

NTNP00CA

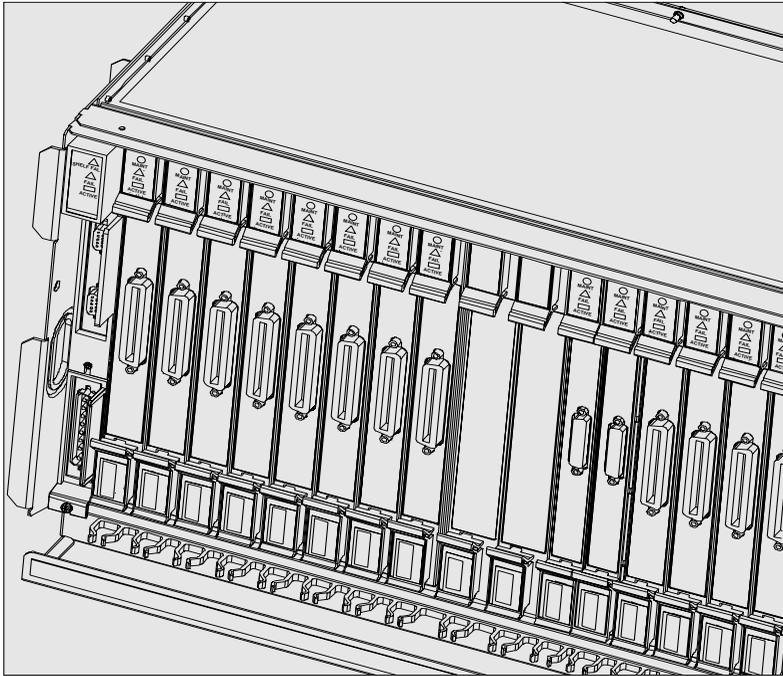
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AccessNode

Universal Edge 9000

Installation Quick Reference

Issue 2.0 October 2000



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About this guide

This guide describes the physical installation procedures for the Universal Edge 9000 (UE9000) product in a central office environment.

Audience

Installation personnel who have experience in AccessNode installation can use this guide to:

- Install a new, factory-configured ABM (access bandwidth manager) UE9000 single bay
- Install a UE9000 shelf into an existing ABM AccessNode

Objectives

After reading this guide, you will know how to perform the following tasks.

- Install the shelf
- Install power I/O cables
- Insert circuit packs
- Connect D-link cables
- Connect VF cables
- Connect MTA cables
- Connect ATM interface cables
- Connect CU interface and power cables
- Verify in-service status

References

The following documents are referenced in this guide:

- *UE9000 Pre-Installation Quick Reference*
- *UE9000 Adjacent Bay Installation Quick Reference*
- *UE9000 Data Setup Guide*
- *UE9000 Voice System Setup Quick Reference*
- *UE9000 Data OAM&P User Guide*
- *AccessNode Module Replacement Procedures, 323-3001-547, in Maintenance, Volume 5C*

You may also need the upgrade change application procedure (CAP) for the desired software release (for example, the *AD3.0 Upgrade CAP*).

Before you begin

Read this guide before installing this product.

This guide describes the physical installation procedures for the Universal Edge 9000 (UE9000) product in a central office environment.

About the UE9000

The UE9000 is a shelf on the AccessNode that provides voice and data services. The UE9000 supports the following circuit packs:

- ATM (asynchronous transfer mode) core cards
- TDM (time division multiplexing) core card
- SI (shelf interconnect) card
- Power I/O (input/output) card
- MLCs (multi-circuit line cards), for example, POTS, UVG, and xDSL

AccessNode ABM can support up to seven UE9000 shelves, three shelves in the main bay and four in an adjacent bay. Each UE9000 shelf has a greater line density than traditional copper distribution shelves (CDS). One UE9000 shelf can hold a variety of voice, voice and data and data-only up to 16 MLCs, with a capacity of up to 24 circuits per MLC. This provides a total of 384 lines per UE9000 shelf.

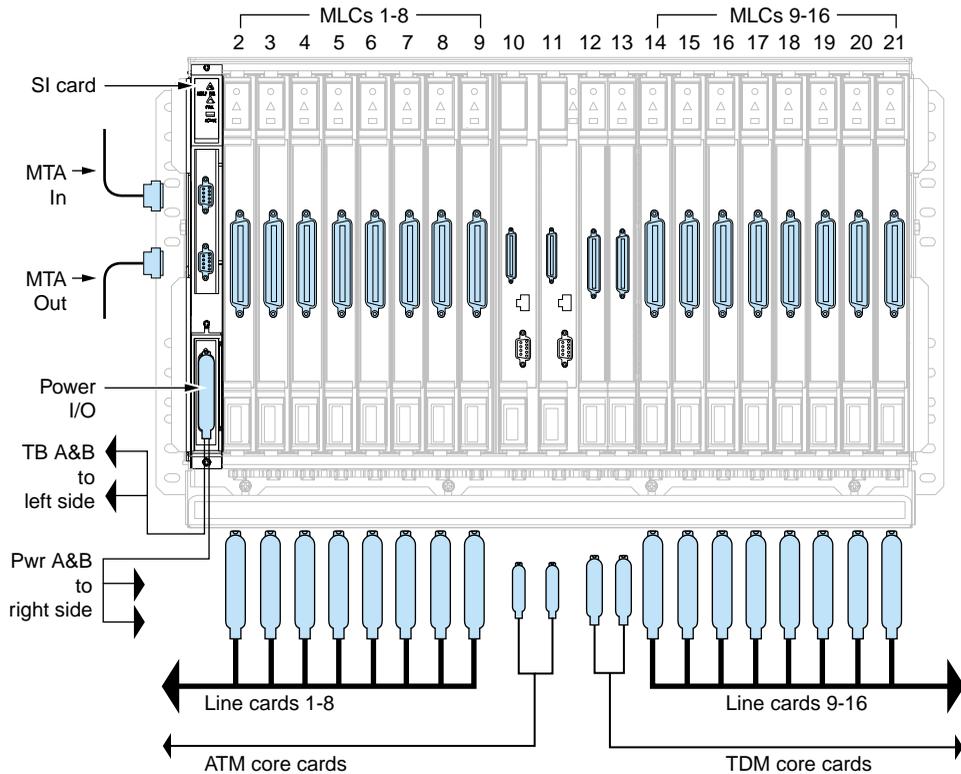
Configuration facts

A single AccessNode ABM bay can support the following:

