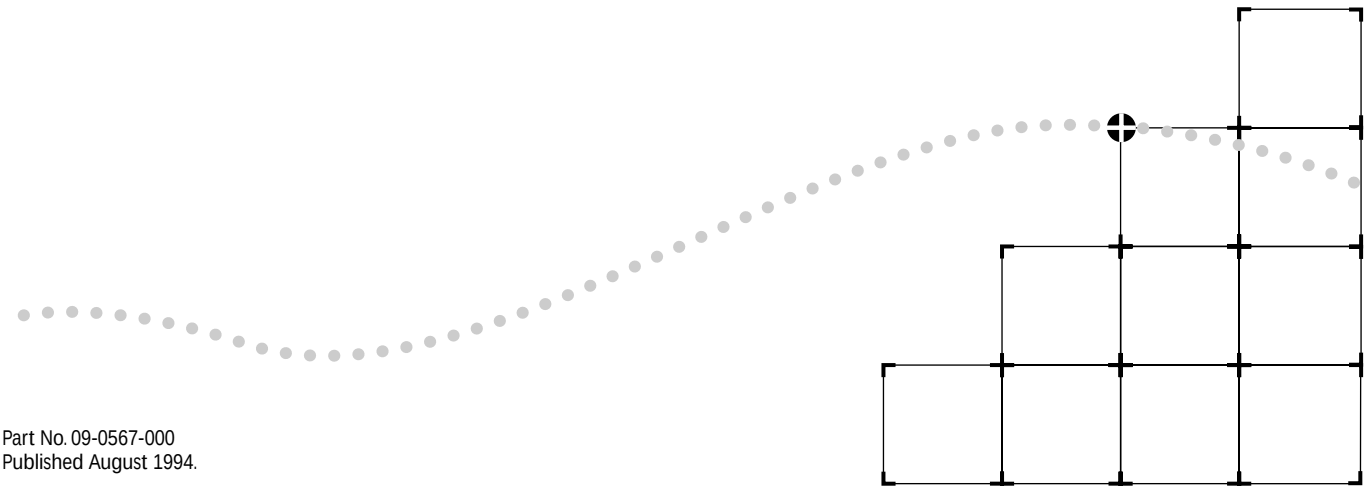
NETBUILDER II® HIGH-SPEED SERIAL RS-449/X.21 3-PORT MODULE INSTALLATION GUIDE

A member of the NETBuilder® Family



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Guide written by Ramona Boersma. Edited by Chris Dresden. Technical illustration and production by Ramona Boersma.

The following advice and subsequent warnings are given to satisfy the requirements of the United Kingdom's BABT approval of the NETBuilder II HSS RS-449 3-port module as a host independent module.

This module is approved only for installation in a host and with host attachments, which are either type-approved for such apparatus, or, if supplied after March 1, 1993, are marked with or supplied with a statement that the host is supplied over General Approval Number NS/G/1234/J/100003.

This module has been designed to comply specifically with BABT and all the 3Com NETBuilder family of modules for use in the NETBuilder chassis. These considerations are outlined herein.

Except at the edge connector, which plugs into the host's expansion slot, clearance and creepage distances of Xmm and Ymm, as listed below, must be maintained between this module and other parts of the host, including any other additional modules fitted therein.

Clearance	Creepage	Voltage used or generated by other parts of the host or expansion board
Xmm	Ymm	Vrms/Vac
4.0	5.0 (8.0)	up to 250

The creepage distances apply when installed in a normal office environment. The creepage distances shown in parentheses apply where the normal office environment within the host is subject to conductive pollution or dry non-conductive pollution, which could become conductive due to condensation.

If in doubt, advice should be sought from a competent telecom safety engineer.

Users must ensure that the power drawn by the 3Com NETBuilder II HSS RS-449 3-port module (as described in Chapter 2) together with any auxiliary apparatus, lies within the rating of the host power supply.

Failure to install the module in accordance with these instructions, invalidates the approval.

The NETBuilder II chassis are supplied in the United Kingdom under the General Approval Number NS/G/1234/J/100003 and do not hold a BABT license in their own right. In view of this, users are reminded that when the HSS RS-449 3-port module is installed in a chassis, it is still only the module that is approved and so the BABT license label must not be moved so that it is attached to the chassis itself.

The network connector RS-449 is a TNV connection point as defined by EN 41 003. The bus connectors J1, J2, and J3 are SELV connections as defined by EN 60 950.

About This Guide

Introduction

This guide describes how to install, cable, maintain, and troubleshoot the high-speed serial (HSS) RS-449/X.21 3-port module for the NETBuilder II® system. The information in this guide applies to the NETBuilder II 4-slot chassis and the NETBuilder II 8-slot chassis, both single wide and dual wide configurations.

