3Com®

ONline Ethernet Bridge Module Installation and Operation Guide

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How to Use This Guide

This guide describes the architecture, principal features, operating characteristics, and diagnostic procedures of the ONline™ Ethernet Bridge Module. It also describes the controls and indicators of the Bridge Module and explains how to install and verify its operation. This guide is applicable for firmware Version 2.12 of the module.

Audience

This guide is intended for the following people at your site:

❑ Network manager or administrator

❑ Hardware installer

Structure of This Guide

This guide contains six chapters and four appendices:

Chapter 1, Introduction – Introduces the ONline Ethernet Bridge Module from a functional point of view and explains the front panel LEDs, button, and connectors.

Chapter 2, Installation – Discusses important setup information and provides illustrated procedures for installing, configuring, and verifying the operation of the Bridge Module.

Chapter 3, Management Functions – Describes the management capabilities of the Bridge Module, such as setting a password or viewing network statistics.

Chapter 4, Management Commands – Provides a complete reference of Bridge Management commands, parameters, and values.

Chapter 5, Troubleshooting – Provides help in isolating and correcting problems that can arise during installation and during normal operation.

Chapter 6, Firmware Download Instructions – Describes the process you will need to follow to download new firmware to your Bridge Module when upgrades are issued from 3Com.

Appendix A, Specifications – Provides Bridge Module product specifications.

Appendix B, Spanning Tree Discussion – Explains the Spanning Tree Parameters that can be set within the Bridge Module and describes how a network configuration would appear using Spanning Tree.

Appendix C, Cable Pinouts – Shows the pinouts for the transceiver cable and RS-232 cable.

Appendix D, Power-Up Self-Test – Describes the Bridge Module power-up self-test routines and lists error codes and solutions.

Appendix E, - Technical Support – Lists the various methods for contacting the 3Com technical support organization and for accessing other product support services.

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Document Conventions

The following document conventions are used in this manual:

Convention	Indicates	Example
Courier text	User input	In the Agent Information Form, enter `MIS` in the New Contact field.
	System output	After pressing the Apply button, the system displays the message `Transmitting data`.
Bold command string	Path names	Before you begin, read the readme.txt file located in **/usr/snm/agents**.
Italic text in braces	User-substituted identifiers	Use the following command to show port details: `SHOW PORT {`*slot*`.all} VERBOSE`
Capitalized text in plain brackets	Keyboard entry by the user	Type your password and press [ENTER].
Italics	Text emphasis, document titles	Ensure that you press the Apply button *after* you add the new search parameters.

Convention	Indicates	Example
Note:	A **Note**. The information is important	**Note:** Use STP lobe cables for your system.
Caution:	A **Caution.** A condition may damage software or hardware	**Caution:** Do not put your installation diskettes on a magnetic surface. This may damage the diskettes.
Warning:	A **Warning.** A condition may threaten personal safety	**Warning:** Wear eye protection when performing these maintenance procedures.

Related Documents

This section provides information on supporting documentation, including:

❑ 3Com Documents

❑ Reference Documents

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3Com Documents

The following documents provide additional information on 3Com products:

17-Slot ONline System Concentrator Installation and Operation Guide – Explains how to install, operate, and manage the 3Com ONline 17-Slot System Concentrator (Models 5017C-LS and 5017C with load sharing).

6-Slot ONline System Concentrator Installation and Operation Guide – Explains how to install, operate, and manage the 3Com ONline 6-Slot System Concentrator.

ONline Ethernet Management Module Installation and Operation Guide – Explains how to install, operate, and use the 3Com ONline Ethernet Management Module.

ONline Management Commands Guide – Provides an alphabetized reference resource describing all ONline management commands.

For a complete list of 3Com documents, contact your 3Com representative.

Reference Documents

The following documents supply related background information:

Case, J., Fedor, M., Scoffstall, M., and J. Davin, *The Simple Network Management Protocol*, RFC 1157, University of Tennessee at Knoxville, Performance Systems International and the MIT Laboratory for Computer Science, May 1990.

