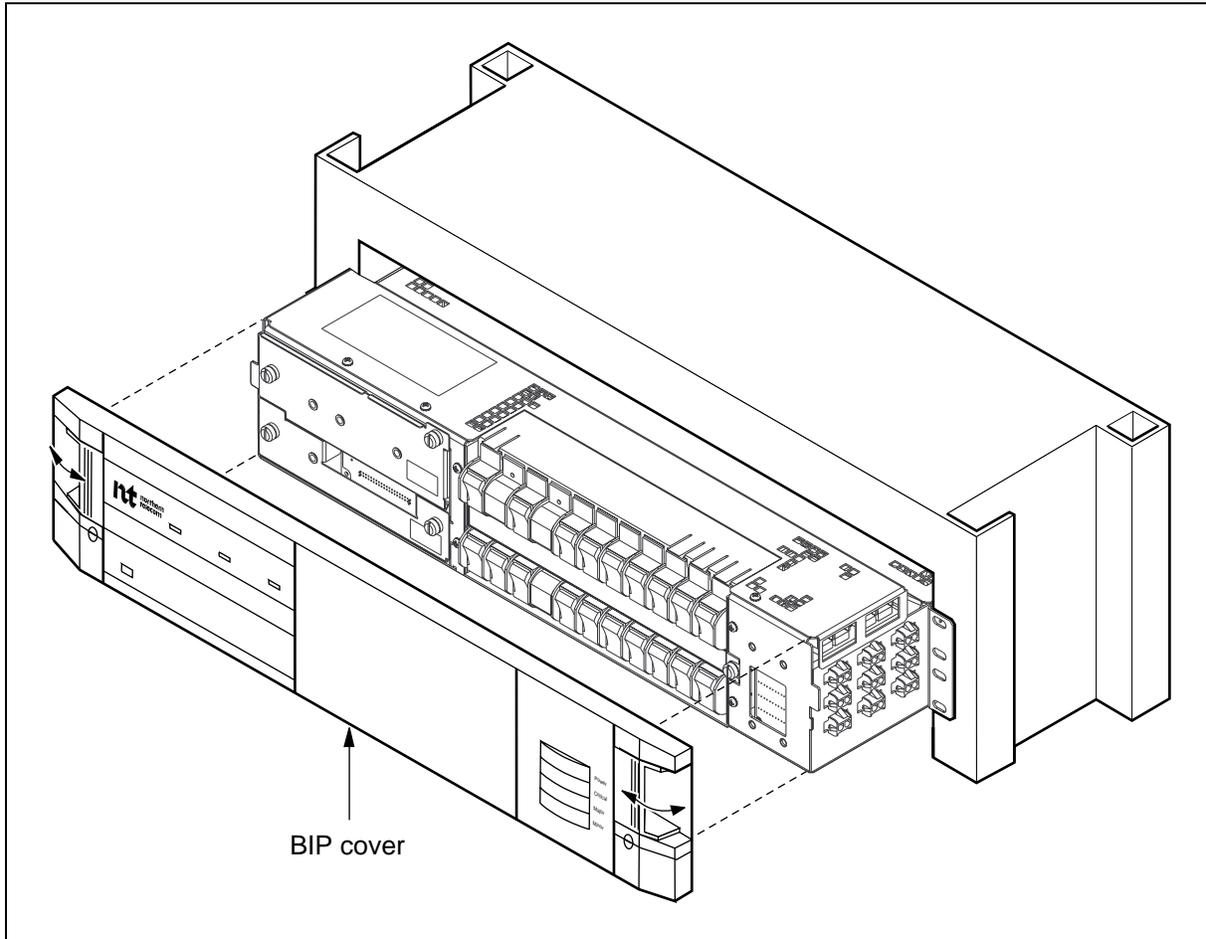
Procedure 9-2 (continued)

Removing the breaker interface panel cover

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

Figure 9-1
Remove the BIP cover

PC-16504



—end—

Procedure 9-3

Replacing the breaker interface panel cover

Use this procedure to replace the cover on the NT4K14 BIP. Other procedures in this document will call upon this procedure.

Action

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

**CAUTION****Damage to locking screws and the finish of the equipment covers**

Do not use a coin to turn the locking screws on the equipment covers, as it may damage the locking screws and the finish on the covers. Only use a 1/4 in. slot screwdriver to turn the locking screws.

- 1 Push the cover into place, close both latches, and secure the cover by using a 1/4-inch slot screwdriver to turn the right and left locking screws until the dots are aligned. See Figure 9-2 on page 9-6.

—continued—

9-6 Common procedures

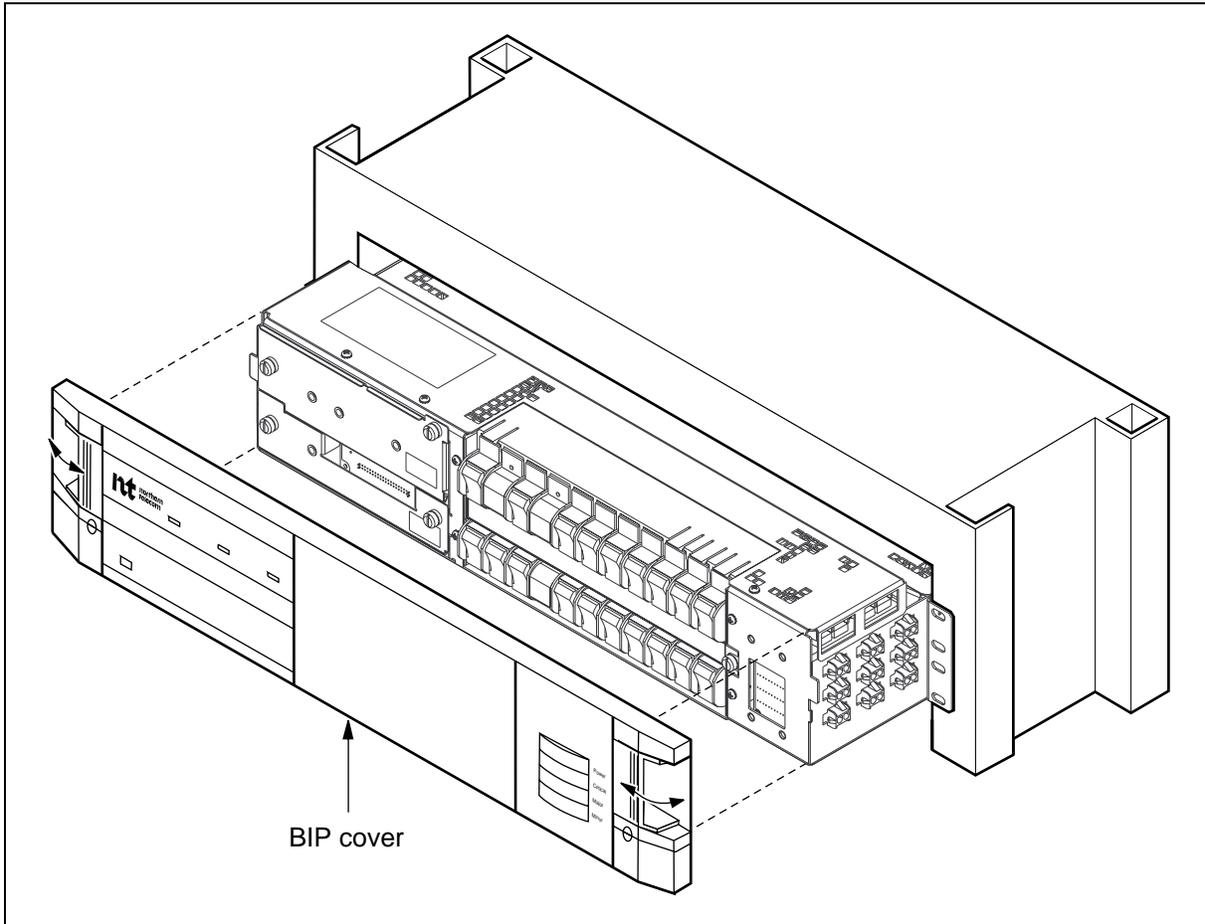
Procedure 9-3 (continued)

