

SONET Products

# **AccessNode**

## Quick Reference Guide

Product engineering code: NT4K00KG

Release: Issue 1.0

Date: February 1999





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## About this document

### Purpose of this document

This document is a quick reference guide for operations, administration, and maintenance technicians. It provides guidelines for clearing alarms, a list of the alarm LEDs with their definitions, and information on shelf layouts. It also serves as a log for provisioning information, circuit designations, and system test results.

Use this guide as a supplement to the documents in the AccessNode documentation library (documents with publication numbers 323-3001-nnn), and not as a replacement for them.

### What you should do when you first open this document

This document contains a number of tables and forms, which when filled in serve as a record to allow you to perform maintenance more quickly and effectively. When you first open this document, fill in the following tables and forms:

### Tables and forms

Title	See page
ABM group and slot associations	2
DS1 TBM group and slot associations	16
DS3, STS-1, OC-3, and OC-12 TBM group and slot associations	17
Network-element identification	78
Subnetwork identification	79
DS1 facility identification	80
DS3 and STS-1 tributary facility identification	82
Power feed information	84

### Symbols used in this guide

The following symbols are used in this guide.



#### **DANGER**

##### **Risk message**

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



#### **DANGER**

##### **Risk of electric shock**

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



#### **CAUTION**

##### **Risk message**

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



#### **CAUTION**

##### **Risk of equipment damage**

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

## Laser radiation warning



### **DANGER**

#### **Risk of injury from laser radiation**

Exposure to either visible or invisible laser light could cause eye damage under certain conditions. Do not expose your eyes or any other part of your body to laser radiation. If you disconnect optical patchcords, cover the ends with proper dust caps. The transmit connector on an OC-3 or an OC-12 interface circuit pack should be covered by the built in dust cover when not connected to a fiber.



### **CAUTION**

#### **Risk of equipment damage**

Take necessary precautions to prevent damage to circuit packs that are being stored.



### **CAUTION**

#### **Risk of equipment damage**

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



## Access bandwidth manager shelf

You can use the access bandwidth manager (ABM) shelf as a common-equipment shelf or as an OPC shelf.

You can equip the ABM shelf with DS1 mappers, DS3 mappers, and OC-3 tributaries. Refer to the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1, for equipping rules.

### Group and slot associations

The next two pages contain the group and slot associations for the different ABM shelf functions and mapper types. For each mapper, circle the slots that you use for future reference.

## ABM shelf information

This section contains the following information:

ABM group and slot associations	page 2
ABM shelf layouts	page 3
ABM shelf fully equipped with DS1 mappers	page 4
ABM shelf fully equipped with DS3 mappers	page 5
ABM shelf handling protected OC-3 tributaries	page 6
ABM shelf used as an OPC shelf	page 7
ABM shelf used as an OPC shelf supporting OMCs	page 8
Connectors on the front of the ABM shelf	page 9
Connectors on the left side of the ABM shelf	page 11
Connectors on the right side of the ABM shelf	page 14

**ABM group and slot associations**

Mapper type	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	-
DS1	RFT, RFT_BLSR, FCOT, or FCOT_BLSR	Group	g1*	g2*	P*	g4*	g5*	g6*	g7	g8											
		Input slot	30*	31*	34p*	35*	38	39	42	43											
		Output slot	32*	33*	36p*	37*	40	41	44	45											
DS3	RFT, RFT_BLSR, FCOT, or FCOT_BLSR	Group	P	S	g1	—	g2	—	g3	—											
		I/O slots	—	—	34	—	38	—	42	—											
			—	—	35	—	39	—	43	—											
			—	—	36	—	40	—	44	—											
OC-3 tributary	any	Group	G3		G4		G1S		G2S												
OC-3 or OC-12 feeder	any	Group																			

**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 symbol "P" in DS3 slot 1 denotes a protection mapper; the symbol "S" in slot 2 denotes a protection switch card.  
**Note 4:** The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.

### **ABM shelf layouts**

ABM shelf layouts are shown in the figures on the following pages. The illustrations of the shelf layouts using DS1 mappers and DS3 mappers do not show all of the possible slot locations for the modules available, nor do they show all of the individual configurations that are possible for DS1s, DS3, or mixes of DS1s and DS3s. For complete engineering rules and all of the configurations possible, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

Once the installation has been engineered, we recommend that you circle the numbers of the mappers you installed in the table on page 2. You can then use the table to quickly identify the locations of mappers and input and output cards.

**Note:** When the equipment is in operation, do not remove the front cover from the shelf except when necessary for maintenance purposes. The cover provides EMI shielding.









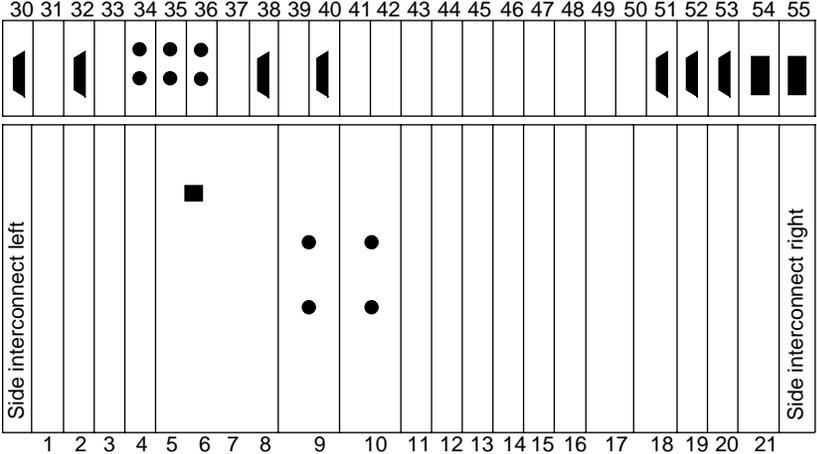


### Connectors on the front of the ABM shelf

This table lists the connector types and purposes for the connectors on the ABM shelf.

DS1 input card	D connector (44-pin)	Carries up to 14 incoming DS1s from a DSX-1 cross-connect or equivalent.
DS1 output card	D connector (44-pin)	Carries up to 14 outgoing DS1s to a DSX-1 cross-connect or equivalent.
DS3 input-output card	2 BNC connectors, 1 Tx and 1 Rx	Carries one DS3 to a DS3 cross-connect panel or a transmission ground reference panel.
OC-3 or OC-12 int. card	FC, ST, SC, or biconic connectors	Upper connector is for the transmit fiber; lower connector is for the receive fiber.
Common-eq. power card	Molex connectors	Carries -48 V battery feed from the breaker interface panel to the shelf.
Test access path card	D subconnector (25-pin)	Can provide external interface connection for MTAU testing, or can provide external interface for test bypass pairs (used in RFT only).
Test bypass pair card	D subconnector (25-pin)	Provides external interface for test bypass pairs (used in FCOT only).
PGTC/MTA card	D connector (44-pin)	Provides relays for the pair-gain-test-controller interface; provides relays and resistive terminations for the metallic test access interface (used in FCOT only).
Operations controller module	Connector that accepts a Dupont "latch-n-lock"	Connector for an Ethernet 10 BaseT LAN, which provides an interface for third-party X.11 terminals, for the graphical OPC interface.
Serial I/O card	D connector (25-pin)	Connectors for serial ports 2 and 3 of the OPC, which are used by external operations systems.

**Connectors on the front of the ABM shelf (continued)**



- Shown:
- Slot 30: DS1 input card
  - Slot 32: DS1 output card
  - Slots 34, 35, 36: BNC I/O cards
  - Slots 38, 40: Serial I/O cards
  - Slot 51: test bypass pair card
  - Slot 52: PGTC/MTA card
  - Slot 53: test access pair card
  - Slots 54, 55: common-eq. power cards
  - Slot 5: operations controller module
  - Slots 9, 10: OC-3 or OC-12 circuit packs

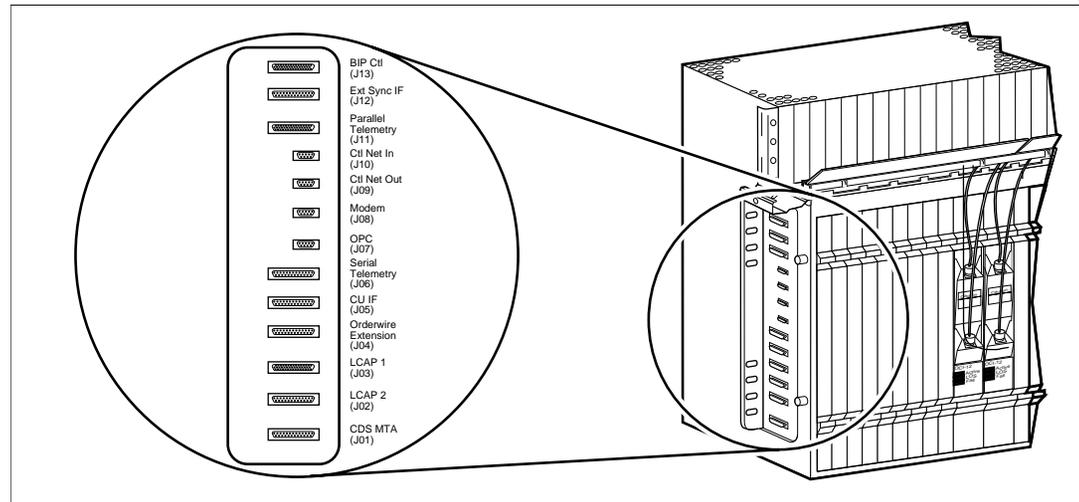
- Not shown:
- Slots 31, 35, 38, 39, 42, 43: DS1 input cards
  - Slots 33, 37, 40, 41, 44, 45: DS1 output cards
  - Slots 38, 39, 40, 42, 43, 44: BNC I/O cards

### Connectors on the left side of the ABM shelf

The figure on this page shows the connectors on the side interconnect left circuit pack in the access bandwidth manager shelf.

The side interconnect left circuit pack is part of the shelf assembly. There are 13 connectors. The connectors and their uses are listed on the following pages.

**Note:** For information on cables and equipping rules, see *Engineering and Ordering Information*, 323-3001-032, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.



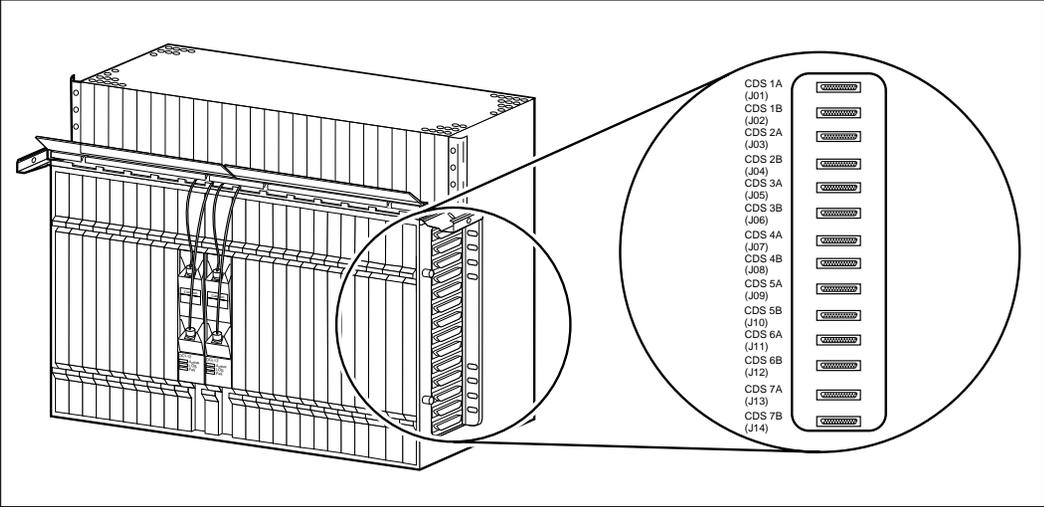
Conn.	Type	Label	Description
J13	44-pin D connector	BIP Ctl	cable that goes to the breaker interface panel (BIP).
J12	25-pin D connector	Ext Sync IF	cable from an external timing source, such as a building integrated timing supply (BITS). Timing information flows between the BITS and the working external synchronization interface card in the access bandwidth manager (ABM) shelf.
J11	44-pin D connector	Parallel Telemetry	cable carrying parallel telemetry between AccessNode and external equipment.
J10	9-pin D connector	Ctl Net In	incoming control-network cable. Control network is a local area network (LAN). If there is no incoming control-network cable, a control-network termination plug must be installed on this connector.
J09	9-pin D connector	Ctl Net Out	outgoing control-network cable, that is, the cable going to the next AccessNode in the local area network (LAN). If there is no outgoing control-network cable, a control-network termination plug must be installed on this connector.
J08	9-pin D connector	Modem	RS-232C port that is supported by the maintenance interface circuit pack in the access bandwidth manager shelf. A remote terminal, connected to this connector by way of an external modem, can access the processor card in the access bandwidth manager shelf.

