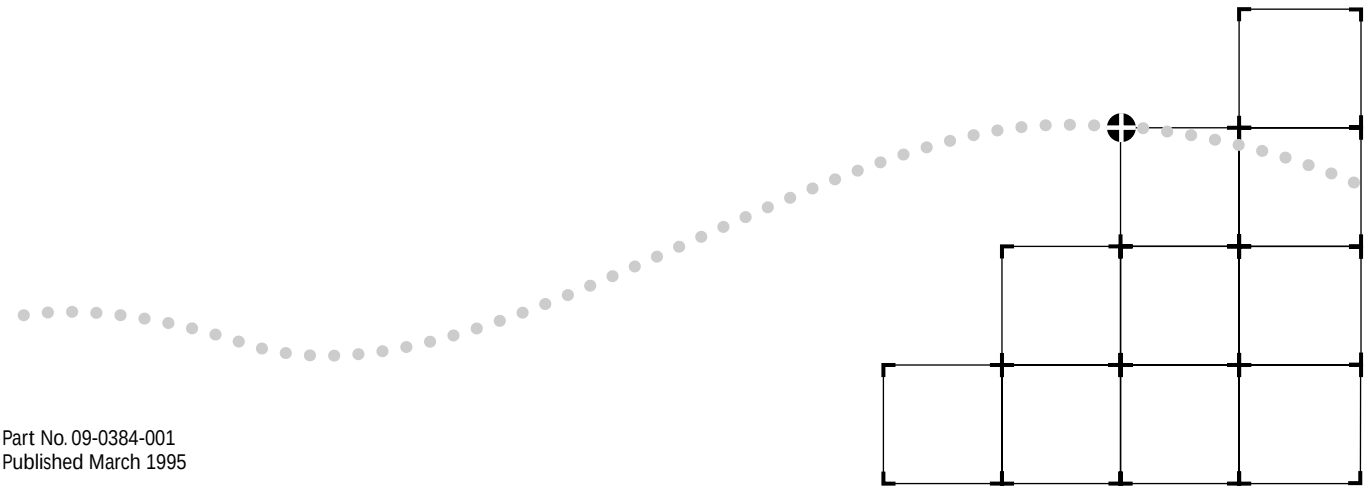
NETBUILDER II® TOKEN RING+ MODULE INSTALLATION GUIDE



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ABOUT THIS GUIDE

Introduction

This guide describes how to install, cable, and troubleshoot the Token Ring+ module for the NETBuilder II® system. The information in this guide applies to all NETBuilder II chassis.

For more information about NETBuilder II base system installation, refer to the *NETBuilder II Base System Installation Guide*.

This guide is intended for the system administrator, network equipment installer, or network manager who is responsible for installing and managing the network hardware. It assumes a working knowledge of network operations, but it does not assume prior knowledge of 3Com® internetworking equipment.

If the information in the release notes shipped with your product differs from the information in this guide, follow the release notes.

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Text Conventions

Convention	Description
"Enter" vs. "Type"	When the word "enter" is used in this guide, it means type something, then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
"Syntax" vs. "Command"	When the word "syntax" is used in this guide, it indicates that the general form of a command syntax is provided. You must evaluate the syntax and supply the appropriate port, path, value, address, or string; for example: Enable RIPIP by using the following syntax: `SETDefault !<port> -RIPIP CONTrol = Listen` In this example, you must supply a port number for !<port>. When the word "command" is used in this guide, it indicates that all variables in the command have been supplied and you can enter the command as shown in text; for example: Remove the IP address by entering the following command: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**  *For consistency and clarity , the full form syntax (upper- and lowercase letters) is provided. However, you can enter the abbreviated form of a command by typing only the uppercase portion and supplying the appropriate port, path, address, value, and so forth. You can enter the command in either upper- or lowercase letters at the prompt.*
Text represented as `screen display`	`This typeface` is used to represent displays that appear on your terminal screen, for example: `NetLogin:`

Table 1 Text Conventions (continued)

Convention	Description
Text represented as **`commands`**	**`This typeface`** is used to represent commands that you enter, for example: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**
Keys	When specific keys are referred to in the text, they are called out by their labels, such as “the Return key” or “the Escape key,” or they may be shown as [Return] or [Esc]. If two or more keys are to be pressed simultaneously, the keys are linked with a plus sign (+), for example: Press [Ctrl]+[Alt]+[Del].
Italics	*Italics* are used to denote *new terms* or *emphasis*.

Table 2 Notice Icons

Icon	Type	Description
	Information Note	Information notes call attention to important features or instructions.
	Caution	Cautions contain directions that you must follow to avoid immediate system damage or loss of data.
	Warning	Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully.

1 INSTALLATION

This chapter describes how to install the Token Ring+ module into the NETBuilder II® system and includes information on the following:

- Preinstallation procedure
- Installation in a NETBuilder II 4- or 8-Slot chassis
- Installation in a NETBuilder II 8-Slot Extended chassis
- Cabling the module

For information about the module's features, refer to Chapter 2.

