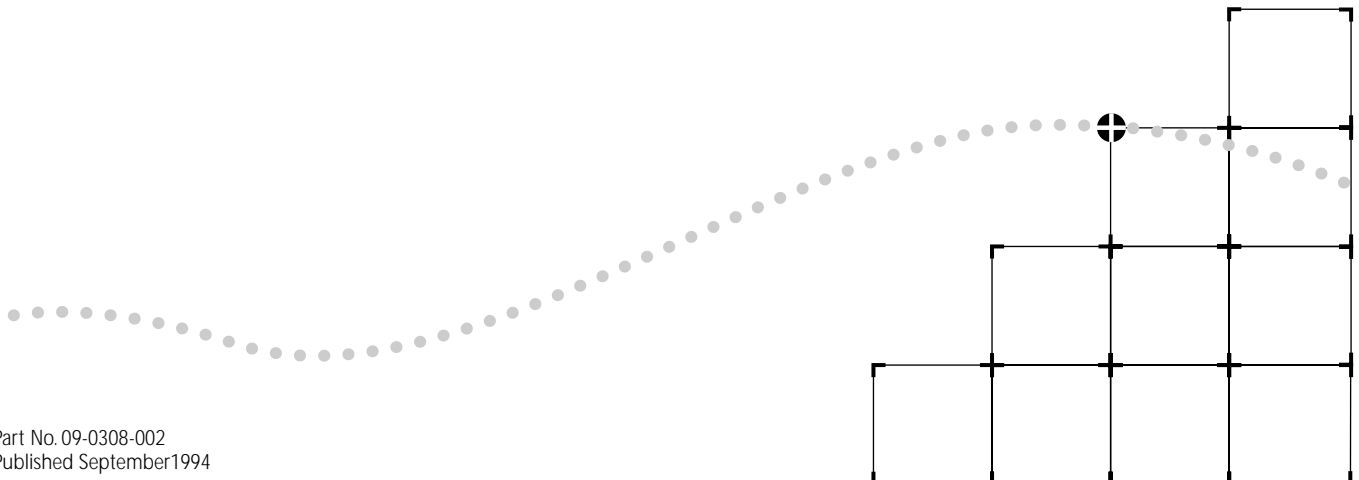




NETBUILDER II[®] FIBER DISTRIBUTED DATA INTERFACE (FDDI) MODULE INSTALLATION GUIDE

A member of the NETBuilder II[®] family



3Com Corporation ■ 5400 Bayfront Plaza ■ Santa Clara, California ■ 95052-8154

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SINGLE-MODE FDDI MODULE LASER SAFETY

USA and International



LASERKLASSE 1
LASER CLASSE 1
LASER PRODUCTO CLASE 1

The NETBuilder II single-mode FDDI PHY modules are certified Class 1 laser safe.

Class 1 defined by the U.S. Department of Health and Human Services 21 CFR 1040.10 and 1040.11.

The single-mode PHY modules employ laser components for which the laser emissions are continuously monitored and adjusted by internal electro-optic circuits.

User adjustments are not provided and maintenance is not needed.

Optical instruments should not be used to view the laser output.



WARNING: The use of optical instruments will increase eye hazard.

ATTENTION: L'utilisation d'instruments optiques augmentera les troubles visuels.

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ABOUT THIS GUIDE

Introduction

This guide describes how to install, cable, and troubleshoot the Fiber Distributed Data Interface (FDDI) modules for the NETBuilder II® system. The FDDI modules come in multi-mode, single-mode, and mixed- (multi- and single-) mode versions. 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: <code>SETDefault !<port> -RIPIP CONTROL = Listen</code> 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: <code>SETDefault !0 -IP NETaddr = 0.0.0.0</code>






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.

(continued)

Table 1 Text Conventions (continued)

Convention	Description
Text represented as screen display	<code>This typeface</code> is used to represent displays that appear on your terminal screen, for example: <code>NetLogin:</code>
Text represented as commands	This typeface is used to represent commands that you enter, for example: <code>SETDefault !0 -IP NETaddr = 0.0.0.0</code>
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].
<i>Italics</i>	<i>Italics</i> are used to denote <i>new terms</i> or <i>emphasis</i> .

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 FDDI module into the NETBuilder II® system and includes information on the following:

- Preinstallation procedure
- Supported configurations
- Installation in a NETBuilder II 4- or 8-Slot chassis
- Installation in a NETBuilder II 8-Slot Extended chassis
- FDDI cabling

The FDDI module consists of two boards: the media access control (MAC) board and the physical layer interface (PHY) board. The operating components of the module are split between the two boards, and the connection link between them is through designated pins on the NETBuilder II backplane.

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

Before Installing the Module

Before you install the FDDI module into the NETBuilder II base 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 boards.
 - Handle the boards 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 assembly must be returned to your network supplier, ship it in its original shipping carton. If the original carton was damaged in shipment, repack the system in a carton that provides equivalent protection.