This guide comes with both the HSS RS-449 3-port module and the HSS X.21 3-port module packages. The module in both packages is referred to as the HSS RS-449/X.21 3-port module throughout this manual.

For more information about the 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

The following tables 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."

Table 1 Text Conventions (continued)

Convention	Description
"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:`
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 HSS RS-449/X.21 3-port module into the NETBuilder II® system and includes information on the following:

- Pre-installation and installation procedures
- RS-449 3-port cable pinout
- X.21 3-port cable pinout
- RS-449 to X.21 cable pinout
- RS-449 to RS-530 cable pinout

The label on the module's connector/LED panel reads "HSS RS-449 3-Port" for both the HSS RS-449 3-port and HSS X.21 3-port packages. The module is also called the HSS RS-449 3-port module in the software. Throughout this manual, it is referred to as the HSS RS-449/X.21 3-port module.

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

Before Installing the Module

Before you install the HSS RS-449/X.21 3-port 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 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 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 HSS RS-449/X.21 3-port module, you receive the following:

- HSS RS-449/X.21 3-port module

The label on the module's connector/LED panel reads "HSS RS-449 3-Port" for both the HSS RS-449 3-port and HSS X.21 3-port packages.

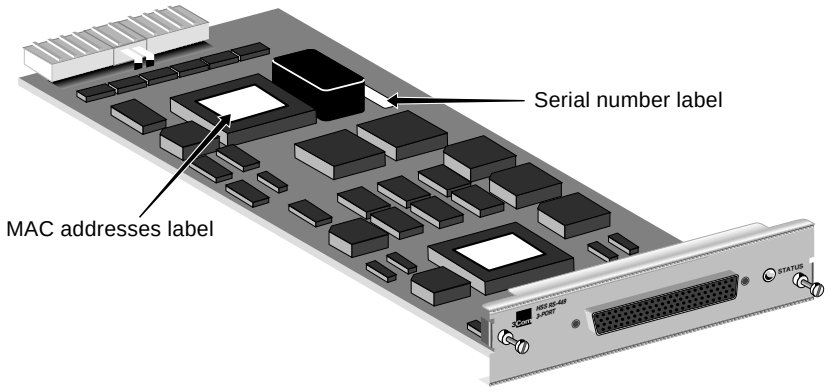
- *NETBuilder II High-Speed Serial RS-449/X.21 3-Port Module Installation Guide*
- HSS RS-449 3-port cable *or* HSS X.21 3-port cable

  You will receive one of the above cables depending on which package you purchased.

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 three MAC addresses from the label on the component side of the module on the following line:

_____



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

Serial number example: S/N:1BL12345

MAC addresses example: 0800021A4B5C, 0800021A4B5D, 0800021A4B5E

The MAC addresses are also encoded in the module's EEPROM. Use the procedure in the *NETBuilder II Base Guide* to display the MAC addresses encoded in the EEPROM.

The HSS RS-449/X.21 3-port module has IEEE network addresses and not MAC addresses as stated throughout this guide. "MAC address" is an encompassing term used by the software to indicate both MAC and IEEE network addresses.

Installing the Module

Use this procedure to install the module into the NETBuilder II base system. You will need a small flatblade screwdriver.