Rose, M., and K. McCloghrie, *Structure and Identification of Management Information for TCP/IP-based Internets*, RFC 1155, Performance Systems International and Hughes LAN Systems, May 1990.

1 *Introduction*

This chapter describes the ONline™ Ethernet Bridge Module basic capabilities, operation, and system configuration alternatives. The ONline Ethernet Bridge Module is referenced throughout this manual as the Bridge Module.

The Bridge Module

The Bridge Module is a high-performance bridge that transparently interconnects your facility-wide Ethernet and IEEE 802.3 networks to form a single extended LAN. The Bridge Module fits into your ONline System Concentrator unit using only two slots and allows you to perform the following functions:

❑ Interconnect Ethernet and IEEE 802.3 subnetworks

❑ Isolate local traffic on subnetworks through dynamic and permanent packet filtering

❑ Configure redundant LAN interconnection by using the IEEE 802.1(d) Spanning Tree Protocol

❑ Monitor your extended LAN using network management features including:

– Traffic counters

– Diagnostic information

– Address Table information

Bridge Module Features

The following section describes the major features of the Bridge Module. These features include:

❑ Interoperability

❑ Spanning Tree Loop Control

❑ Traffic Localization

❑ Automatic Address Learning

❑ High Performance Design

❑ Transparent Operation

❑ Downloadable Firmware

❑ Network Management Capabilities

❑ Media Configuration Options

❑ Diagnostics and Self-Test

Interoperability

The Bridge Module provides one external 15-pin transceiver cable connector for hookup to an Ethernet and/or IEEE 802.3 subnetwork. If you do not make this external connection, both the incoming and outgoing connections are made over the backplane.

Depending upon the type of bridge connection you select (backplane or the AUI connection), an individual port can connect to any of the following devices:

- ONline System Concentrator
- Ethernet transceivers
- Ethernet repeaters
- Other data-link bridges

ONline System Concentrator

You can connect to another concentrator through the AUI port or through another module that is on the same channel as the Bridge Module. For example, you can use an ONline Fiber Module on the same channel as the bridge backplane connection to interconnect 10BASE-FB Stars, ONline System Concentrators, LAN-TO-LAN Hubs, 10BASE-FB/PC Adapter Cards, or 10BASE-FB Transceivers.

Ethernet Transceivers

You can use the Bridge Module to interconnect Ethermodem Broadband Ethernet LANs with the ONline System Concentrator. The Bridge Module front panel AUI port connects to a male AUI port on the Ethermodem transceiver. It can also be connected to the following transceivers:

- A transceiver multiplexer such as DEC's DELNI™
- A transceiver on a standard Ethernet coaxial cable
- A transceiver on a thin coaxial or twisted pair cable
- An Ethermodem® broadband transceiver

Ethernet Repeaters

You can use the Bridge Module to interconnect Ethernet/IEEE 802.3 subnetworks that contain repeaters. The bridge acts as a node on each subnetwork to which it is attached, and therefore does not affect the maximum distance or repeater limitations.

Other Bridges

The Bridge Module can operate on an expanded LAN that contains other bridges under the following two conditions:

1. The other bridges must forward packets transparently at the data link layer.

2. The total end-to-end delay in the extended network must not exceed the time-out requirements of higher level protocols. 3Com does not recommend configuring the Bridge Module on networks with more than seven (7) bridge hops between any two nodes.

You can connect the Bridge Module to any of the above devices in various combinations and configurations. Refer to the section in this chapter, Media Configuration Options, for configuration examples and diagrams.

Note: The Bridge Module is not compatible with Ethernet Version 1 transceivers or cables.

Spanning Tree Loop Control

The Spanning Tree Algorithm and Protocol (STAP) is used among bridges in a LAN to ensure only single paths exist between stations. The Spanning Tree protocol is needed when there are parallel bridges forming a loop between Ethernet LANs on the network. This type of network also provides redundancy throughout the network so that if the primary bridge fails, a backup bridge will take over within 10 to 20 seconds.