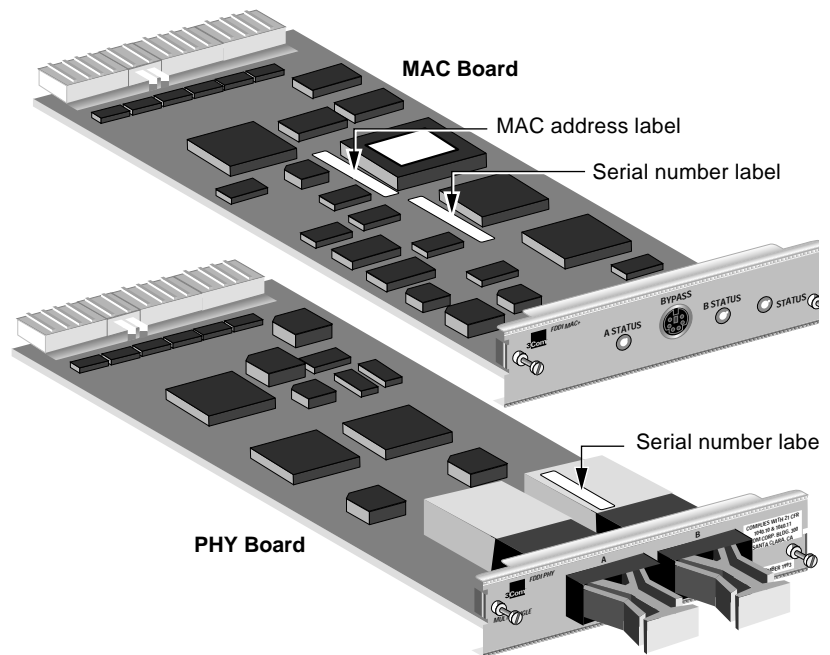
3 Verify that you have received all the contents.

When you purchase the FDDI module, you receive the following:

- FDDI module MAC board
- FDDI module PHY board (multi-mode, single-mode, or mixed-mode)
- *NETBuilder II Fiber Distributed Data Interface (FDDI) Module Installation Guide*

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

4 Write down the serial number from the component side of the MAC and PHY boards and the MAC address on the MAC board on the following line:



You will need this information if you have to contact your network supplier.

Serial number example: S/N:1AH12345

MAC address example: 0800021A4B5C

The 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.

Software Compatibility

Both the single- and multi-mode FDDI modules need version 7.2 or later of the NETBuilder Family Bridge/Router software.

Supported NETBuilder II Configurations

The following sections describe the configurations of older and newer FDDI modules in the NETBuilder II 4-Slot chassis, the single-wide and dual-wide 8-Slot chassis, and the Extended chassis. This manual comes with newer versions of the FDDI modules, which include the MAC+ board. Identify which versions you have by referring to Figure 1-1:

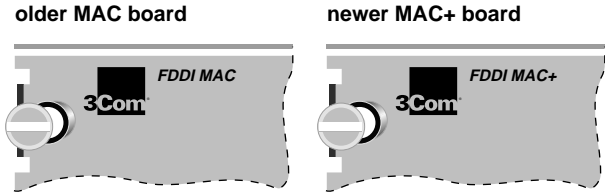


Figure 1-1 MAC and MAC+ Boards

There are two versions of the NETBuilder II 4- and 8-Slot chassis. The older, single-wide versions of the NETBuilder II 4-Slot and 8-Slot chassis have two ejector tabs for each module. The newer, dual-wide versions have one ejector tab for each module, except for the CEC module slot which has two ejector tabs. The dual-wide chassis has a removeable center column which allows for the installation of extended-format modules.



CAUTION: You must install the MAC board above the PHY board. The MAC board contains active components on the bottom side that should not come in contact with the board installed below it.

4-Slot Chassis

Figure 1-2 shows the possible configurations for the NETBuilder II 4-Slot chassis, both single-wide and dual-wide versions.

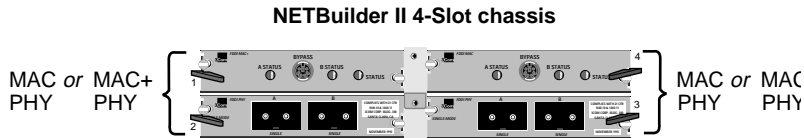


Figure 1-2 FDDI Module Configuration in 4-Slot Chassis

Single-Wide 8-Slot Chassis

Figure 1-3 shows the possible configurations for the single-wide NETBuilder II 8-Slot chassis.

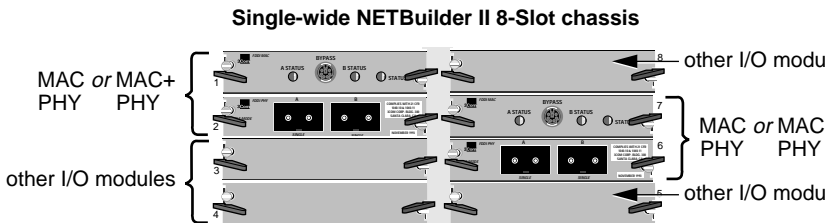


Figure 1-3 Maximum FDDI Module Configuration in Single-Wide 8-Slot Chassis

Dual-Wide 8-Slot Chassis

The FDDI module set must be installed in the dual-wide 8-Slot chassis in slot pairs as shown in Figure 1-4. You cannot install a set of MAC and PHY boards side by side.