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

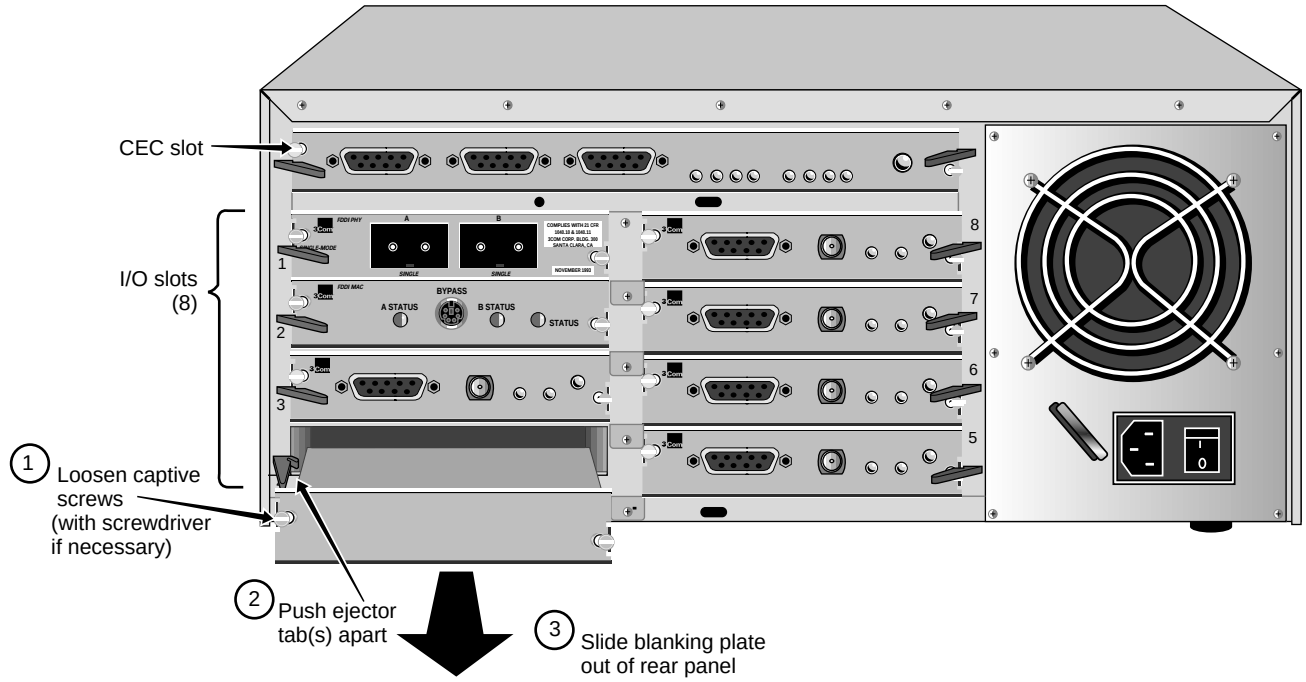
There are two versions of the NETBuilder II 4-slot and 8-slot chassis. The older, single-wide versions of the NETBuilder II 4-slot and 8-slot chassis have two ejector tabs for each module. The newer, dualwide versions have one ejector tab for each module, except for the CEC module slot which has two ejector tabs. When the term "dualwide NETBuilder II chassis" is used in this manual, it refers to a chassis with only one ejector tab per module.

1 Select an I/O slot in which to install the HSS RS-449/X.21 3-port module.

You can install the module in any available I/O slot in the rear of the NETBuilder II base system. The top slot is designated for the CEC module only.

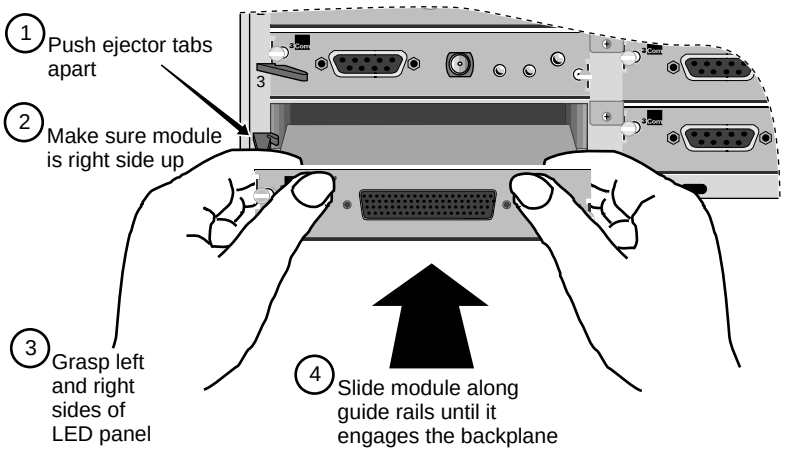
2 Remove the blanking plate from the I/O slot you have selected for the module.

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

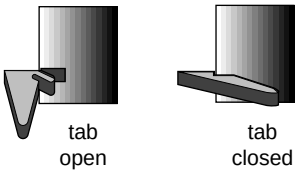


CAUTION: *Only remove the blanking plate from an I/O slot that will house an I/O module. All unused I/O slots require blanking plate covers to maintain proper cooling of the unit and regulatory compliance. Failure to cover open slots can result in overheating of the NETBuilder II base system and voiding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

3 Insert the module into the uncovered I/O slot.



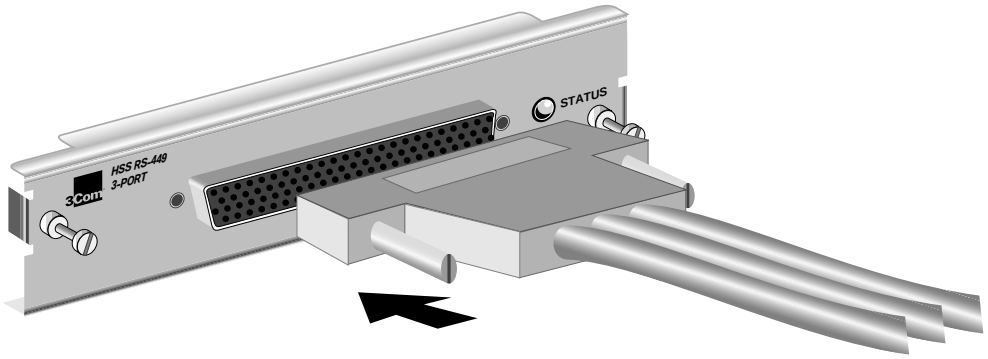
5
- For the dual-wide chassis, the ejector tab will engage itself
- For the single-wide chassis, push the ejector tab closed