Replacing the breaker interface panel cover

Step Action

Figure 9-2
Replace the BIP cover

PC-16504



—end—

Power feed maintenance

This chapter has instructions relating to the maintenance of the power feeds, which includes any of the following activities:

- replacing fuses on the battery distribution fuse bay (BDFB)
- replacing power cards on the common-equipment shelf
- disconnecting power cables from the common-equipment shelf or breaker interface panel (BIP) feed 1 and 2.

Note: Power feed 1 and feed 2 affect the following equipment:

- Feed 1 affects cards on plane A of the ABM common equipment shelf, and copper-distribution shelf (CDS) 1, 3, 5, and 7.
- Feed 2 affects cards on plane B of the ABM common equipment shelf, and copper-distribution shelf (CDS) 2, 4, and 6.
- Cards on the TBM common equipment shelf are dual powered, from both planes A and B.

See Figure 10-1 on page 10-5 for a schematic of the power feeds.

Before disrupting power to common equipment for any of the reasons listed above, follow the procedure below.

If local safety procedures require removal of the fuse from the battery distribution fuse bay, service interruption will occur.

In the following table look up the task you are required to perform, then proceed to the page specified.

If you cannot successfully complete this procedure, contact your next level of support.

Chapter contents

Topic	See
Power feed maintenance	page 10-2

Procedure 10-1

Power feed maintenance

Action

Step	Action						
1	Determine which plane will be affected by the feed maintenance: <ul style="list-style-type: none">• Feed 1 affects cards on plane A of the common equipment shelf• Feed 2 affects cards on plane B of the common equipment shelf						
2	From the network element status screen, display the equipment screen for the TIC in the affected plane: eq tic <plane> ↵ where <plane> number of the affected plane: a or b <i>The TIC equipment screen appears.</i> <table><thead><tr><th>If the affected plane contains</th><th>Then</th></tr></thead><tbody><tr><td>the primary in-service TIC</td><td>go to step 3</td></tr><tr><td>the secondary in-service TIC</td><td>go to step 4</td></tr></tbody></table>	If the affected plane contains	Then	the primary in-service TIC	go to step 3	the secondary in-service TIC	go to step 4
If the affected plane contains	Then						
the primary in-service TIC	go to step 3						
the secondary in-service TIC	go to step 4						
3	Switch service from the primary TIC to the secondary TIC: switch ↵ y ↵						
4	Change the state of the affected TIC to out-of-service (OOS): chgstate oos ↵ <i>The system prompts for confirmation of the state change.</i>						
5	Confirm the state change: y ↵ <i>The state changes to OOS.</i>						
6	From the TIC equipment screen, display the AIC equipment screen for the AIC in the affected plane: eq aic <plane> ↵ where <plane> number of the affected plane: a or b <i>The AIC equipment screen appears.</i>						
7	Ensure that the redundant unit state is in-service (IS).						

—continued—

Procedure 10-1 (continued)
Power feed maintenance

Step	Action
8	<p>If the redundant unit is in service, change the state of the AIC in the affected plane to out-of-service (OOS):</p> <p>chgstate oos.↵</p> <p><i>The system prompts for confirmation of the state change.</i></p>
9	<p>Confirm the state change:</p> <p>y.↵</p> <p><i>The state changes to OOS.</i></p>
<div style="border: 1px solid black; padding: 10px;">  <p>CAUTION Power interruption</p> <p>Removing power feeds will interrupt power as follows:</p> <ul style="list-style-type: none"> • Feed 1 affects cards on plane A of the common equipment, and copper-distribution shelf (CDS) 1, 3, 5, and 7. • Feed 2 affects cards on plane B of the common equipment, and copper-distribution shelf (CDS) 2, 4, and 6. <p>See Figure 10-1 on page 10-5 for a schematic of the power feeds.</p> </div>	
10	<p>Perform the required maintenance on the feeds. When power is restored, proceed to step 11.</p>
11	<p>From any screen, select, the AIC on the affected plane:</p> <p>eq aic <plane>.↵</p> <p style="padding-left: 40px;">where</p> <p style="padding-left: 80px;"><plane> number of the affected plane: a or b</p> <p><i>The AIC equipment screen appears.</i></p>
12	<p>Change the state of the AIC to in-service (IS):</p> <p>chgstate is.↵</p> <p><i>The state changes to in-service.</i></p>

—continued—

10-4 Power feed maintenance

Procedure 10-1 (continued)

Power feed maintenance

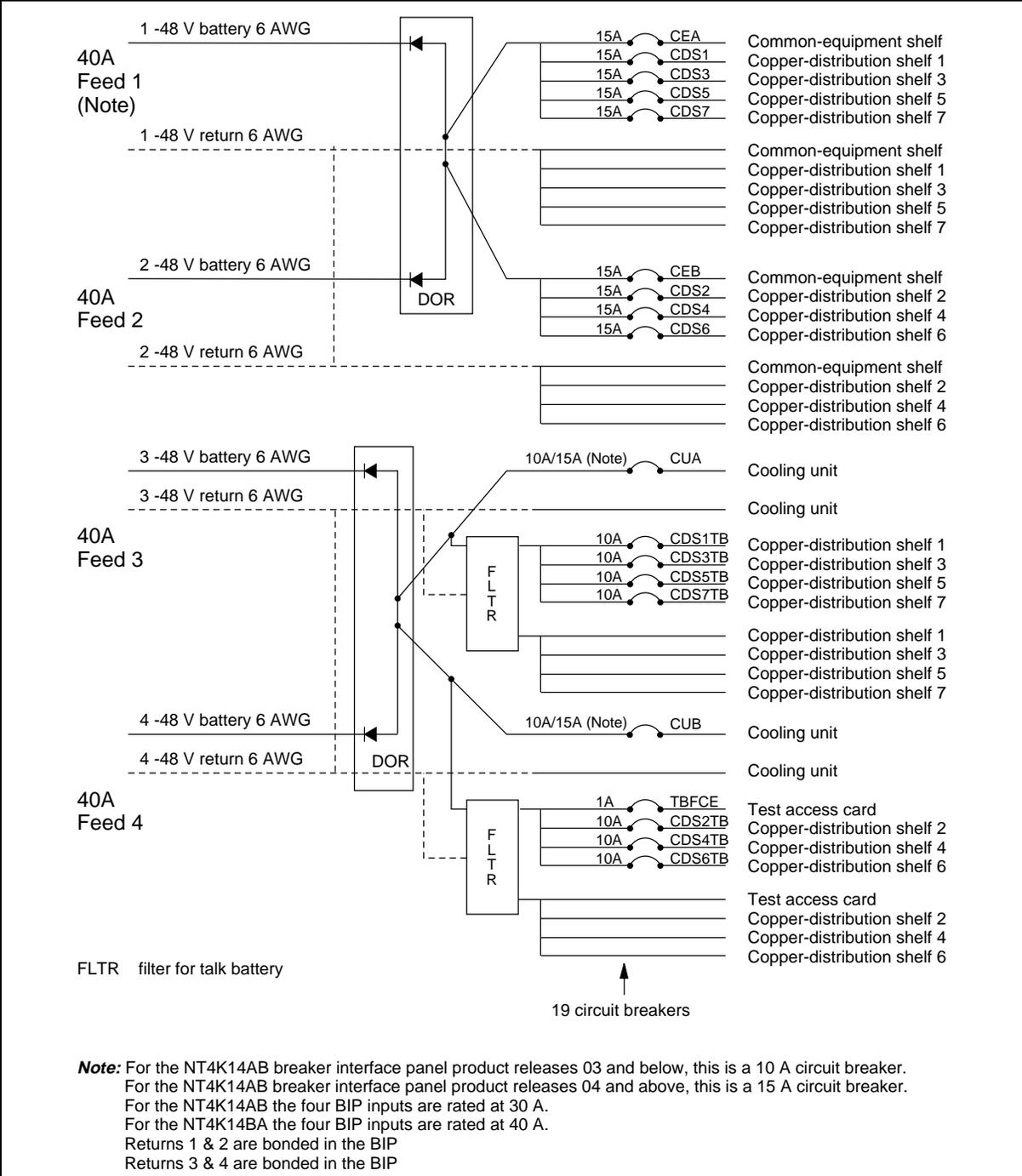
Step	Action
13	From the AIC equipment screen, select the TIC on the affected plane: eq tic < plane> ↵ where <plane> number of the affected plane: a or b <i>The TIC equipment screen appears.</i>
14	Change the state of the TIC to in-service (IS): chgstate is ↵ <i>The state changes to in-service.</i>