Conn.	Type	Label	Description
J07	9-pin D connector	OPC	serial port #1 of the operations controller (OPC). This is a DTE port using the RS-232C standard. The port supports either asynchronous or synchronous (LAPB, LAPD, or X.25) protocols, to a maximum data rate of 19,200 baud.
J06	25-pin D connector	Serial Telemetry	cable carrying serial-telemetry data. The maintenance interface card in the access bandwidth manager shelf supports two 2-wire serial ports. Both ports use this connector.
J05	25-pin D connector	CU IF	cable to the cooling unit in the bay, for fan control.
J04	25-pin D connector	Orderwire Extension	cable carrying the orderwire channel to another piece of equipment in the office.
J03	44-pin D connector	LCAP 1	cable to the local craft access panel (LCAP).
J02	25-pin D connector	LCAP 2	cable to the LCAP.
J01	25-pin D connector	CDS MTA	cable that carries the two metallic test buses to the first copper-distribution shelf. The two metallic test buses are daisy-chained to all the copper-distribution shelves.

**Connectors on the right side of the ABM shelf**

This figure shows the connectors on the side interconnect right circuit pack in the access bandwidth manager shelf. The side interconnect right circuit pack is part of the shelf assembly.

As shown in the figure, there are fourteen 24-pin D connectors on the side interconnect right circuit pack. Each cable carries the D-links to a copper-distribution drawer (CDS).



## Transport bandwidth manager shelf

You can use the transport bandwidth manager (TBM) shelf as a common-equipment shelf or as an OPC shelf.

You can equip the TBM shelf with DS1 mappers, DS3 mappers, and OC-3 tributaries. Refer to the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1, for equipping rules.

### Group and slot associations

The next two pages contain the group and slot associations for the different TBM shelf functions and mapper types. For each mapper, circle the slots that you use for future reference.

## TBM shelf information

This section contains the following information:

Group and slot associations	page 16
DS1 TBM group and slot associations	page 16
DS3, STS-1, OC-3, and OC-12 TBM group and slot associations	page 17
TBM shelf layouts	page 18
TBM FCOT shelf fully equipped with DS1 mappers	page 19
TBM FCOT_BLSR shelf fully equipped with DS1 mappers	page 20
TBM TN_BLSR shelf fully equipped with DS1 mappers	page 21
TBM FCOT shelf fully equipped with DS3 mappers	page 22
TBM FCOT_BLSR or TN_BLSR shelf fully equipped with DS3 mappers	page 23
TBM TN_BLSR shelf fully equipped with STS-1 interface mappers	page 24
TBM shelf fully equipped with protected OC-3 tributaries	page 25
TBM shelf used as an OPC shelf	page 26
Connectors on the front of the TBM shelf	page 27
Connectors on the left side of the TBM shelf	page 29

**DS1 TBM group and slot associations**

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, STS-1, OC-3, and OC-12 TBM group and slot associations**

Mapper	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	
DS3	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				
STS-1	TN_BLSR	Group	—	S	P	—							g1	—	g2	—	g3	—	g4	—	—	
		I/O slots	—	—										38		42		46		50		
			—	—										39		43		47		51		
			—	—								40		44		48		52				
OC-3 tributary	any	Group	G3		G4		G1S		G2S				G5		G6		G7		G8			
OC-3 or OC-12 feeder	any	Group									G1	G2										
<p><b>Note 1:</b> * This group is available for FCOT_BLSR or TN_BLSR shelves that have no DS1s provisioned.</p> <p><b>Note 2:</b> The feeder occupies slots 9 and 10. If an OPC is installed, it occupies slots 5 through 8.</p> <p><b>Note 3:</b> The symbol "P" in slot 1 denotes a protection mapper; the symbol "S" in slot 2 denotes a protection switch card.</p>																						

### **TBM shelf layouts**

TBM shelf layouts are shown in the figures on the following pages. The illustrations of the shelf layouts do not show all of the possible slot locations for the modules available, nor do they show all of the individual configurations that are possible.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

Once the installation has been engineered, we recommend that you circle the mappers you installed on the group and slot association tables on page 16 and page 17. When completed, this form allows you to quickly identify the locations of mappers and input and output cards in the installation.

**Note:** When the equipment is in operation, do not remove the front cover from the shelf except when necessary for maintenance purposes. The cover provides EMI shielding.

### TBM FCOT shelf fully equipped with DS1 mappers

								DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 out	DS1 PB	DS1 in	DS1 PB	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	CEP	CEP
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55					
											Slot numbers																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Side interconnect left				DS1/VT mapper	DS1/VT mapper	Operations controller module		A OC-12 VTBM		B OC-12 VTBM		DS1/VT mapper	DS1/VT mapper	DS1/VT protection mapper	DS1/VT mapper	ESL carrier	Maintenance interface	A Processor	B Processor											

This figure shows the cards in a fully-equipped shelf that has OC-12 interface or OC-12 VTBM circuit packs in slots 9 and 10.

If OC-3 interface circuit packs are used in slots 9 and 10, the shelf can support fewer working DS1/VT mappers, and the maximum number depends on whether the map that is in effect is the default map or a non-default map.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

CEP = Common-equipment power card  
 DS1 PB = DS1 protection bridge card

**TBM FCOT\_BLSR shelf fully equipped with DS1 mappers**

DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 PB	DS1 PB	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	CEP	CEP	
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
											Slot numbers														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Side interconnect left	DS1/VT mapper	DS1/VT mapper	DS1/VT mapper	DS1/VT mapper	Operations controller module	▷ OC-12VTBM	▯ OC-12VTBM	DS1/VT mapper	DS1/VT mapper	DS1/VT protection mapper	DS1/VT mapper	ESI carrier	Maintenance interface	▷ Processor	▯ Processor										

This figure shows the cards in a fully-equipped shelf that has OC-12 VTBM circuit packs in slots 9 and 10.

If OC-12 VTBM circuit packs are used in slots 9 and 10, the shelf can support eleven working DS1/VT mappers because slots 1 and 2 are not reserved for DS3 protection and can be used to provision DS1/VT mappers.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

CEP = Common-equipment power card  
 DS1 PB = DS1 protection bridge card

**TBM TN\_BLSR shelf fully equipped with DS1 mappers**

DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	DS1 in	DS1 in	DS1 out	DS1 out	CEP	CEP
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
Slot numbers																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Side interconnect left	DS1/VT mapper	DS1/VT mapper	DS1/VT mapper	DS1/VT mapper	Operations controller module	OC-12 VTBM	OC-12 VTBM	DS1/VT mapper (Protection)	Maintenance interface	Processor	ESI														

This figure shows a TBM shelf handles DS1s in a TN\_BLSR application.

If OC-12 VTBM circuit packs are used in slots 9 and 10, the shelf can support twelve working DS1/VT mappers because slots 1 and 2 are not reserved for DS3 protection and can be used to provision DS1/VT mappers.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

No protection bridge cards are required for the physical shelf of a TBM TN\_BLSR.

CEP = Common-equipment power card



**TBM FCOT\_BLSR or TN\_BLSR shelf fully equipped with DS3 mappers**

								BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O			CEP	CEP
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	
								8	9		10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Side interconnect left	DS3 mapper (protection)	DS3 protection switch						Operations controller module	A OC12 or OC-12 VTBM	B OC12 or OC-12 VTBM	DS3 mapper	ES1 carrier (FCOT_BLSR)	Maintenance interface	A Processor (FCOT BLSR)	B Processor											

This figure shows the cards in a fully-equipped shelf that has OC-12 interface circuit packs in slots 9 and 10.

The mapper in slot 13 is available only if no DS1s are provisioned.

If OC-3 interface circuit packs are used in slots 9 and 10, the shelf can support only one working DS3/STS mapper, and can do so only if a non-default map is in effect.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

CEP = Common-equipment power card

**TBM TN\_BLSR shelf fully equipped with STS-1 interface mappers**

									BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O		BNC I/O	BNC I/O	BNC I/O			CEP	CEP
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
Side interconnect left		STS-1 protection switch	STS-1 (protection)			Operations controller module		A OC12 or OC-12 VTBM		B OC12 or OC-12 VTBM		STS-1 interface		STS-1 interface		STS-1 interface		STS-1 interface				Maintenance interface			Processor	ESI	

This figure shows the cards in a fully-equipped shelf that has OC-12 interface circuit packs in slots 9 and 10.

The mapper in slot 13 is available only if no DS1s are provisioned.

If OC-3 interface circuit packs are used in slots 9 and 10, the shelf can support only one working DS3/STS-1 interface, and can do so only if a non-default map is in effect.

For equipping rules and information on default and non-default maps, see the *Mapper Layouts Planning Guide*, 323-3001-154, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.

CEP = Common-equipment power card

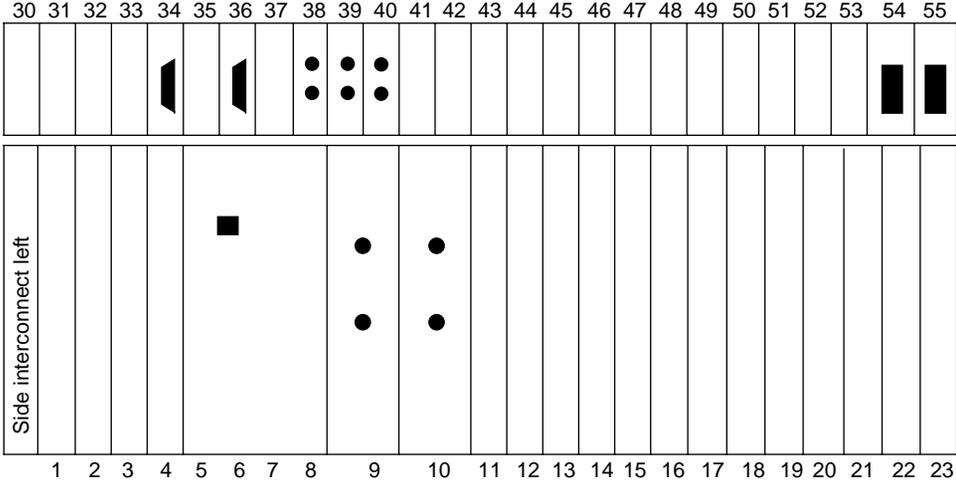




### Connectors on the front of the TBM shelf

The figure on page 28 shows the front-accessible connectors on transport bandwidth manager shelf. The table on this page contains detailed information about the connectors.