4 Hand tighten the captive screws. Do not use a screwdriver.

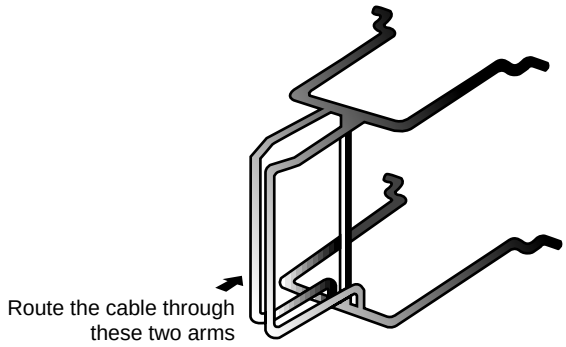
A solid connection of the connector/LED panel to the chassis is required for proper operation. Do *not* use the screws to force the board into place.

5 Attach the HSS RS-449 3-port cable or the HSS X.21 3-port cable to the module.



Hold the connector firmly in place while hand tightening the screws on either side of the connector.

6 Route the cable through the cable strain relief bracket.



CAUTION: *Due to the weight of the 3-port cable, use the strain relief bracket to decrease the possibility of damage to the module. If the cable is too large to fit in the bracket along with other NETBuilder II module cables, use cable ties or other means of strain relief.*

7 If you have the HSS X.21 3-port cable, attach each connector to an X.21 interface. If you have the HSS RS-449 3-port cable, attach each connector to an RS-449 interface.

Each connector may be attached to any of the following interfaces with user-provided cables:

- RS-449
- X.21
- RS-530

Refer to the following sections for cable pinouts.

Module Connector to RS-449 Cable Pinout

You may connect the HSS RS-449 3-port cable directly to an RS-449 interface. If you need an RS-449 extension cable, refer to Table 1-1 for the pin assignments of the RS-449 cable. The table also includes the pinouts for the module connector to the RS-449 3-port cable.

Table 1-1 HSS RS-449/X.21 3-Port Module Connector and Cable Pin Assignments

RS-449 Port Pinout						RS-449 Cable Pinout
A	**B**	**C**	**Signal**	**I/O**	**Signal Description**	**(37 pin male)**
76	63	1	GND	-	Shield	1
47	14	2	SD(A)	Output	Transmit Data (inverted)	4*
66	33	21	SD(B)	Output	Transmit Data (non-inverted)	22
48	15	3	ST(A)	Input	Transmit Signal Element Timing (inverted)	5
67	34	22	ST(B)	Input	Transmit Signal Element Timing (non-inverted)	23
49	16	4	TT(A)	Output	Transmit Signal Element Timing (inverted)	17
68	35	23	TT(B)	Output	Transmit Signal Element Timing (non-inverted)	35
50	17	5	RS(A)	Output	Request to Send (inverted)	7
69	36	24	RS(B)	Output	Request to Send (non-inverted)	25

Table 1-1 HSS RS-449/X.21 3-Port Module Connector and Cable Pin Assignments

RS-449 Port Pinout						RS-449 Cable Pinout
A	**B**	**C**	**Signal**	**I/O**	**Signal Description**	**(37 pin male)**
51	18	6	RD(A)	Input	Receive Data (inverted)	6
70	37	25	RD(B)	Input	Receive Data (non-inverted)	24
52	19	7	CS(A)	Input	Clear to Send (inverted)	9
71	38	26	CS(B)	Input	Clear to Send (non-inverted)	27
53	20	8	RT(A)	Input	Receive Signal Element Timing (inverted)	8
72	39	27	RT(B)	Input	Receive Signal Element Timing (non-inverted)	26
54	41	9	DM(A)	Input	Data Mode (inverted)	11
73	60	28	DM(B)	Input	Data Mode (non-inverted)	29
55	42	10	TR(A)	Output	Terminal Ready (inverted)	12
74	61	29	TR(B)	Output	Terminal Ready (non-inverted)	30
56	43	11	RR(A)	Input	Receiver Ready (inverted)	13
75	62	30	RR(B)	Input	Receiver Ready (non-inverted)	31
57	44	12	LL	Output	Local Loopback	10
77	64	31	RL	Output	Remote Loopback	14
59	46	13	RI	Input	Incoming Call	15
78	65	32	TM	Input	Test Mode	18
58	45	40	SG	-	Signal Ground	19 20 37

*

CAUTION: *All interconnecting cables must be properly shielded to reduce the potential for interference. Only cables from 3Com are guaranteed to meet emissions standards. If other cables are used, 3Com cannot guarantee compliance.*

Module Connector to X.21 Cable Pinout

You may connect the HSS X.21 3-port cable directly to an X.21 interface. If you need an X.21 extension cable, refer to Table 1-1 for the pin assignments of the module connector and HSS X.21 3-port cable.