—continued—

Procedure 10-1 (continued)
Power feed maintenance

Figure 10-1
Power feed schematic

PC-16496



—end—

MBP and MPP procedures

This chapter contains procedures that are specific to the Modular Business Package (MBP) and Modular Power Package (MPP).

Chapter contents

In the following table look up the task you are required to perform, then proceed to the page specified.

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

Topic	See
Remove the MBP/MPP equipment cover	<i>Modular Business Package Cabinet Installation Manual, 323-3001-206</i>
Replace NT4K2620: MBP blower module	page 11-2
Replace NT5C06: MPR25 rectifier	page 11-6
Replace the MBP/MPP equipment cover	<i>Modular Business Package Cabinet Installation Manual, 323-3001-206</i>

Procedure 11-1

NT4K2620: MBP blower module

Use this procedure to replace the NT4K2620 blower module housed in the pedestal of the Modular Business Package (MBP) cabinet.

Action

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

- 1 Remove the front pedestal grille from the MBP cabinet, as shown in Figure 11-1:
 - a. Release the two captive screws that hold the pedestal grille in place.
 - b. Grasp the top left and top right edges of the grille.
 - c. Tilt the grille outward and lift it upward to remove it.
- 2 Set both blower module circuit breakers to the down (off) position.



DANGER

Risk of personal injury from fan blades

Turn blower power off and wait 2 minutes before removing unit.

Fan blades may still be turning after power is turned off.

- 3 Wait 2 minutes for the fan blades inside the blower module to stop rotating.
- 4 As shown in Figure 11-2 on page 11-4, turn the two screws on the blower module counterclockwise until the cam is rotated 90 degrees, then pull firmly to remove the blower from the pedestal.

