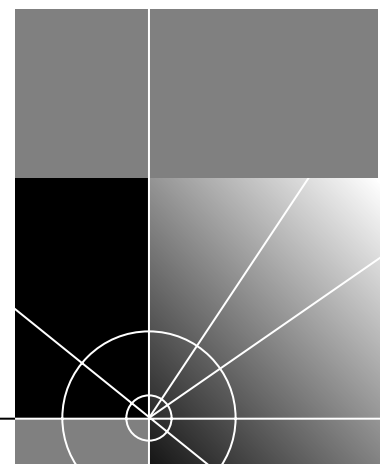




Installing the NETBuilder II[®] HSS 8-Port BRI Module

<http://www.3com.com/>

Part No. 09-1076-000
Published October 1997



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Santa Clara, California
95052-8145

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Connections between 3Com equipment and other equipment and peripherals must be made using shielded cables in order to maintain compliance with FCC, and other agency, electromagnetic frequency emissions limits.

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This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules. On the product is a label that contains the FCC registration number for this device. If requested, this information must be provided to the telephone company.

This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

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The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment or for repair or warranty information, please follow the applicable procedures explained in the "Technical Support" section of this manual.

Canadian Type Approval Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



CAUTION: *Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.*

Australian Product Safety Notice

Notice to installers in Australia:

This customer equipment is to be installed and maintained by service personnel as defined by AS/NZS 3260 Clause 1.2.14.3. (Service Personnel). Incorrect connection of connected equipment to the General Purpose Outlet could result in a hazardous situation.

Safety requirements are not fulfilled unless the equipment is connected to a wall socket outlet with protective earth contact.

European Union CE Notice

Marking by the symbol **CE0344X** indicates compliance of this equipment with the EMC, Telecom and Low Voltage Directives of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:

EN55022 - Limits and methods of measurement of radio interference characteristics of information technology equipment.

EN50082-1 - Electromagnetic compatibility - generic immunity standard part 1: residential, commercial, and light industrial.

CTR 3 - Connection to Euro-ISDN Basic Access service.

EN 60950 - Safety of Information Technology Equipment including Electrical Business Equipment.

EN 41003 - Particular safety requirements for electrical equipment to be connected to Telecom networks.

European Product Safety Notice

The individual installing the 8-Port BRI module must ensure that the host chassis and module are compatible and that the host chassis is capable of providing adequate power to the module and any other auxiliary host apparatus.

The required power for the module is +5V dc @ 5 Amps.

Please contact 3Com for an up-to-date list of compatible host chassis.

In order to maintain the independent approval of this card, it must be installed in such a way that, with exception of connections to the host, when other option cards are introduced which use or generate a hazardous voltage, the minimum creepages and clearances specified in the table below are maintained. A hazardous voltage is a voltage that exceeds 42.4V peak ac or 60V dc.

If you have any doubts, seek advice from a component engineer before installing other adapters in the host equipment.

Clearance (mm)	Creepage (mm)	Voltage Used or Generated By Host Or Other Cards
2.0	2.4 (3.8)	Up to 50V _{rms} or V _{dc}
2.6	3.0 (4.8)	Up to 125V _{rms} or V _{dc}
4.0	5.0 (8.0)	Up to 250V _{rms} or V _{dc}
4.0	6.4 (10.0)	Up to 300V _{rms} or V _{dc}

For a host or other expansion card using or generating voltages greater than $300v_{rms}$ or dc, advice from a telecommunications engineer must be obtained before installation of the card.

The larger distance, shown in parenthesis, applies where the environment within the host is subject to conductive pollution or dry non-conductive pollution which could become conductive through condensation. Failure to maintain these distances will invalidate the approval.

Clearance is defined as the shortest distance between two conductive parts or between the conductive part and the bonding surface of the equipment.

Creepage is defined as the shortest path between two conductive parts or between the conductive part and the bonding surface of the equipment measured along the surface of the insulation.

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3COM CORPORATION LIMITED WARRANTY

ABOUT THIS GUIDE

This guide describes how to install, cable, and troubleshoot the High Speed Serial (HSS) 8-Port Basic Rate Interface (BRI) module for the NETBuilder II® system. It 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 does not assume prior knowledge of 3Com® internetworking equipment.

Conventions

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

Table 1 Notice Icons





Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2 Text Conventions

Convention	Description
Syntax	Evaluate the syntax provided and supply the appropriate values. Placeholders for values you must supply appear in angle brackets. Example: Enable RIPIP using: <pre>SETDefault !<port> -RIPIP CONTrol = Listen</pre> In this example, you must supply a port number for <port>.
Commands	Enter the command exactly as shown in text and press the Return or Enter key. Example: To remove the IP address, enter: <pre>SETDefault !0 -IP NETaddr = 0.0.0.0</pre>  <i>This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.</i>
Screen displays	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."

(continued)

Table 2 Text Conventions (continued)

Convention	Description
[Key] names	<p>Key names appear in text in one of two ways:</p> <ul style="list-style-type: none">■ Referred to by their labels, such as “ the Return key” or “ the Escape key”■ Written with brackets, such as [Return] or [Esc]. <p>If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example:</p> <p>Press [Ctrl]+[Alt]+[Del].</p>
<i>Menu commands and buttons</i>	<p>Menu commands or button names appear in italics. Example:</p> <p>From the <i>Help</i> menu, select <i>Contents</i>.</p>
Words in <i>italicized</i> type	<p>Italics emphasize a point or denote new terms at the place where they are defined in the text.</p>

1

INSTALLATION

The NETBuilder II 8-Port BRI module is an extended-format module that occupies two slots in the NETBuilder II 4-Slot or 8-Slot chassis or one slot in the 8-Slot Extended chassis. The information in this guide is valid for the 8-Port BRI/ST module and the 8-Port BRI/U module.

This chapter describes how to install the 8-Port BRI module in the NETBuilder II bridge/router and includes the following procedures and information:

- Preparing for installation
- Supported configurations
- Installing the module in a NETBuilder II 4- or 8-Slot chassis
- Installing the module in a NETBuilder II 8-Slot Extended chassis
- Cabling the module

For information about module features, refer to Chapter 2.