DS1 input card	D connector (44-pin)	Carries up to 14 incoming DS1s from a DSX-1 cross-connect or equivalent.
DS1 output card	D connector (44-pin)	Carries up to 14 outgoing DS1s to a DSX-1 cross-connect or equivalent.
BNC I/O card	2 BNC connectors, 1 Tx and 1 Rx	Carry one DS3 to a DS3 cross-connect panel or a transmission ground reference panel.
Common-eq. power card	Molex connectors	Carries -48 V battery feed from the breaker interface panel to the common-equipment shelf.
Operations controller module	Connector that accepts a Dupont "latch-n-lock"	Connector for an Ethernet 10 BaseT LAN, which provides an interface for third-party X.11 terminals, for the graphical OPC interface.
OC-3 or OC-12 circuit pack	FC, ST, or biconic connectors	Upper connector is for the transmit fiber; lower connector is for the receive fiber.



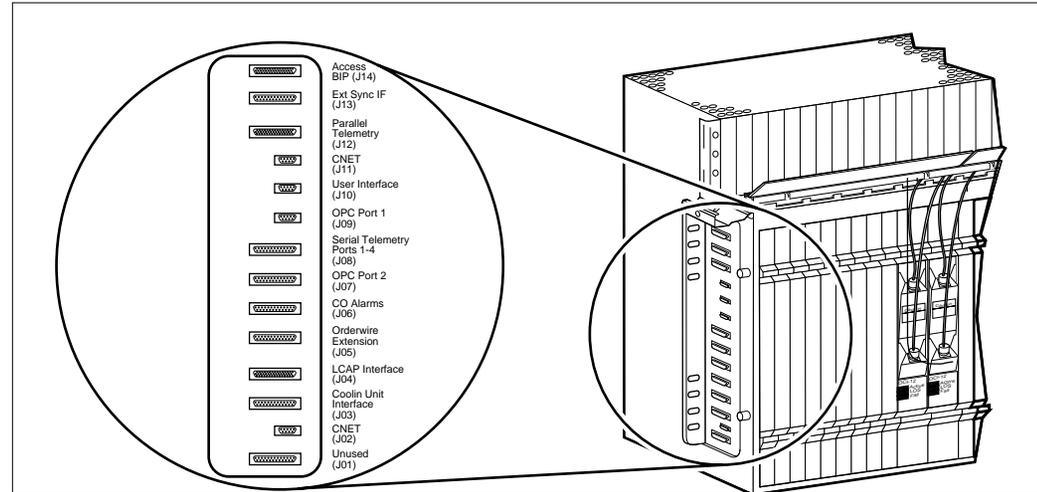
Shown:  
 Slot 34: DS1 input card  
 Slot 36: DS1 output card  
 Slots 38, 39, 40: BNC I/O cards  
 Slots 54, 55: common-equipment power cards  
 Slot 5: operations controller module  
 Slots 9, 10: OC-3 or OC-12 circuit packs

Not shown:  
 Slots 35, 38, 39, 43, 46, 47, 50, 51:  
 DS1 input cards  
 Slots 37, 40, 41, 45, 48, 49, 52, 53:  
 DS1 output cards  
 Slots 46, 47, 48, 50, 51, 52: BNC I/O cards

## Connectors on the left side of the TBM shelf

The figure on this page shows the connectors on the side interconnect left circuit pack in the transport bandwidth manager shelf. The side interconnect left circuit pack is part of the shelf assembly. There are 14 connectors. The connectors and their uses are listed on the following pages.

For information on cables and equipping rules, see *Engineering and Ordering Information*, 323-3001-032, in the *Engineering, Configuration, and Ordering Guide*, Volume 1.



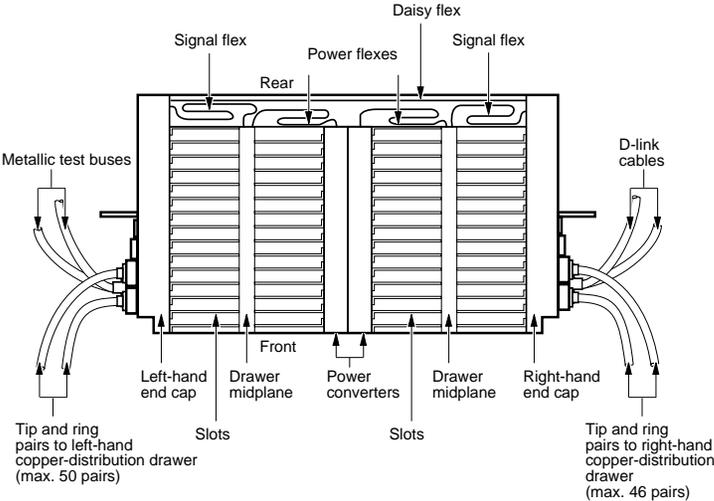
Conn	Label	Connector	Description
J14	Access BIP	44-pin D connector	Connects to NT4K14-series breaker interface panel (BIP), if installed. (See J06 below.) Also can be used for access to the Public Switched Telephone Network (PSTN) for testing orderwire circuits.
J13	External Sync IF	25-pin D connector	Connects to an external timing source such as a building integrated timing source (BITS). Timing information flows between the BITS and the working external synchronization interface card in the TBM shelf.
J12	Parallel Telemetry	44-pin D connector	Connects to external equipment to provide parallel telemetry.
J11	CNET	9-pin D connector	Connects to outgoing control-network cable. Control network is a local area network (LAN). If there is no outgoing control-network cable, a control-network termination plug must be installed on this connector.
J10	User Interface	9-pin D connector	Connects to a remote terminal through an external modem. With this setup, you can access the processor card in the TBM shelf using RS-232C port that is supported by the maintenance interface card.
J09	OPC Port 1	9-pin D connector	Connects to a DTE port using the RS-232C standard. The port supports either asynchronous or synchronous (LAPB, LAPD, or X.25) protocols, to a maximum data rate of 19,200 baud.
J08	Serial Telemetry	25-pin D connector	Connects to external equipment to provide serial telemetry. The maintenance interface card in the transport bandwidth manager shelf supports two 2-wire serial ports. Both ports use this connector.



# Copper-distribution shelf

## CDS layout

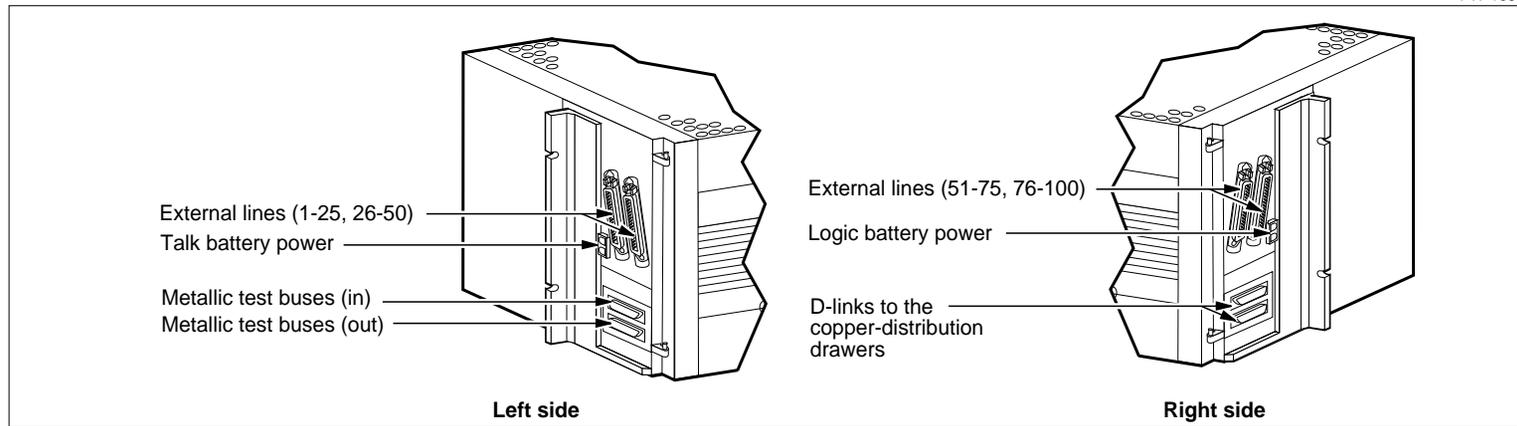
The figure on this page shows the layout of the copper-distribution shelf (CDS), viewed from above.



### Connectors on the sides of the CDS shelf

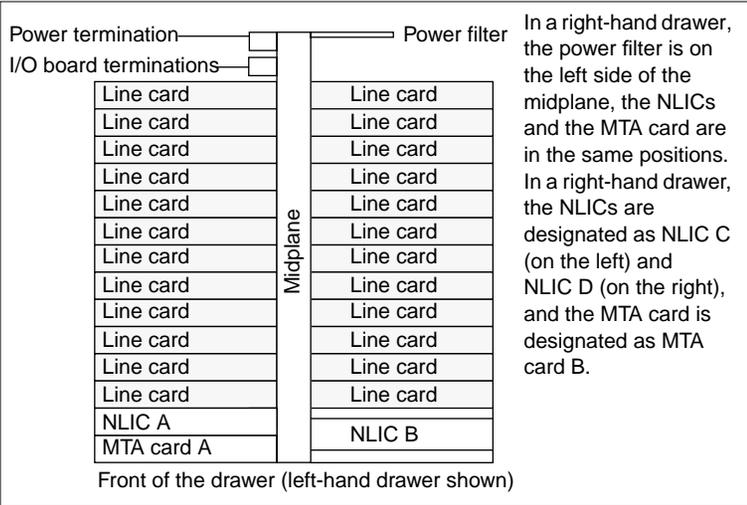
The figure on this page shows the connectors on the ends of the copper-distribution shelf.

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**Copper-distribution drawer**

The figure on this page shows a top view of the layout of the copper-distribution drawer (using a left-hand drawer as an example). (For instructions on how to pull the drawer open, see page 69 in this guide.)

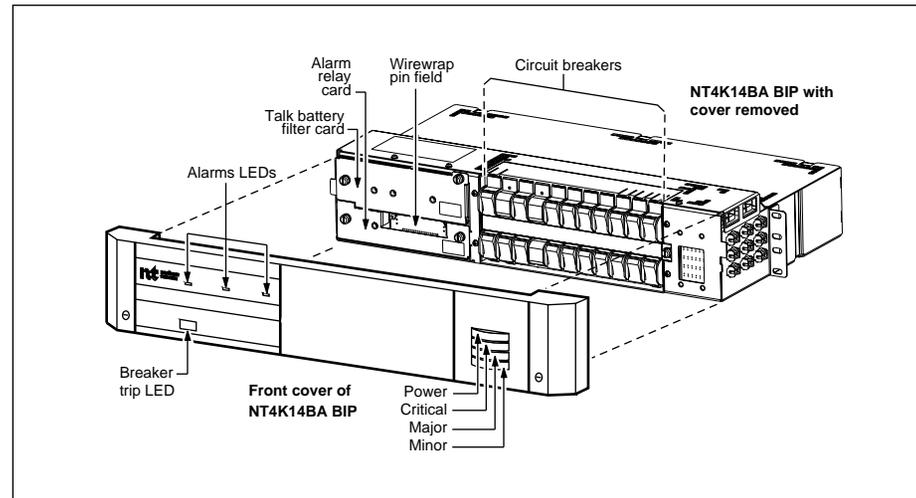


## Breaker interface panel

### NT4K14BA BIP layout

The NT4K14BA breaker interface panel (BIP) is used with the ABM shelf. The figure on page 35 shows the layout of an NT4K14BA BIP that is equipped with LEDs. On the front of the panel there are:

- talk battery filter card
- the alarm relay card containing the wirewrap pin field
- the circuit breakers
- LEDs for power and alarms (The NT4K14BA LED card can not be replaced in the field).