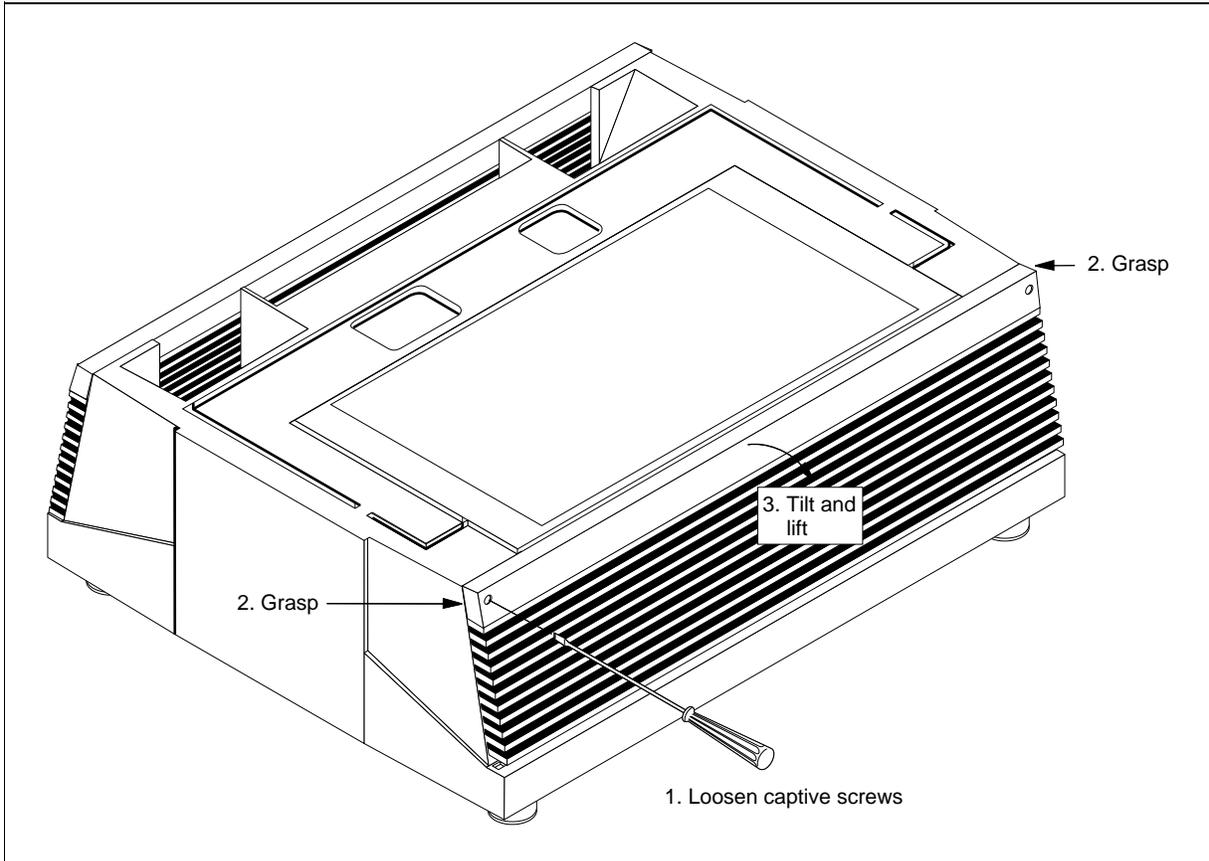
—continued—

Procedure 11-1 (continued)
NT4K2620: MBP blower module

Step Action

Figure 11-1
Removing MBP pedestal grille

PC-10852



—continued—

11-4 MBP and MPP procedures

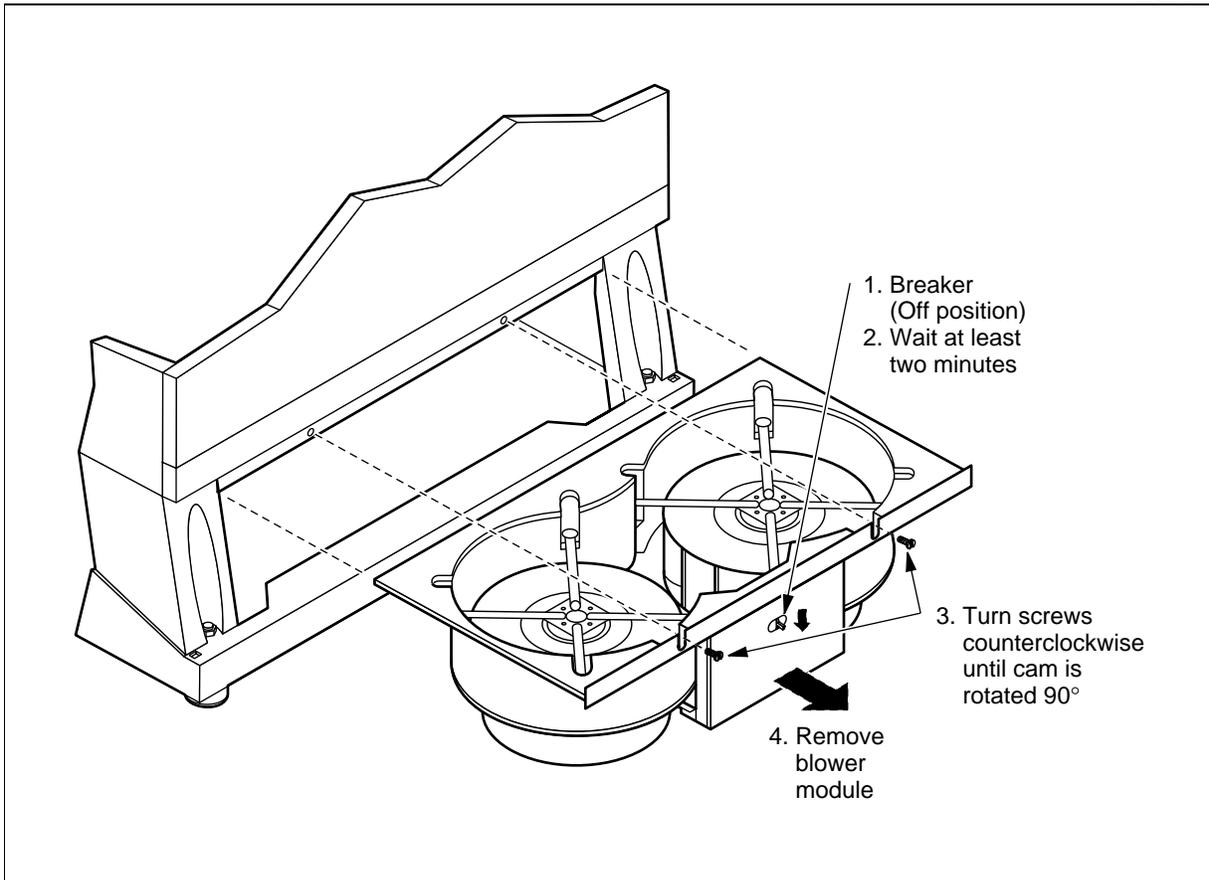
Procedure 11-1 (continued)

NT4K2620: MBP blower module

Step	Action
5	Insert the replacement blower module into the pedestal and slide it all the way in until it engages with the connector at the rear of the pedestal.
6	Turn the 2 screws on the blower module clockwise until the cam is rotated 90 degrees. Torque screws to 12 inch-pounds.

Figure 11-2
Removing the blower module

PC-10899

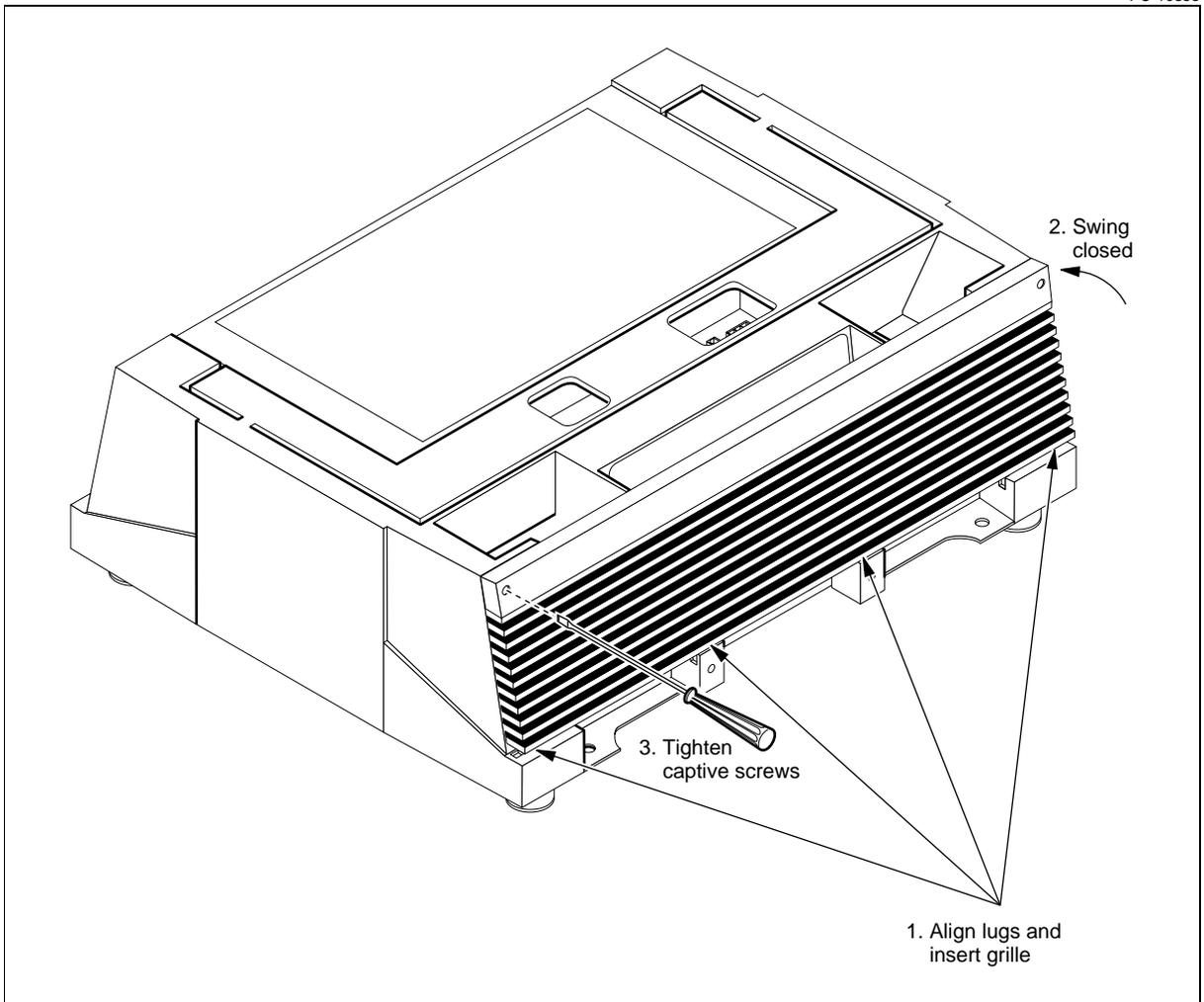


—continued—

Procedure 11-1 (continued)
NT4K2620: MBP blower module

Step	Action
7	Set the blower module circuit breakers to the up (on) position.
8	Install the pedestal grille, as shown in Figure 11-3.