Software Compatibility

The 8-Port BRI module requires version 10.1 or later of the NETBuilder software and is not compatible with earlier software releases. The module does not support network boot and network dump procedures.

You can view 8-Port BRI module diagnostics, detect errors, and initiate call tracing by connecting a console to your NETBuilder II bridge/router. The module can be managed and configured by Transcend, through the NETBuilder II console, or remotely with Telnet.

Hardware Requirements

Use the information in this section to determine if your chassis will accommodate the 8-Port BRI module.

The following chassis will accommodate the 8-Port BRI module:

- 4-Slot chassis (assembly part number 20-0250-xxx or 20-0406-xxx)
- 8-Slot chassis (assembly part number 20-0249-xxx or 20-0407-xxx)
- Extended chassis (assembly part number 20-0270-000 or 20-0270-001)
- Any chassis labeled "EZBuilt"

Older Chassis Modification

If your chassis assembly part number is 20-0250-xxx or 20-0249-xxx, you will need to modify the chassis with a field upgrade kit before installing the 8-Port BRI module. Contact your 3Com service organization to obtain a field upgrade kit and installation instructions. Figure 1-1 shows the chassis configuration that requires the use of a field upgrade kit. The illustration shows only the 4-Slot chassis but the configuration requirements are the same for the 8-Slot chassis.

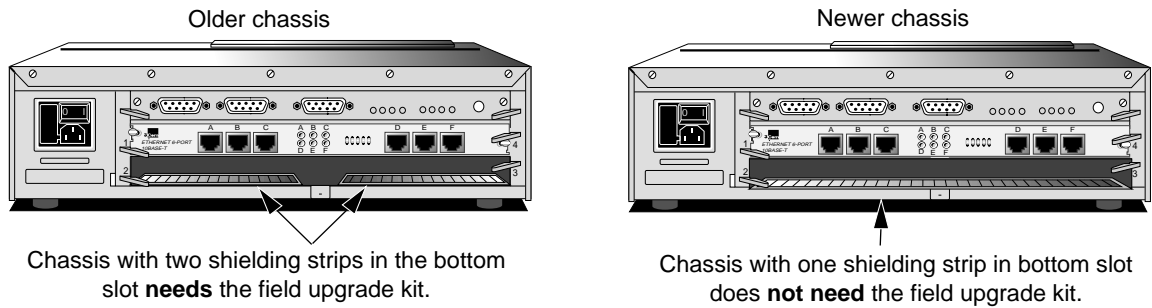


Figure 1-1 Determining the Need for a Field Upgrade Kit

The original 4-Slot chassis (assembly part number 20-0151-xxx) and 8-Slot chassis (assembly part number 20-0125-xxx) do not have a removable center column between the slots and cannot accommodate extended-format modules.

Before Installing the Module

Before you install an 8-Port BRI module into your 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 the warranty. To prevent ESD, follow these handling procedures:

- Keep the module in its antistatic shielded bag until you are ready to install it.
- 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 or equivalent packaging.

- 3 Write down the serial number and the MAC address from the labels on your module in the space provided in Figure 1-2. You will need this information if you have to contact your network supplier.

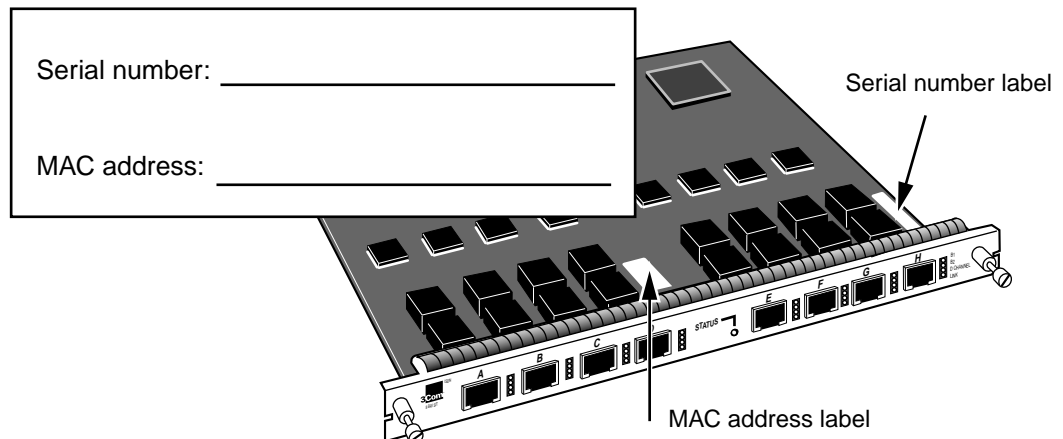


Figure 1-2 8-Port BRI Module Label Information

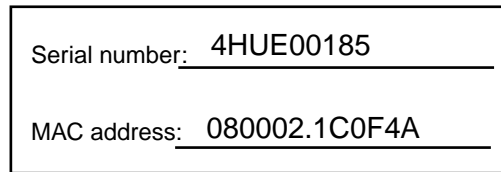


Figure 1-3 Serial Number and MAC Address Information Sample

There are a total of 24 MAC addresses for the module. The first address is printed on the component side of the module. The other 23 addresses are the consecutive hexadecimal numbers following the one printed on the module. If you are installing two 8-Port BRI modules into a NETBuilder II chassis, the MAC addresses on each module will be different. You can install a maximum of two 8-Port BRI modules in any NETBuilder II system.

Installing the Module in the 4-Slot or 8-Slot Chassis

When you install any extended-format module into the NETBuilder II 4-Slot or 8-Slot chassis, start with the first available slot under the CEC/DPE module slot. If you are installing the module in the bottom slot of an older 4-Slot or 8-Slot chassis (assembly part number 20-0250-xxx or 20-0249-xxx), you will need a field upgrade kit. See "Hardware Requirements" for information on purchasing a field upgrade kit.