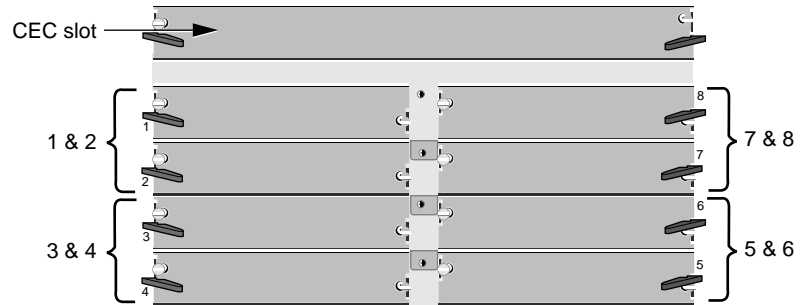


Figure 1-4 Slot Pairs in the NETBuilder II 8-Slot Chassis

The maximum configuration of FDDI modules is as follows:



Refer to Figure 1-1 to determine older and newer FDDI modules.

- If you have *any* older FDDI modules in your NETBuilder II chassis, you can install a maximum of two FDDI modules, even if the second FDDI module is a newer one.
- If you have only newer FDDI modules in your chassis, you may install up to four FDDI modules.

Extended Chassis

The FDDI module set must be installed in the NETBuilder II Extended chassis in slot pairs as shown in Figure 1-5.

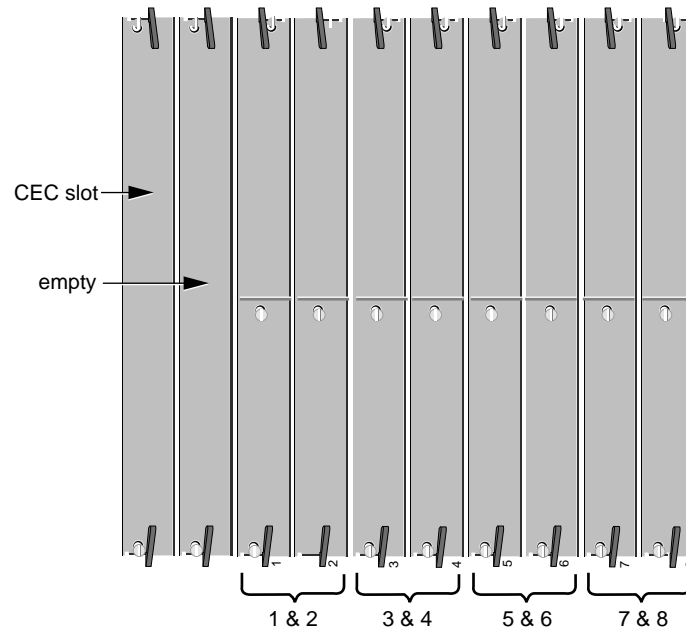


Figure 1-5 Slot Pairs in the NETBuilder II Extended Chassis

The maximum configuration of FDDI modules is as follows:



Refer to Figure 1-1 to determine older and newer FDDI modules.

- If you have *any* older FDDI modules in your NETBuilder II chassis, you can install a maximum of two FDDI modules, even if the second FDDI module is a newer one.
- If you have only newer FDDI modules in your chassis, you may install up to four FDDI modules.

Installing in the 4- or 8-Slot Chassis

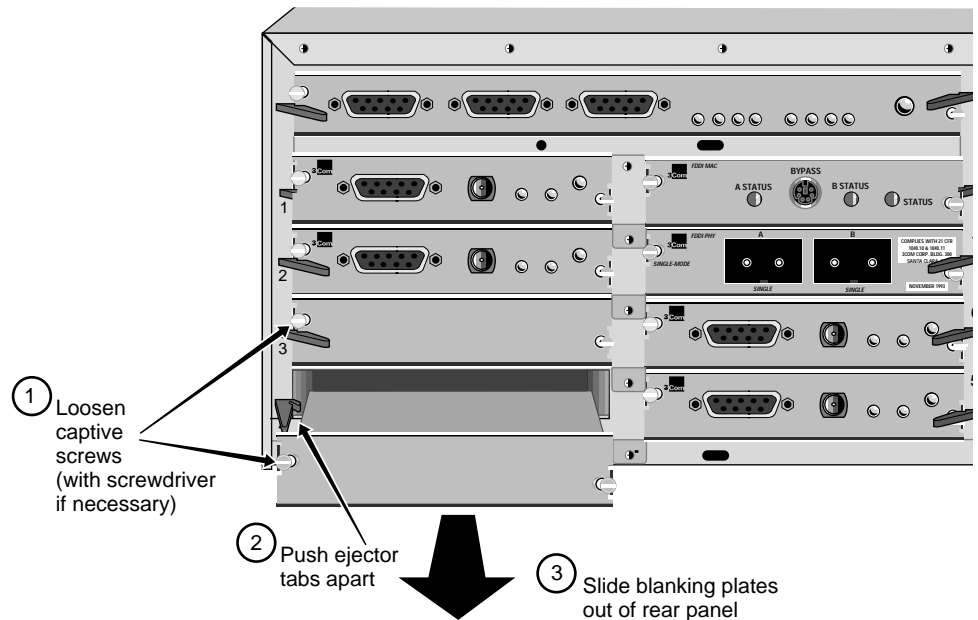
Use this procedure to install the module into the NETBuilder II 4- or 8-Slot chassis. To install in the NETBuilder II Extended chassis, see the next section.

You will need a small flatblade screwdriver.