- A total of seven D-link based shelves (CDS or UE9000)
- A maximum of three UE9000 shelves (provides 1152 lines) installed in the main bay; four additional UE9000s in a fully configured UE9000-only adjacent bay (provides 1536 additional lines). An ABM with three UE9000s in the main bay and four in the adjacent bay can support a maximum total of 2688 lines.
- UE9000 and CDS in combination (a maximum of four CDSs with one UE9000 in the main bay). One UE9000 requires the equivalent height of two CDSs.

Quick connect reference

UE-1007



Installation

Use the directions that follow to install the UE9000. Installation steps are in numerical order.

Note: There are prerequisites for this installation. For details, see the *UE9000 Pre-Installation Quick Reference*.

General installation guidelines:

- Always install UE9000 shelves below any existing CDSs in the bay. When installing a combination of CDS and UE9000 shelves, you must install the CDSs immediately below the first cooling unit in the bay (located just below the ABM).
- For factory-configured UE9000 ABM bays, you can use identical installation procedures as those for a CDS-equipped AccessNode, with the exception of adding new VF, ATM interface, and MTA cabling. These procedures are in this guide.
- For all UE9000 installations, use the same connections for power, talk-battery, MTA, and D-link as you would traditionally use for the CDS.
- An operations controller (OPC) must be available on-site during new UE9000 shelf installation into an existing system. This is necessary in case commissioning information for a network element (NE) needs to be restored.

Remove a CDS



CAUTION **Service interruption**

Removal of a CDS from the AccessNode is an *out-of-service* procedure. To replace CDSs with the UE9000, you must decommission and remove at least two CDSs from service. (Remove three CDSs if you are installing the first UE9000 in a bay.)

Removing an existing CDS and installing a UE9000 shelf

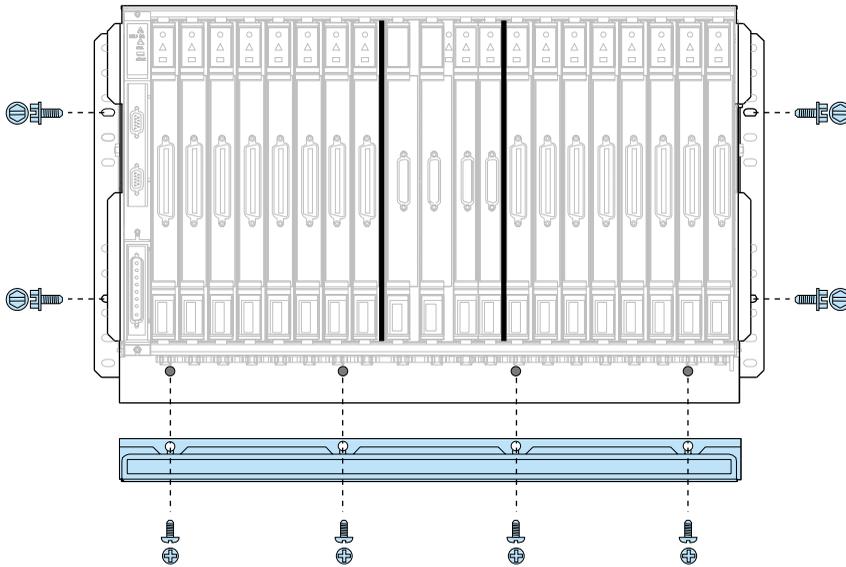
Refer to the chapter on replacing a copper-distribution shelf in the *AccessNode Module Replacement Procedures, 323-3001-547, in Maintenance, Volume 5C*, in order to accomplish the following:

- Deprovision all services before removing the CDS. This is an out-of-service procedure.
- During removal of the CDS, disconnect all existing power cables, talk battery (TB) cables, VF cables, and D-link cables, but do not remove them from the bay. You will use these cables to connect to the UE9000.

1 Install the shelf

The UE9000 shelf takes up two physical CDS slots in the bayframe. You must install the UE9000 **below** any CDS in the bay.

UE-1013



To install:

- 1 Assemble the cable trough to the UE9000 shelf before placing the UE9000 into the bayframe (non-factory configured shelves only). Use the screws provided.
- 2 Slide the UE9000 into the bay.
Important: The UE9000 must fit tight against the equipment in the space above. Do not leave gaps between shelves.
- 3 Fasten the UE9000 to the bayframe using four mounting bolts (provided).