If there are multiple Bridge Modules or Midnight Bridges between LANs on the network, the Spanning Tree protocol ensures that only one bridge enters the data sending (or forwarding) state. This bridge is called the *Designated* bridge. Other bridges remain in the blocking state until needed. While in the blocking state the bridge does not forward packets, but it does continue to monitor and participate in the Spanning Tree protocol. If the designated bridge fails for any reason, the blocked bridge will learn of the failure through the Spanning Tree protocol and enter the forwarding state.

More information about the Spanning Tree protocol is included in Appendix B.

Traffic Localization

The Bridge Module is a packet store-and-forward device that receives all packets and, if necessary, forwards them from the subnetwork on one side of the bridge to the subnetwork on the other side. The Bridge Module also acts as a packet filter, filtering packets based upon local destination addresses.

Filtering can isolate high traffic subnetworks from the rest of the LAN. For example, if the systems and servers in a cluster or subnetwork usually communicate with each other and rarely communicate with systems on other LANs, the Bridge Module does not forward that traffic to the extended LAN, except as needed.

The Bridge Module allows you to set up to 100 device addresses to be *always forwarded to* or *never forwarded to*. This can be used to keep sensitive subnetwork traffic local at all times. Enhanced network performance is also gained through the use of this feature.

Topology Switching

Topology switching enables you to automatically change the extended LAN topology without having to recable or take the network down. Bridging functionality lets you switch between any two ONline channels or between any ONline channel and an external Ethernet network. Topology switching is performed using the Bridge Module's command interface. The Bridge Module automatically recalculates the Spanning Tree to reorient the bridge in the network.

Automatic Address Learning

When attached to a subnetwork, the Bridge Module dynamically learns the addresses of all nodes on the subnetwork - thus it is called a *learning*

bridge. The Bridge looks at the source address of each packet generated on the subnetwork and creates a database containing these addresses.

Note: If a node does not generate any packets, its location cannot be dynamically learned by the Bridge Module.

When a packet is received by the Bridge Module, its destination address is compared with the addresses in the source subnetwork database. Table 1-1 describes what happens when a packet is received by the Bridge Module.

Table 1-1. Packet Distribution by Bridge Module

The Destination Address is..	The Packet is...
Found in the source subnetwork database	Considered to be local to that subnetwork (its source and destination are on the same subnetwork). The Bridge Module does not forward the packet.
Not found in the source subnetwork database	Considered to be on a different subnetwork and forwarded onto the other subnetwork (or the destination node has not generated any traffic).

High-Performance Design

While address filtering can reduce traffic loads on your network, it is important to overall network integrity for a learning bridge to run as fast as the network. The Bridge Module ensures high performance in the following ways:

1. It uses high-speed multi-port memory so the IEEE 802.3 controllers and the CPU all have separate access to the common packet memory. Once a packet is received into this memory, it does not have to be copied to be forwarded.