Hot-Swap Capability

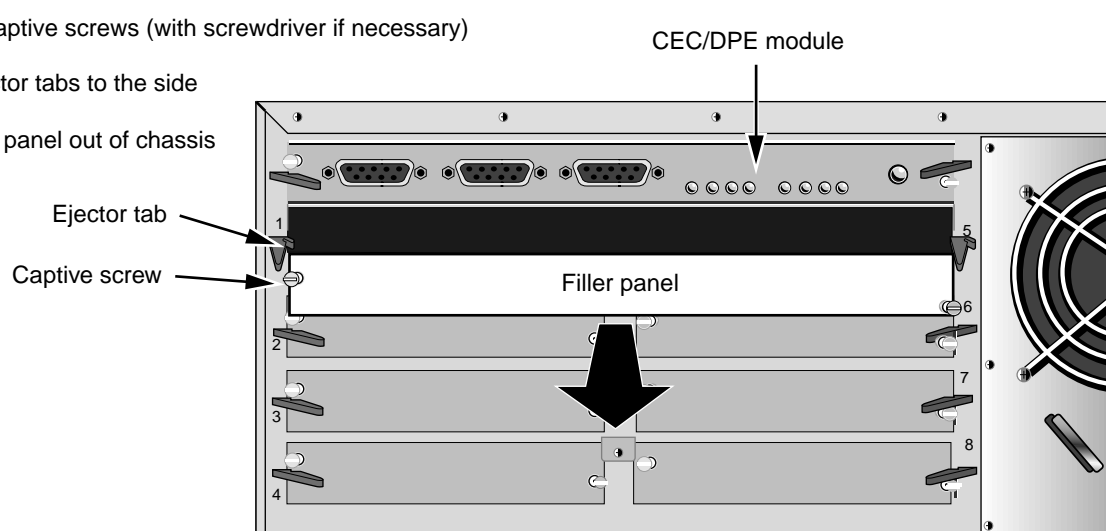
The 8-Port BRI Module has hot-swap capability. This means you can safely install it without turning off or rebooting the bridge/router.

To install the module into the NETBuilder II 4-Slot or 8-Slot chassis, follow these steps. You will need a small flat-blade screwdriver.

- 1 Remove the filler panels and the center column from the first available slot below the CEC/DPE Module.

If the cable strain-relief bracket that came with your chassis is already installed, you must remove it.

- (a) Loosen captive screws (with screwdriver if necessary)
- (b) Push ejector tabs to the side
- (c) Slide filler panel out of chassis



CAUTION: Only remove the filler panel from the slot that will house the 8-Port BRI module. All unused slots require filler panels to maintain proper cooling of the unit and regulatory compliance. Failure to cover open slots may overheat the NETBuilder II system and void the warranty.

- 2 Slide the 8-Port BRI module into the slot.
- 3 Engage the ejector tabs to secure the module in the slot. See Figure 1-4.

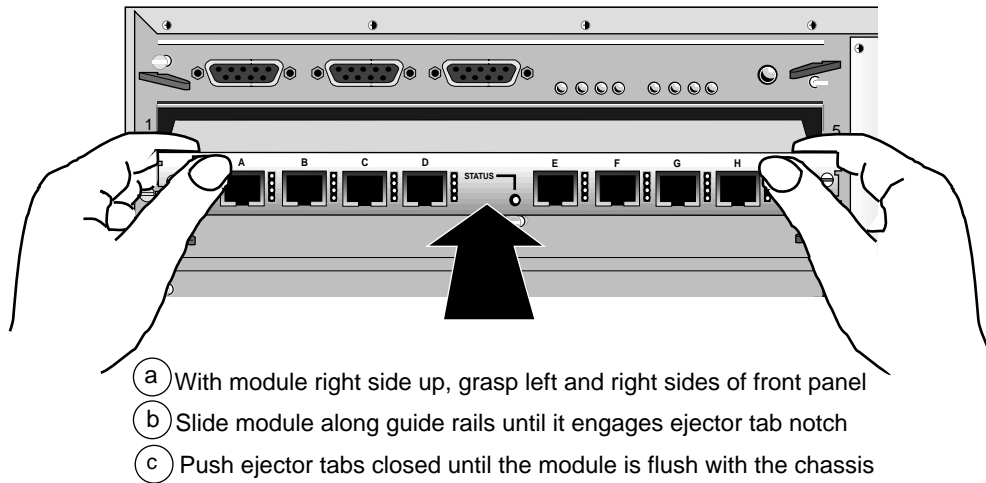


Figure 1-4 Insert Module into Chassis

- 4 Tighten the captive screws.



Engaging the ejector tabs should seat the module firmly in the chassis. Do not use the captive screws to force the board into place.

Refer to “Cabling the Module” on page 1-5 to cable your 8-Port BRI module.

Installing the Module in the 8-Slot Extended Chassis

To install the module into the NETBuilder II 8-Slot Extended chassis, follow these steps. You will need a small flat-blade screwdriver.

Hot-Swap Capability

The 8-Port BRI Module has hot-swap capability. This means you can safely install it without turning off or rebooting the bridge/router.

To install the module into the NETBuilder II 8-Slot Extended chassis, follow these steps. You will need a small flat-blade screwdriver.

- 1 Remove the filler panel from the slot you have selected. See Figure 1-5.