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

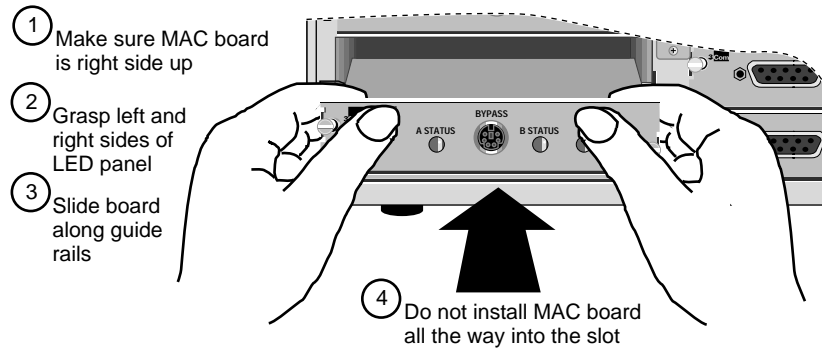
- 1 Select a slot pair by referring to the previous section, "Supported NETBuilder II Configurations".
- 2 Remove the blanking plates from the I/O slots you have selected.

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



CAUTION: Only remove the blanking plates from I/O slots that will house the FDDI 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 base system and voiding of the warranty.

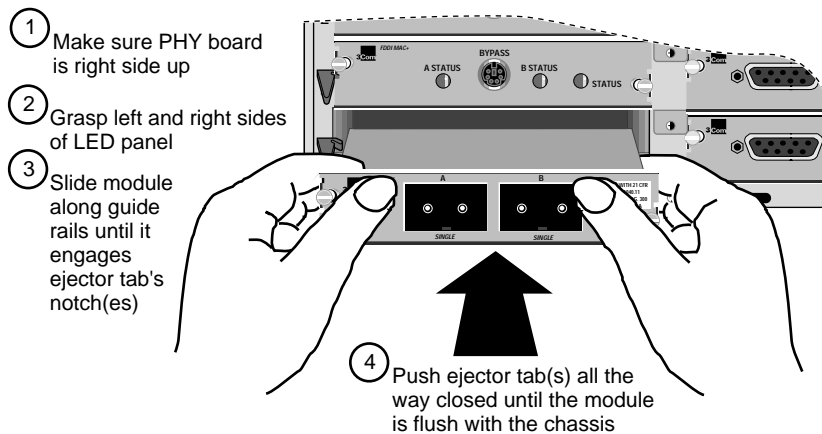
- 3 Insert the MAC board into the top uncovered slot. Do not insert all the way.



CAUTION: The MAC board must be installed first. If you insert the MAC board second, physical interference can occur between the MAC board and the PHY board below it.

- 4 Install the PHY board in the bottom uncovered slot.

For the single- and mixed-mode FDDI modules, optical instruments should not be used to view laser output.



WARNING: The use of optical instruments will increase eye hazard.

ATTENTION: L'utilisation d'instruments optique augmentera les troubles visuels.

- 5 Install the MAC board all the way into the slot. Refer to the previous step for the detailed installation procedure.

- 6 Hand tighten the captive screws. Do **not** use a screwdriver.

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 FDDI Module" on page 1-10 to cable your FDDI module.

Installing in the Extended Chassis

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

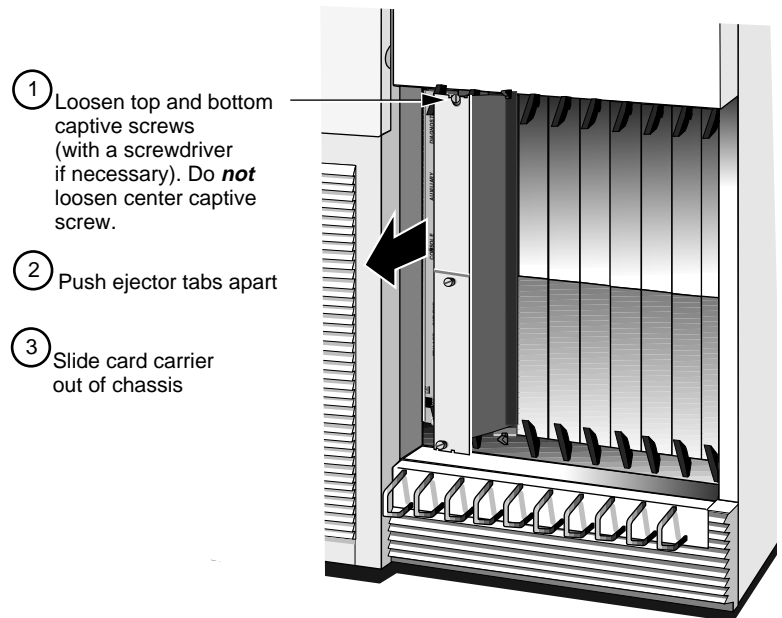
You will need a small flatblade screwdriver.

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

- 1 Select a slot pair by referring to the previous section, "Supported NETBuilder II Configurations".
- 2 Remove the card carriers from the I/O slots you have selected.