Use these guidelines when cabling:

- Factory-configured UE9000 ABM bays have all intraframe cabling in place, (including cabling for the cooling units). Installation procedures are identical to those for a CDS-equipped AccessNode, with the following exceptions:
 - D-link cable (additional D-link extension cables)
 - ATM DS1 (new cables)
 - ATM DS3 (new cables, or a DS3 I/O cross-connect kit)

Note: The DS3 I/O cross-connect assembly is required for a redundant system (UE9000 shelf equipped with two DS3 ATM core cards). The DS3 I/O cross-connect assembly is also highly recommended for a non-redundant system (UE9000 shelf equipped with one DS3 ATM core card), since the cross-connect assembly allows you to upgrade to a redundant system without a service outage. Refer to step 7, “Connect ATM interface cables,” on page 16 for more information.
 - MTA (different cable)
 - VF cables (additional VF extension cables; specific connector required)
 - For non-factory-configured UE9000 ABM bays, the following applies:
 - Position cables to one shelf at a time, in front of the UE9000 faceplate.
 - Secure cables into cable guides; position cables down into the cable trough; and exit cables right and left into the bayframe. Once in the bayframe, route external cables up or down, depending on the site configuration. Route intrabay cables to appropriate shelves. See “Quick connect reference” on page 3 of this guide for correct cable routing.

Important: Use the Nortel Networks-recommended connector type for subscriber loop (VF) cable connections. The UE9000 multi-circuit line cards require the use of a particular style of connector on the subscriber loop (VF) cables. The required connector is of metal construction, has a special low-profile hood, and has two screws to secure the cable to the faceplate. For this reason, we highly recommend that you order VF cables from Nortel Networks. In addition, Nortel Networks-supplied 50-pair VF cables are designed to alleviate cable congestion in the UE9000 shelf cable trough and in the bayframe.
- Note:** If you (or a third party) are building VF cables, you must use the following connector: Amphenol part number **157-72500-42(448)**. This part number includes the connector, hood, and mounting screws.

BIP relabeling

The designations for BIP breakers on the AccessNode are labelled for CDS. You must relabel the BIP breaker switches after UE9000 installation.

Note: Each label covers two CDS breaker designations.

For information on how to relabel the UE9000 Adjacent Bay BIP breaker designations, see the *UE9000 Adjacent Bay Installation Quick Reference*.

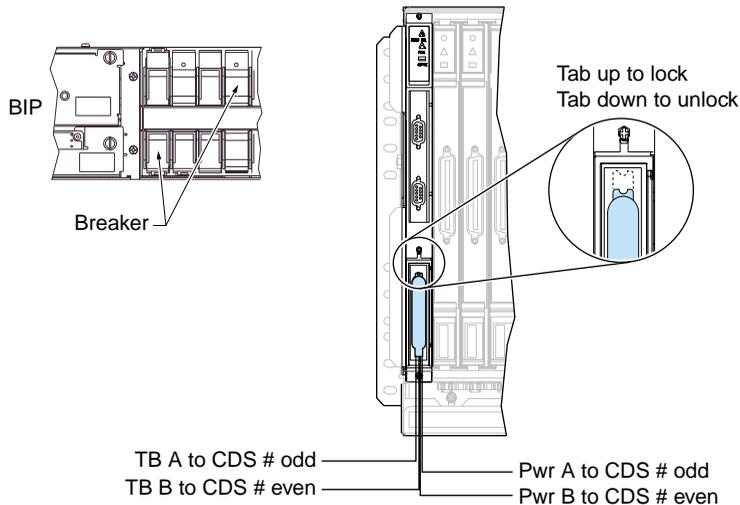
If the UE9000 main bayframe contains...	Cover these BIP breaker designations...	With these UE9000 labels...
One UE9000 only	CDS 1 CDS 2	A UE9000-1 B
Two UE9000s only	CDS 1 CDS 2 CDS 3 CDS 4	A UE9000-1 B A UE9000-2 B
Three UE9000s only	CDS 1 CDS 2 CDS 3 CDS 4 CDS 5 CDS 6	A UE9000-1 B A UE9000-2 B A UE9000-3 B
One CDS/one UE9000	CDS 2 CDS 3 CDS 4	UNUSED/A UE9000-1 B
One CDS/two UE9000s	CDS 2 CDS 3 CDS 4 CDS 5 CDS 6	UNUSED/A UE9000-2 B A UE9000-3 B
Two CDSs/one UE9000	CDS 3 CDS 4	A UE9000-3 B
Two CDSs/two UE9000s	CDS 3 CDS 4 CDS 5 CDS 6	A UE9000-3 B A UE9000-4 B
Three CDSs/one UE9000	CDS 4 CDS 5 CDS 6	UNUSED/A UE9000-4 B
Four CDSs/one UE9000	CDS 5 CDS 6	A UE9000-5 B

2 Install power I/O cables

Power I/O cables connect the power I/O card on the UE9000 to the existing power and talk-battery feeds (as traditionally used by the CDS).

Note: Factory-configured UE9000s are prewired.

UE-1005



To install:



DANGER

Risk of serious injury and equipment damage.

Verify that the CDS breakers you intend to use are turned OFF at the breaker interface panel (BIP) before connecting the power connections.

- 1 Install eight-pin power connector NTNP85AD onto the power I/O card. To install, the slide latch on the connector must be in the **down** position. Make certain the top of the latch is **not visible** on the top of the connector. This indicates that the latch is in the unlocked position. The connector attaches only one way.
- 2 Push **up** on the slide latch to lock the connector into place. Make certain the top of the latch is **visible** on the top of the connector. This indicates that the latch is in the locked position.
- 3 Connect the four power connectors (see labels) to the existing power feeds in the bay.
- 4 Attach the power cables to the side of the shelf with cable ties.

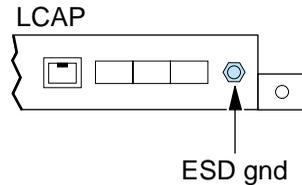
3 Insert circuit packs



CAUTION

Risk of equipment damage.

Before handling circuit packs, connect your wrist ground strap to the **ESD gnd** connector on the front of the local craft access panel (LCAP).