- (a) Loosen top and bottom captive screws (with a screwdriver if necessary). Do not loosen center captive screw.
- (b) Push ejector tabs apart
- (c) Slide filler panel out of chassis

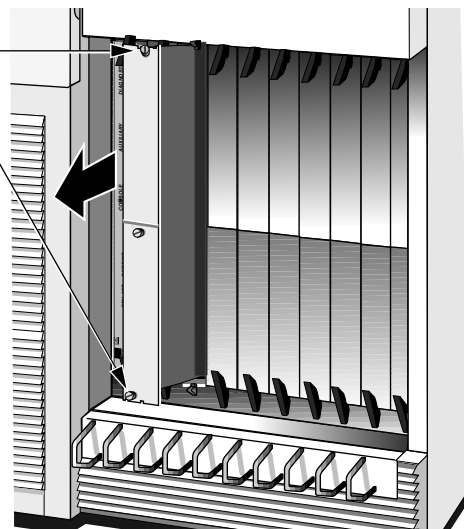


Figure 1-5 Removing a Filler Panel from an Extended Chassis



CAUTION: Remove the filler panel only from the slot that will house the 8-Port BRI module. All unused slots must be covered by filler panels to maintain proper cooling and regulatory compliance. Failure to cover open slots can cause the NETBuilder II system to overheat and void the warranty.

- Slide the 8-Port BRI module into the slot. See Figure 1-6.

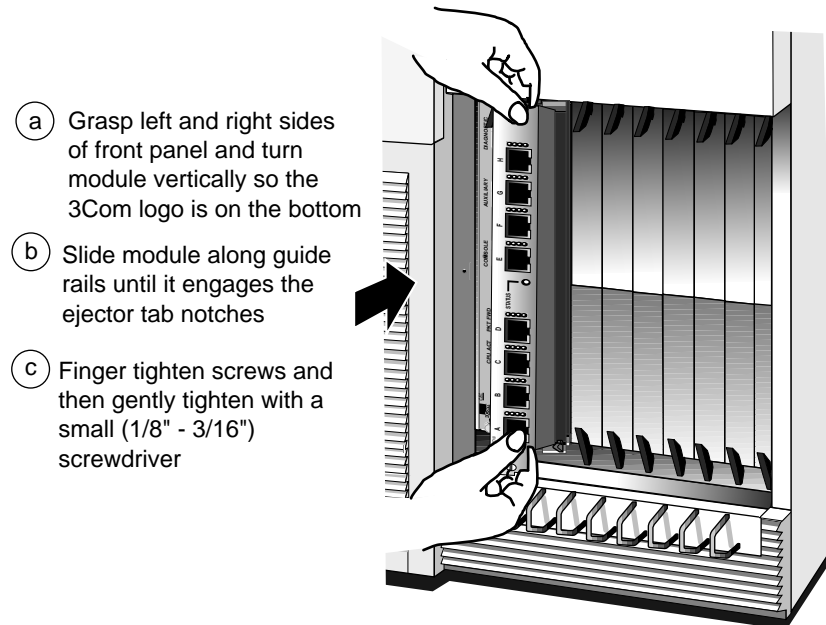


Figure 1-6 Inserting an 8-Port BRI Module into an Extended Chassis

- Engage the ejector tabs to secure the module in the slot.
- Tighten the captive screws.



Engaging the ejector tabs should seat the module firmly in the chassis. Do not use the captive screws to force the board into place.

Refer to "Cabling the Module" to cable your 8-Port BRI module.

Cabling the Module

The NETBuilder II system requires at least category 3 shielded twisted pair wire (not supplied) with an RJ 45 connector. 3Com recommends category 5 wire

Cabling the BRI/ST Module

Figure 1-7 shows how to connect an ISDN cable to the 8-Port BRI/ST module.

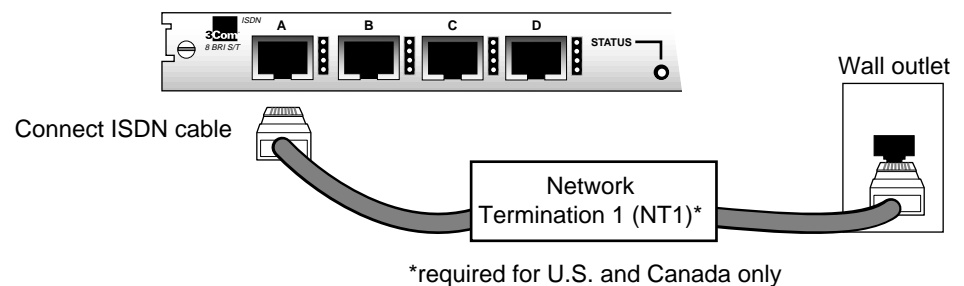


Figure 1-7 Cabling an 8-Port BRI/ST Module

If the 8-Port BRI/ST module is being used in North America, an NT1 must either be leased from the telephone company or purchased from an ISDN equipment

vendor. In countries offering ISDN/ST service, the NT1 function is provided at the customer site by the telephone company.

Cabling the BRI/U Module

The 8-Port BRI/U module has an internal NT1 and is used in North America only.

Figure 1-8 shows how to cable the 8-Port BRI/U module.

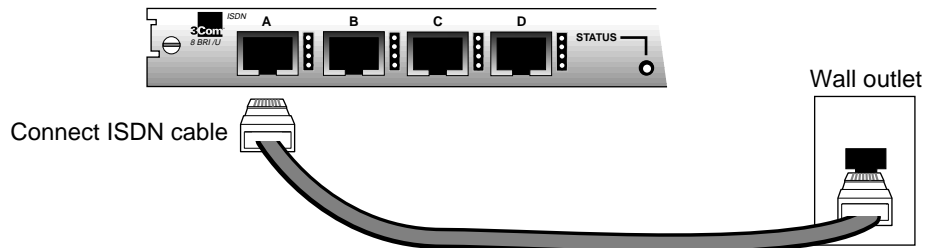


Figure 1-8 Cabling an 8-Port BRI/U Module



To ensure proper cabling of a multipoint connection, all BRI ports on a module must connect to the same channel bank card at the Telco central office. Check with your ISDN service provider to ensure that all module ports are connected to the same channel bank card.

2

OVERVIEW OF THE 8-PORT BRI MODULE

This chapter describes the features, specifications, and typical use of the 8-Port BRI module for the NETBuilder II system.

Module Features

Table 2-1 summarizes the features of the 8-Port BRI module.