Before Installing the Module

Before you install the Token Ring+ module into the NETBuilder II system, follow these steps:

1 Observe appropriate electrostatic discharge (ESD) precautions.

ESD can damage circuit board components. Failures resulting from ESD may not be covered under your warranty. To prevent this, follow these handling procedures:

- Keep the module in its antistatic shielded bag until you are ready to install it.
- Do not touch pins, leads, or solder connections on the board.
- Handle the board by the edges only.
- Store or ship the module in static-protective packaging.

Observe proper grounding techniques when handling the module: Use a foot strap and grounded mat, or wear a grounded static discharge wrist strap.

2 Inspect the module for shipping damage.

If you find any damage, contact the shipping company to file a report. If the module must be returned to your network supplier, ship it in its original shipping carton. If the original carton was damaged in shipment, repack the module in a carton that provides equivalent protection.

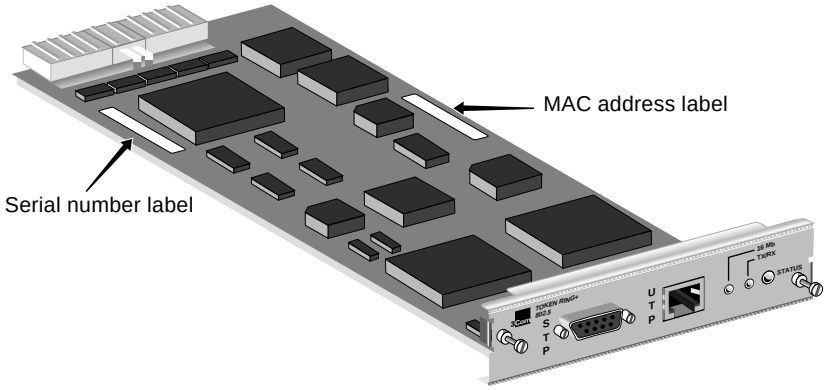
3 Verify that you have received all the contents.

When you purchase the Token Ring+ module, you receive the following:

- Token Ring+ module
- *NETBuilder II Token Ring+ Module Installation Guide*
- *NETBuilder II VFG-243/1991 Configuration Exceptions List*

If an item is missing from an undamaged carton, contact your network supplier to secure a replacement.

4 Write down the serial number and the MAC address on the following line. You will need this information if you have to contact your network supplier.:



Serial number example: S/N:1DM12345

MAC address example (in canonical format): 0800021A4B5C

The canonical MAC address is also encoded in the module's EEPROM. Use the procedure in the *NETBuilder II Base System Installation Guide* to display the MAC address encoded in the EEPROM.

Token ring networks use noncanonical addressing. See Table 3-1 for a more detailed discussion of canonical and non-canonical addressing.

Software Compatibility

The Token Ring+ module needs version 8.1 or later of the NETBuilder Family Bridge/Router software.

Installing in the 4- or 8-Slot Chassis

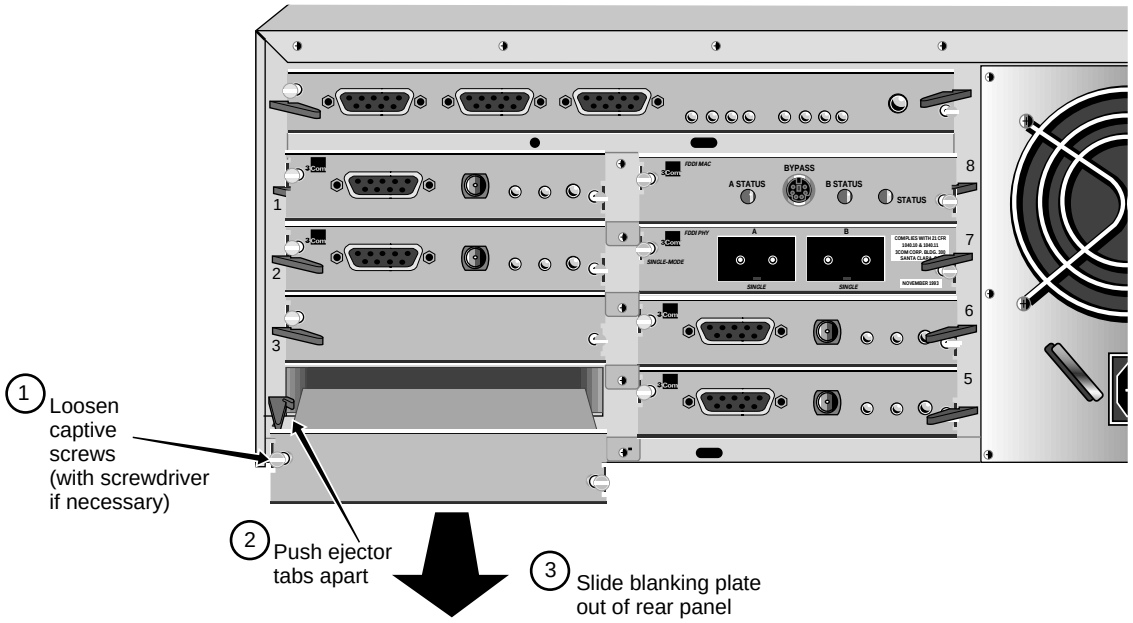
Use this procedure to install the module into the NETBuilder II 4- or 8-Slot chassis. To install in the NETBuilder II 8-Slot Extended chassis, see the next section.