Breaker interface panel NT4K00KG Issue 1.0 page 35

**NT4K14BA BIP indicators**

The following indicators are found on the NT4K14BA BIP:

- a breaker-trip indicator near the bottom of the face of the alarm relay card (lit whenever any NC breaker is tripped or switched off)

**Note:** Depending on how it is wired, any breaker can be normally closed (NC) or normally open (NO). Normally closed breakers must be switched on, even if they are unused.

- red fail indicators on the following plug-in cards:
  - the alarm relay card
  - the talk battery filter card)
- the LEDs, located at the right-hand side of the BIP (shown in the table to the right).

power	green	always lit when there is power to feed A or feed B
critical alarm	red	lit whenever a critical alarm exists, for example, loss 129 or more subscriber lines
major alarm	red	lit whenever a major alarm exists, for example, loss of 24 or more subscriber lines
minor alarm	yellow	lit whenever a minor alarm exists, for example, loss of 2 to 23 subscriber lines

### NT7E56 BIP layout

The NT7E56 breaker interface panel (BIP) is used with the transport bandwidth manager shelf. The figure on this page shows the layout of the NT7E56 BIP.

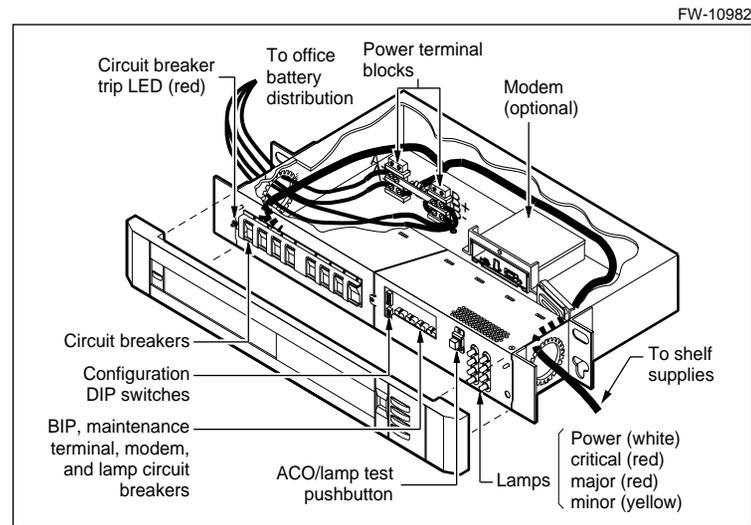
From left to right, the features on the front of the NT7E56 breaker interface panel are:

- a red circuit-breaker-trip LED
- a group of four 15A circuit breakers, corresponding to battery A
- a group of four 15A circuit breakers, corresponding to battery B
- the configuration DIP switches

**Note:** For instructions on setting the DIP switches, see *Bay in Central Office Installation Manual—TBM*, 323-3001-202.

- a group of four auxiliary 2A circuit breakers
- the ACO/lamp-test button and indicator
- bay power and alarm indicators

For the instructions for replacing lamps that have burned out, see page 68 in this guide.



Breaker interface panel NT4K00KG Issue 1.0 page 37

**NT7E56 BIP indicators**

The following indicators are found on the NT7E56 BIP:

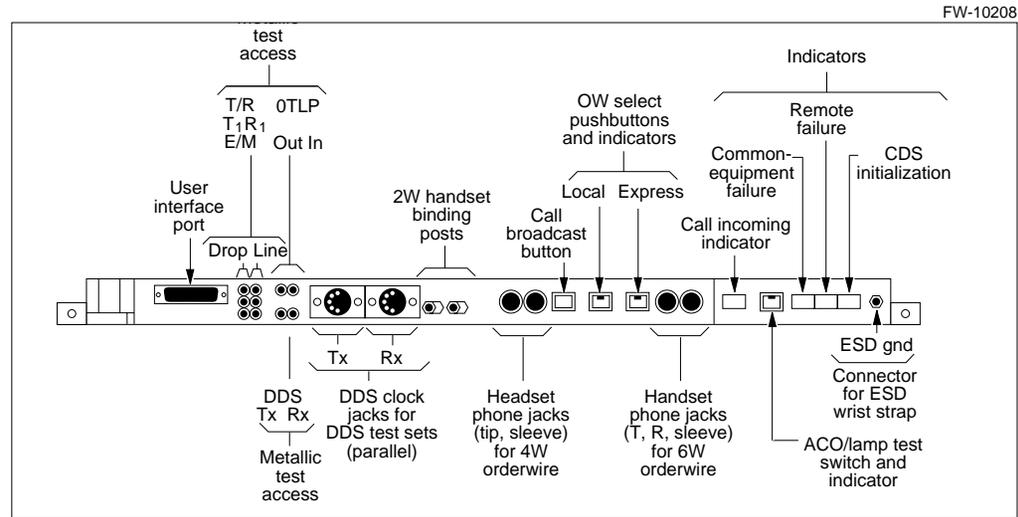
- A red circuit-breaker-trip LED. This is lit whenever any one of the breakers is tripped or switched off.
- The ACO/lamp-test button and indicator. This is a pushbutton with a square cap and a green LED. The LED lights if there is an active alarm that has been cut off. The button does one of two things: cuts off active cuttable alarms, or, if there are no such alarms, performs a lamp test of the lamps and LEDs on the BIP.
- The lamps listed in the table in the next column. These lamps are located at the right-hand side of the BIP.

Lamp	Color	Description
power	white	always lit when there is power to the frame
critical alarm	red	lit whenever a critical alarm exists, for example, loss 129 or more subscriber lines)
major alarm	red	lit whenever a major alarm exists, for example, loss of 24 or more subscriber lines)
minor alarm	yellow	lit whenever a minor alarm exists, for example, loss of 2 to 23 subscriber lines)

## Local craft access panel

### NT4K16 LCAP

The NT4K16 local craft access panel (LCAP) is used with the access bandwidth manager shelf. The figure on this page shows the layout of the NT4K16 LCAP.



### **NT4K16 LCAP (continued)**

From left to right, the connectors, buttons, and LEDs found on the front of the NT4K16 LCAP are as follows:

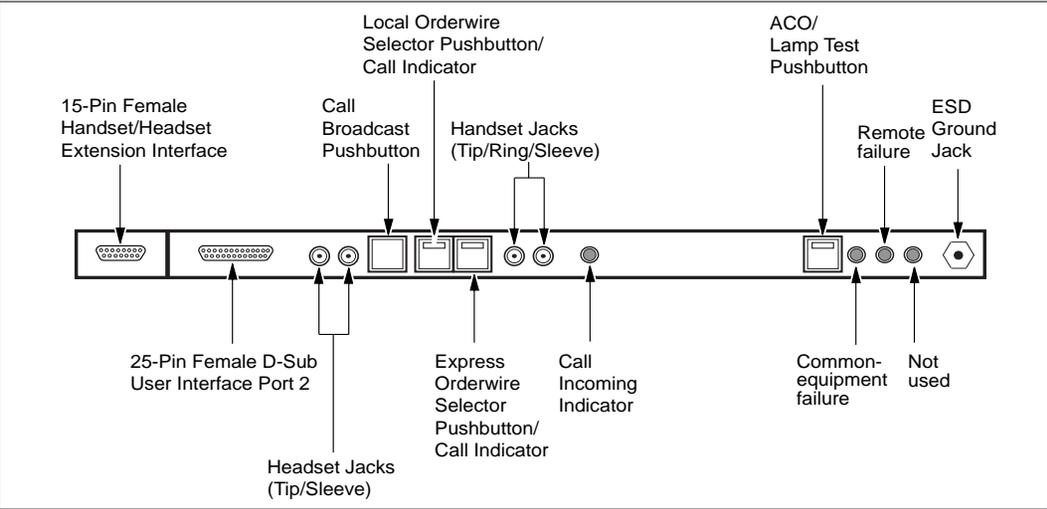
- A 25-pin D connector for the user-interface port, which is an RS-232C DCE-type port that is supported by the maintenance interface card in the access bandwidth manager shelf. The user-interface port supports connection to DTE-type devices. You can access the processor card in the ABM shelf by connecting a local VT100-type terminal to this port.
- three pairs of bantam jacks for carrying out tests on the drop sides of line cards:
  - T and R, labeled T/R, for connection to a remote test unit, for testing 2-wire line cards
  - T1 and R1, labeled T1/R1, for connection to a remote test unit, for testing 4-wire line cards
  - E and M, labeled E/M, for connection to a remote test unit, for testing 6/8-wire line cards
- a pair of bantam jacks labeled OTLP Out and In, for a connection to a remote test unit, for testing the line side of a line card
- a pair of connectors for DDS clock jacks for DDS test sets, labeled Tx and Rx
- a pair of tip-sleeve phone jacks for access by headset for 4-wire orderwire
- the orderwire call button, a pushbutton with a square cap and a green LED

**NT4K16 LCAP (continued)**

- the local orderwire select button, a pushbutton with a square cap
- the express orderwire select button, a pushbutton with a square cap and a green LED
- a pair of orderwire handset tip-ring-sleeve phone jacks for access by handset for 6-wire orderwire
- a green LED that lights when an incoming call is waiting on the orderwire
- the ACO/lamp-test button and indicator, a pushbutton with a square cap and a green LED. The LED lights if there is an active alarm that has been cut off. The button does one of two things: cuts off active cuttable alarms, or, if there are no such alarms, performs a lamp test, which lights all the lamps and LEDs on the bay for 30 seconds.
- an LED that lights whenever there is a failure on any of the circuit packs in the common-equipment shelf
- an LED that lights whenever there is an alarm at another location in the system
- an LED that lights during the initialization of the copper-distribution shelf (while initialization diagnostics on line cards are in progress)
- the connector for the electrostatic-discharge (ESD) wrist strap

**NT7E5047 LCAP**

The NT7E5047 local craft access panel (LCAP) is used with the transport bandwidth manager shelf. The figure on this page shows the layout of the NT7E5047 LCAP.



### **NT7E5047 LCAP (continued)**

From left to right, the connectors, buttons, and LEDs found on the front of the NT7E5047 LCAP are as follows:

- A 15-pin female D connector for orderwire extension. This provides a remote orderwire interface, supporting full handset or headset orderwire operation.
- A 25-pin D connector for the user-interface port 2, which is an RS-232C DCE-type port that is supported by the maintenance interface card in the transport bandwidth manager shelf. The user-interface port supports connection to DTE-type devices. By way of this port, a local VT100-type terminal can access the processor card in the transport bandwidth manager shelf.
- A pair of tip-sleeve phone jacks for access by headset for 4-wire orderwire.
- The orderwire call button. This is a pushbutton with a square cap.
- The local orderwire select button. This is a pushbutton with a square cap and a green LED.
- The express orderwire select button. This is a pushbutton with a square cap and a green LED.
- A pair of orderwire handset tip-ring-sleeve phone jacks for access by handset for 6-wire orderwire.
- A green LED that lights when an incoming call is waiting on the orderwire.
- The ACO/lamp-test button and indicator. This is a pushbutton with a square cap and a green LED. The LED lights if there is an active alarm that has been cut off. The button does one of two things: cuts off active cuttable alarms, or, if there are no such alarms, performs a lamp test, which lights all the lamps and LEDs on the bay (except for those on the NT7E56 breaker interface panel) for 30 seconds.