Table 2-1 8-Port BRI Module Features

Feature	Summary
Hot-swap capability	Allows you to install, or remove and reinstall, the module without turning off or rebooting the NETBuilder II system.
Compatibility	Operates using software release 10.1. The module is not backward compatible with earlier software releases.
Accessible information on the EEPROM	Provides 8-Port BRI module product information that can be accessed using the software user interface.
System Clocks	25 MHz

Module Components

The module has 8 BRI ports, four LEDs per port that indicate status for channels B1, B2, D, and Link, and a general STATUS LED for the module. Figure 2-1 shows the module components.

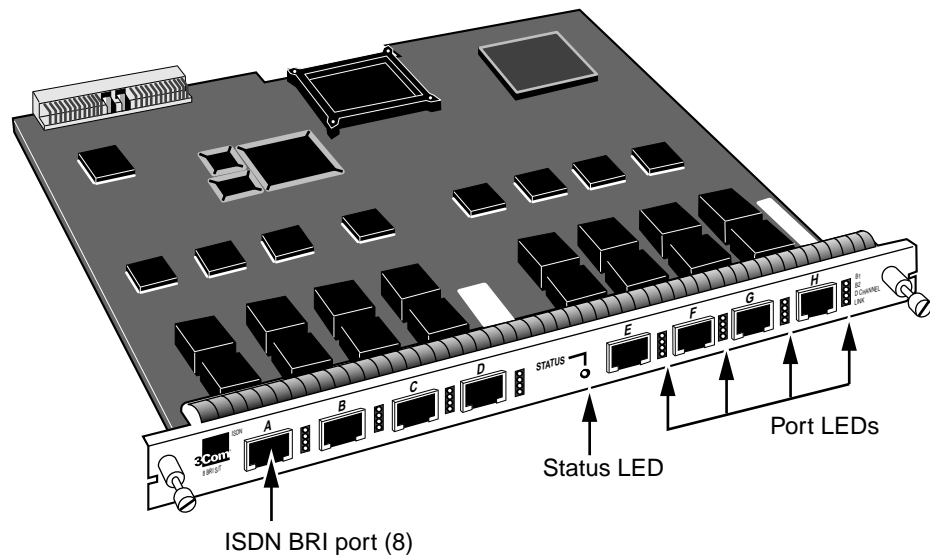


Figure 2-1 8-Port BRI/ST Module Components

Table 2-2 summarizes the LED states and Table 2-3 lists the module connectors.

Table 2-2 LED States

LEDs	Off	Orange	Green
B1	Channel inactive	Call in progress	Data call connected
B2	Channel inactive	Call in progress	Data call connected
D Channel	Channel inactive	Call in progress	Data call connected
Link	Port disabled or out of service	Activation in progress	Operational
Status	No Power	Self-test failure	Operational

Table 2-3 Connectors

Location	Connector	No. of Pins	Purpose
Backplane	J1	104	Connects module to core bus
I/O panel	Eight RJ-45	-	Connect BRI ports to central office

Specifications

Table 2-4 lists the physical dimensions of the module and Table 2-5 lists the nominal current consumption.

Table 2-4 Module Dimensions

Attribute	Description
Length	8.99 in (23.1 cm)
Width	9.70 in (24.9 cm)
Height	0.6 in (1.5 cm)
Weight	1.2 lbs (0.54 kg)

Table 2-5 Nominal Current Consumption

+5 Volts	+12 Volts	-12 Volts
5 Amps	0 Amps	0 Amps

3

TROUBLESHOOTING AND REPLACING THE MODULE

This chapter describes how to troubleshoot and replace the 8-Port BRI module.

Troubleshooting

Table 3-1 describes malfunctions that can occur with the module, possible causes, and actions to take. If you are unable to resolve a problem, contact your network supplier. Refer to Appendix B for information about who to contact in your area.

Table 3-1 Troubleshooting the 8-Port BRI/ST and U Module

Symptom	Cause and Action
The following message is displayed at start-up: <code>BRI Interface: Self Tests failed - slot X</code> (The value of X can be 1 through 4 or 1 through 8, depending on whether the NETBuilder chassis has 4 or 8 slots.)	<i>Self-test failure</i> <ul style="list-style-type: none"> Make sure the card is properly seated in the NETBuilder II chassis. Make sure the NETBuilder II backplane connector has no bent pins. If you still have a self-test failure, contact your network supplier
The STATUS LED is off when there is power to the system and other installed modules are operating.	<i>Disabled module</i> <ul style="list-style-type: none"> The module may not be properly connected to the NETBuilder II backplane. Remove and reinsert the module. If it is still not working, contact your network supplier.
The STATUS LED is orange.	<i>Error condition</i> <ul style="list-style-type: none"> Make sure the NETBuilder II system is operating correctly. Make sure the network you are connected to is operating correctly. Make sure 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.
The B1, B2 or D LED is off.	<i>The data channels are not connected yet or the path is down</i> <ul style="list-style-type: none"> Redial the path to establish a link.
On the U module, the Link LED shows orange upon activation then turns off. (The LED may cycle through the orange-to-off state repeatedly approximately every 30 seconds.)	<i>Physical layer 1 activation has failed or a loss of signal has been detected during the ISDN Activation Phase</i> <ul style="list-style-type: none"> Make sure all cables between the module ports and the ISDN-U wall jack are connected. Make sure you are using the correct cable. Make sure you are connected to an active ISDN service at the wall jack. If the symptom persists, contact your network supplier.
On the ST module, the Link LED shows steady orange upon activation and stays orange for longer than 30 seconds.	<i>Layer 1 activation malfunction on either the ISDN/ST or U side when an external NT1 is used</i> <ul style="list-style-type: none"> Make sure the cables between the module ports and the ISDN/ST wall jack and NT1 are connected. Make sure that you are using the correct cable. Make sure you are connected to an active ISDN service at the wall jack. If an external NT1 is being used, check to see that it is functioning properly. Repeated cycles of orange to off indicate a physical connection problem between the module and the Telco switch. If the symptom persists, contact your network supplier.
(continued)	

Table 3-1 Troubleshooting the 8-Port BRI/ST and U Module (continued)

Symptom	Cause and Action
U or ST module Link LED shows green upon activation then turns off	<p><i>Layer 2 to 3 initialization failure</i></p> <ul style="list-style-type: none"> ■ Make sure the module and system software are properly configured for the phone number, SPID and other settings for the Telco switch type. <p>Repeated cycles of green to off indicate a layer 2 to 3 problem between the module and the Telco switch.</p>

Replacing the Module

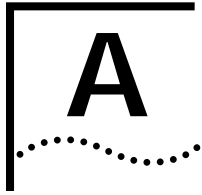
If any component in the module fails, you must replace the module.