2. It uses dedicated hardware to accelerate the address filtering operation to ensure the highest possible performance in an 802.3 to 802.3 bridge (Figure 1-1).
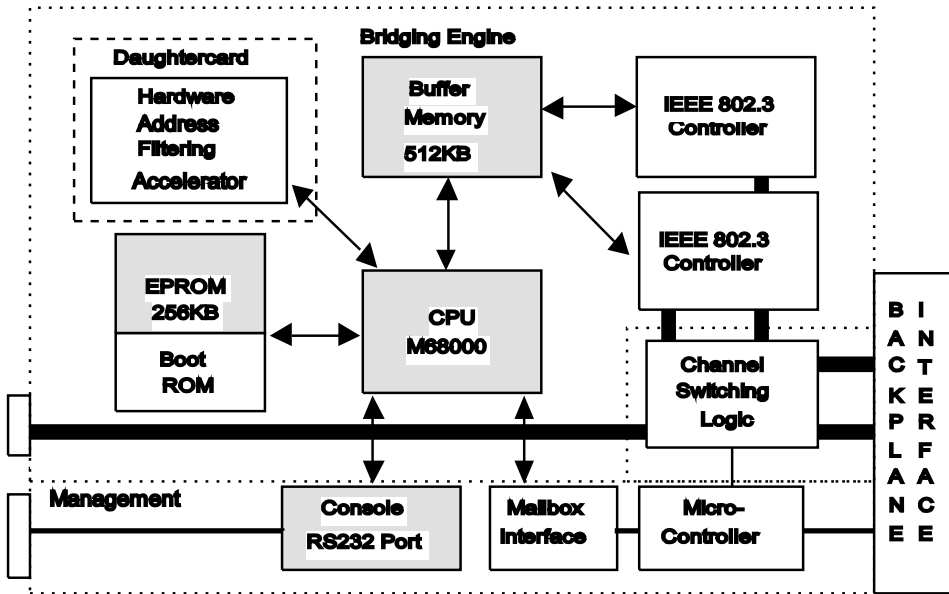
Figure 1-1. Bridge Module Hardware Design

Transparent Operation

The ONline Ethernet Bridge Module operates transparently to other stations on the LAN, therefore no special software is required on any other station. This means an extended LAN using Ethernet Bridge Modules can support any protocol that runs over IEEE 802.3 LANs, such as Sun Microsystems NFS, Novell Inc. NetWare, 3Com 3+, and other products based on protocols such as XNS, TCP/IP, and ISO.

Downloadable Firmware

As firmware upgrades become available from 3Com, you can download this new firmware to your Bridge Module using an IBM-compatible PC connected to the module's RS-232 serial port. Downloadable firmware ensures that you have access to new features as soon as possible - saving the cost, time, and inconvenience of installing new PROM chips. This feature is explained in detail in Chapter 6, Firmware Download Instructions.

A 3Com Firmware Distribution Kit (Part number 5000-FDK) is necessary for downloading the firmware to your Bridge Module. This kit contains the appropriate RS-232 cable and software for performing future firmware upgrades. The kit is ordered as a single copy per site, supporting multiple Bridge Modules. The upgrades themselves are contained in another kit, the Ethernet Bridge Update Distribution Kit (Part number 5102B-UDK-x.x).

The Ethernet Bridge Update Distribution Kit is available in two versions - limited and unlimited. The limited version (5102B-UDKL-x.x) allows you to upgrade only one Bridge Module. The unlimited version (5102B-UDKU-x.x) enables you to upgrade an unlimited number of Bridge Modules.

Network Management Capabilities

You access the Bridge Module management functions through an out-of-band connection via the serial RS-232 port on the front panel. You can also access the module through an inband connection from an existing Bridge Module, Midnight Bridge, or network management module. To manage all other Bridge Modules and manageable devices in the extended LAN via inband management, you must first log out of the current session and then log in to another device. Refer to the REMOTE_LOGIN command in Chapter 4 for details on accessing remote devices.

Connection through the RS-232 port means you can manage your Ethernet Bridge Modules locally, from remote locations using modems and dial-up telephone lines, and through LAN-based terminal servers.

This version of the Bridge Module software also provides SNMP (Simple Network Management Protocol), which allows the bridge to be managed from a SNMP-based network management workstation.

The Bridge Module offers capabilities to help manage your extended LAN. The primary categories of management functions are:

1. Bridge and Network Status Reporting

2. Network Statistic Collection and Reporting

3. Bridge Address Filter Settings

The reporting and other network management options are described in detail in Chapters 3 and 4.