To install:

Seat **all** circuit packs into the UE9000 shelf before connecting cables. Use the guide on the bottom of the UE9000 to match circuit pack type to slot number.

- 1 Carefully slide circuit packs into slots and seat into the UE9000 backplane connectors. If adjacent card faceplates touch, it may be necessary to gently move tight-fitting circuit packs from side to side while inserting.
- 2 Lock latches on the top and bottom of each circuit pack.

To remove:

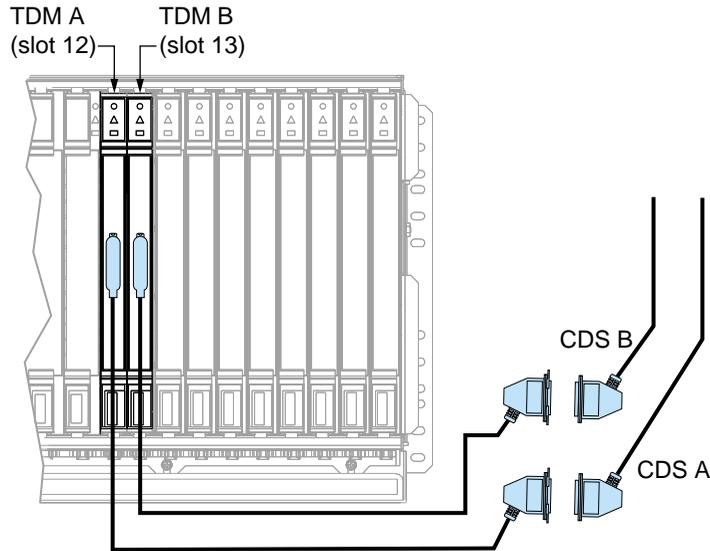
To remove a circuit pack from the UE9000, do the following:

- 1 Unlock the latches on the top and bottom of the circuit pack.
- 2 Carefully pull the circuit pack outward.

4 Connect D-link cables

Two D-link (voice interface) cables connect two TDM core cards to the ABM. TDM core cards occupy UE9000 slots 12 and 13.

UE-1006



To install:

- 1 Connect D-link extension cable A to TDM core card A in slot 12; connect D-link extension cable B to TDM core card B in slot 13. Each D-link extension cable (NTNP82AA) is identified A and B.
- 2 Connect the extension cables to the next available D-link A/B pair (on the right side of the bay). The D-link pair connection determines the shelf location in the NEUI software, for example, D-link #3 denotes shelf #3.
- 3 Coil and tie-wrap any excess NTNP82AA cable to the right side of the shelf, or into the cable area of the bayframe. Tie-wrap each connector pair together and position next to the cables either on the side of the nearest UE9000 shelf, or in the cable area of the bayframe.

Note: The amount of excess NTNP82AA extension cable depends on the physical location of the UE9000 shelf in the bayframe.



DANGER

Risk of injury or equipment damage

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

VF cables connect UE9000 multi-circuit line cards (MLCs) to the MDF. See "Quick connect reference" on page 3 for correct cable routing.

Important: The UE9000 multi-circuit line cards require the use of a particular style of connector on the subscriber loop (VF) cables. See "About cabling" on page 6.

- Factory-configured UE9000 bayframes use up to eight dual-head, 50-pair VF cables (lengths vary) for each shelf. There is one cable for every two MLCs (16 maximum MLCs for each shelf).
- For CDS replacement, all four existing 25-pair VF cables (from the CDSs) require VF cable extenders.

To install VF cables:

- 1 Connect VF cable extensions to the existing CDS VF cabling, **or** run new VF 50-pair cables from the MDF to the UE9000 shelf. These are marked 1-25 and 26-50.
- 2 Connect VF cables to UE9000 MLCs (slots 2 through 9, and 14 through 21). Start from the MLCs in the center of the shelf and work outward (to the left and right). **Record each connection** (card number/cable).
- 3 Bundle the cables into right and left bundles. **Important:** VF cable bundles must be tight to fit in the space between the bayframes.
- 4 Use the tiewrap lance plate to secure VF cable bundles to the bayframe.
- 5 Connect the other end of the VF cable to the MDF (master distribution frame). At the MDF, start with the BLUE binder, connecting pairs 1-24. **Do not connect pair 25.** Continue with the ORANGE binder, connecting pairs 1-24. **Do not connect pair 25.** See the wiring table that follows.

Note: We recommend that you wire all 24 pairs for every MLC slot (this is the optimum configuration). In a custom wiring configuration, some MLCs may not use all pairs. In this case, only wire the appropriate pairs for the specific MLC. This will limit which MLCs can be connected to these cables. For example: If you connect 4 pairs (ADSL 4x4 linecard), you will not be able to replace this card with any linecard requiring more than 4 connections.

Wiring table

The following table shows the pinouts for the UE9000 50-pair VF cable, for both the blue and the orange binder.

Note: Each MLC uses enough VF pairs for all its subscriber lines, beginning with VF pair number 1. For example, the SAA-12 uses only the first twelve VF pairs.