To remove and replace the module you will need a flat-blade screwdriver. The module has hot-swap capability, so you will not need to turn off or reboot the bridge/router. To replace a module, follow these steps:



Label all cables to ensure they are reconnected properly once the module has been replaced.

- 1 Disconnect all network cabling from the module.
- 2 Unscrew the two captive screws on the module until they disengage from the chassis. Do not remove the screws from the front panel.
- 3 Push the ejector tab outward from the module.
The module disengages from the NETBuilder II backplane and partially ejects from the slot.
- 4 Use both hands to grasp the module and gently pull it out of the slot.
- 5 Install the new module using the procedure in Chapter 1.



ORDERING ISDN SERVICE

This appendix provides information you need to order leased lines and 3Com-specific information for ordering ISDN service from North American (U.S. and Canadian), German, and Dutch suppliers. For all other countries, no 3Com-specific information is required to order ISDN service.



All BRI ports on a module must connect to the same channel bank card at the Telco central office. This ensures proper clocking of a multi-port connection. Check with your ISDN service provider to ensure that all BRI ports on a module are connected to the same channel bank card.

Ordering U.S. and Canadian ISDN BRI Service

This section describes how to order ISDN service for the NETBuilder II bridge/router in the U.S. and Canada.

For additional information about ISDN, refer to *Using NETBuilder Family Software*.

To order ISDN service from your telephone company, follow these steps:

- 1 Call the telephone company and ask for the ISDN representative.
- 2 Tell the representative you want to order ISDN service for a NETBuilder II bridge/router with a BRI module, and that you have the following information:
 - Line provisioning
 - ISDN outlet type
 - Network terminator (NT1) (BRI/ST only)
- 3 Tell the representative that the Bellcore ISDN ordering code (IOC) is "Capability R." The IOC tells the telephone company which parameter settings to use for NETBuilder II bridge/routers.



Not all Regional Bell Operating Companies use IOCs. If the representative has the IOC for NETBuilder II bridge/router listed, skip to step 7; otherwise, continue on to step 4.

- 4 Ask for an RJ-45 connector to be installed with your new ISDN outlet.
- 5 For the BRI/ST module, ask for an NT1 for each port to connect your NETBuilder II bridge/router to the ISDN line. (Or, you can purchase an NT1 from a reseller. Refer to "NT1s and Power Supplies" on page A-5 for more information about NT1s.) The 8-Port BRI/U module does not need an external NT1 for North American installations.
- 6 Ask for the following information to fill out the ISDN Information Sheet:
 - **ISDN Switch Type.** Ask the representative which ISDN switch type your line uses. Place a check mark next to that switch on the ISDN Information Sheet. Each switch type has a corresponding provisioning information table later in this section.

- **Number of ISDN Phone Numbers.** Each ISDN line can support one or two phone numbers. Specify how many phone numbers you are ordering.
- **Phone Numbers.** Ask the telephone representative for your ISDN phone numbers and write them in the space provided.
- **Service Profile ID (SPID) Number.** Ask the telephone representative for your SPID numbers. (For a multipoint line, the telephone representative should provide SPID numbers for each line. For a point-to-point line, one SPID number is provided.) A SPID number has 10–15 characters; for example, 0155512120. Your telephone company may not require the SPID number.

ISDN Information Sheet 3Com NETBuilder II Bridge/Router System	
ISDN Switch Type	
AT&T 5ESS NI1	<input type="checkbox"/>
AT&T 5ESS Custom	<input type="checkbox"/>
Northern Telecom DMS 100 or National ISDN	<input type="checkbox"/>
Siemens EWSD	<input type="checkbox"/>
Number of ISDN phone numbers (1 or 2) per ISDN line	
Phone number 1	_____
Phone number 2	_____
SPID number for phone number 1	_____
SPID number for phone number 2	_____



Your telephone company gives you the phone number and SPID numbers after it installs your line.



If your telephone company has the IOC for a NETBuilder II bridge/router, you do not need to complete step 8.

- 7 Provide provisioning information that corresponds to your ISDN switch using the tables in the following sections.

This completes the ISDN ordering process for NETBuilder II bridge/routers with a BRI module. Keep this information sheet handy; you will need it when you install your bridge/router.

AT&T 5ESS Switch

To order ISDN service for an AT&T 5ESS switch, provide the telephone company with the information in Table A-1.

Table A-1 Ordering ISDN Service for an AT&T 5ESS Multi-Point Switch

Required Information	Specification
Line type	National ISDN 1 line
Line code	2B1Q (2B+D)
Interface type	S/T interface with an RJ-11 cable. U interface with an RJ-11 cable.
Maximum terminals (MAXTERM)	2
Maximum B channels (MAXB CHNL)	2
Actual user	Yes
(continued)	
Circuit-switched data	2

Table A-1 Ordering ISDN Service for an AT&T 5ESS Multi-Point Switch (continued)

Required Information	Specification
Circuit-switched data channel	Any
Terminal type	A-Basic or E-Type (data only) Terminal
Display	No
Circuit-switched data limit	2
Voice or data	Data
Call appearance	Idle
DN (directory number) must be set as follows:	
Parameter	Setting
B1	Circuit-switched data
B2	Circuit-switched data
D	Signaling only
MAXTERM	2
MAXB CHNL	2
ACT USR	Y
CSD	2
CSD CHL	Any
TERMTYP	TYPEA or TYPEE
Display	No
CSD Limit	2
CA PREF	1

AT&T 5ESS Custom Switch

To order ISDN service for an AT&T 5ESS custom switch, provide the telephone company with the information in Table A-2.