Media Configuration Options

The Bridge Module offers two connection alternatives:

❑   One AUI port connector (port 1) and one Backplane channel (port 2)

❑   Two Backplane channels (ports 1 and 2)

Message traffic flows between stations on LANs connected by the Bridge Modules as if they were on one extended LAN. Since CSMA/CD (Carrier Sense Multiple Access/Collision Detection) collision information does not have to propagate between interconnected networks on an extended LAN, you can configure each LAN up to the normal maximum length and number of stations.

A sample configuration is shown in Figure 1-2.
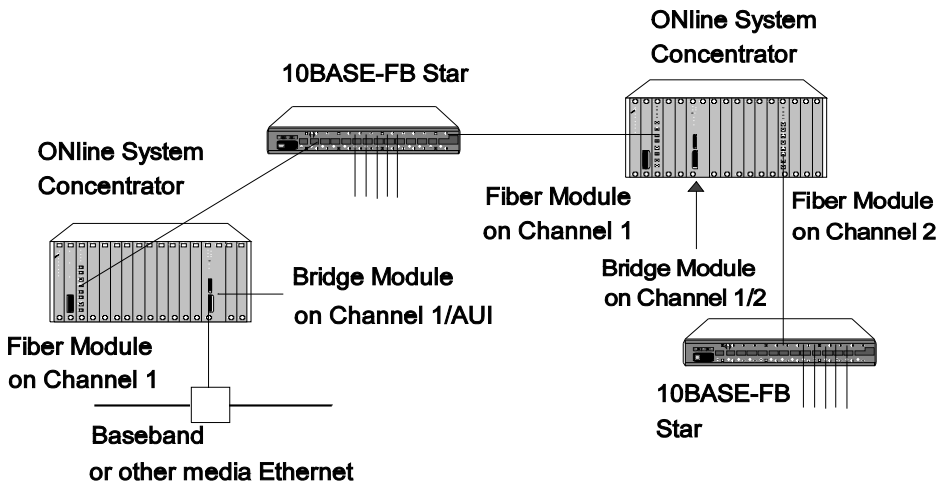
Figure 1-2. Sample Bridge Module Configuration

⚠ **Caution:** If your extended LAN includes protocol-specific routers, make sure the total number of routers in the extended LAN does not exceed the maximum allowed by the protocol for a single LAN.

AUI and Backplane Connections

When the bridging connections are made through the AUI port on the front of the Bridge Module and over the backplane, the distance between two end-node devices can be:

❑ 8000 meters for baseband (4000 meters from the backplane connection and 400 meters from the AUI connection)

❑ 8000 meters for broadband (4000 meters on each side of the bridge)

An example of a thick-cable configuration is shown in Figure 1-3.
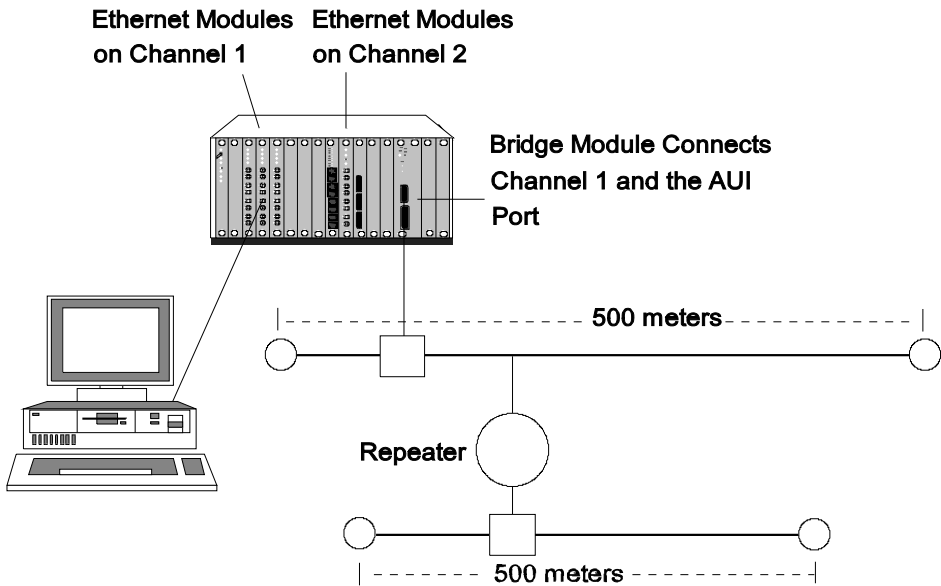
Figure 1-3. Backplane Channel Bridged to Broadband Segment