**NT7E5047 LCAP (continued)**

**Note:** The NT7E56 breaker interface panel has an ACO/lamp test button that tests the lamps and LEDs on the breaker interface panel. For the location of the button, see the figure on page 37.

- An indicator that lights whenever there is a failure on any of the circuit packs or cards in the transport bandwidth manager shelf.
- An indicator that lights whenever there is an alarm at another location in the system.
- An indicator that is not used when the local craft access panel is installed in an AccessNode.
- The connector for the electrostatic-discharge (ESD) wrist strap.

## Cooling unit

### Cooling unit used in bays

Each AccessNode bay contains either an NT4K18AA, NT4K18BA (enhanced through-flow), or an NT4K18CA 8-fan cooling unit. Both the NT4K18AA/BA cooling units look the same from the front and both have three cooling modules, as shown in the figure on page 65. The 8-fan NT4K18CA also looks similar but contains no modules, as shown in the figure on page 67.

**Note:** None of the cooling units are used in the Modular Business Package (MBP) packaging option.

There are three visual alarm indicators on the NT4K18AA/BA cooling units. There is a red fail indicator on the face of each of the three cooling modules. The NT4K18CA has only one red fail indicator. The fail indicator on a cooling module or unit lights if the module fails. When the red indicator is lit, replace the cooling module or for the NT4K18CA replace the unit.

For instructions to replace the cooling modules, see page 64. To replace the NT4K18CA cooling unit see page 67.

**Note:** The figure on page 65 does not show the air filter unit, which is installed with the NT4K18AA cooling unit. The air filter unit is shown on page 60.

### **Fan Unit in the COP/CU**

The purpose of the COP/CU is to help cool the bay by boosting the air flow. Only certain bays contain COP/CUs. If a bay contains three transport bandwidth manager shelves, the transport bandwidth manager shelf in position three (the lowest position) may contain a COP/CU rather than a standard cable organizer panel.

The horizontal slot at the top of the COP/CU accommodates a fan unit as well as the local craft access panel.

The fan unit is not visible from the front of the bay because it is located behind the local craft access panel.

For instructions on replacing the fan unit in a COP/CU, see *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

## LEDs

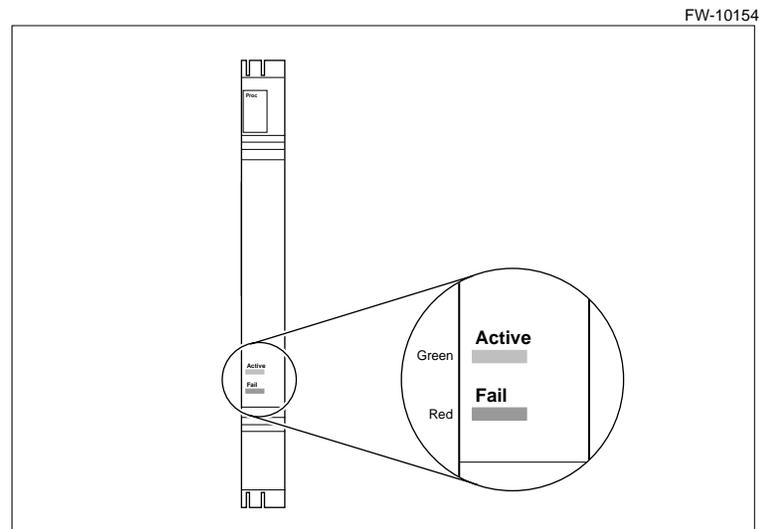
### Active and Fail LEDs on circuit packs and cards

Each card used in the lower level of the common-equipment shelf has at least the following light-emitting diodes (LEDs) on its faceplate:

LED	Description
Active	A green LED that indicates that the card is active.
Fail	A red LED that indicates card failure.

**Note:** Do not pull a card out unless you have checked the user interface.

The figure at right shows a front view of the processor card, which is typical.

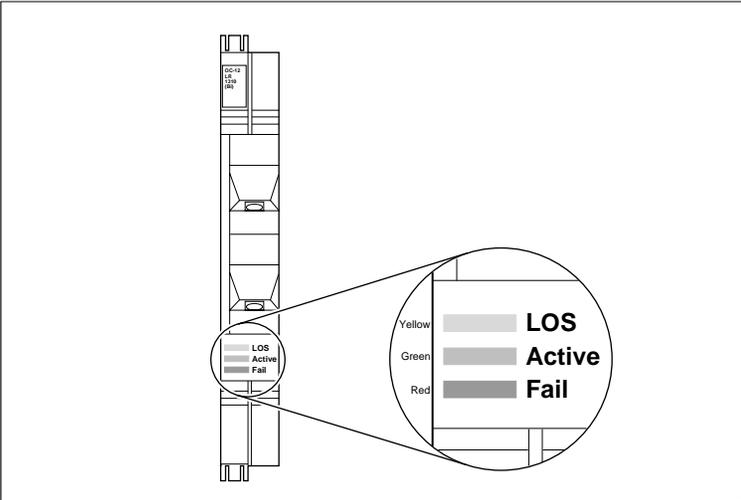


**LEDs on the OC-3 and OC-12 interface circuit packs**

Each OC-3 or OC-12 interface circuit pack has the following LEDs on its faceplate:

LED	Description
LOS	A yellow LED that indicates loss of the optical input signal.
Active	A green LED that indicates that the circuit pack is active.
Fail	A red LED that indicates circuit-pack failure.

The figure at right shows a front view of the OC-12 interface circuit pack.



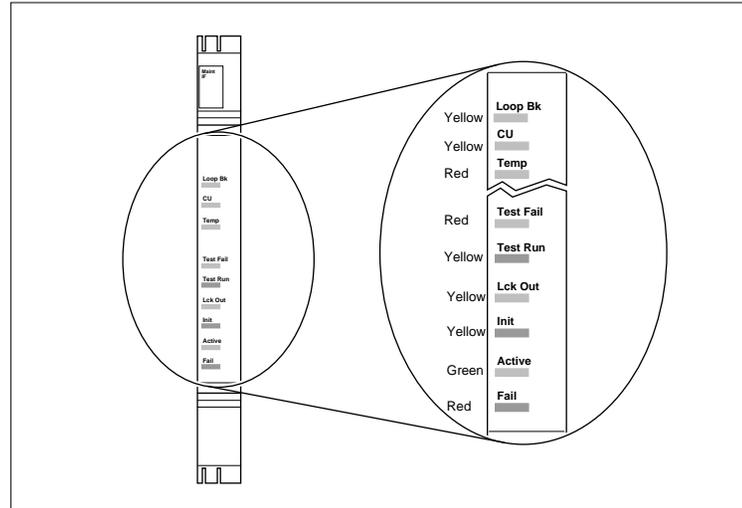
### LEDs on the maintenance interface card

The maintenance interface card has the following LEDs on its faceplate:

LED	Description
LoopBk	The transport loopback is active.
CU	Reserved for future use.
Temp	The shelf is over temperature.
TestFail	An exerciser test has failed.
TestRun	An exerciser test is running.
LckOut	Protection for DS1s, DS3s, OC-3s or OC-12 is locked out.
Init	The transport system is initializing.
Active	The maintenance interface card is working.
Fail	The maintenance interface card has failed.

**Note:** If you remove this card while a protection switch is in effect, the protection switch will drop. Before removing, refer to *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

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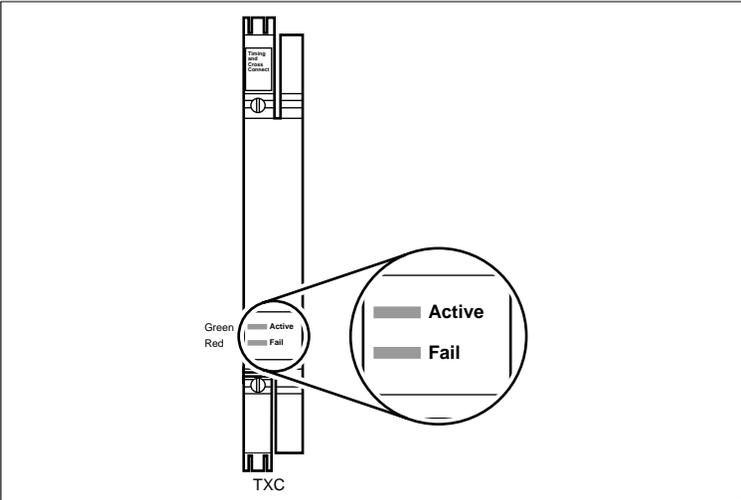


**LEDs on the timing and cross-connect card**

Each timing and cross-connect (TXC) card has the following LEDs on its faceplate:

LED	Description
Active	A green LED that indicates that the circuit pack is active.
Fail	A red LED that indicates card failure.

The figure at right shows a front view of the timing and cross-connect card.

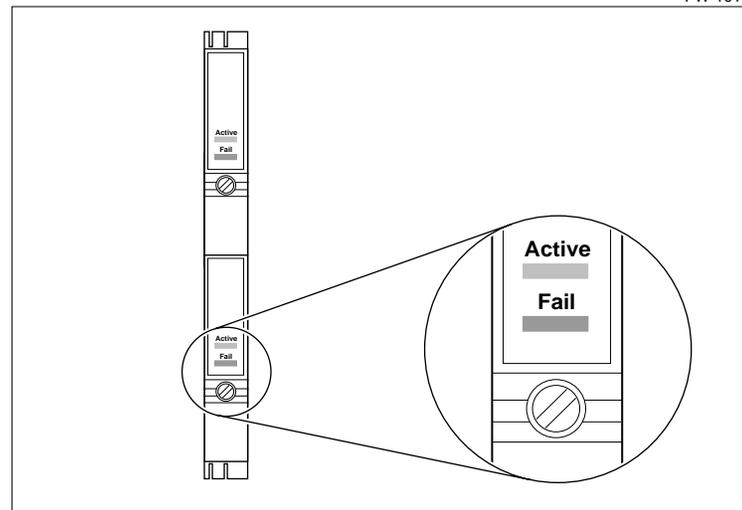


### LEDs on external synchronization interface cards

The figure at right shows the LEDs on a pair of external synchronization interface (ESI) cards. The cards are housed in an external synchronization carrier. Each card has the following LEDs on its faceplate:

LED	Description
Active	A green LED that indicates that the circuit pack is active.
Fail	A red LED that indicates card failure.

**Note:** Before removing an ESI card, refer to the NTPs.



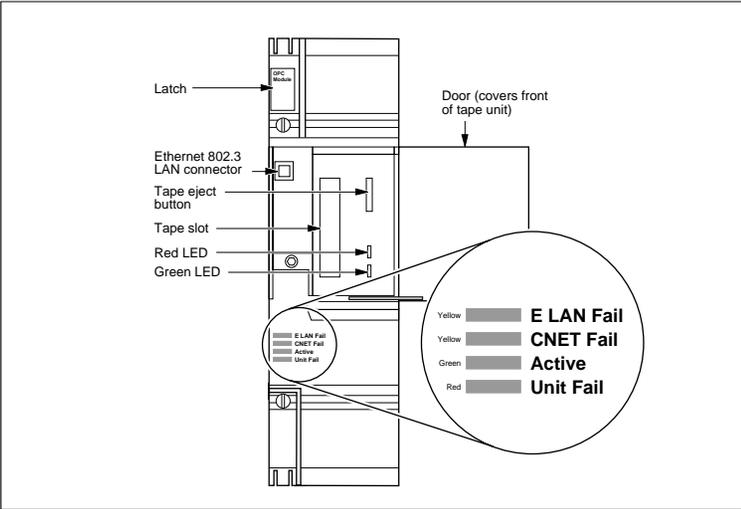
**LEDs on the operations controller module**

As shown in the figure at left, the operations controller (OPC) module has the following LEDs on its faceplate:

LED	Description
ELAN Fail	The OPC cannot communicate through the Ethernet port. (The connector for this port is on the front of the OPC.)
CNET Fail	The OPC cannot communicate through the control-network port. (As an option, the OPC may be linked to multiple network elements by way of control network.)
Active	The OPC module is working.
Unit Fail	The OPC module has failed.