VF pair	UE9000 end of cable	Tip or Ring	Other end of cable
	Connector pin		Color
1	1	R	Blue/White
	26	T	White/Blue
2	2	R	Orange/White
	27	T	White/Orange
3	3	R	Green/White
	28	T	White/Green
4	4	R	Brown/White
	29	T	White/Brown
5	5	R	Slate/White
	30	T	White/Slate
6	6	R	Blue/Red
	31	T	Red/Blue
7	7	R	Orange/Red
	32	T	Red/Orange
8	8	R	Green/Red
	33	T	Red/Green
9	9	R	Brown/Red
	34	T	Red/Brown
10	10	R	Slate/Red
	35	T	Red/Slate
11	11	R	Blue/Black
	36	T	Black/Blue
12	12	R	Orange/Black
	37	T	Black/Orange
—continued—			

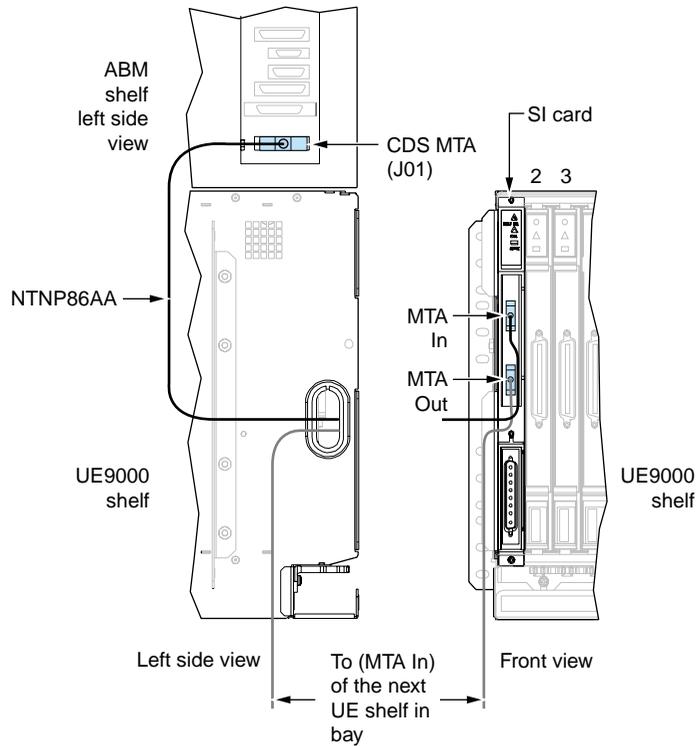
VF pair	UE9000 end of cable		Other end of cable
	Connector pin	Tip or Ring	
13	13	R	Green/Black
	38	T	Black/Green
14	14	R	Brown/Black
	39	T	Black/Brown
15	15	R	Slate/Black
	40	T	Black/Slate
16	16	R	Blue/Yellow
	41	T	Yellow/Blue
17	17	R	Orange/Yellow
	42	T	Yellow/Orange
18	18	R	Green/Yellow
	43	T	Yellow/Green
19	19	R	Brown/Yellow
	44	T	Yellow/Brown
20	20	R	Slate/Yellow
	45	T	Yellow/Slate
21	21	R	Blue/Violet
	46	T	Violet/Blue
22	22	R	Orange/Violet
	47	T	Violet/Orange
23	23	R	Green/Violet
	48	T	Violet/Green
24	24	R	Brown/Violet
	49	T	Violet/Brown
25	25	R	Slate/Violet
	50	T	Violet/Slate
—end—			

6 Connect MTA cables

Two MTA (metallic test access) cables connect the shelf interconnect (SI) card on the UE9000 to the ABM. These cables provide metallic access to the UE9000 shelf.

- NTNP86AA, for ABM-to-UE9000 connection, or CDS-to-UE9000 connection
- NTNP86AD, for UE9000-to-UE9000 connection

UE-1009



Connect MTA—no CDS in bay

To install:

- 1 Connect new cable NTNP86AA to **CDS MTA (J01)** on the ABM. From the ABM, route the cable through the hole on the left side of the UE9000, and connect to **MTA IN** on the shelf interconnect (SI) card.
- 2 If there is another UE9000 below, use cable NTNP86AD to connect **MTA OUT** on the SI card in the above UE9000, to **MTA IN** on the SI card in the next UE9000.

Connect MTA—CDS in bay

To install:

- 1 Connect NTNP86AA from the last (or lowest) **CDS MTA OUT** to **UE9000 MTA IN**.
- 2 If there is another UE9000 below, use cable NTNP86AD to connect **MTA OUT** on the SI card in the above UE9000, to **MTA IN** on the SI card in the next UE9000.

7 Connect ATM interface cables

The UE9000 supports both DS1 IMA and DS3 ATM core cards. Only one DS1 IMA ATM core card (non-redundant configuration) is supported per UE9000 shelf. The UE9000 shelf supports either one DS3 ATM core card (non-redundant configuration) or two DS3 cards (redundant configuration). Cabling instructions differ, depending on the ATM configuration. For the appropriate ATM core card cabling instructions, refer to the following:

- DS1 IMA non-redundant configuration, see “DS1 IMA cables”
- DS3 non-redundant configuration, see “DS3 cabling for non-redundant configuration” on page 18
- DS3 redundant configuration, see “DS3 cabling for redundant configuration” on page 20

Note: If you need to upgrade an existing UE9000 shelf equipped with a DS1 IMA core card to DS3 core card(s), refer to “Changing from DS1 IMA to DS3 ATM core card” on page 22.



CAUTION

Risk of equipment damage.

The ATM core card is not intended to meet first level lightning requirements. ATM core cards are suitable for connection to intrabuilding or nonexposed wiring or cabling only. (Bellcore GR-1089-CORE Requirement R4-12.)

DS1 IMA cables

Two DS1 IMA cables connect the ATM core card to the data back-haul network. There are two installation methods. You can use method one or method two.

Installation using method one:

Connect DS1 IMA cables (NTNP82BX) from the ATM core card on the UE9000 to the DS1 I/O cards in the ABM.

Note: When you connect the ATM core card DS1s to the ABM shelf, the ATM DS1 connector uses the space for 14 DS1s, though only 8 DS1s are actually in use.