Figure 11-3
Installing the MBP pedestal grille



—end—

Procedure 11-2

NT5C06: MPR 25 rectifier

Use this procedure to replace an NT5C06 MPR25 rectifier in the Modular Power Package (MPP) cabinet.

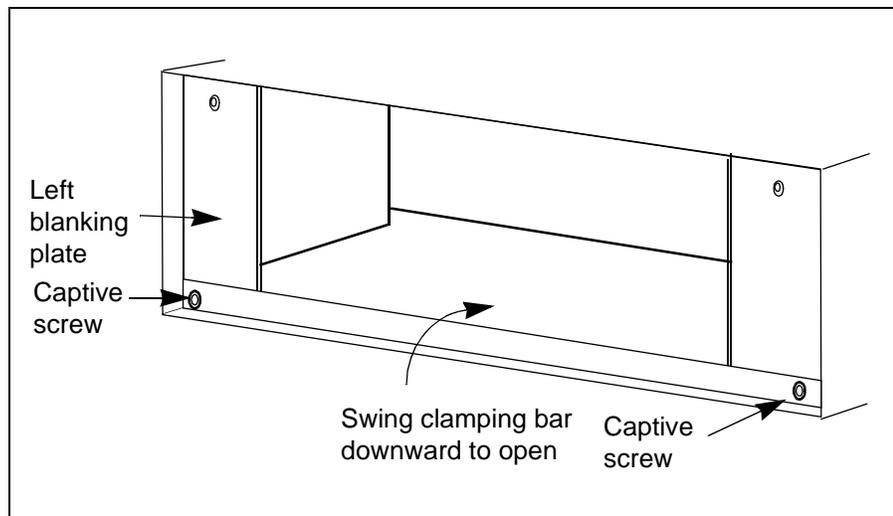
The MPR25 rectifier can be replaced in-service without power interruption to the load (hot insert).

Requirements

A screwdriver, flat blade, 1/4-in. blade width is required.

Action

Step	Action
1	Remove the Modular Power Package (MPP) equipment cover. Note: For details, see the procedure for removing the MPP equipment cover in <i>Modular Business Package Cabinet Installation Manual</i> , 323-3001-206.
2	On the rectifier to be replaced, set the AC and DC circuit breakers to the OFF position.
3	Set the sense DIP switch for this rectifier to the OFF position. The sense DIP switch is located on the control circuit pack.
4	At the front of the MPP cabinet, release the two captive screws that hold the clamping bar in place, as shown following. Swing the clamping bar downward. Note: For clarity, the following figure shows a shelf with no rectifiers installed.



—continued—

 Procedure 11-2 (continued)
 NT5C06: MPR 25 rectifier

Step	Action
5	<p>Carefully slide the rectifier out of the shelf, and place it in the packing carton from the replacement rectifier for shipping or storage.</p> <p>Note: If only the cooling fan on the rectifier is defective, it can be replaced according to the replacement procedure in <i>Equipment Installation Operation and Maintenance</i>, 169-2071-500, for MPR25 / MPR15 Series Single Phase -48V, 25A Switch Mode Rectifier NT5C06.</p>
6	Make sure the AC and DC circuit breakers on the replacement rectifier are switched to the OFF (down) position, then slide the unit firmly into the shelf, resting it on top of the stored blank panel.
7	Replace the clamping bar and tighten the two captive screws.
8	Set the sense DIP switch for this rectifier to the ON position.
9	Switch the DC circuit breaker to the ON (up) position.
10	Switch the AC circuit breakers to the ON (up) position to power the rectifier.
11	<p>Verify that the replacement rectifier is sharing the load by observing its ammeter. It should display approximately the same value as the ammeter on the other rectifiers. If not, adjust the float and equalize voltage as specified in <i>Equipment Installation Operation and Maintenance</i>, 169-2071-500, for MPR25 / MPR15 Series Single Phase -48V, 25A Switch Mode Rectifier NT5C06.</p> <p>For installations with batteries, set both the float and equalize voltages to -56.0 Vdc.</p> <p>For installations without batteries, set both the float and equalize voltages to -52.0 Vdc.</p> <p>Difficulty in achieving load sharing between rectifiers could be an indication that one or more rectifiers have their sense leads open. Check for proper sense lead connection inside the NT6C14 panel. Check the sense fuse F1 on the control circuit pack. Check that the sense DIP switches are all set to ON (closed).</p>
12	<p>Replace the Modular Power Package (MPP) equipment cover.</p> <p>Note: For details, see the procedure for replacing the MPP cabinet cover in <i>Modular Business Package Cabinet Installation Manual</i>, 323-3001-206.</p>

—end—

Series 800A OSP procedures

This chapter contains procedures that are specific to the Series 800A outside plant (OSP) cabinet.

Chapter contents

In the following table find the task you are required to perform, then go to the page specified.

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

Topic	See
Open the doors of the S800A OSP cabinet	<i>Series 800A Outside Plant Cabinet Installation Manual</i> , 323-3001-210
Replace an internal fan unit in the heat exchanger roof	page 12-2
Replace an external fan unit in the heat exchanger roof	page 12-4
Replace a fan unit in the air induction roof	page 12-6
Replace the rectifier	page 12-8
Close the doors of the S800A OSP cabinet	<i>Series 800A Outside Plant Cabinet Installation Manual</i> , 323-3001-210

Procedure 12-1 Replacing an internal fan unit in the heat exchanger roof

This procedure explains how to replace an internally mounted fan unit in the Series 800A cabinet with the NT7A69DA-FA heat exchanger roof options.



DANGER

Fire Hazard

Remove all paper and any other combustible materials from the cabinet

Failure to comply with this warning could result in a fire.

Requirements

- Can wrench (216 tool) with Harris insert part number 10660-001 (Tool and insert are shipped inside the cabinet.)
- Stubby Phillips head screwdriver
- 5-foot step ladder

Action

Step	Action
1	Open the electronics compartment doors (on the front side).
2	Turn OFF circuit breakers CU A and CU B on the breaker interface panel (BIP).
3	Open the equipment bay frames and locate the defective fan (see Figure 12-1 on page 12-3).
4	Replace the fan by removing the two screws and fan grille. Note: Do not discard or misplace the two screws and fan grille.
5	Disconnect the fan connector from fan wiring harness.
6	Install the new fan using the screws and fan grille removed in step 4.
7	Plug fan connector back into fan wiring harness.
8	Repeat step 4 through step 7 for each defective fan.
9	Turn CU A and CU B ON to verify that the new fan is operating properly.
10	Close the equipment bay frames and the electronics compartment doors.