You will need a small flat-blade screwdriver.

You can safely install a module without turning off or rebooting the NETBuilder II system.

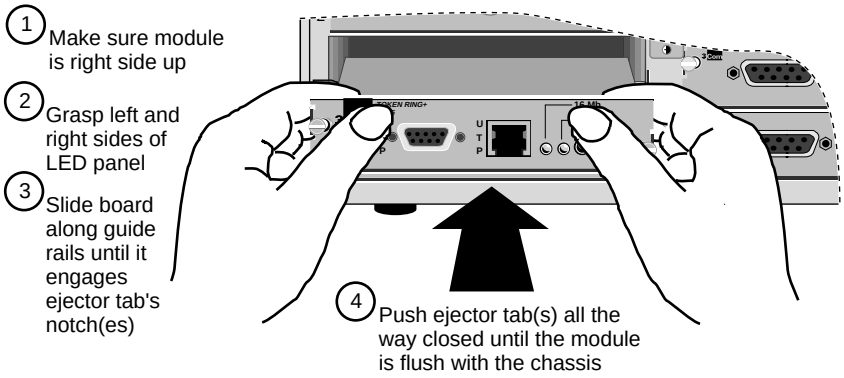
1 Remove the blanking plate from the I/O slot you have selected.

You do not need to remove the cable strain relief bracket that came with your NETBuilder II chassis.



CAUTION: *Only remove the blanking plate from an I/O slot that will house the Token Ring+ module. All unused I/O slots require blanking plate covers to maintain proper cooling of the unit and regulatory compliance. Failure to cover open slots can result in overheating of the NETBuilder II system and voiding of the warranty.*

2 Insert the module into the slot.



3 Tighten the captive screws with a screwdriver. Do **not** overtighten.

A solid connection of the connector/LED panel to the chassis is required for proper operation. Do **not** use the screws to force the board into place.

See "Cabling the Module" on page 1-6 to finish installation. See also "Network Configuration" on page 2-2 for more information on token ring networks.

Installing in the Extended Chassis

Use this procedure to install the module into the NETBuilder II 8-Slot Extended chassis. To install in the NETBuilder II 4- or 8-Slot chassis, see the previous section.

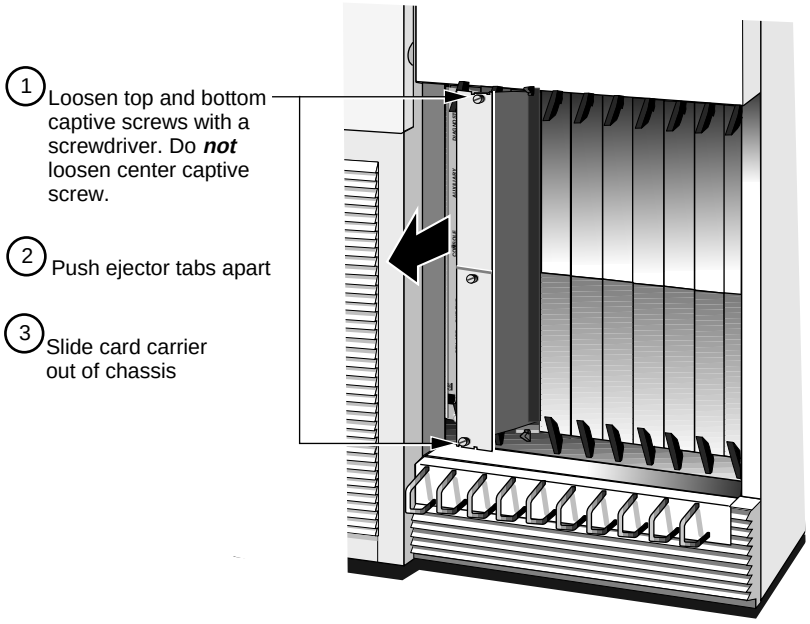
You will need a small flat-blade screwdriver.

You can safely install a module without turning off or rebooting the NETBuilder II system.