Backplane Connections

When you bridge two channels using the backplane as both port 1 and port 2, the maximum distance between two end-node devices can be 8000 meters (4000 m on each side of the bridge). This type of configuration is shown in Figure 1-4.
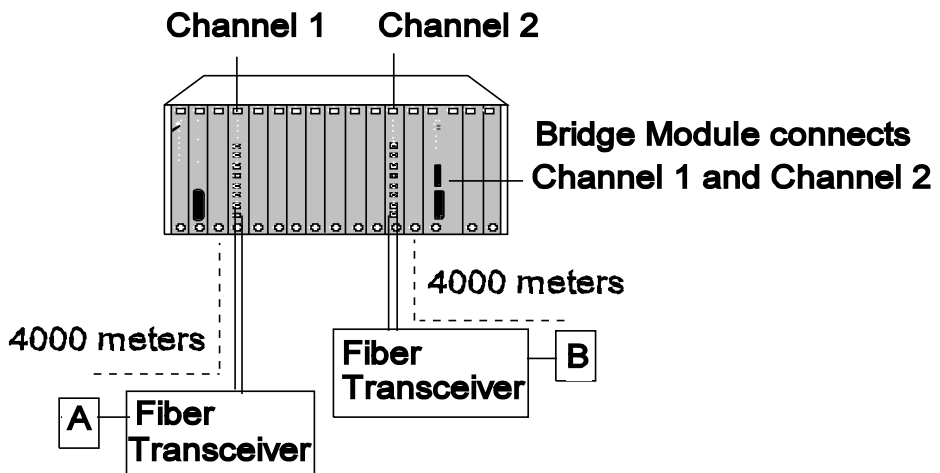
Figure 1-4. Backplane Channels Bridged Together

Diagnostics and Self-Test

On power-up, the Bridge Module performs the following diagnostic tests:

❑ Bridge self-tests

❑ CRC check of code memory (Flash EPROM)

❑ Port loopback tests

These tests allow the Bridge Module to check its own circuitry and communication interfaces to verify its ability to send and receive data. If the bridge fails any of the diagnostics, the front panel LEDs indicate an error code. Power-up self-test and error codes are described in Chapter 5 and in Appendix D. You can also diagnose local and remote bridges using the management commands. These commands allow you to view bridge and network information that is helpful in diagnosing network and bridge problems. Chapter 4 provides a complete description of each Bridge Module command.

2 *Installation*

This chapter describes the precautionary, unpacking, and installation procedures for the Bridge Module. It also provides illustrations of the module and describes the front panel indicators, button, and connectors. This chapter is divided into the following sections:

❑ Precautionary Procedures

❑ Unpacking Procedures

❑ Summarized Bridge Installation Procedure

❑ Installation Procedures

❑ Confirming Bridge Operation

This chapter provides examples of the commands necessary to initially configure the Bridge Module. In the examples, user input is indicated as lower-case underlined text.

Precautionary Procedures

Electrostatic discharge (ESD) can damage static-sensitive devices on circuit boards. Follow these precautions when you handle the Bridge Module.

❑ Do not remove the board from its anti-static shielding bag until you are ready to inspect it.

❑ Handle the board by the faceplate only.

Use proper grounding techniques when you install the Bridge Module. These techniques include using a foot strap and grounded mat or wearing a grounded static-discharge wrist strap. An alternate method is to touch a grounded rack or other source of ground just before handling the module.

Unpacking Procedures

Use the following procedure when unpacking your Bridge Module.