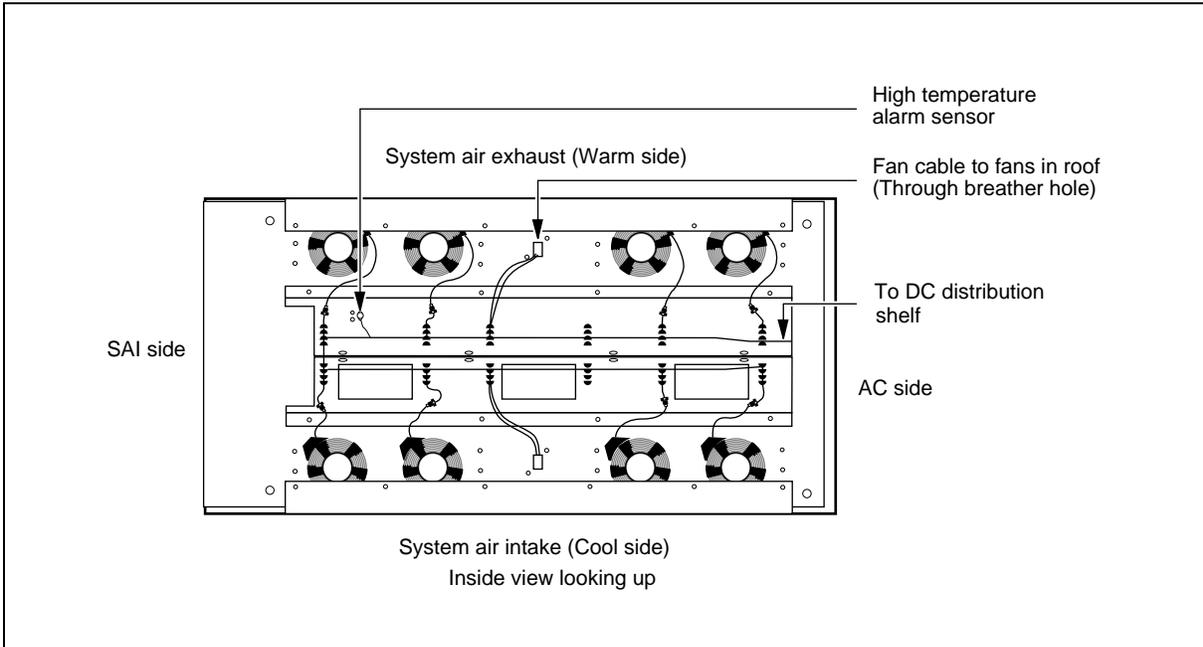
—continued—

Procedure 12-1 (continued)
Replacing an internal fan unit in the heat exchanger roof

Step Action

Figure 12-1
Replacing an internal fan in the heat exchanger roof

PC-11324



—end—

Procedure 12-2

Replacing an external fan unit in the heat exchanger roof

This procedure explains how to replace an externally mounted fan unit in the Series 800A cabinet with the NT7A69DA-FA heat exchanger roof options.



DANGER

Fire Hazard

Remove all paper and any other combustible materials from the cabinet.

Failure to comply with this warning could result in a fire.

Requirements

- Can wrench (216 tool) with Harris insert part number 10660-001 (Tool and insert are shipped inside the cabinet.)
- Stubby Phillips head screwdriver
- 5-foot step ladder

Action

Step	Action
1	Remove the roof cover by loosening the 10 1/4 turn fasteners and removing the four lifting eye bolts and set it aside a safe distance from any debris or tools.
2	Open the equipment bay frames and locate the defective fan (see Figure 12-2 on page 12-5).
3	Open the electronics compartment doors (on the front side) and turn OFF circuit breakers CU A and CU B on the BIP.
4	Replace the defective fan by removing the two screws and fan grille. Note: Do not discard or misplace the two screws and fan grille.
5	Disconnect the fan connector from the fan wiring harness (see Figure 12-2 on page 12-5).
6	Install the new fan using the screws and fan grille removed in step 4.
7	Plug the fan connector back into the fan wiring harness.
8	Repeat step 4 through step 7 for each defective fan.
9	Turn CU A and CU B ON to verify that the new fan is operating properly.
10	Close the equipment bay frames and the electronics compartment doors.

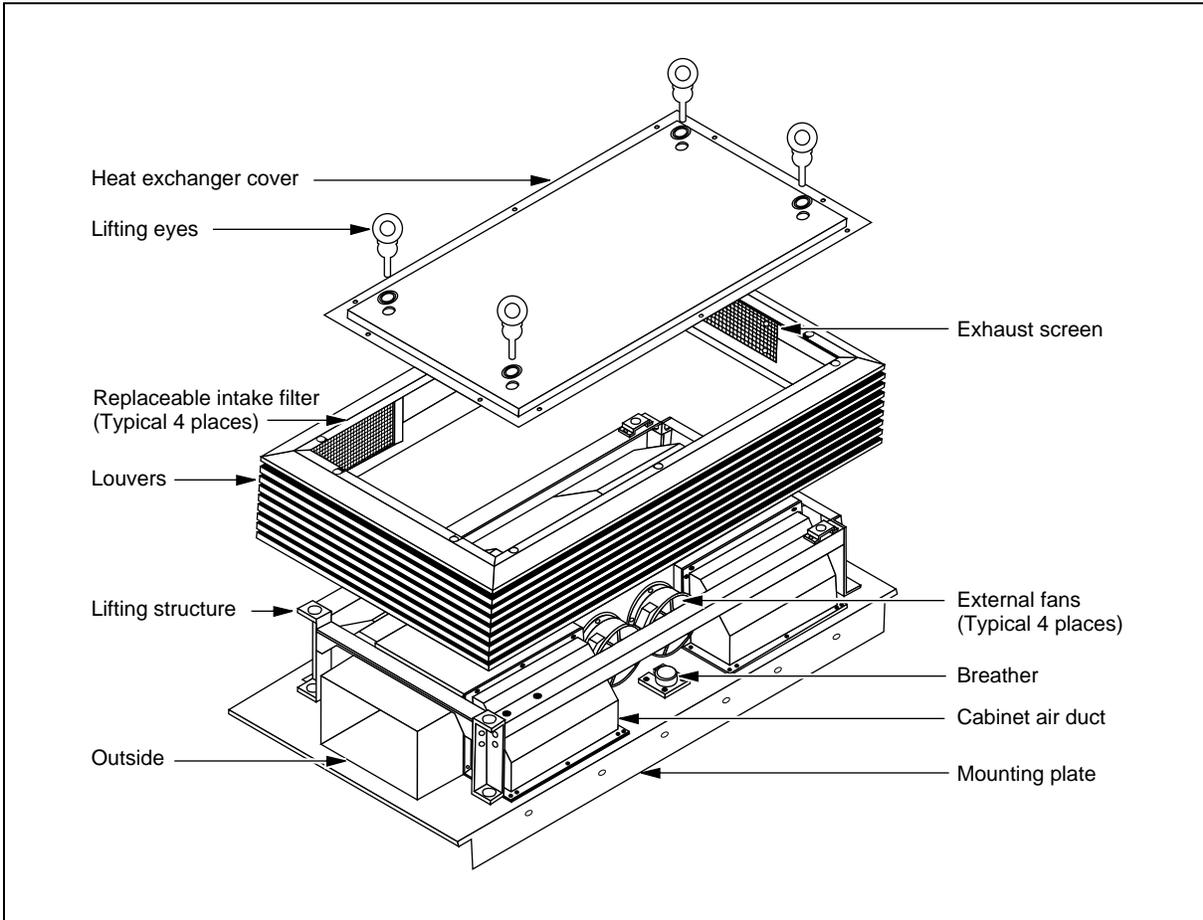
—continued—

Procedure 12-2 (continued)
Replacing an external fan unit in the heat exchanger roof

Step Action

Figure 12-2
Replacing an external fan in the heat exchanger roof

PC-11325



—end—

Procedure 12-3

Replacing a fan unit in the air induction roof

This procedure explains how to replace a fan unit in the Series 800A cabinet with the NT7A69AA-CA air induction roof options.