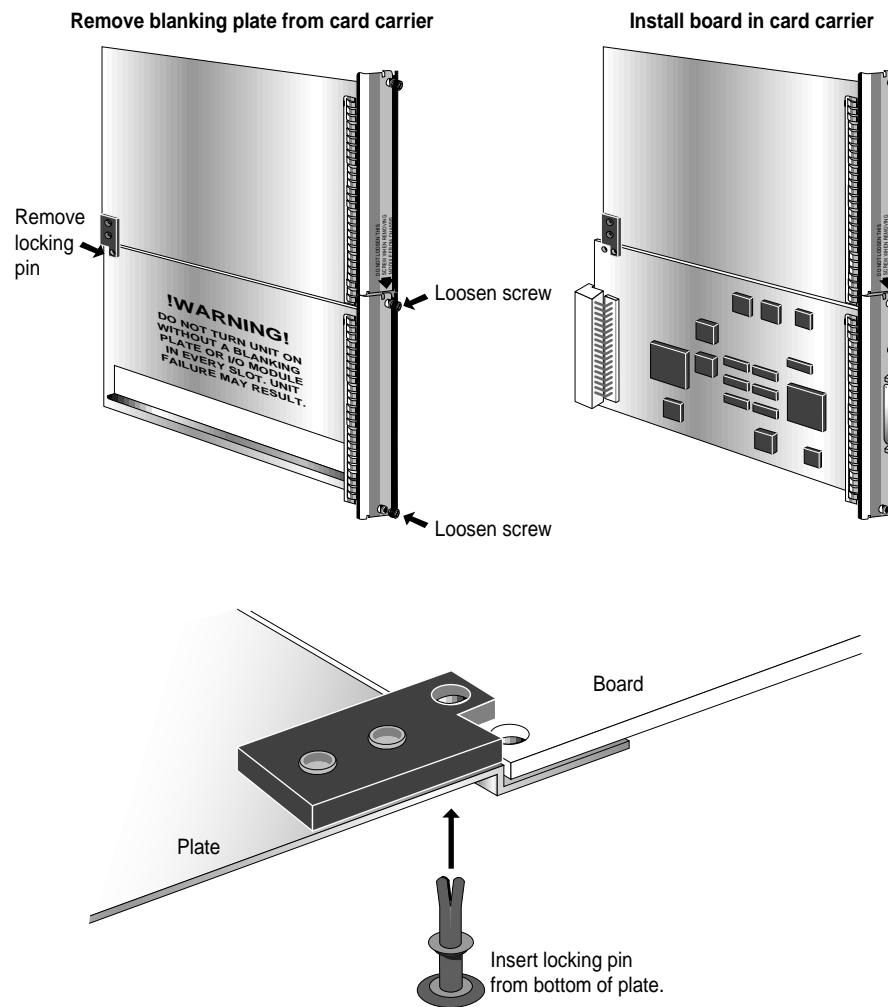
The card carrier acts as a blanking plate when a module is not installed.

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



CAUTION: Only remove the card carriers from I/O slots that will house the FDDI 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.

3 Install the MAC and PHY boards into each card carrier.

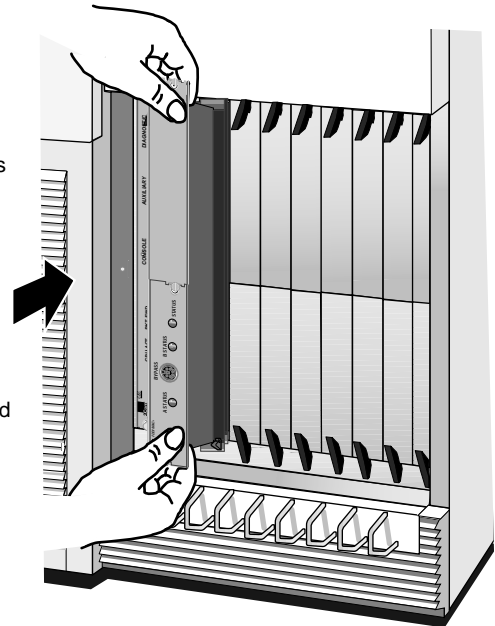


- 4 Insert the MAC board (in the card carrier) into the left uncovered slot. Do not insert all the way.



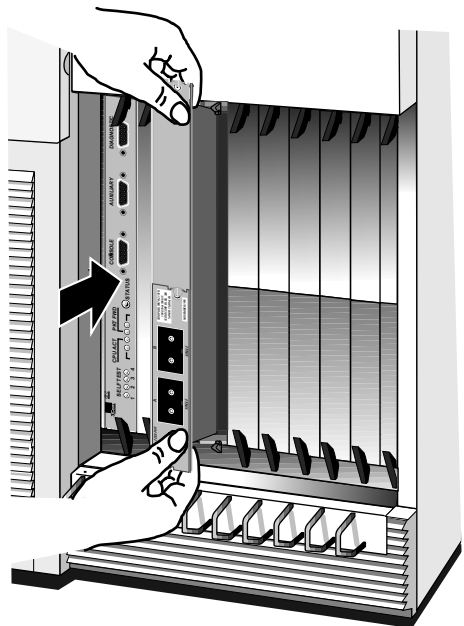
CAUTION: The MAC board must be installed first. If you insert the MAC board second, physical interference can occur between the MAC board and the PHY board next to it.

- 1 Make sure MAC board is right side up
- 2 Grasp left and right sides of LED panel
- 3 Turn the board vertically so the 3Com logo is on the bottom
- 4 Slide board along guide rails
- 5 Do not install MAC board all the way into the slot



- 5 Install the PHY board (in the card carrier) in the right uncovered slot. For the single- and mixed-mode FDDI modules, optical instruments should not be used to view laser output.