**Note 1:** Do not remove the OPC module unless you have parked the head of the disk drive.

**Note 2:** If the OPC module is equipped with a tape drive, there are LEDs for the tape drive.



### **LEDs on the copper-distribution shelf**

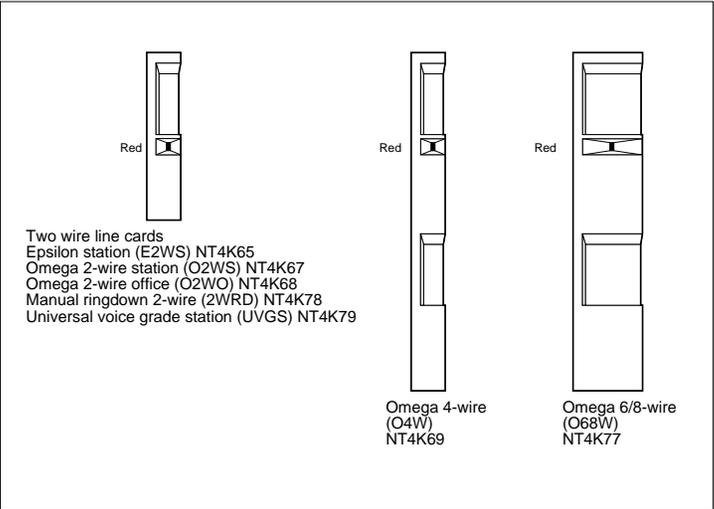
The figures on page 54 show the LEDs on the modules used in the copper-distribution shelf. The red LEDs indicate failures. The green LED on the narrowband line interface card indicates the unit is active.

The copper-distribution shelf power converters (CDSPs) are visible from the front of the shelf.

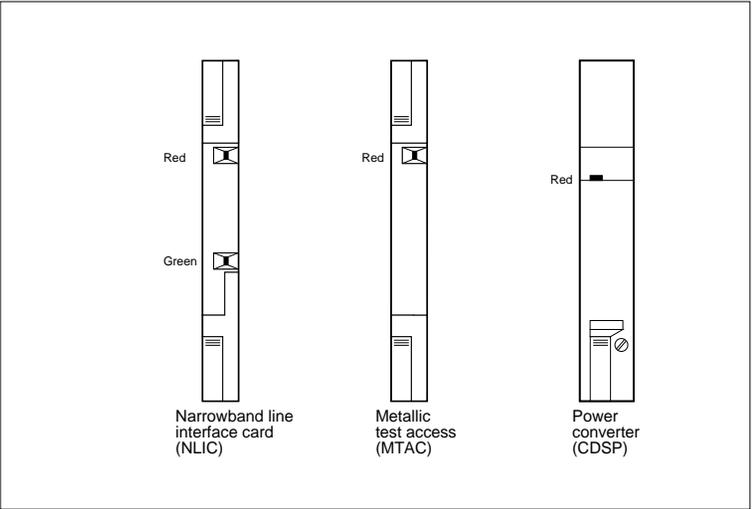
All the other modules shown on page 54 are cards that are installed in the copper-distribution drawer. To see the LEDs on the cards, you must pull the drawer out and look at it from the side. For the instructions on opening the drawer, see page 69.

**Note:** The metallic test access card has a second red fail LED, which is visible through the front of the drawer. When lit, it indicates a failure has occurred in one of the other cards in the drawer.

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FW-10788



## Procedures

### Troubleshooting

When trouble occurs, an AccessNode uses any or all of the following signals to notify you: alarm lamps, audible signals like buzzers, and messages that appear on user-interface screens. No matter what signal AccessNode uses to notify you of trouble, you always follow the same process to troubleshoot and trouble-clear:

- 1 Look up the trouble signal in *Alarm and Trouble Clearing Procedures*, 323-3001-543, in *Maintenance*, Volume 5A.
- 2 Follow the instructions for that alarm.

To locate a fault quickly, use the Alarms screen in the network-element user interface. (For instructions on how to log on to the network-element user interface, see page 72 in this guide.) After logging on to the network-element user interface, you access the Alarms screen by typing **alarm** and pressing Return. The Alarms screen appears, as shown on page 56.

The information on the Alarms screen indicates the location of the source of the alarm, by circuit-pack type, shelf, and protection group. The screen also displays the reason for the alarm, the alarm severity (C = critical M = major m = minor), and the service-code (SA = service-affecting nsa = not-service-affecting).

```

Critical Major minor warning FailProt Lockout ActProt PrfAlrt
Network View 1 1 . . . . .
1 1 1 . . . . .

Alarms
0 Quit
2 Select
3 Subset
4 Update
5
6 AlmRpt
7 NewAlms
8
9 DtlAlms
10 DtlProt
11
12
13
14
15
16
17
18 Help
NE 1
Time 17:35 >

Active Alarms
Alm Class Sh Type Unit Reason Severity
7 Fac 1 OC12 G1 Loss of frame C,SA
12 Fac 1 DS1 G1 Bipolar violation M,SA

```

**Note:** For instructions on clearing alarms, see *Alarm and Trouble Clearing Procedures*, 323-3001-543, in *Maintenance*, Volume 5A.

## Procedures

### Installing and removing circuit packs and cards



#### **CAUTION**

##### **Risk of equipment damage**

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

For instructions for installing and removing circuit packs and cards, see *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

**Note 1:** If there is a failure in the alarm system, remove the alarm relay card from the breaker interface panel.

**Note 2:** There will be no bay-level alarms if you remove the alarm relay card from the breaker interface panel.

**Note 3:** When replacing line cards located at the back of a copper-distribution drawer, take care to avoid touching the pins on adjacent cards.

### Inserting a tape into the OPC module

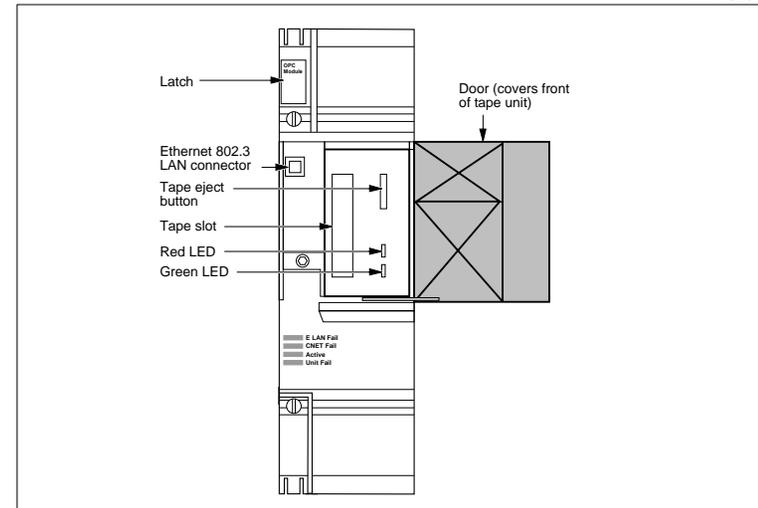
The OPC module is available with a built-in tape drive. The tape drive is covered by a spring-hinged door, hinged at the right side.

You use the tape drive when loading software or data into an OPC module, and when making backup copies of software or data. Always follow the instructions found in *Commissioning and Testing*, Volume 3, and *Data Administration Procedures*, 323-3001-304, in *Operations, Administration, and Provisioning*, Volume 4A.

As shown in the figure at right, the tape drive has the following controls and indicators:

- a tape-eject button
- a red LED, which, when lit, indicates tape activity
- a green LED, which when lit, indicates that a tape has been loaded

When you need to insert a tape into the tape drive in the OPC module, find the triangle pointer on the tape cassette. Orient the cassette so that the pointer is on the left, and insert the edge indicated by the pointer.



### **Changing an air filter element in a bay**

You should change each air filter element every six months, or sooner if required.

**Note:** If the AccessNode is housed in a Modular Business Package (MBP) rather than a bay, see page 61 in this guide for instructions for replacing the air filter.

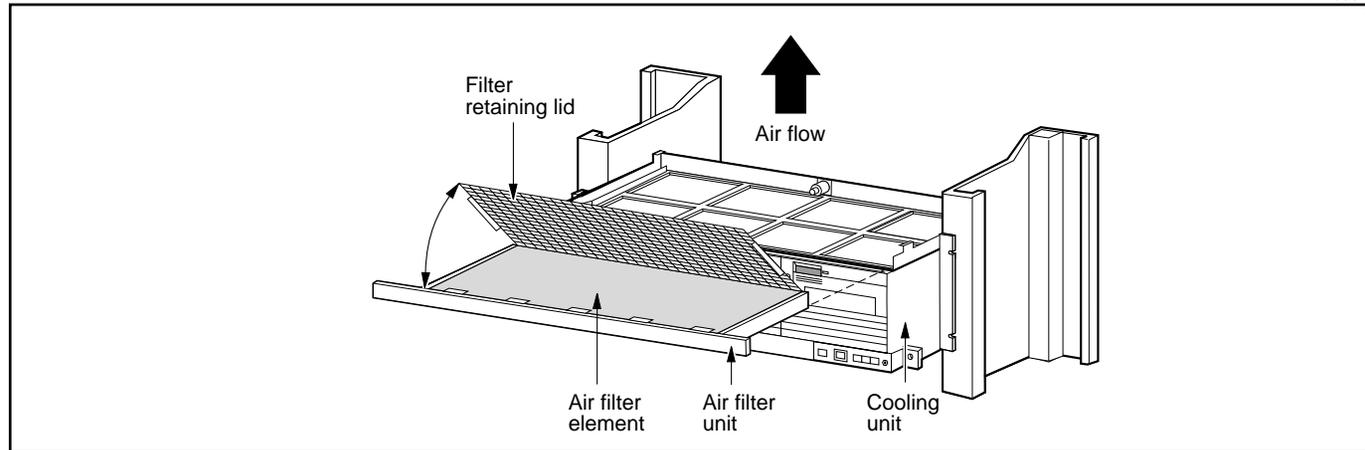
There is an air filter element in each air filter unit. The location of air filter units varies with the type of cooling unit. In the NT4K18AA cooling unit, the air filter unit is above the cooling unit, and, if one or more shelves are installed below the NT4K18AA cooling unit, there is a second air filter unit, below the lowest shelf. In the NT4K18BA enhanced cooling unit and the NT4K18CA 8-fan cooling unit, the air filter is located below the lowest shelf in the bay.

To change the air filter element, perform the following steps:

- 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 outward.
- 3 Replace the old air filter element, reinsert the air filter unit, and push home.
- 4 Record the date on the air-filter replacement record, on page 75.

**Note:** When replacing the filter element, remember that air flows upward through the filter. Insert the filter element with the proper side up, following the manufacturer's instructions.



### **Changing an air filter in a Modular Business Package**

You should change the air filter in the Modular Business Package (MBP) cabinet every six months, or sooner if required.