DANGER
Fire Hazard

Remove all paper and any other combustible materials from the cabinet.

Failure to comply with this warning could result in a fire.

Requirements

- Screwdriver, flat head medium
- NT7A99EA fan replacement kit

Action

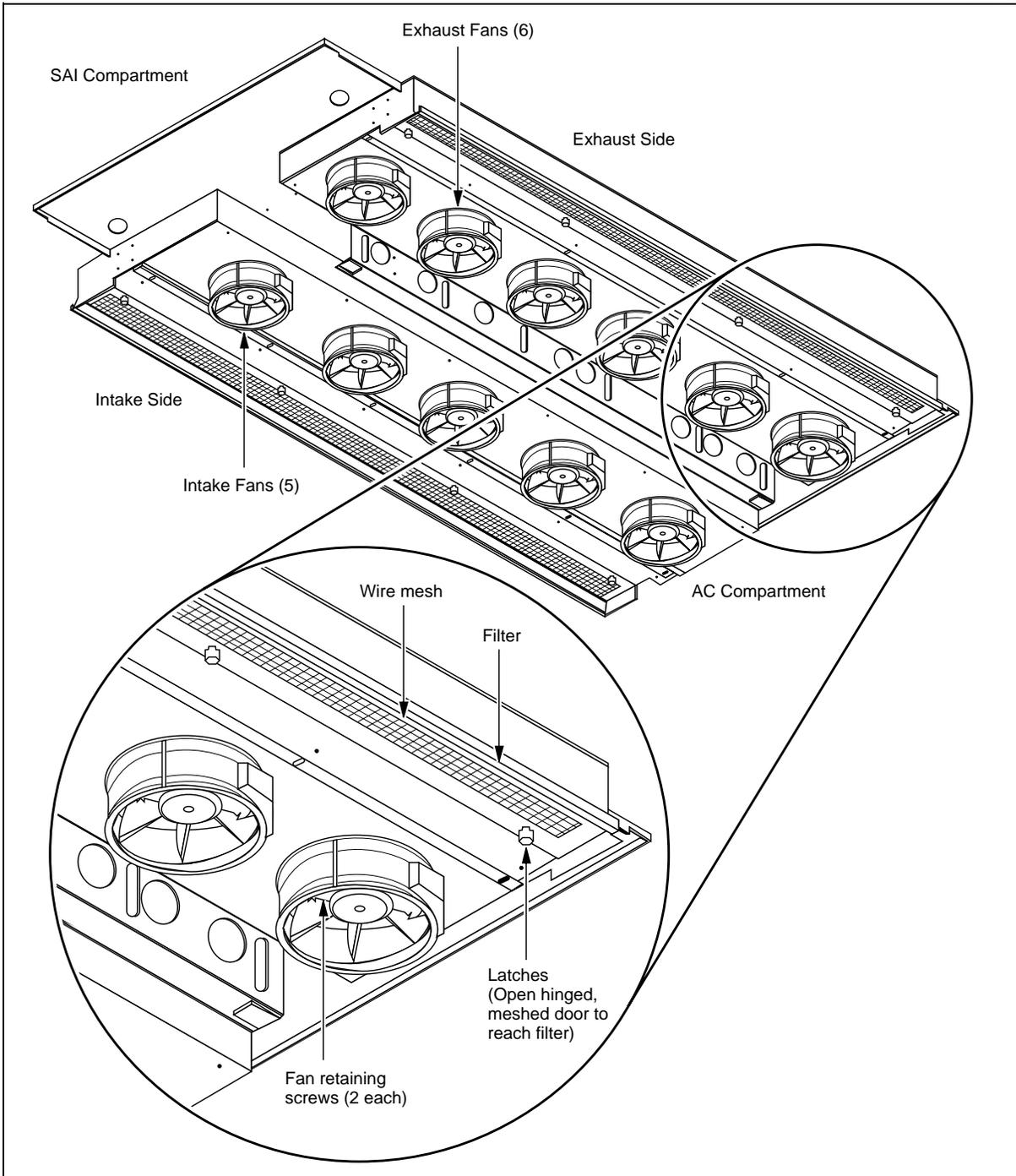
Step	Action
1	Open the electronics compartment doors (on the front side).
2	Turn OFF circuit breakers CU A and CU B on the breaker interface panel (BIP).
3	Open the equipment bay frames and locate the defective fan (see Figure 12-3).
4	Remove the fan grille and two screws. Note: Do not discard or misplace the two screws and fan grille (see Figure 12-3).
5	Disconnect the fan connector from the fan wiring harness.
6	Install the new fan using the screws and fan grille removed in step 4.
7	Plug fan connector back into fan wiring harness.
8	Repeat step 3 through step 7 for each defective fan.
9	Turn CU A and CU B ON to verify that the new fan is operating properly.
10	Close the electronics compartment doors.

—continued—

Procedure 12-3 (continued)
Replacing a fan unit in the air induction roof

Figure 12-3
Interior view of fans in air induction roof (looking up from inside cabinet)

PC-11327



—end—

Procedure 12-4

Replace the rectifier

Use this procedure to replace rectifiers in an S800A cabinet that is currently carrying traffic.

If the rectifiers that are to be replaced are installed in a new installation or in a cabinet that is not in-service, see *Series 800A Outside Plant Cabinet Installation Manual*, 323-3001-210, for rectifier installation and adjustment.

General

The Series 800A cabinet can be equipped with up to three NT5C06CA-3 MPR25 25A rectifier modules installed in the NT5C10CE rectifier shelf.

This procedure applies to a system that is equipped with one, two, or three rectifier modules.

Each rectifier is connected to a separate ac circuit breaker in the ac service panel.

Each rectifier module has an ac input and dc output circuit breaker on the faceplate.

The rectifier shelf dc output connects to the RECT input on the NT6C14 dc distribution shelf.

Documentation references

-48 V, 25A Switch Mode Rectifier NT5C06 Equipment Installation, Operation, and Maintenance Manual, 169-2071-500

Test sets

Voltmeter rms Fluke 8050A (or equivalent)

Requirements

Screwdriver, slotted, small (0.1 inch width)

—continued—

Procedure 12-4 (continued)
Replace the rectifier

Cautions

Prior to performing any rectifier replacement procedures, read each caution carefully. Important battery and rectifier information is presented here.

**CAUTION**

Perform the steps in the order shown because the sequence of turning the breakers on and off is critical.

**CAUTION**

If this is a new installation, the dc voltage output level from each rectifier module *must* be tested and adjusted as per Nortel Networks recommended float voltages for the battery manufacturers listed below.

Eagle-Picher 6V: 54.70 ±0.10 V dc

Gates 12V: 55.00 ±0.10 V dc

Yuasa 12V: 54.00 ±0.10 V dc

Note: These ranges are subject to change without notice. For other battery manufacturers, reference the following Caution.

**CAUTION**

The AccessNode input voltage specifications require that the dc input to the BIP shall not exceed -56.0 V dc. Battery float, equalize and high voltage shutdown levels *must* be set below this maximum regardless of the type of batteries installed.