- 1 Make sure PHY board is right side up
- 2 Grasp left and right sides of LED panel
- 3 Turn the board vertically so the 3Com logo is on the bottom
- 4 Slide board along guide rails until it engages ejector tabs' notches
- 5 Push ejector tabs all the way closed until the module is flush with the chassis



WARNING: The use of optical instruments will increase eye hazard.

ATTENTION: L'utilisation d'instruments optique augmentera les troubles visuels.

- 6 Install the MAC board all the way into the slot. Refer to step 5 for the detailed installation procedure.

- 7 Hand tighten the captive screws. Do not use a screwdriver.

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 the next section to cable your FDDI module.

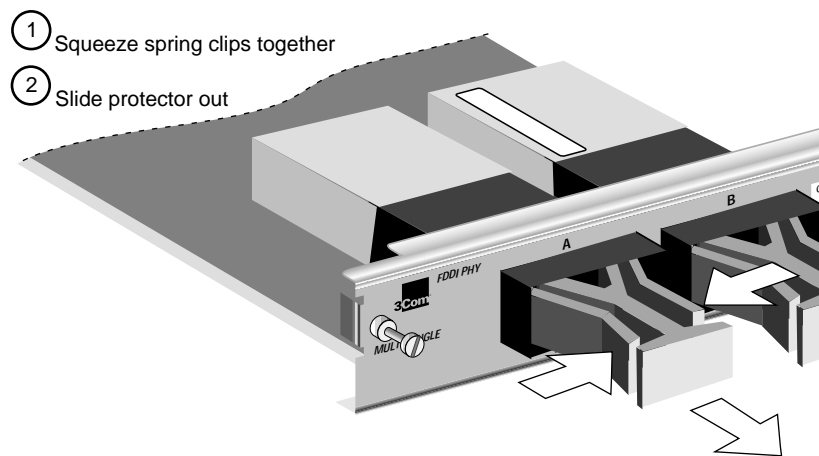
Cabling the FDDI Module

Cable and connect the FDDI module by performing the following steps:

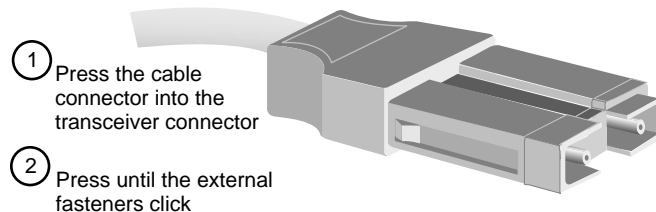
- 1 Remove the plastic protectors from the transceiver connectors on the PHY board. If you are only using one connector, leave the protector on the unused connector.



CAUTION: Great care must be taken to keep transceivers clean and dust free. Do not remove the plastic protectors from the PHY card or the end caps from the cable until you are ready to connect. Always replace protectors and end caps immediately after disconnecting.



- 2 Connect the appropriate network cable (not supplied) to the transceiver connector.
 - For the multi-mode FDDI transceiver, use multi-mode duplex fiber of 62.5/125 μm with media interface connectors (MIC). An 11-db optical budget size allows cables up to 2 km long.
 - For the single-mode FDDI transceiver, use single-mode duplex fiber of 8.7/125 μm with MICs. An 11-db optical budget size allows cables up to 14.4 km long.



CAUTION: If keying pins were removed from the transceivers, it is possible to insert the MIC upside down. Take care to avoid this.

2

OVERVIEW OF THE FDDI MODULE

This chapter describes the features, specifications, and typical use of the Fiber Distributed Data Interface (FDDI) module for the NETBuilder II system.

FDDI Module Features

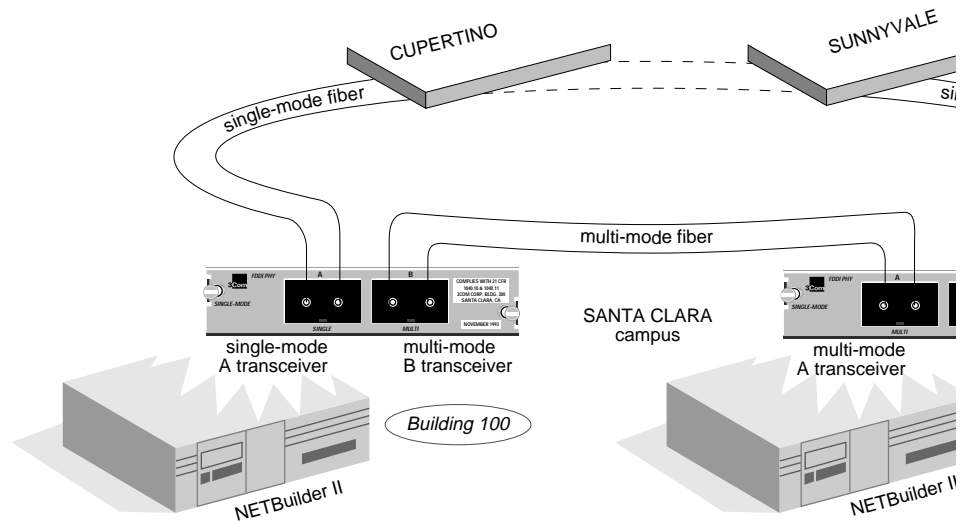
Table 2-1 summarizes the module's features.