Table 1-2 HSS RS-449 3-Port Module Connector and Cable Pin Assignments

RS-449 Port Pinout					X.21 Cable Pinout	
A	**B**	**C**	**Signal**	**I/O**	**(15 pin female)**	**Signal**
76	63	1	GND	-	1	Shield
47	14	2	SD(A)	Output	2*	TA
66	33	21	SD(B)	Output	9	TB
51	18	6	RD(A)	Input	4	RA
70	37	25	RD(B)	Input	11	RB
48	15	3	ST(A)	Input	6	SA
53	20	8	RT(A)	Input	6	SA
67	34	22	ST(B)	Input	13	SB
72	39	27	RT(B)	Input	13	SB
55	42	10	TR(A)	Output	3	CA
74	61	29	TR(B)	Output	10	CB
54	41	9	DM(A)	Input	5	IA
73	60	28	DM(B)	Input	12	IB
58	45	40	SG	-	8	SG
†50	†17	†5	RS(A)	Output		
52	19	7	CS(A)	Input		
56	43	11	RR(A)	Input		
†69	†36	†24	RS(B)	Output		
71	38	26	CS(B)	Input		
75	62	30	RR(B)	Input		

*

= twisted pair

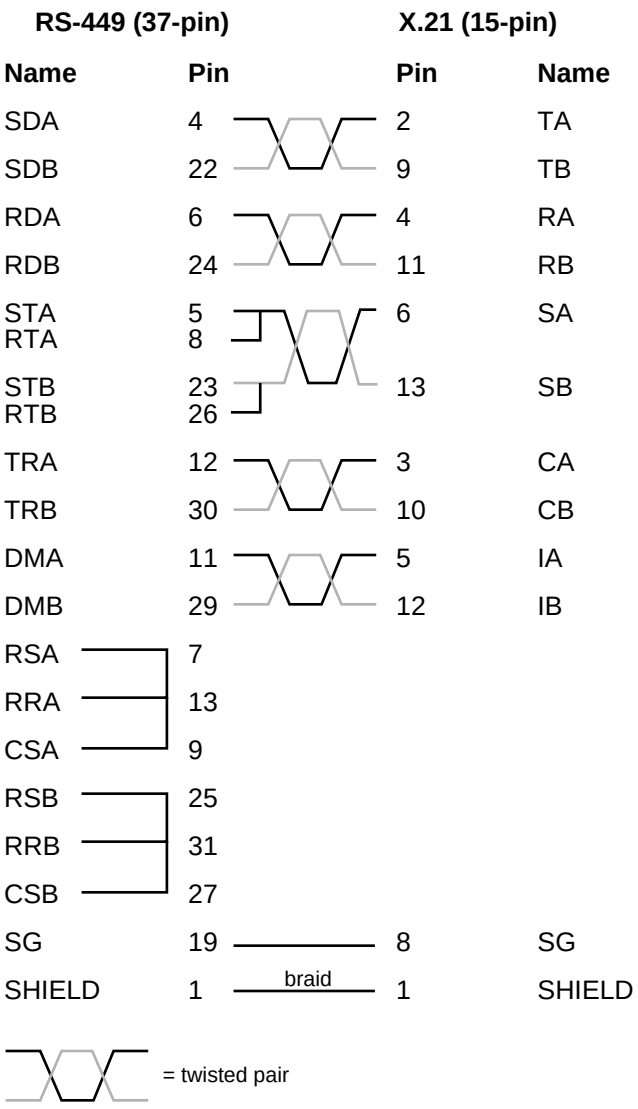
† These pins are looped on the 78-pin cable connector.

RS-449 Cable to X.21 Cable Pinout

An X.21 transition cable with a 15-pin female X.21 connector and a 37-pin female RS-449 connector may be attached to the HSS RS-449 3-port cable to connect the module to an X.21 interface.

An X.21 transition cable with a 15-pin male X.21 connector and a 37-pin male RS-449 connector may be attached to the HSS X.21 3-port cable to connect the module to an RS-449 interface.

The following figure describes the pin assignments for an X.21 transition cable.



X.21 European Connector Compliances

For installations where compliance to the European standard NET 1 is required, the X.21 connector used to construct the RS-449-to-X.21 conversion cable should be an ISO 4903 connector. In addition, for compliance in Austria, Denmark, Finland, Germany, and the United Kingdom, M3-threaded attaching screws should be used with this connector.