1 Remove the card carrier from the I/O slot you have selected.

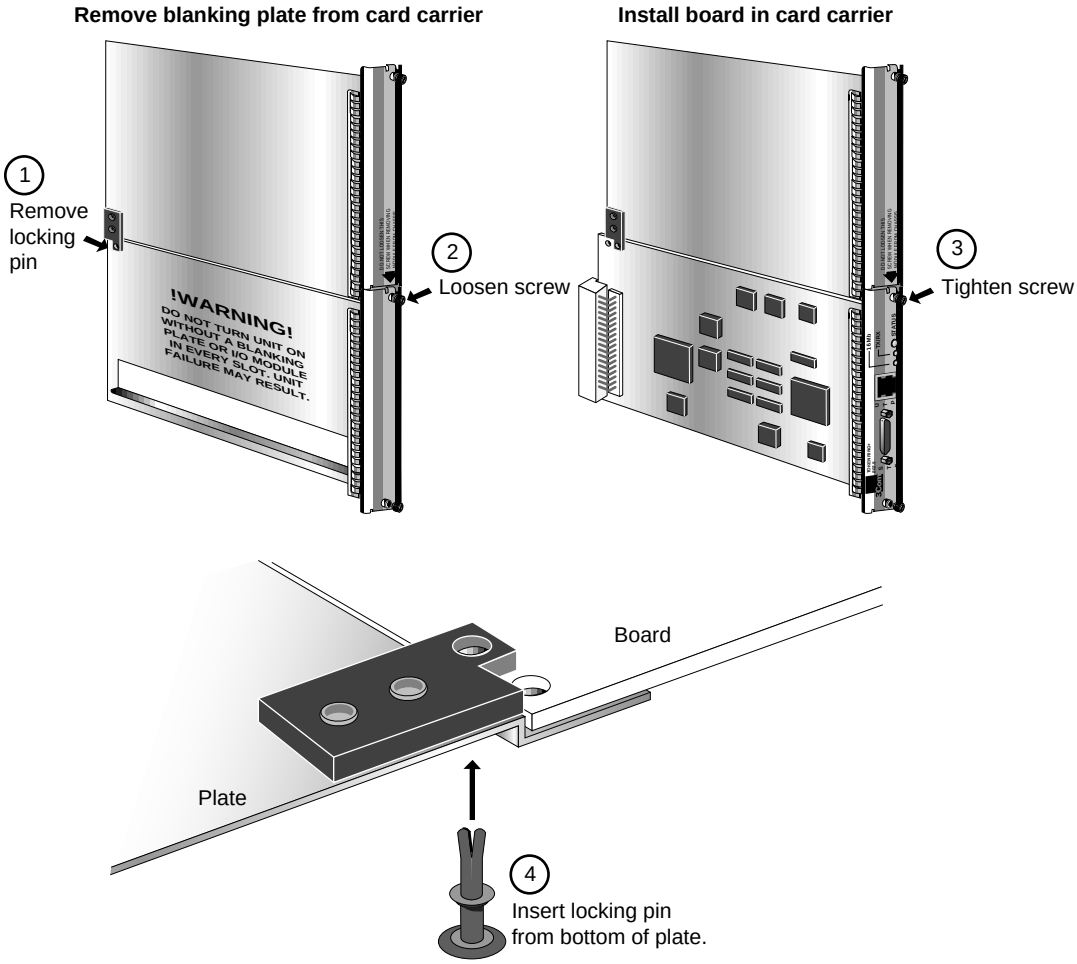
The card carrier acts as a blanking plate when a module is not installed.

You do not need to remove the cable strain relief bracket that came with your NETBuilder II chassis.

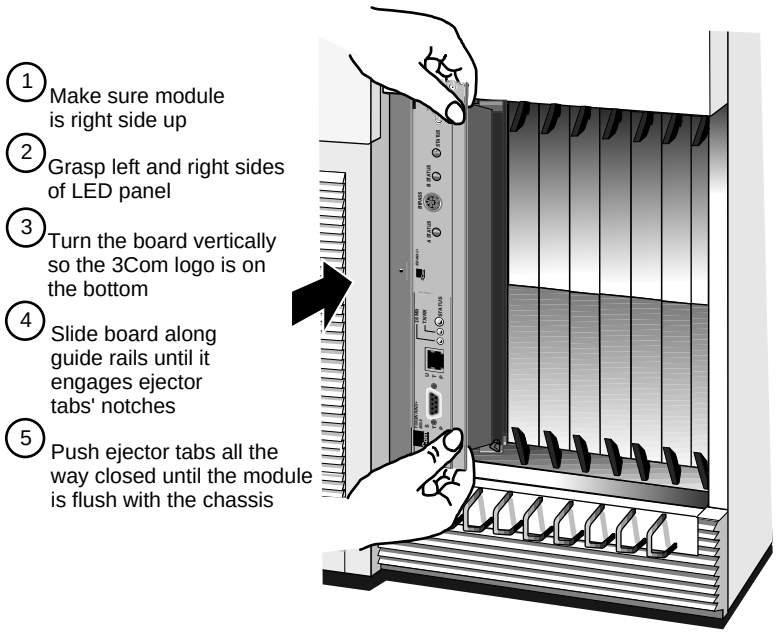


CAUTION: *Only remove the card carrier from an I/O slot that will house the Token Ring+ module. All unused I/O slots must be covered by a card carrier to maintain proper cooling of the unit and regulatory compliance. Failure to cover open slots can result in overheating of the NETBuilder II base system and voiding of the warranty.*

2 Install the module in the card carrier.



3 Insert the card carrier into the slot.



4 Tighten the captive screws with a screwdriver. Do **not** overtighten.

A solid connection of the connector/LED panel to the chassis is required for proper operation. Do **not** use the screws to force the board into place.

See "Cabling the Module" to finish installation. See also "Network Configuration" on page 2-2 for more information on token ring networks.

Cabling the Module

Choose one connector to attach cabling. The Token Ring+ module has two connector interfaces: shielded twisted pair (STP) and unshielded twisted pair (UTP). You can use only one connector at a time.

Cable Types

Table 1-1 lists cable types, multistation access units (MAUs), and emissions classes compatible with the Token Ring+ module.