Table 2-1 FDDI Module Features

Feature	Summary
Hot-swap capability	Allows you to install or remove and reinstall the module without turning off the NETBuilder II system.
Compatibility	
Multi-mode	Connects to any FDDI network through media interface connectors (MIC). Transceiver accepts 100 μm 62.5 center core, multi-mode fiber with 62.5 μm core and 125 μm cladding.
Single-mode	Connects to any FDDI network through MICs. Transceiver accepts 100 μm 8.7 center core, single-mode fiber with 8.7 μm core and 125 μm cladding.
Connections	Single- or dual-attached capabilities
Keying	Supports and accepts A, B, or S type ports for network connection.
Cable support	
Multi-mode	Accepts multi-mode duplex fiber of 62.5/125 μm . An 11-db optical budget size allows cables up to 2 km long.
Single-mode	Accepts single-mode duplex fiber of 8.7/125 μm . An 11-db optical budget size allows cables up to 14.4 km long.
Flexible topology	Topology and capacity can be configured by setting conditions on the network external to the NETBuilder II base system. The capacity and topology of the FDDI network is not fixed. Capacity is determined by a combination of cable lengths and connector capabilities.
Accessible information on the EEPROM	Provides FDDI module product information that can be accessed via the monitor utility.
Interface speed	25 MHz
Controller speed	12.5 MHz
Clocks	25 MHz symbol clock rate 12.5 MHz byte clock rate
Laser safety	Single- and mixed-mode FDDI modules certified Class 1 laser safe.

Network Configuration

The following figure shows an example of a typical mixed-mode FDDI module and NETBuilder II network.

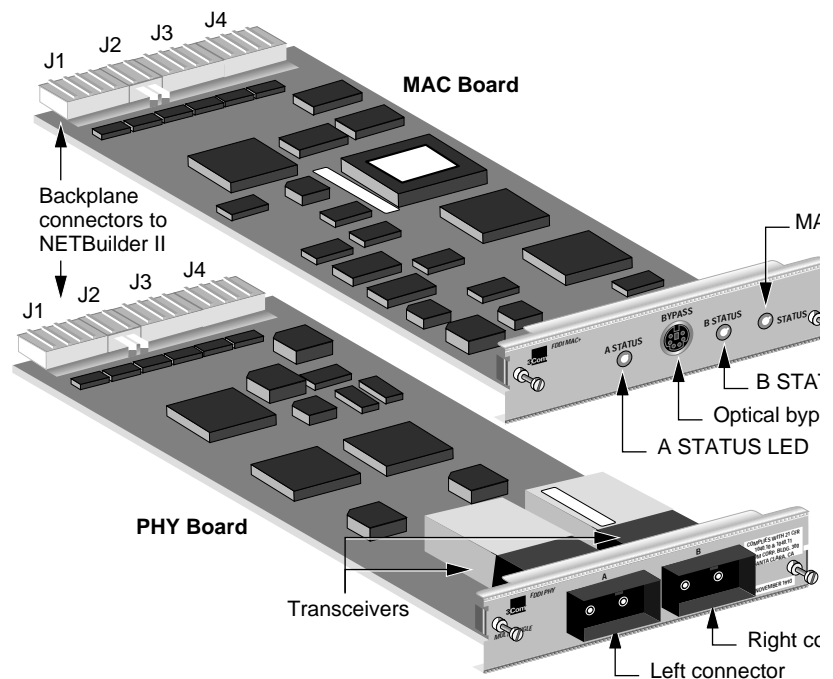


Specifications

This section describes the FDDI module components and gives the specifications of the board. The FDDI module consists of two boards:

- media access control (MAC) board
- physical layer interface (PHY) board

The operating components of the module are split between the two boards, and the connection link between them is through designated pins on the NETBuilder II backplane.



LEDs The FDDI module's LED panel is on the MAC board. There are three LEDs: One indicates the status of the MAC board and the other two indicate the status of the physical fiber connection to each transceiver. The A STATUS LED corresponds with the left transceiver, and the B STATUS LED corresponds to the right transceiver. Table 2-2 explains the LED states.

Table 2-2 LED States

LED	Color	Indicates	Normal Behavior
STATUS	Green	Normal operation	On continuously
	Off	No power to module	Off
	Yellow	Path not enabled (may be caused by duplicate address on FDDI ring)	Off
	Red	Fault or reset	Off
A STATUS	Green	Normal operation	On continuously
	Off	No power to PHY board	Off
	Yellow	Self-test or stand-by mode (stand-by mode occurs if Transceiver B is connected to a concentrator master port)	Off
	Red	Fault or reset	Off
B STATUS	Green	Normal operation	On continuously
	Off	No power to PHY board	Off
	Yellow	Self-test	Off
	Red	Fault or reset	Off

MAC Board Connectors

Table 2-3 describes the MAC board connectors.

Table 2-3 MAC Board Connectors

Location	Connector(s)	No. of Pins	Purpose
Backplane connector	J1, J3, and J4	48-pin	Connects module to the core bus
	J2	8-pin	Power connector
Front LED/connector panel	Optical bypass connector	6-pin	Allows the network to continue in primary and secondary mode even if the NETBuilder II is turned off. DISABLED in the single- and mixed-mode FDDI modules.