RS-449 Cable to RS-530 Cable Pinout

An RS-530 transition cable with a 25-pin male "D" connector may be attched to the HSS RS-449 3-port cable to connect the module to an RS-530 interface. The following figure describes the pin assignments for an RS-530 transition cable.

	RS-449 (37-pin female)		RS-530 (25-pin male)		
Signal	**Name**	**Pin**	**Pin**	**Name**	**Signal**
Shield	-	1	1	-	Shield
Send Data	SDA SDB	4 22	2 14	BA(A) BA(B)	Transmitted Data
Receive Data	RDA RDB	6 24	3 16	BB(A) BB(B)	Received Data
Request to Send	RSA RSB	7 25	4 19	CA(A) CA(B)	Request to Send
Clear to Send	CSA CSB	9 27	5 13	CB(A) CB(B)	Clear to Send
Data Mode	DMA DMB	11 29	6 22	CC(A) CC(B)	DCE Ready
Terminal Ready	TRA TRB	12 30	20 23	CD(A) CD(B)	DTE Ready
Signal Ground	SG	19	7	AB	Signal Ground
Receiver Ready	RRA RRB	13 31	8 10	CF(A) CF(B)	Received Line Signal Detector
Send Timing	STA STB	5 23	15 12	DB(A) DB(B)	Transmit Signal Element Timing (DCE source)
Receive Timing	RTA RTB	8 26	17 9	DD(A) DD(B)	Receiver Signal Element Timing (DCE source)
Terminal Timing	TTA TTB	17 53	24 11	DA(A) DA(B)	Transmit Signal Element Timing (DTE source)

= twisted pair

2 OVERVIEW OF THE HSS RS-449/X.21 3-PORT MODULE

This chapter describes the features, specifications, and typical use of the high-speed serial (HSS) RS-449/X.21 3-port module for the NETBuilder II® system.

HSS RS-449/X.21 Module Features

Table 2-1 summarizes the module's features.

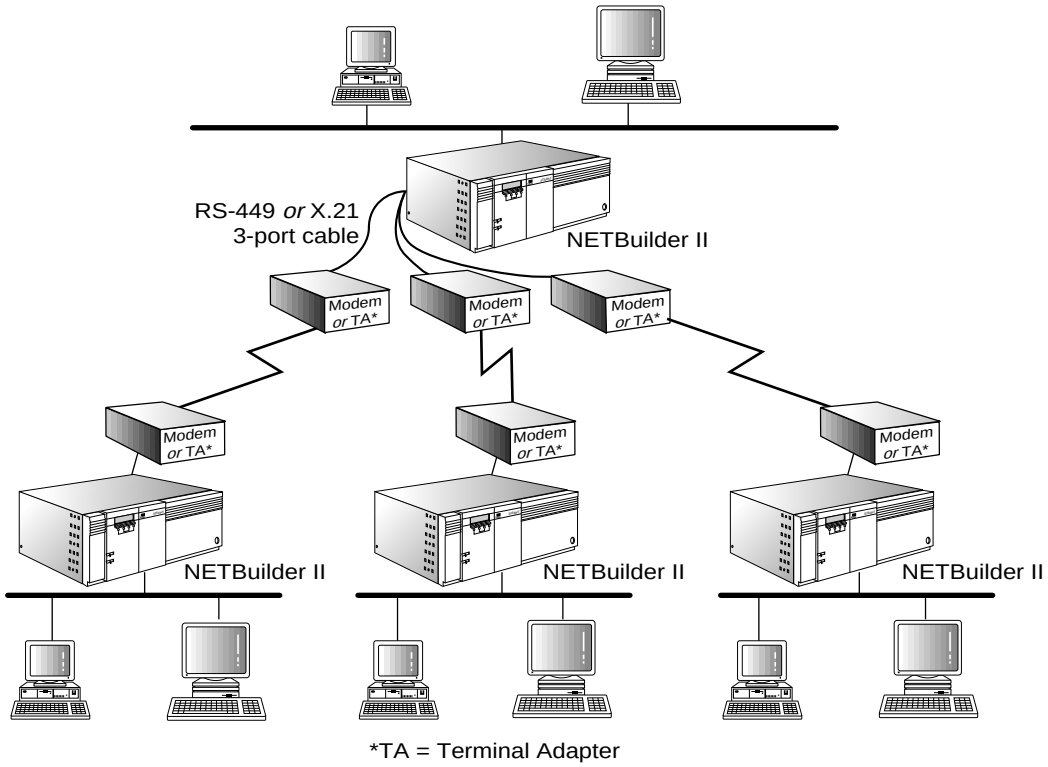
Table 2-1 HSS RS-449/X.21 3-Port Module Features