Table 1-1 Cable Types, Multistation Access Units (MAUs), and Emissions Compliance

		MAUs		Emissions Compliance*	
Cable Type		**Passive**	**Active Retimed**	**FCC Class A VCCI Class A**	**EN55022 Class B VDE Class B**
UTP†	100 ohm:				
	Category 3	no	yes	yes	no
	Category 4	yes	yes	yes	no
	Category 5	yes	yes	yes	no
Shielded UTP†	100 ohm:				
	Category 3	no	yes	yes	yes
	Category 4	yes	yes	yes	yes
	Category 5	yes	yes	yes	yes
STP	150 ohm:				
	IBM® Type 1	yes	yes	yes	yes

Table 1-1 Cable Types, Multistation Access Units (MAUs), and Emissions Compliance

	MAUs		Emissions Compliance*	
Cable Type	**Passive**	**Active Retimed**	**FCC Class A VCCI Class A**	**EN55022 Class B VDE Class B**
IBM Type 6	yes	yes	yes	yes

* Shielding of all cable types should be terminated 360º at the cable plug.

† All UTP compliance testing was accomplished using cables built with Stewart Connector Co. connector, part number 940 SP-36-08-08.

Cable Configurations

Cabling should be installed in accordance with the ANSI/TIA/EIA Commercial Building Telecommunications Standard SP-2840 and IBM cabling guidelines.

3Com supports the following maximum configurations:

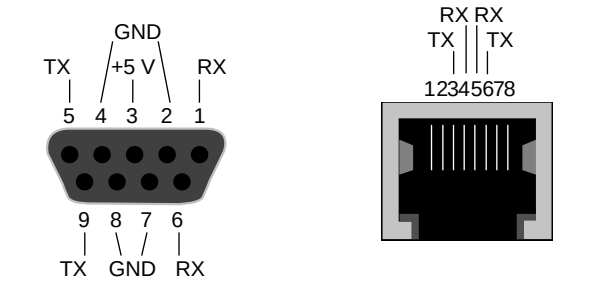
Table 1-2 Maximum Workstations on a Token Ring

	Token Ring Speed	
Cable Type	**4 Mbps**	**16 Mbps**
STP	250 stations*	250 stations*
UTP	144 stations*	250 stations*

* Ports on active retimed MAUs usually count as one "station." If your device is plugged into an active retimed MAU, the device and the MAU port total 2 "stations." For example, a token ring with all **active retimed** MAUs will support a total of 125 devices with STP cabling. A token ring with all **passive** MAUs will support a total of 250 devices with STP cabling. Check the documentation for your MAU for Port and Ring In/Out station equivalencies.

Connector Pinouts

Refer to the following illustration for the pinouts of the STP connector (DB-9) and the UTP connector (RJ-45). The connector bodies connect the cable shield to chassis ground.



STP
DB-9 Female (shielded)

UTP
RJ-45 Female (shielded)

2 Overview of the Token Ring+ Module

This chapter describes the features, specifications, and typical use of the Token Ring+ module for the NETBuilder II system.

Token Ring+ Module Features

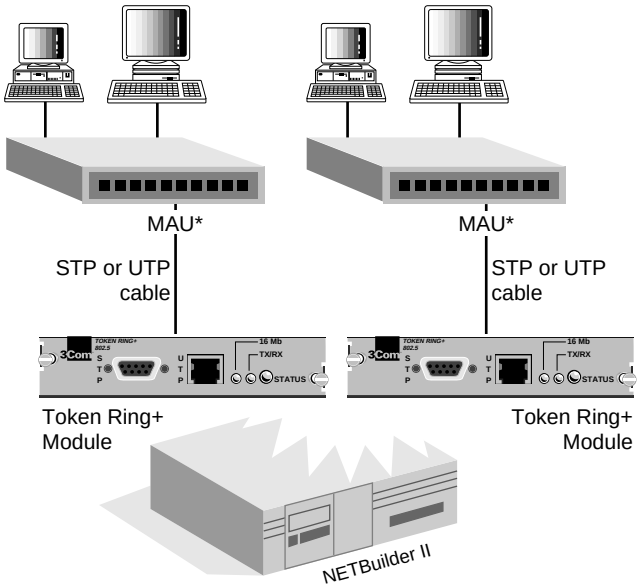
Table 2-1 summarizes the module's features.

Table 2-1 Token Ring+ Module Features

Feature	Summary
Hot-swap capability	Allows you to install or remove and reinstall the module without turning off the NETBuilder II system.
Cable support	Accepts shielded twisted pair (STP) or unshielded twisted pair (UTP) cable. See "Cabling the Module" on page 1-6 for more information.
Two token ring interfaces	Connects to any token ring network through a DB-9 (STP) or RJ-45 (UTP) connector. You **cannot** use both connectors at the same time.
External auxilliary power	+5 volt power available on the STP connector for specialty powered MAUs or signal conversion devices. See "Auxilliary Power" on page 2-2 for more information.
PacketBlaster™ accelerator	The module uses Texas Instruments' PacketBlaster token ring chipset hardware accelerator.
4 Mb and 16 Mb data rate operation	Software selectable data rate operation.
Accessible information on the EEPROM	Provides Token Ring+ module product information that can be accessed via the Monitor utility.

Network Configuration

The following figure shows a typical Token Ring+ module and NETBuilder II Bridge/Router network.