PHY Board Connectors

Table 2-4 describes the PHY board connectors.

Table 2-4 PHY Board Connectors

Location	Connector(s)	No. of Pins	Purpose
Backplane connector	J1, J3, and J4	48-pin	Connects module to the core bus
	J2	8-pin	Power connector

Table 2-4 PHY Board Connectors

Location	Connector(s)	No. of Pins	Purpose
Front LED/connector panel	2 FDDI MICs	2-pin	Connects module to fiber with a MIC

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	.75 lbs (0.34 kg)

Table 2-6 Maximum Current Consumption

	+5 Volts	+12 Volts	-12 Volts
MAC board	1.5 amp	0.0 amp	0.0 amp
PHY board	2.3 amp	0.1 amp	0.2 amp

3

TROUBLESHOOTING AND REPLACING THE MODULE

This chapter describes how to troubleshoot and replace the FDDI module. Malfunctions that can occur include:

- Self-test failure at startup
- Nonworking 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 FDDI Module

Symptom	Cause	Action
The following message is displayed at startup: <code>FDDI Interface: Self Tests failed - slot X</code> (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	<ul style="list-style-type: none">■ 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 off when there is power to the system and other installed modules are operating.	Disabled module	The module may not be properly connected to the NETBuilder II backplane. Remove and reinsert the module. If it is still not working, replace the module.
The module's STATUS LED is red.	Error condition	<ul style="list-style-type: none">■ Check that all cable connections are intact.■ Check that the NETBuilder II base system is operating correctly.■ Check that the network you are connected to is operating correctly.■ Check that the connected serial device is operating correctly. If none of these actions solve the problem, replace the module and/or contact your network supplier for assistance.

Replacing the Module

If any component in the module fails, you will need to replace the entire module. The FDDI 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. The PHY board must be removed first.

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

- 1 Disconnect any network cabling from the PHY board.
 - a For the single- and mixed-mode FDDI modules, optical instruments should not be used to view laser output.



WARNING: The use of optical instruments will increase eye hazard.

ATTENTION: *L'utilisation d'instruments optique augmentera les troubles visuels.*

- 2 Unscrew the two captive screws (use a screwdriver if necessary) that anchor the PHY board 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 PHY board.

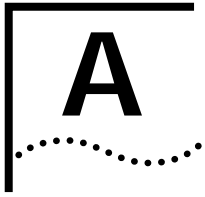
The board will disengage from the NETBuilder II backplane and partially eject from the slot.
- 4 Use both hands to grasp the board and gently pull it from the slot.
- 5 Repeat steps 2 through 4 to remove the MAC board.



CAUTION: *Be extremely careful when inserting or removing the MAC board from an I/O slot. The MAC board contains active components on the bottom side that should not come in contact with the board installed below it.*

Do not remove the PHY and the MAC boards at exactly the same time.

- 6 Install the new module using the procedures outlined in Chapter 1.



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)
- Ask3ComSM on CompuServe[®]
- 3ComFactsSM 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 9600 baud	(852) 537 5601
Italy (fee required)	up to 9600 baud	(39) (2) 273 00680
Japan	up to 14400 baud	(81) (3) 3243 9245
Singapore	up to 9600 baud	(65) 534 5693
Taiwan	up to 14400 baud	(886) (2) 577 6160
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 CardFactsSM for adapter information, or NetFactsSM 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:

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:

Country	Fax Number	Country	Fax Number
Australia	800 123853	Italy	1678 99085
Denmark	800 17319	Netherlands	06 0228049
Finland	98 001 4444	Norway	05 01 1062
France	05 90 81 58	Sweden	020 792954
Germany	0130 8180 63	U.K.	0800 626403

3Com Documentation on CD-ROM

An extensive library of 3Com product documentation is available in CD-ROM format through Support On-Site for Networks subscription service. This multivendor CD-ROM service, offered by Computer LibraryTM, a division of Ziff Communication, contains technical information and documentation from major data networking hardware and software manufacturers. Stand-alone and concurrent user subscriptions are available. For more information, call Computer Library at the following numbers:

Country	Telephone Number	Fax Number
U.S. and Canada	(800) 827 7889, ext. 515	(212) 503 4487
Outside the U.S. and Canada	(212) 503 4400, ext. 515	(212) 503 4487

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	Country	Telephone Number
Australia (Sydney)	(61) (2) 959 3020	Mexico	(525) 531 0591
(Melbourne)	(61) (3) 653 9515	Netherlands	(31) (3) 402 55033
Belgium	(32) (2) 7164880	Singapore	(65) 538 9368
Brazil	(55) (11) 241 1571	South Africa	(27) (11) 803 7404
Canada	(905) 882 9964	Spain	(34) (1) 3831700
France	(33) (1) 69 86 68 00	Sweden	(46) (8) 632 91 00
Germany	(49) (89) 6 27 32 0	Taiwan	(886) (2) 577 4352
Hong Kong	(852) 868 9111	United Arab Emirates	(971) (4) 311303
Italy	(39) (2) 273 02041	U.K.	(44) (1628) 897000
Japan	(81) (3) 3243 9234	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

Country	Telephone Number	Fax Number
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, NEGLIGENCE, 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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