Installation using method two:

Connect DS1 IMA cables from the ATM core card to a DS1 DSX panel that cross connects the DS1s to an ATM edge switch. The DS1 IMA cables are NTNP88AX (AA, AB, AD, AE, AF, or AG).

DS1 ATM pinouts

The following table shows the DS1 IMA ATM cable pinouts

UE9000 end of cable		Other end of cable	
DS1 pair number	Connector pin	Color	DS1 pair number
TX-1	3	Blue/White	RX-1
	18	White/Blue	
TX-2	2	Orange/White	RX-2
	1	White/Orange	
TX-3	32	Green/White	RX-3
	17	White/Green	
TX-4	31	Brown/White	RX-4
	16	White/Brown	
TX-5	21	Slate/White	RX-5
	36	White/Slate	
TX-6	34	Blue/Red	RX-6
	19	Red/Blue	
TX-7	22	Orange/Red	RX-7
	6	Red/Orange	
TX-8	5	Green/Red	RX-8
	4	Red/Green	
RX-1	44	Blue/White	TX-1
	30	White/Blue	
RX-2	29	Orange/White	TX-2
	43	White/Orange	
RX-3	42	Green/White	TX-3
	28	White/Green	
RX-4	41	Brown/White	TX-4
	40	White/Brown	
—continued—			

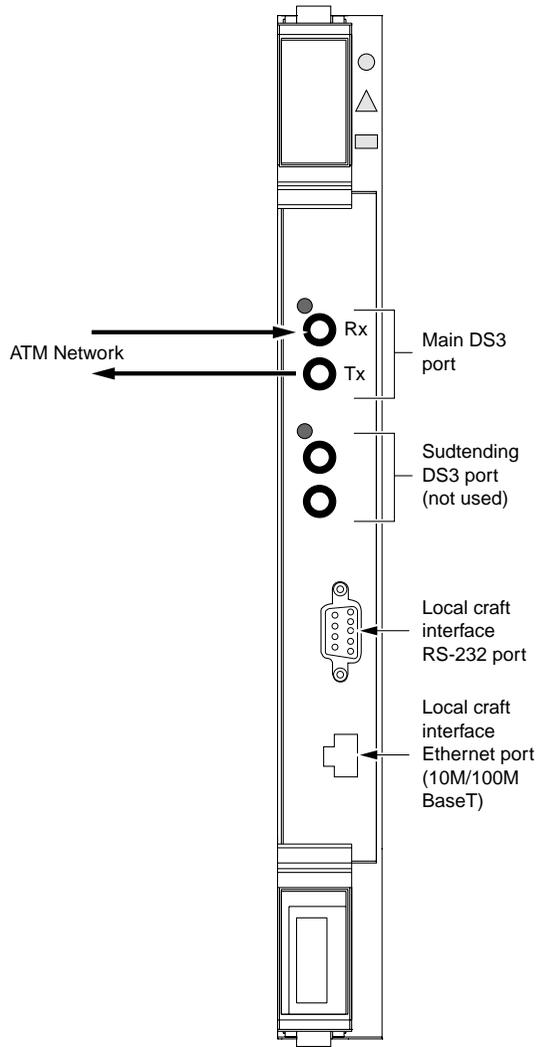
UE9000 end of cable		Other end of cable	
DS1 pair number	Connector pin	Color	DS1 pair number
RX-5	11	Slate/White	TX-5
	10	White/Slate	
RX-6	25	Blue/Red	TX-6
	9	Red/Blue	
RX-7	15	Orange/Red	TX-7
	14	Red/Orange	
RX-8	13	Green/Red	TX-8
	12	Red/Green	
—end—			

DS3 cabling for non-redundant configuration

Connect two DS3 cables from the ATM core card to the ATM edge switch (see the following figure). The DS3 cables for this configuration are SMZ to BNC adapter cables (NTNP88EC).

Note 1: In a non-redundant configuration, the DS3 ATM core card must be installed in slot 10 of the UE9000 shelf.

Note 2: When a non-redundant configuration is converted to a redundant configuration, there will be a service outage, *if* a DS3 I/O cross-connect assembly was not used in the initial installation. The DS3 I/O cross-connect can operate feeding only one DS3 ATM card with the other output left unconnected. Therefore, it is recommended to install the DS3 I/O cross-connect assembly on non-redundant systems as well. See “DS3 cabling for redundant configuration,” for additional information.



DS3 ATM Core cards

DS3 cabling for redundant configuration

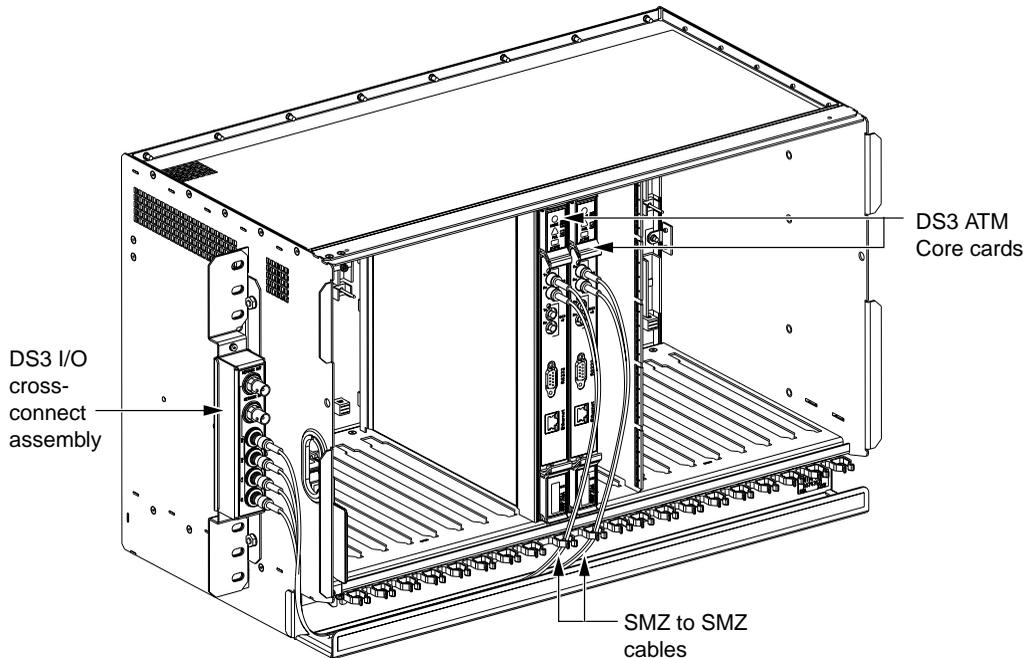
To cable a UE9000 shelf with two DS3 ATM core cards (redundant configuration), you must use the DS3 I/O cross-connect kit (NTNP88FA) which consists of:

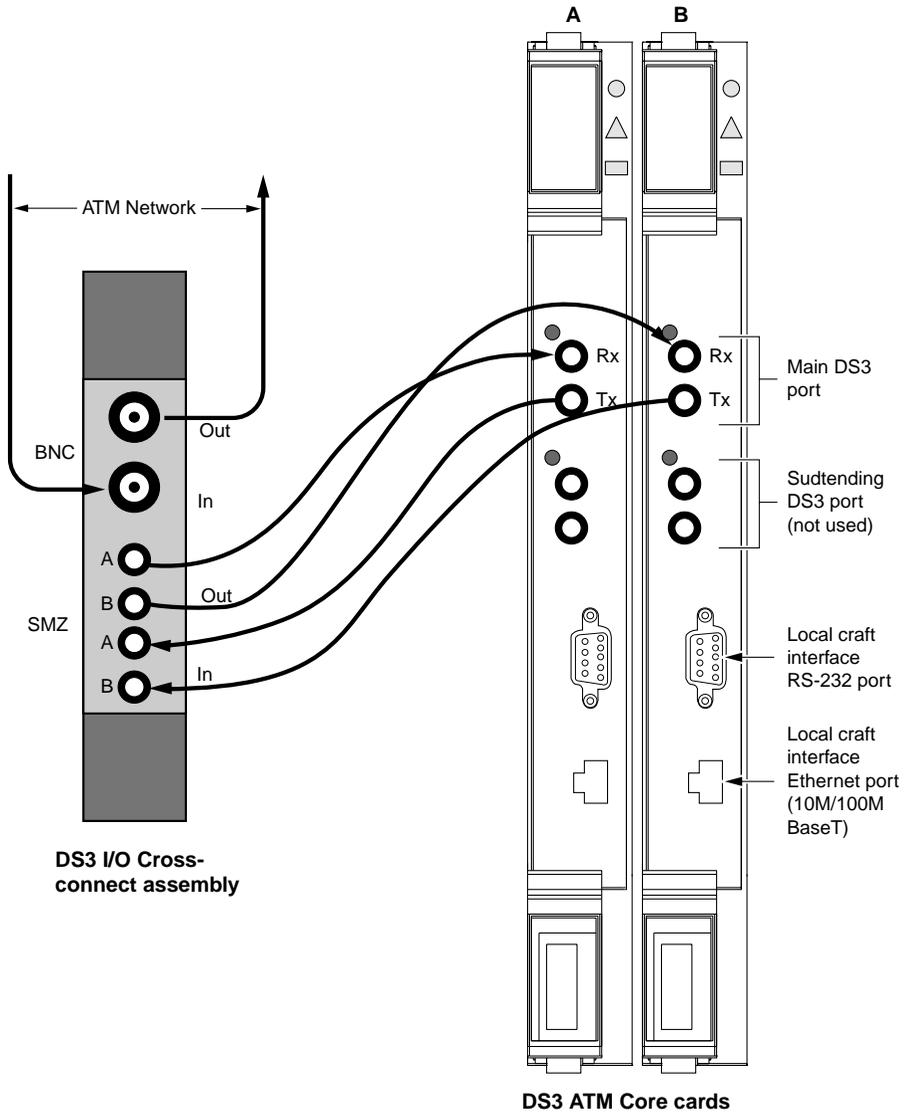
- I/O cross-connect assembly (NTNP8810)
- four 2-ft. SMZ to SMZ cables (NTNP88EB)

Use this procedure to install the DS3 I/O cross-connect and cables:

- 1 Install the DS3 I/O cross-connect on the left-side of the UE9000 shelf using the two screws provided.
Note: The DS3 I/O cross-connect can be installed over the screws holding the left side of the UE9000 shelf to the bay, as long as the screws holding the shelf to the bay are located from the 4th holes (top and bottom), in relation to the shelf. If the screws holding the UE9000 shelf to the bay are in the top 3 holes (from top and bottom), you must relocate those screws before installing the DS3 I/O cross-connect.
- 2 Connect the four SMZ-SMZ cables to the DS3 I/O cross-connect and route the cables to the DS3 core cards. See the following figures.
Note: The DS3 I/O cross-connect can operate feeding only one DS3 ATM card with the other output left unconnected.
- 3 Connect the DS3 I/O cross-connect to the ATM edge switch using BNC cables.

UE-1082





Changing from DS1 IMA to DS3 ATM core card

Note: In order to change from a DS1 IMA core card to a DS3 core card, the voice system must be at version AN18.0, and the data system must be at AD3.0.