Table A-2 Ordering ISDN Service for an AT&T 5ESS Custom Point-to-Point Switch

Required Information	Specification
Line type	ISDN line with point-to-point configuration
Line code	2B1Q (2B+D)
Interface type	S/T interface with NT1 U interface
Maximum terminals (MAXTERM)	2
Maximum B channels (MAXB CHNL)	2
Circuit-switched data (CSD)	2
Circuit-switched data channel (CSD CHL)	Any
Terminal type (TERMTYP)	A-Basic or E-Type (data only) Terminal
Display	No
Voice or data	Data
Call appearance preference	Idle
DN must be set as follows:	
Parameter	Setting
B1	Circuit-switched data
B2	Circuit-switched data
D	Signaling only
ACT USR	Yes
TERMTYP	TYPEA or TYPEE
CSD Limit	2
CA PREF	1



A point-to-point configuration on a NETBuilder II bridge/router is selected by setting the SPIDdn1 and SPIDdn2 parameters to none.

DMS 100 and National ISDN To order ISDN service for a DMS 100 or National ISDN switch, provide the telephone company with the information in Table A-3.

Table A-3 Ordering ISDN Service for a DMS 100 or National ISDN Switch

Required Information	Specification
Line type	DMS 100 or National ISDN 1 line (in North America)
Line code	2B1Q (2B+D)
Interface type	S/T interface with NT1 U interface
Circuit-switched option	Yes
Bearer Restriction option	No packet mode data (NOPMD)
Protocol	Functional version 0 (PVC 0) for DMS 100 custom Functional version 2 (PVC 2) for National ISDN
SPID suffix	User-specified. Could be none.
Terminal endpoint identifier (TEI)	Dynamic
Ring	No
Key system (EKTS)	No
Voice or data	Data

Siemens EWSD Switch To order ISDN service for a Siemens EWSD switch, provide the phone company with the information in Table A-4.

Table A-4 Ordering ISDN Service for a Siemens EWSD Switch

Required Information	Specification
Line Type	National ISDN 1 line
Line Code	2B+D
Interface Type	S/T interface with NT1 U interface
Circuit-switched Option	Yes
Bearer Restriction Option	No packet mode data (NOPMD)
Protocol	PPP
SPID suffix	1 or none
Terminal Endpoint Identifier (TEI)	Dynamic
Ring	No
Maximum Keys	64
Key System (EKTS)	No
Voice or Data	Data

Service Profile Identifiers

When you request service in North America, you may also need the following information about Service Profile Identifiers (SPIDs) and other service attributes:

- Request multipoint, initializing terminal service; the maximum number of terminals is two. The service provider supplies you with two SPIDs. No SPID is required for point-to-point service.
- If you request ISDN service from an AT&T 5ESS service provider and the switch is running custom (or non-national ISDN 1) software, the format is:

01 + 7-digit telephone number + 1-digit suffix.

Your telephone company will tell you if you need a different SPID format.

If you request a different telephone number for each B channel, the suffix can be the same. A suffix of 0 is typical in this case. If you decide to use the same telephone number for both B channels, use a different suffix so that the two SPIDs are unique.

- If you request NI-1 (national ISDN 1) service from an AT&T 5ESS service provider, the format is:
01 + 7-digit telephone number + 1-digit suffix + 2-digit TID (terminal identifier).
The SPID numbers must be unique. The 2-digit TID can be any number from 0 to 62. The TID has no effect on the operation of the NETBuilder II bridge/router, but it is a necessary part of the SPID that the bridge/router uses to gain access to the ISDN network.
- If you request ISDN service from a Northern Telecom DMS-100 service provider, the format is:
Area code + 7-digit telephone number + 0- to 8-digit suffix + 2-digit TID.
The TID can be any number from 0 to 62, but needs to be unique so that the SPIDs are also unique. This format applies when the switch is running Custom and NI-1 versions of software.
- If you order AT&T 5ESS ISDN service, choose either a Type A or Type E terminal. The Type E terminal is preferable because it is for data only.

Do not request supplementary services, such as autohold or conference, because a NETBuilder II bridge/router with an ISDN interface does not support them.

NT1s and Power Supplies

To use an 8-Port BRI/ST module in North America, telephone companies require a network termination device type 1 (NT1) and a power supply for every ISDN line. For a small monthly fee, your service provider or telephone company can provide you with an NT1 and power supply and can explain how to connect and use them. However, you may prefer to purchase these devices from an ISDN equipment vendor. The NT1 and power supply may come in a single, standalone box or the two may be in separate units. In this discussion, the two units together are referred to as an NT1.

Telephone companies in North America use two kinds of NT1s that are differentiated by the data encoding scheme used in transmitting data between the NT1 and the equipment provided by the telephone company. The two data encoding schemes are 2B1Q (two bits mapped into one quaternary symbol) and alternate mark inversion (AMI). The 2B1Q scheme is the dominant method in use today. The 8-Port BRI module supports the 2B1Q scheme only. The AMI scheme is older and rarely used.

Ordering German ISDN BRI Service

To order German ISDN service for a NETBuilder II bridge/router, follow these steps:

- 1 Acquire a form entitled "Telefondienstauftrag im ISDN (Euro-ISDN-Anschluß)" from the Telekom.
- 2 At the top of the form, select "Neuanschluß."
- 3 Under "Auftraggeber," provide the requested information.
- 4 Under "Anschluß," specify "Basisanschluß als Standardanschluß."

By specifying "Basisanschluß als Standardanschluß," you are requesting standard basic rate interface (BRI) service. Under "Anschrift Standort," provide the requested information.

- 5 Under "Anschlußnutzung," specify "Mehrgeräteanschluß."

By specifying "Mehrgeräteanschluß," you are requesting a connection for multiple types of equipment, such as bridge/routers, telephones, faxes, and computers.