*Multistation Access Unit

Auxilliary Power

Auxilliary +5 volt power is available on the STP connector for specialty powered MAUs, powered port expanders, or signal conversion devices such as token ring STP-to-fiber optic transceivers. To use the auxilliary power pins, follow the guidelines below and in Table 2-2.

Guidelines

3Com does not guarantee compatibility with external devices that use the auxilliary power pins of the STP connector. Consult the manufacturer of external devices to ensure compliance with the maximum current allowed and to ensure the device does not compromise STP token ring signalling.

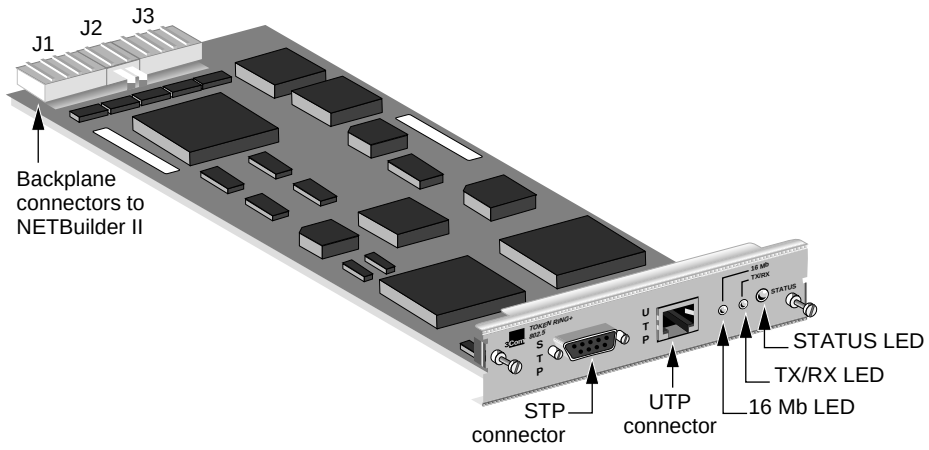
Table 2-2 Auxilliary Power Guidelines

Pinout (STP)	Maximum Current
Pin 3	+5 volts (+/- 10%), 500 mA (fused at 2.5 A)
Pins 2, 4, 7, 8	Ground pins

Continuous draw of 500 mA from multiple Token Ring or Token Ring+ modules in a NETBuilder II chassis may exceed NETBuilder II power supply limits in some configurations of Token Ring and other modules.

Specifications

This section describes the Token Ring+ module components and gives the specifications of the board.



LEDs

The Token Ring+ module has three LEDs for displaying information. Table 2-3 describes each of the LEDs.

Table 2-3 Token Ring+ Module LEDs

LED	State	Meaning
STATUS	Off	Not functioning; it may be disabled or there is no power to the system.
	Red	Reset, error condition, or self-test failure. A self-test failure causes the LED to blink red while the system intermittently checks the status.
	Green	Functioning normally.
	Yellow	Self-test mode; cable not connected.
TX/RX	Off	No activity on the network.
	Green	Network activity; module is functioning normally. The green light appears intermittently, whenever data is present on the network.
16 Mb	Off	4 Mbps token ring speed.
	Green	16 Mbps token ring speed.

Connectors

Table 2-4 describes the Token Ring+ module's connectors.

Table 2-4 Token Ring+ Module Connectors

Location	Connector(s)	No. of Pins	Purpose
Backplane connector	J1 and J3	48-pin	Connects module to the core bus.
	J2	8-pin	Power connector.
Front LED/connector panel	DB-9	9-pin	Connects module to token ring.
	RJ-45	8-pin (4 active pins)	

Physical Specifications

Table 2-5 and Table 2-6 list the module's physical dimensions and the maximum current consumption.

Table 2-5 Physical Dimensions

Attribute	Description
Length	8.8 in (22.3 cm)
Width	3.9 in (9.9 cm)
Height	0.5 in (1.3 cm)
Weight	0.75 lbs (0.34 kg)

Table 2-6 Maximum Current Consumption

+5 Volts	-5 Volts	+12 Volts	-12 Volts
2.3 A	0.0	0.0	0.0
2.8 A if using the auxilliary power on pin 3 of the STP connector.	0.0	0.0	0.0

3 TROUBLESHOOTING AND REPLACING THE MODULE

This chapter describes how to troubleshoot and replace the Token Ring+ module.

Troubleshooting

Table 3-1 describes common malfunctions that can occur with the module. If you are unable to resolve a problem, you will need to contact your network supplier. Refer to Appendix A for information about who to contact in your area.

Table 3-1 Troubleshooting the Token Ring+ Module

Symptom	Cause and Action
Suspected cabling or ring speed problems.	*Many initial token ring problems are a direct result of cabling or incorrect ring speed.* When cabling or selected network speed problems are suspected, be sure to carefully check that the cabling type and lengths are compatible with the Token Ring+ module and that the ring speed is properly set for the network you are connecting to. See additional discussions below.

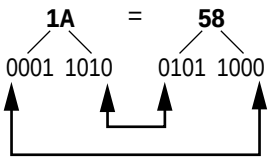
The following message is displayed at startup:
`Token Ring Interface: Self Tests failed - slot X`
or
`TMDx: Token Ring Chipset Self Test(s) failed`
(The value of X can be 1 through 4 or 1 through 8, depending on whether you have a 4- or an 8-slot NETBuilder II chassis.)
	Self-test failure
	or
	Self-test(s) failure of token ring chipset
	■ Check to see if the card is inserted completely into the NETBuilder II chassis.
	■ Make sure there are no bent pins on the NETBuilder II backplane.
	If you still have a self-test failure, contact your network supplier.