**Note:** If the AccessNode is housed in a bay, see page 59 in this guide for instructions for replacing the air filter element.

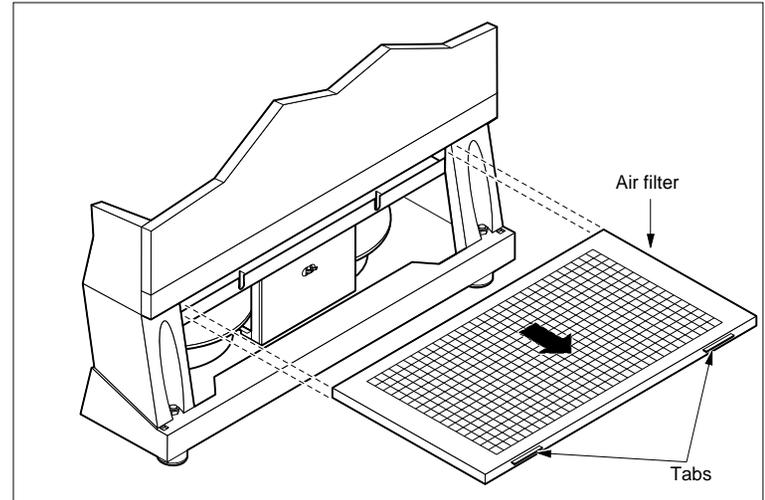
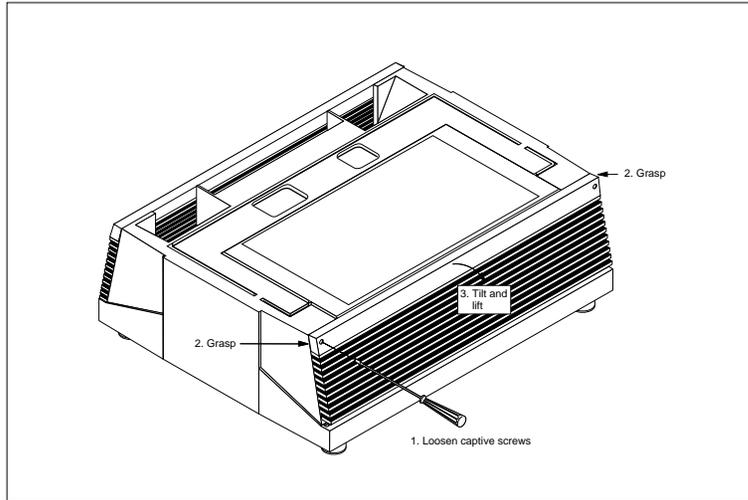
The air filter is located in the pedestal, above the blower assembly. To change an air filter, perform the following steps:

- 1 Remove the front pedestal grille from the MBP cabinet as shown on page 62 (left).
  - 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 Grasp the tabs on the filter, and pull the filter towards you to withdraw it from its slot, as shown on page 62 (right).

- 3 Insert the replacement filter into the slot.
- 4 Replace the pedestal grille.
- 5 Record the date on the air-filter replacement record, on page 75.

FW-10852

FW-10900



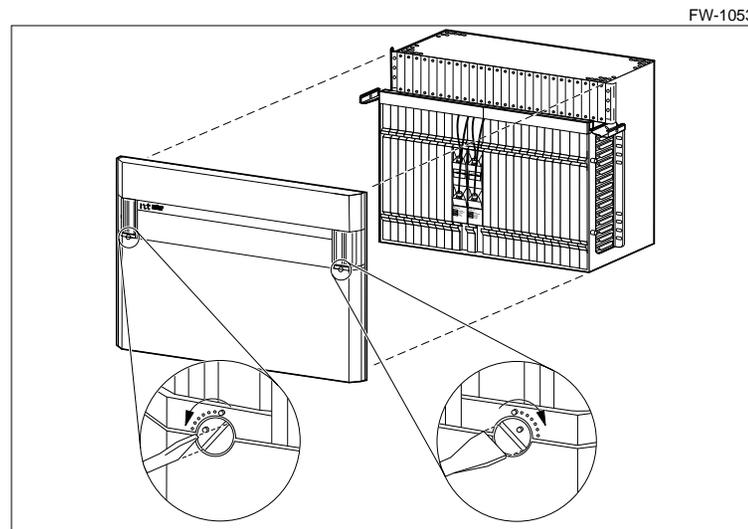
### Removing the cover from an ABM or a TBM

An access bandwidth manager shelf or a transport bandwidth manager shelf has a protective cover. The cover is held in position by locking screws. The figure at right shows the locations of the screws.

To remove the cover, perform the following steps:

- 1 Check whether the locking slot-head screws are in the locked or unlocked position. In the locked position, the slots are horizontal. In the unlocked position, the slots are vertical. If the screws are in the locked position, use a flathead screwdriver to rotate them 90 degrees to the unlocked position.
- 2 Grasp the cover by the two handles and pull the handles until they unlatch.

**Note:** The cover provides EMI shielding. Do not remove it except when it is necessary to perform maintenance.



**Removing a cooling module from the cooling unit in a bay**

The NT4K18AA cooling unit contains three NT4K17AA cooling modules; the NT4K18BA through-flow cooling unit contains three NT4K17BA cooling modules. Each cooling module can be pulled out of its cooling unit as shown in the figure on page 65.

This procedure does not apply to Modular Business Package (MBP) cabinets. For instructions on how to change the MBP blower module, see *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

**Note:** Always replace a cooling module with one of the same type (NT4K17AA or BA). The two **are not** interchangeable.



**DANGER**

**Risk of personal injury**

Do not put your fingers around the back of the cooling module. Keep your fingers away from the fan blades. The fan blades might still be rotating and can cause bodily harm.

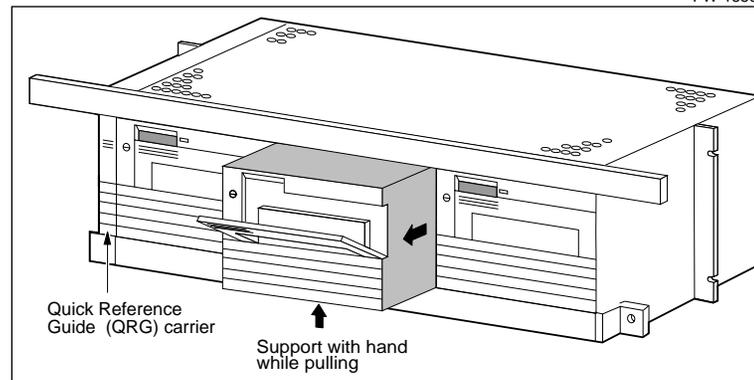
To gain access to a cooling module, perform the following steps:



**CAUTION**  
**Heavy equipment**

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

- 1 To unlock the screw that secures the cooling module, with a flathead screwdriver, rotate the screw until the raised dots are no longer aligned.
- 2 Pull the cooling module out just far enough to disengage it from the backplane by grasping the handle on the front of the module and pulling straight out. When it disengages, stop pulling.
- 3 Use both hands to pull the module all the way out of the cooling unit.



### Removing an 8-fan cooling unit (NT4K18CA)

To remove the 8-fan cooling unit perform the following steps.



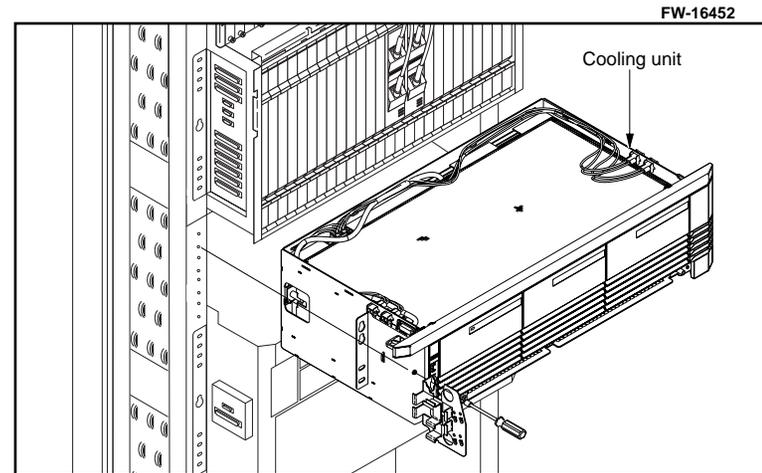
#### CAUTION

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

Perform replacement of unit in a timely manner.

- 1 Remove LCAP from below cooling unit (four Phillips screws)
- 2 Open circuit breakers CU-1 and CU-2 on BIP.
- 3 Remove cable covers on both sides of bay.
- 4 Remove two power cables and interface cable from left side of unit.
- 5 Remove the four slotted #12 screws from the CU mounting brackets (two on each side of the CU).

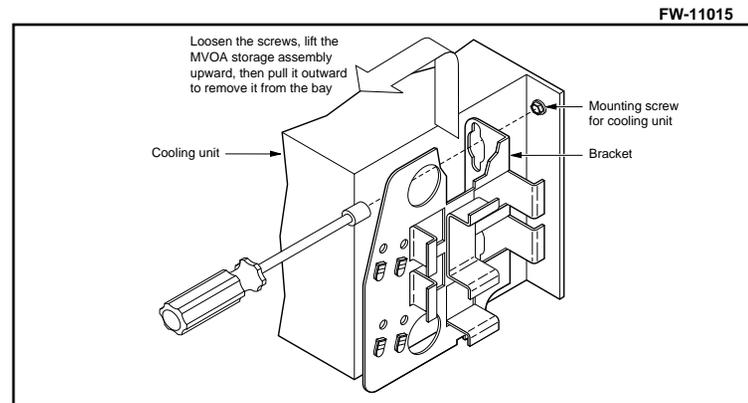
- 6 Pull the CU straight out of the bay.



**Note:** If the removed CU has MVOA storage assemblies installed remove them for installation on the replacement CU.

Install replacement CU in reverse order of removal.

After replacing CU install MVOA storage assemblies as shown.



### Changing lamps on the breaker interface panel



#### **CAUTION**

#### **NT7E56 lamp voltage differences**

Replace NT7E56 BIP lamps with lamps of the correct voltage rating.

There are two types of lamps for the NT7E56 BIPs: 28V lamps for the NT7E56AA BIP, and 6V lamps for the NT7E56AB BIP. (28V lamps have a dark blue pill in the center of the lamp.) Installing a 6V lamp into a 28V lamp socket damages the socket.

**Note 1:** It is recommended to replace lamps in pairs. For example, if one Critical lamp burns out, replace the adjacent lamp as well.

**Note 2:** This procedure does not apply to newer NT4K14 BIPs, which are equipped with LEDs. For the instructions for replacing LEDs, see *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

To change lamps on the BIP, perform the following steps:

- 1 Locate the defective lamps by pressing the ACO/lamp test push button to perform a lamp test on the BIP lamps—power (white), critical (red), major (red), and minor (yellow). Any lamp that does not light is defective.
- 2 Remove the BIP cover.
- 3 Remove a burned out BIP lamp by pulling the lamp straight out of the socket.
- 4 Carefully replace the lamp by gently pushing the new lamp straight into the socket.
- 5 Test the replacement lamp by pressing the ACO/lamp test push button. The replacement lamp should light with all other lamps.

### **Opening a copper-distribution drawer**

To access the cards in a copper-distribution drawer, you must pull the drawer out of the copper-distribution shelf. The drawer is held closed by a locking screw. The screw is on the front lower-right of the drawer.

To pull open the drawer, do the following:

- 1 Check whether the locking slot-head screw is horizontal or vertical. If the screw is horizontal (locked), use a quarter-inch flathead screwdriver to rotate it 90 degrees counterclockwise.