- 6 Sign your name at the bottom of the form.



The NETBuilder II bridge/router software does not currently support the 1TR6 switch type. If you have an existing 1TR6 connection, request that the connection be changed to a Euro-ISDN connection using this form. In case the Telekom requests this information, the approval number for Germany (Bundesamt Für Zulassungen In Der Telekommunikation) is A115352E.

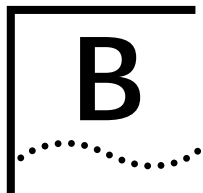


When ordering ISDN lines for use with NETBuilder II bridge/routers in Germany, make sure to order point-to-multipoint ISDN lines. The NETBuilder II bridge/routers do not support point-to-point configurations when attached to the German ISDN network.

Ordering Dutch ISDN BRI Service

To order ISDN service from the Dutch PTT for a NETBuilder II bridge/router, follow these steps:

- 1 Acquire a form entitled "Aanvraag formulier ISDN aansluiting from the Dutch PTT."
- 2 Under 1, specify "Nieuwe ISDN-aansluiting".
- 3 Under 3, specify the requested connection date.
- 4 Under 4, specify "Enkelvoudige ISDN-2 aansluiting".
- 5 Under 7, specify how many phone numbers you want to assign to the ISDN line (MSN).
- 6 Under 8, specify any extra services required.
- 7 Provide the requested information for parts 13 through 22.
- 8 Sign your name at the bottom of the form.



TECHNICAL SUPPORT

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

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site as described below.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFactsSM automated fax service
- 3ComForum on CompuServe online service

World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

<http://www.3Com.com/>

This service features the latest information about 3Com solutions and technologies, customer service and support, news about the company, *NetAge*[®] Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853

(continued)

Country	Data Rate	Telephone Number
P. R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

408 654 2703

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, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
Hong Kong	852 2537 5610
U.K.	44 1442 438279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1800 678 515	Netherlands	06 0228049
Belgium	0800 71279	New Zealand	0800 446 398
Denmark	800 17319	Norway	800 11062
Finland	98 001 4444	Portugal	0505 442 607
France	05 90 81 58	Russia (Moscow only)	956 0815
Germany	0130 81 80 63	Singapore	800 6161 463
Hong Kong	800 933 486	Spain	900 964 445
Italy	1678 99085	Sweden	020 792954
Malaysia	1800 801 777	U.K.	0800 626403

3ComForum on CompuServe Online Service

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

- 1 Log on to CompuServe.
- 2 Type **go threecom**
- 3 Press [Return] to see the 3ComForum main menu.

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.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number
3Com Corporation P.O. Box 58145 5400 Bayfront Plaza Santa Clara, California 95052-8145 U.S.A.	800 NET 3Com or 1 408 764 5000 408 764 5001 (fax)
3Com Asia Limited	
Australia	61 2 9937 5000 (Sydney) 61 3 9866 8022 (Melbourne)
China	8610 68492568 (Beijing) 86 21 63740220 Ext 6115 (Shanghai)
Hong Kong	852 2501 1111
India	91 11 644 3974
Indonesia	6221 572 2088
Japan	81 6 536 3303 (Osaka) 81 3 3345 7251 (Tokyo)
Korea	822 2 319 4711
Malaysia	60 3 732 7910
New Zealand	64 9 366 9138
Phillippines	632 892 4476
Singapore	65 538 9368
Taiwan	886 2 377 5850
Thailand	662 231 8151 4
3Com Benelux B.V.	
Belgium	32 2 725 0202
Netherlands	31 30 6029700
3Com Canada	
Calgary	403 265 3266
Montreal	514 683 3266
Ottawa	613 566 7055
Toronto	416 498 3266
Vancouver	604 434 3266
3Com European HQ	49 89 627320
3Com France	33 1 69 86 68 00

Regional Sales Office	Telephone Number
3Com GmbH	
Austria	43 1 513 4323
Czech Republic/Slovak Republic	420 2 21845 800
Germany (Central European HQ)	49 30 34 98790 (Berlin) 49 89 627320 (Munich)
Hungary	36 1 250 83 41
Poland	48 22 6451351
Switzerland	41 31 996 14 14
3Com Ireland	353 1 820 7077
3Com Latin America	
U.S. Headquarters	408 326 2093
Northern Latin America	305 261 3266 (Miami, Florida)
Argentina	541 312 3266
Brazil	55 11 546 0869
Chile	562 633 9242
Colombia	571 629 4110
Mexico	52 5 520 7841/7847
Peru	51 1 221 5399
Venezuela	58 2 953 8122
3Com Mediterraneo	
Italy	39 2 253011 (Milan) 39 6 5279941 (Rome)
Spain	34 1 383 17 00
3Com Middle East	971 4 349049
3Com Nordic AB	
Denmark	45 39 27 85 00
Finland	358 0 435 420 67
Norway	47 22 18 40 03
Sweden	46 8 632 56 00
3Com Russia	007 095 258 09 40
3Com Southern Africa	27 11 807 4397
3Com UK Ltd.	
	44 131 220 8228 (Edinburgh) 44 161 873 7717 (Manchester) 44 162 889 7000 (Marlow)

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers 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.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 2927	408 764 7120
Europe, South Africa, and Middle East	44 1442 438125	44 1442 435822
Outside Europe, U.S.A., and Canada	1 408 326 2926	1 408 764 7120

3Com Corporation 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:

Network adapters	Lifetime
Other hardware products (unless specified above)	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above 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 for repair, whether under warranty or not.

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 media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation with respect to this express warranty 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 or representation 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 noncompatibility 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 of the defective product by 3Com.

WARRANTIES EXCLUSIVE

IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND SATISFACTORY QUALITY. 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 MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, 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, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers or the limitation for personal injury, so the above limitations and exclusions may be limited in their application to you. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW

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

3Com Corporation, 5400 Bayfront Plaza, Santa Clara, CA 95052-8145 (408) 764-5000

9/1/96