The module's STATUS LED is **red**.	*Error condition* ■ Check that all cable connections are intact. ■ Check that the NETBuilder II base system is operating correctly and has finished booting. ■ Check that the network you are connected to is operating correctly. ■ Try hot swapping the module in the chassis. Check to make sure there are no bent pins on the NETBuilder II backplane and check to see that the module is inserted completely into the NETBuilder II chassis. If none of these actions solve the problem, replace the module and/or contact your network supplier for assistance.

Table 3-1 Troubleshooting the Token Ring+ Module (continued)

Symptom	Cause and Action
The module's STATUS LED is **off** when there is power to the NETBuilder II system and other installed modules are operating.	*The module may not be properly connected to the NETBuilder II backplane.* Remove and reinsert the module. *The module's slot position may be disabled.* Refer to the software manual to determine how to use the SETDefault !<port> -PATH CONTrol = Enabled command via an external console or network management connection to reenable the module's path. If none of these actions solve the problem, replace the module and/or contact your network supplier.
The module's STATUS LED is **yellow**.	*If the STATUS LED remains **yellow** for more than a minute after insertion in the NETBuilder II chassis, it may have:* *Misconnected cable* Check the connection of the token ring lobe cable at each end, including the token ring module, wall plate if used, and the central wiring center's muitistation access unit (MAU). *Bad cable* Swap the cable for another known working token ring cable. You may have an incorrectly wired cable that fits the STP or UTP connector of the Token Ring+ module. *Bad concentrator port* Move the station's cable to another known working MAU port. The MAU's port or port connector may be defective. *Very heavy network traffic* Wait for network traffic to subside. You may experience a longer period of **yellow** STATUS LED than expected. *Insertion at the wrong speed* Check that the speed of the Token Ring+ module matches the network at either 4 Mbps or 16 Mbps. *Duplicate node address* Verify that the MAC address of the Token Ring+ module (shown on the MAC address label) is unique on your network. Consult your network manager for assistance. *Token ring experiencing network error recovery* Wait for normal token ring operation after an automatic error recovery. You may experience a longer period of **yellow** STATUS LED than expected until the module automatically retries ring entry. If none of these actions solve the problem, replace the module and/or contact your network supplier.

Table 3-1 Troubleshooting the Token Ring+ Module (continued)

Symptom	Cause and Action
The 16 Mb LED changes state often while the STATUS LED remains **yellow**.	*Module trying to enter token ring at wrong speed* Upon detection of a token ring network at an incorrect speed, the module will automatically try the opposite speed (4 Mbps or 16 Mbps). The 16 Mb LED will change state and the module will retry insertion. The STATUS LED should turn **green** soon after changing to the correct network speed. Under certain network error conditions, the module may be unable to enter the ring at either speed. Under this condition, the 16 Mb speed LED may or may not change state while the STATUS LED remains **yellow**. Contact the network administrator at your site for assistance in determining if there is a global network problem. *Module may be preset via NETBuilder software or network management to try only one ring speed* Use of this feature is recommended only when the speed of the network, 4 Mbps or 16 Mbps, is known for certain. Refer to the software manuals for information about setting this feature. If none of these actions solve the problem, replace the module and/or contact your network supplier or 3Com Customer Support for assistance.
Specialty powered wiring center (MAU) or signal conversion device (such as STP-to-fiber optic transceivers) will not work on STP connector.	*External device may have overstressed the auxilliary power's limits, lowering available voltage to unacceptable levels* See "Auxilliary Power" on page 2-2 for voltage, current, and pinout specifications of this feature. Consult the external device's user guide and manufacturer to ensure compatibility. *External device may have blown the protection fuse by connecting the module's pin 3 to the cable shield (ground). This is not compatible with the auxillary power feature.* If the fuse has been blown, the module must be returned for repair. If none of these actions solve the problem, replace the module and/or contact your network supplier for assistance.
Token Ring+ module's MAC address does not appear on the network.	*The MAC address on the network is in noncanonical format.* The MAC address provided on the EEPROM and the label needs to be converted to the noncanonical format. Each byte, represented by the number pairs below, consists of eight bits. To convert the canonical byte 1A (in hex) to the noncanonical byte, you must mirror the bits, as shown. 08 00 02 1A 4B 5C canonical (least significant bit first) *is converted to* 10 00 40 58 D2 3A noncanonical (most significant bit first) 

Replacing the Module

If any component in the module fails, you will need to replace the entire module. The Token Ring+ module can be hot-swapped, which means that you can safely remove and install a new one without turning off or rebooting the NETBuilder II system.

To perform the following procedure, you may need a small flat-blade screwdriver. Follow these steps to remove and replace the module:

1. Disconnect any network cabling from the module.
2. Unscrew the two captive screws (use a screwdriver if necessary) that anchor the module in the slot until they disengage from the chassis. Do not remove the screws from the I/O panel.
3. Push the tab(s) outward from the module.