Feature	Summary
Three ports	Provides maximum port density in a single module, saving slots for other NETBuilder II modules.
Hot-swap capability	Allows you to install or remove and reinstall the module without turning off the NETBuilder II system.
Cable support	Supports RS-449 *or* X.21; user-provided cables required to support RS-449, X.21, and RS-530 interfaces, depending on which 3-port cable was purchased.
Line speeds*	Supports a total of 2.048 Mbps full-duplex over all three ports. A sample configuration would be one port at 1.544 Mbps and two ports at 256 Kbps.
Clocking	External
Interface	RS-449 *or* X.21 (physical), and CCITT v.10/v.11. User-provided cables required to support physical X.21, RS-449 and RS-530 interfaces, depending on which 3-port cable was purchased.
Dialling Support	Software supports CCITT v.25bis call control for attachment to switched service modems and terminal adapters.
Self-test and diagnostic capability	Monitors network and signals status via the LED.
Accessible information on the EEPROM	Provides HSS RS-449/X.21 3-port module product information that can be accessed via the monitor utility.

* Line speeds are selected through software. Refer to the software manuals for more information.

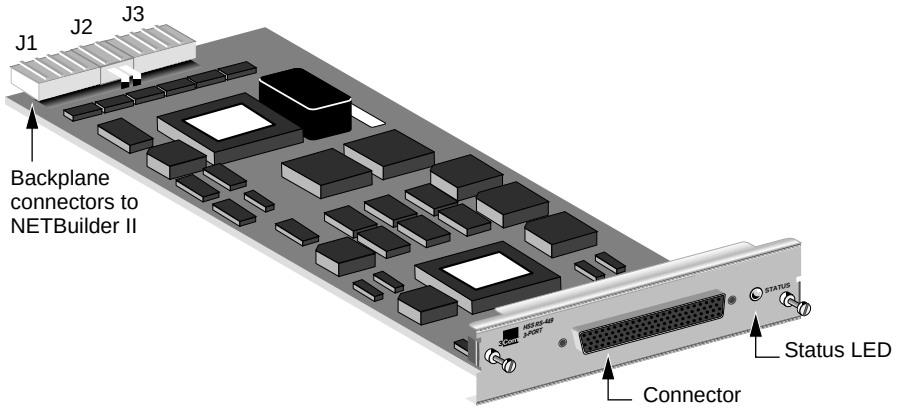
Network Configuration

The following figure shows an example of a typical HSS RS-449/X.21 3-port module and NETBuilder II Bridge/Router network using RS-449 *or* X.21 connections.



Specifications

This section describes the HSS RS-449/X.21 3-Port module components and gives the specifications of the board. The following figures show the module's surface and backplane.



Status LED

The module has one tricolor LED that indicates status. The status LED is located on the module's connector/LED panel. Table 2-2 explains the LED states.

Table 2-2 LED States

LED	Color	Indicates	Normal Behavior
STATUS	Green	Normal operation	On continuously
	Off	Module disabled	Off
	Yellow	Self-test	Off
	Red	Fault or reset	Off

Connectors

Table 2-3 describes the connector information for the module and cable.

Table 2-3 HSS RS-449/X.21 3-Port 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	78-pin cable connector	78-pin	Connects module to HSS RS-449 *or* X.21 3-Port cable
HSS RS-449 3-port cable	Three RS-449 connectors	37-pin	Connects module to RS-449 interface
HSS X.21 3-port cable	Three X.21 connectors	15-pin	Connects module to X.21 interface

Physical Specifications

Table 2-4 and Table 2-5 list the module's physical dimensions and the maximum current consumption.

Table 2-4 Physical Dimensions

Attribute	Description
Length	8.8 in (22.3 cm)
Width	3.9 in (9.9 cm)
Height	0.6 in (1.5 cm)
Weight	8.5 oz (0.24 kg)

Table 2-5 Maximum Current Consumption

+5 Volts	+12 Volts	-12 Volts
1.0 amp	0.04 amps	0.04 amps

3 TROUBLESHOOTING AND MAINTENANCE

This chapter describes how to troubleshoot and maintain the HSS RS-449/X.21 3-port module. Malfunctions that can occur include:

- Self-test failure at startup
- Inappropriate network connection
- 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 HSS RS-449/X.21 3-Port Module

Symptom	Cause	Action
The following message is displayed at startup: `HSS RS-449 3-Port Interface: Self Tests failed - slot X` (The value of X can be 1 through 4 or 1 through 8, depending on whether you have a 4-slot or an 8-slot NETBuilder II chassis.)	Self-test failure	■ 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.

If the board has a physical interface to another serial device and the following message is displayed:
`Path 1 Available`
`Path 1B Available`
`Path 1C Available`
but the next message is *not* displayed:
`Path 1 Up`
`Path 1B Up`
`Path 1C Up`
	Incomplete path	Make sure the cable is securely attached.
		If the cable is attached correctly and your paths are still not coming up, make sure there is a complete data path and correct clocking between both ends of the serial link. Check DSU/CSU and telco connections.
		If the paths still do not come up, check that your software configuration is correct.