**CAUTION**

Because there are circuit breakers on the ac service panel, rectifier modules, and the battery breaker panel (BBP), use caution before switching a circuit breaker. Make sure you are switching the correct one.

—continued—

Procedure 12-4 (continued)

Replace the rectifier



DANGER

Fire Hazard

Remove all paper and any other combustible materials from the cabinet.

Failure to comply with this warning could result in a fire.

Action

Step Action

Prepare to remove the defective rectifier

- 1 Verify that the battery circuit breakers on the BBP are in the ON position.
Note: This provides dc battery power to the system.
- 2 Switch the ac circuit breakers on all rectifiers to the OFF position (see Figure 12-4 on page 12-12).
- 3 Switch the dc circuit breakers on all rectifiers to the OFF position (see Figure 12-4 on page 12-12).
- 4 Switch the RECT1, RECT2 and RECT3 ac circuit breakers in the AC Load Box (or AC Power Pedestal, if installed) to the OFF position.

Remove the defective rectifier

- 5 Loosen the two thumb screws on the bottom left and right side of the rectifier shelf (see Figure 12-4).
- 6 Fold-down the hinged retainer bracket (see Figure 12-4).
- 7 Remove the rectifier module being replaced by sliding it out of the rectifier shelf.

Insert a new rectifier

- 8 Insert a new rectifier module into the same slot of the rectifier shelf from which the defective rectifier was removed.
- 9 Push the rectifier module into the shelf until the connector on the back is seated firmly within the rectifier shelf connector.
- 10 Switch the ac circuit breaker for the replacement rectifier (RECT1, RECT2 or RECT3) in the AC load box (or AC power pedestal, if installed) to the ON position.
Note: The rectifier positions are numbered right to left with position #1 on the far right side of the shelf.
- 11 Flip-up the hinged retainer bracket on the rectifier shelf and secure it by tightening two thumb screws on the left and right side.

—continued—

 Procedure 12-4 (continued)
Replace the rectifier

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

Power the new rectifier

- | 12 | Switch the dc circuit breaker on the replacement rectifier to the ON position.
Note: The dc circuit breaker on the rectifier must be turned ON before the ac circuit breaker is turned ON. | | | | | | |
|--------------------------|---|--------------------------|------|----------------------|---|-------|----------------|
| 13 | Switch the ac circuit breaker on the replacement rectifier to the ON position.
Note: When the rectifier is initially powered ON, the fail alarm (ON/RFA) LED illuminates red. When the rectifier is operational, the RFA LED illuminates green. | | | | | | |
| 14 | Determine your next action based on the RFA LED indication on the rectifiers:

<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If the RFA LED indicates</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">red after 15 seconds</td> <td>verify the in-rush fuse.
If the fuse is faulty, replace the fuse and go to step 13.
If the fuse is good, re-insert the fuse.
Go to step 5.</td> </tr> <tr> <td style="vertical-align: top;">green</td> <td>go to step 15.</td> </tr> </tbody> </table> | If the RFA LED indicates | Then | red after 15 seconds | verify the in-rush fuse.
If the fuse is faulty, replace the fuse and go to step 13.
If the fuse is good, re-insert the fuse.
Go to step 5. | green | go to step 15. |
| If the RFA LED indicates | Then | | | | | | |
| red after 15 seconds | verify the in-rush fuse.
If the fuse is faulty, replace the fuse and go to step 13.
If the fuse is good, re-insert the fuse.
Go to step 5. | | | | | | |
| green | go to step 15. | | | | | | |
| 15 | To continue the rectifier adjustments, see “High voltage shutdown adjustments for replacement rectifiers”, in <i>Routine Maintenance Procedures</i> , 323-3001-546, in <i>Maintenance</i> , in this volume. | | | | | | |

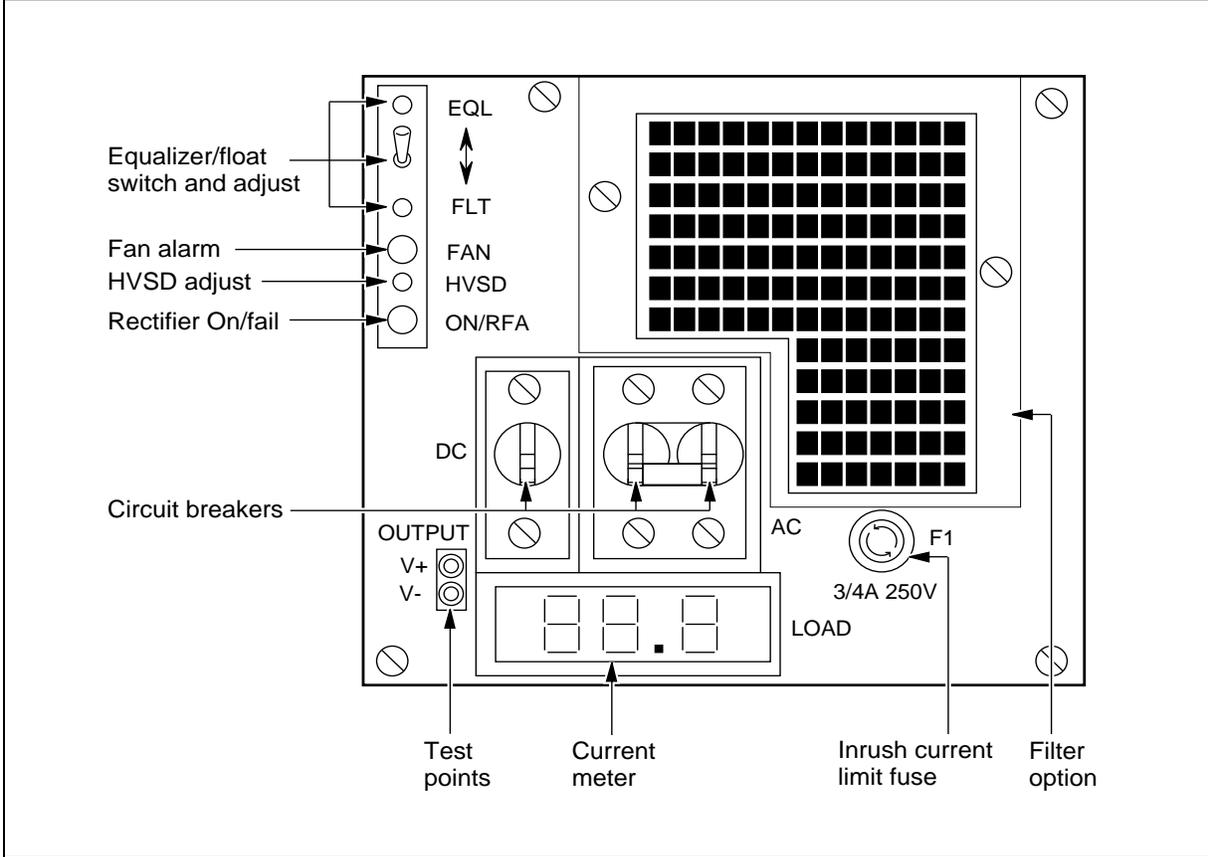
—continued—

Procedure 12-4 (continued)

Replace the rectifier

Step Action

Figure 12-4
NT5C10CE rectifier shelf e/w three MPR25 (NT5C06) rectifiers



—end—

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Module Replacement Procedures

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