To remove a DS1 IMA ATM core card from the UE9000 shelf and install a DS3 ATM core card, use the following procedure.

- 1 Back up the database. Refer to the *UE9000 Data OAM&P User Guide*.
- 2 Lock the DS1 IMA card. Refer to the *UE9000 Data OAM&P User Guide*.
- 3 Unprovision the DS1 IMA card. Refer to the *UE9000 Data OAM&P User Guide*.
- 4 Remove the DS1 IMA card from the UE9000 shelf.
- 5 Install the DS3 card into the UE9000 shelf.
- 6 Setup the DS3 card using the local craft interface (LCI) and TL1 command interpreter. Refer to the *UE9000 Data Setup Guide*.
- 7 Provision the DS3 card through the uEMS. Refer to the *UE9000 Data OAM&P User Guide*.

8 Connect CU interface and power cables

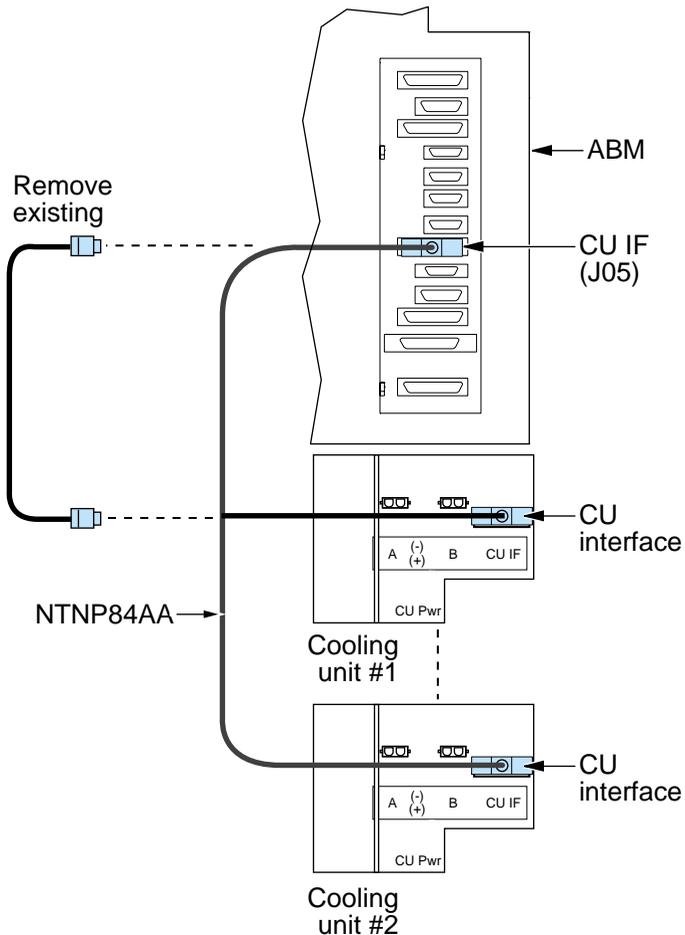
Cooling unit (CU) control interface cables connect the ABM to CUs in the bay. CU power cables connect the BIP to CUs in the bay.

Note: If the bay is in-service, you must complete all work in less than 15 minutes. Position all new cables first before removing power to the first CU.

CU interface cables

To install:

UE-1012

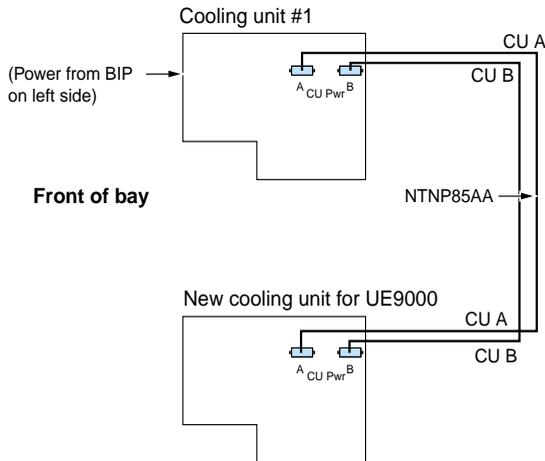


- 1 Turn off the BIP breakers for the existing CU.
- 2 Remove the existing ABM-to-CU intrabay cable (NT4K85KA) and discard. This cable connects **CU IF (J05)** on the ABM to **CU Interface** on the first CU.
- 3 Install the new CU control cable NTNP84AA. Connect the first feed to **CU IF (J05)** on the ABM.
- 4 Connect the second feed to **CU Interface** on the nearest CU in the bay.
- 5 Connect the third feed to **CU Interface** on the last CU in the bay.

CU power cables:

To install:

UE-1020



The BIP-to-cooling unit (CU) wiring harness is factory installed on the left side of the bay. To add a CU for use with the UE9000, you must install power harness NTNP85AA on the right side of the bay, between the first CU and the new CU.

- 1 Begin with the first CU in the bay. Using wiring harness NTNP85AA, install the power connector labeled **CUA** to connector **CU POWER A**; install the power connector labeled **CUB** to connector **CU POWER B**.
- 2 Connect the remaining end of the harness to the corresponding CU POWER connectors in the new CU in the bay.
- 3 Turn on the BIP breakers for the CUs.

9 Verify in-service status

After physical installation, you must complete specific tasks to bring the UE9000 to an in-service status. This includes verifying proper installation. These tasks are described in the *UE9000 Voice System Setup Quick Reference*.

NOTES:

AccessNode
Universal Edge 9000
Installation Quick Reference

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Document number: P0917846

Document release: Issue 2.0

Date: October 2000

Printed in Canada