**Note:** Do not use a coin to turn the locking screw.

- 2 Grasp the latch and pull until it unlatches. Continue pulling until the drawer is extended to the first set of stops.

**Note 1:** For information on accessing and replacing the power filter and the interconnects in a copper-distribution drawer, see *Module Replacement Procedures*, 323-3001-547, in *Maintenance*, Volume 5C.

**Note 2:** When replacing line cards at the back of a copper-distribution drawer, take care to avoid touching the pins on adjacent cards.

### **Cutting off audible alarms**

To cut off audible alarms, press the ACO/LT button on the local craft access panel (LCAP). (For the location of the button, see the figures on page 71.)

By pushing the ACO/LT button, you silence the audible alarm indicators. Audible alarms remain cut off until either of the following occurs:

- the clearing of the alarm
- the raising of a new alarm whose severity is greater than or equal to the severity of the alarm that you cut off

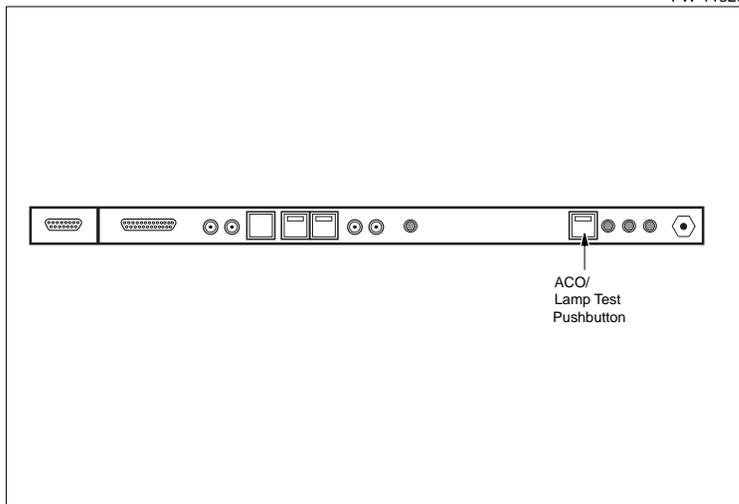
### **Performing a lamp test**

To perform a lamp test, press the ACO/LT button on the local craft access panel at a time when there are no audible alarms. (For the location of the button, see the figures on page 71.)

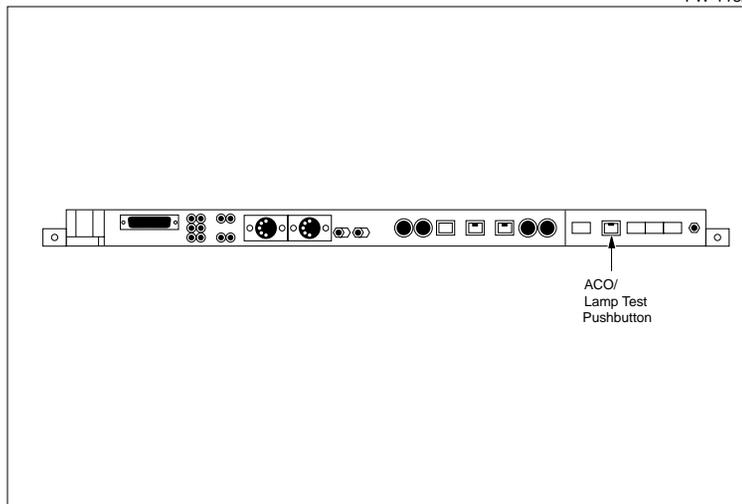
The lamps and LEDs light up for 30 seconds. The test lights all the lamps and LEDs on the bay, except for those on the NT7E56 breaker interface panel, if equipped. (The NT7E56 breaker interface panel is used with the transport bandwidth manager shelf.)

The NT7E56 breaker interface panel has an ACO/lamp test button that tests the lamps and LEDs on the breaker interface panel. (For the location of the button, see the figure on page 37.)

FW-11323



FW-11322



### **Logging on using a VT100-compatible terminal**

**Note:** For detailed instructions, see *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.

To log on to the network-element user interface of the local AccessNode using a local VT100-compatible terminal, do the following:

- 1 Display the login screen by pressing the Break key (which may be the PF5 key on your terminal). If your terminal has the Autobaud feature turned on, press Return twice instead.

*The terminal displays the prompt:*

?  
??

- 2 Type **login** and press Return.

*The terminal displays this message:* Enter userid and password.

- 3 Type your userid and password (separated by a space) on one line, and press Return.

*The Network Element Status screen appears. You are now logged on, and in a user-interface session.*

### Logging off using a VT100-compatible terminal

**Note:** For detailed instructions, see *Network Element User Interface Description*, 323-3001-300, in *Operations, Administration, and Provisioning*, Volume 4A.

There are two alternative methods of logging off from the network-element user interface. Method 1 logs you off directly, in one step. Method 2 closes the user-interface session and returns you to the CI (command interpreter) level.

#### Method 1

- 1 From any screen in the user interface, type **logout** and press Return.

#### Method 2

- 1 From any screen in the user interface, type **quit all** and press Return.  
*The command interpreter prompt appears.*
- 2 To log off from the CI level, type **logout** and press Return.

### **Making a local or express orderwire call**

To make a local or express orderwire call from the AccessNode, you can use a Digitone handset or a four-wire headset (WECO dual tip and sleeve).

To make a local orderwire call, do the following:

- 1 Connect the headset or handset to the appropriate connector on the local craft access panel (LCAP).
- 2 Press the call broadcast button on the LCAP.

To make an express orderwire call, do the following:

- 1 Connect the headset or handset to the appropriate connector on the local craft access panel (LCAP).
- 2 Press the Express button on the LCAP.
- 3 Press the call broadcast button on the LCAP.

### **Making an orderwire call to a number in the public switched phone network**

If the orderwire system has been connected to a line in the public switched network, you can make an orderwire call from an AccessNode to a number in the public switched network. The connection of the orderwire system to the public switched network is optional. If the connection exists, it is by way of pins 25 and 28 on the wirewrap pin field on the NT4K14 breaker interface panel of the FCOT.

To make an orderwire call to a number in the public switched phone network, do the following:

- 1 Connect a Digitone handset to the handset phone jacks on the local craft access panel.
- 2 Dial the three-digit code of the FCOT, followed by the digit 9, followed by the number that you want to call in the public switched network (for example, 111-9-555-1234).

## Records

### Air-filter replacement record

On this page, write down the dates on which you replace the air filter element.

	Date		Date		Date		Date		Date		Date
1		9		17		25		33		41	
2		10		18		26		34		42	
3		11		19		27		35		43	
4		12		20		28		36		44	
5		13		21		29		37		45	
6		14		22		30		38		46	
7		15		23		31		39		48	
8		16		24		32		40		48	



**Optical-levels record: receive BER**

Record the optical-level measurements taken upon installation, acceptance testing, upgrading, and field replacement of optical interface circuit packs.

The serial number of a circuit pack can be found on the bar-coded serial-number label. The label is usually located on the front bottom edge of the printed circuit board, and can be seen after the circuit pack is removed from its slot.

Date	NT code	Serial no.	Rx level 10 <sup>-6</sup> BER requirement	Rx level 10 <sup>-6</sup> BER measured	Comments

**Network-element identification**

Record the following information, which identifies the local AccessNode.

Network-element number: \_\_\_\_\_

Location: \_\_\_\_\_

Shelf type: ABM (NT4K10)  
or TBM (NT4K19): \_\_\_\_\_

**Check one:**     Shelf *does* contain an OPC module.  
                   Shelf *does not* contain an OPC module.

Shelf function: \_\_\_\_\_

Shelf serial number: \_\_\_\_\_

**Note:** You can obtain the network-element number, shelf type, shelf function, and shelf serial number from the Commissioning Data Record form. The form is filled out during commissioning. It is supplied in *Commissioning and Testing*, Volume 3. Ask the system administrator for the Commissioning Data Record.

### Subnetwork identification

Record the following information, which identifies the subnetwork of which the local AccessNode is a part.

**Note:** The terms *subnetwork* and *system* mean the same thing: one or more AccessNodes serving an application, and controlled by a single primary OPC.

Network number: \_\_\_\_\_

Network name: \_\_\_\_\_  
(There may be no name; a network does not need one.)

System ID: \_\_\_\_\_

System name: \_\_\_\_\_  
(There may be no name; a system does not need one.)

System type: \_\_\_\_\_

OPC name: \_\_\_\_\_

Primary OPC serial number: \_\_\_\_\_

Primary OPC alias: \_\_\_\_\_  
(There may be no alias; an OPC does not need one.)

Standby OPC serial number: \_\_\_\_\_  
(A standby OPC is optional.)

Standby OPC alias: \_\_\_\_\_  
(There may be no alias; an OPC does not need one.)

**Note:** You can obtain this information from the Commissioning Data Record form. The form is filled out during commissioning. It is supplied in *Commissioning and Testing*, Volume 3. Ask the system administrator for the Commissioning Data Record.

**DS1 facility identification**

Make copies of the DS1 facility identification form on the following page and fill in each copy with information about each DS1 facility as shown in the following example.

Example

Optical channel number:   1   Site: Dartmouth Application: Multiplexer

<b>DS1</b>	<b>Slot no.</b>	<b>Facility ID (CLFI)</b>	<b>Site of origin</b>	<b>Destination</b>	<b>Comments</b>
1	1	DAATSTJ001	Dartmouth	St Johns	



**DS3 and STS-1 tributary facility identification**

Make a copy of the DS3 facility identification form on the following page and fill in information about each DS3 facility as shown in the following example.

Example

Optical channel number:   1   Site: Dartmouth Application: Multiplexer

DS3	Slot no.	Facility ID (CLFI)	Site of origin	Destination	Comments
1	1	DAATSTJ001	Dartmouth	St Johns	

**DS3 and STS-1 tributary facility identification form**

Optical channel number: \_\_\_\_\_ Site: \_\_\_\_\_ Application: \_\_\_\_\_

DS3	Slot no.	Facility ID (CLF)	Site of origin	Destination	Comments

### **Circuit-assignment record**

Each copper-distribution drawer can support up to 48 two-wire circuits. Record the circuit assignments on the cards that are attached to the front of the drawers.

### **Power feed information**

Four -48 V dc power feeds are required to supply power to AccessNode equipment.

Bays are powered by four sets of Battery and Return cables that run between a battery-distribution fuse bay (BDFB) and the breaker interface panel (BIP). In bays, the cables connect as follows:

- Battery 1 and Return 1 and Battery 2 and Return 2 attach to the right side of the breaker interface panel.
- Battery 3 and Return 3 and Battery 4 and Return 4 attach to the left side of the breaker interface panel.

Modular Business Package (MBP) cabinets, are powered by four sets of battery and return cables that connect to a terminal block in the master cabinet from terminal blocks in a Modular Power Package (MPP) cabinet.

If there is no MPP, power is supplied by a BDFB supplied by the customer. For bays and in MBP cabinets powered from a BDFB, identify the power feeds in the table on the next page by writing in the number of BDFB and the number of the breaker or fuse on the BDFB for each feed.

**Power feed record**

<b>Bay number:</b> _____		
<b>Power feed</b>	<b>BDFB number</b>	<b>Breaker or fuse number</b>
1		
2		
3		
4		

**Note:** Fill in this table only for AccessNode equipment in bays or in MBP cabinets that are powered from an external customer-supplied power feed. It is not necessary to fill it in for an outside-plant cabinet or for MBP cabinets that are powered by an MPP cabinet.