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.

Table 3-1 Troubleshooting the HSS RS-449/X.21 3-Port Module (continued)

Symptom	Cause	Action
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. ■ 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.

Maintenance

This section describes preventive maintenance and how to replace the HSS RS-449/X.21 3-port module.

Preventive Maintenance

3Com recommends the following procedures for preventive maintenance:

- Follow the electrical and environmental requirements in Appendix A of the *NETBuilder II Base System Installation Guide*.
- Keep the area around the NETBuilder II base system clean.
- Provide sufficient air space around the NETBuilder II base system for proper ventilation.
- Observe ESD guidelines whenever handling the HSS RS-449/X.21 3-port module.

Refer to the *NETBuilder II Base System Installation Guide* for preventive maintenance tips that apply to the entire system.

Replacing the Module

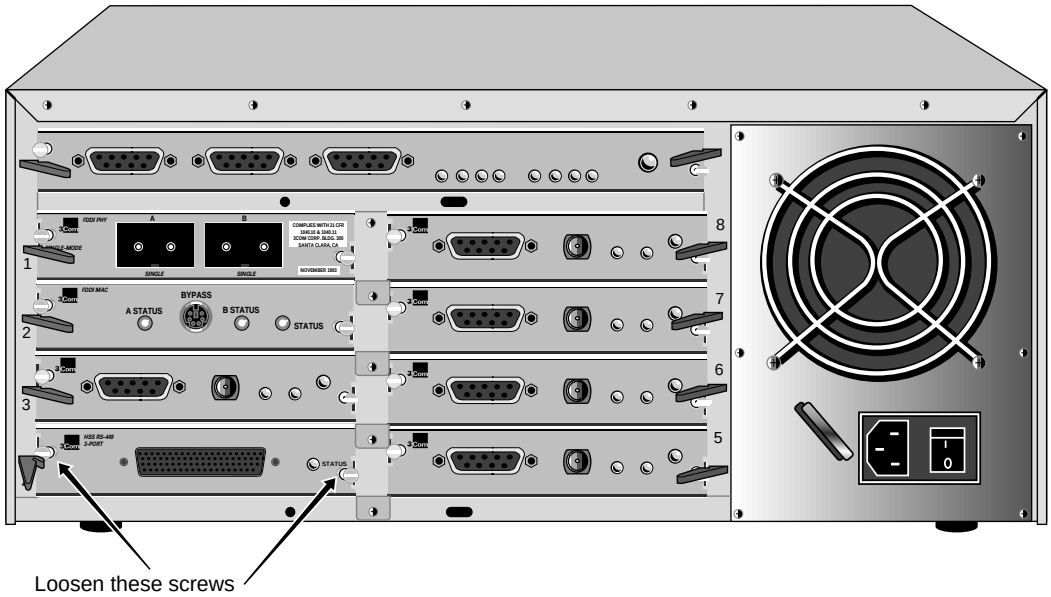
If any component in the module fails, you will need to replace the entire module. The HSS RS-449/X.21 3-port module can be hot-swapped, which means that you can safely remove and install a new one without turning off or rebooting the NETBuilder II system. To perform the following procedure, you may need a small flatblade screwdriver.

Follow these steps to remove and replace the HSS RS-449/X.21 3-port module:

1. Disconnect any network cabling from the module, then remove the cable from the strain relief bracket.

   You do not need to remove the bracket.

2. Unscrew the two captive screws (use a screwdriver if necessary) that anchor the board in the slot until they disengage from the chassis. Do not remove the screws from the I/O panel.



If you have a dualwide NETBuilder II chassis, skip step 3.

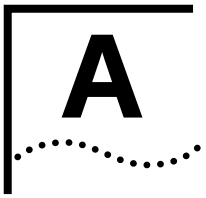
3 Release the ejector tabs on both sides of the board by pushing the tabs apart.

The board will disengage from the NETBuilder II backplane and partially eject from the slot.

4 For the dualwide NETBuilder II chassis, use one hand to disengage the ejector tab by pulling it back, and simultaneously use the other hand to pull on the anchoring screw on the opposite side of the I/O panel.

5 Use both hands to grasp the board and gently pull it from the slot.

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)
- 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 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) (442) 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, trouble-shooting 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 touchtone telephone. International access numbers are:

Country	Fax Number
Hong Kong	(852) 537 5610
U.K.	(44) (442) 278279
U.S.	(1) (408) 727 7021

Local access numbers are available within the following countries:

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

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 Library™, 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
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) 3243 9234

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) (628) 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) (442) 278000	(44) (442) 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 expense, correct any such defect by repairing the defective product or part or, at its option, by delivering to Customer an equivalent product or part to replace the defective item. 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.

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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.

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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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