   The board will disengage from the NETBuilder II backplane and partially eject from the slot.
4. Use both hands to grasp the board and gently pull it from the slot.
5. Install the new module using the procedures outlined in Chapter 1.

A TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

On-line Technical Services

3Com offers worldwide product support seven days a week, 24 hours a day, through the following on-line systems:

- 3Com Bulletin Board Service (3ComBBS)
- Ask3Com℠ on CompuServe®
- 3ComFacts℠ Automated Fax Service

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available via modem seven days a week, 24 hours a day. To reach the service, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Baud Rate	Telephone Number
Australia	up to 14400 baud	(61) (2) 955 2073
France	up to 14400 baud	(33) (1) 69 86 69 54
Germany	up to 9600 baud up to 9600 baud	(49) (89) 627 32 188 (49) (89) 627 32 189
Hong Kong	up to 14400 baud	(852) 537 5601
Italy (fee required)	up to 9600 baud	(39) (2) 273 00680
Japan	up to 14400 baud	(81) (3) 3345 7266
Singapore	up to 9600 baud	(65) 534 5693
Taiwan	up to 14400 baud	(886) (2) 377 5838 (886) (2) 377 5840
U.K.	up to 14400 baud	(44) (1442) 278278
U.S.	up to 14400 baud	(1) (408) 980 8204

Ask3Com on CompuServe

Ask3Com is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as an interactive forum for technical questions. To use Ask3Com, you need a CompuServe account.

To use Ask3Com:

1. Log on to CompuServe.
2. Enter **`go threecom`**

3 Press [Return] to see the Ask3Com main menu.

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, seven days a week. Within this service, you may choose to access CardFacts® for adapter information, or NetFacts® for network system product information.

- **CardFacts** provides adapter installation diagrams, configuration drawings, troubleshooting instruction, and technical articles.

  Document 9999 provides you with an index of adapter documents.

- **NetFacts** provides data sheets and technical articles on 3Com Corporation's hub, bridge, router, terminal server, and software products.

  Document 8888 provides you with an index of system product documents.

Call 3ComFacts using your touch-tone telephone. International access numbers are:

Table A-1

Country	Fax Number
Hong Kong	(852) 537 5610
U.K.	(44) (1442) 278279
U.S.	(1) (408) 727 7021

Local access numbers are available within the following countries:

Table A-2

Country	Fax Number
Australia	800 123853
Denmark	800 17319
Finland	98 001 4444
France	05 90 81 58
Germany	0130 8180 63

Country	Fax Number
Italy	1678 99085
Netherlands	06 0228049
Norway	05 01 1062
Sweden	020 792954
U.K.	0800 626403

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

In the U.S. and Canada, call **(800) 876-3266** for customer service.

If you are outside the U.S. and Canada, contact your local 3Com sales office to find your authorized service provider:

Country	Telephone Number
Australia (Sydney)	(61) (2) 959 3020
(Melbourne)	(61) (3) 653 9515
Belgium	(32) (2) 7164880
Brazil	(55) (11) 241 1571
Canada	(905) 882 9964
France	(33) (1) 69 86 68 00
Germany	(49) (89) 6 27 32 0
Hong Kong	(852) 868 9111
Italy	(39) (2) 273 02041
Japan	(81) (3) 3345 7251

Country	Telephone Number
Mexico	(525) 531 0591
Netherlands	(31) (3) 402 55033
Singapore	(65) 538 9368
South Africa	(27) (11) 803 7404
Spain	(34) (1) 3831700
Sweden	(46) (8) 632 91 00
Taiwan	(886) (2) 577 4352
United Arab Emirates	(971) (4) 311303
U.K.	(44) (1628) 897000
U.S.	(1) (408) 492 1790

Returning Products for Repair

A product sent directly to 3Com for repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to 3Com without an RMA number will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S and Canada	(800) 876 3266, option 2	(408) 764 7120
Europe	(44) (1442) 278000	(44) (1442) 236824
Outside Europe, U.S. and Canada	(1) (408) 492 1790	(1) (408) 764 7290

LIMITED WARRANTY

HARDWARE: 3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Internetworking products	One year
Network adapters	Lifetime
Ethernet stackable hubs and Unmanaged Ethernet fixed port repeaters	Lifetime* (One year if not registered)
*Power supply and fans in these stackable hubs and unmanaged repeaters	One year
Other hardware products	One year
Spare parts and spares kits	90 days

If a product does not operate as warranted during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com pursuant to any warranty.

SOFTWARE: 3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of ninety (90) days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the magnetic media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation hereunder shall be (at 3Com's discretion) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to 3Com's applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a “bug” or defect in the third party's product.

STANDARD WARRANTY SERVICE: Standard warranty service for hardware products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to 3Com's Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for software products may be obtained by telephoning 3Com's Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after receipt by 3Com.

WARRANTIES EXCLUSIVE: IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER’S SOLE REMEDY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM’S OPTION. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY: IN NO EVENT, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE) SHALL 3COM BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE, LOSS OF BUSINESS, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the exclusion of implied warranties or the limitation of incidental or consequential damages for consumer products, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights which may vary from state to state.

GOVERNING LAW: This Limited Warranty shall be governed by the laws of the state of California.

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