1. Verify that the Bridge Module is the correct model by matching the model number listed on the side of the shipping carton to the model number you ordered (5102B-EE).

   Note that the product model number printed on the shipping box differs from the model number on the product. The model number on the shipping box contains the prefix '3C9'.

2. Remove the module in its anti-static shielding bag from the shipping carton.

3. Remove the module from the anti-static shielding bag and inspect it for damage. Always handle the Bridge Module by the faceplate, being careful not to touch the components.

   If the module appears to be damaged, replace it in the anti-static shielding bag, return it to the shipping carton and contact your local supplier.

3Com suggests you keep the shipping carton and anti-static shielding bag in which your module was shipped in case you later want to repackage the module for storage or shipment. Record the serial number of your Bridge Module and other information specific to your modules in the Slot Usage Chart in Appendix B of the *ONline System Concentrator Installation and Operation Guide.*

Summarized Bridge Installation Procedure

The following list summarizes the procedure for installing and operating the Bridge Module.

❑ Plug the Bridge Module into the ONline System Concentrator with the loopback connector attached to the AUI port and verify internal diagnostics.

❑ Once the Bridge Module passes diagnostics, pull it back out of the concentrator and set the dip switches to the two channels you want to bridge (or set these values through network management without removing the module).

❑ Plug the module back in the concentrator and the Bridge Module performs self-test diagnostics. Upon completion of the diagnostics, the unit begins learning the addresses of nodes on either side by monitoring network traffic.

❑ Connect an ANSI terminal to the RS-232 port on the module faceplate to configure SNMP values and any optional parameters.

❑ Monitor the extended LAN using the bridge management capabilities through your connected terminal or via a modem or other interface providing asynchronous serial communications.

Module Front Panel

The front panel has eight indicators (LEDs), one button, two connectors, and the module extractor. The front panel indicators inform you of the operating state of your Bridge Module. Figure 2-1 shows the Bridge Module front panel and Table 2-1 lists the function of each LED, button, and connector on the module faceplate.
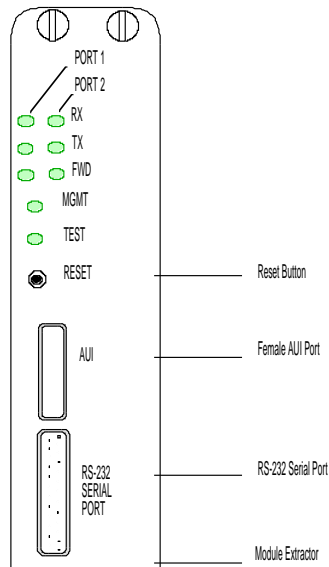
Figure 2-1. Bridge Module Front Panel

Refer to Appendix D for information on using and interpreting the Bridge Module front panel controls and indicators.

Module Extractor

The module extractor is located at the bottom of the module faceplate. Use the module extractor to remove the module from the concentrator.

Just pull the extractor lever down to remove the module from the concentrator.

Table 2-1. Bridge Module LEDs, Button, and Connectors

Label	Function
RX	Indicates receive activity on the IEEE 802.3 or Ethernet network connected to that port.
TX	Indicates transmit activity on the IEEE 802.3 or Ethernet network connected to that port.
FWD	Indicates that the bridge is in forwarding state and is sending packets from that port.
MGMT	Indicates that administrator mode of the bridge is currently active.
TEST	Indicates Bridge Module self-test activity.
RESET	Press this button to reset the Bridge Module. Same as issuing the RESET command or plugging in the module.
AUI	Female AUI connector for 15-pin transceiver connection.
RS-232 SERIAL PORT	RS-232 port for connecting terminal, terminal server, PC or modem for Management Interface.

Dip Switches

The Bridge Module has one dip switch component with 4 switches, located on the larger of the two boards on the module. The switches on this dip switch enable you to set the channels that are to be bridged together. Figure 2-2 shows the location and factory settings of the dip switch on the module.
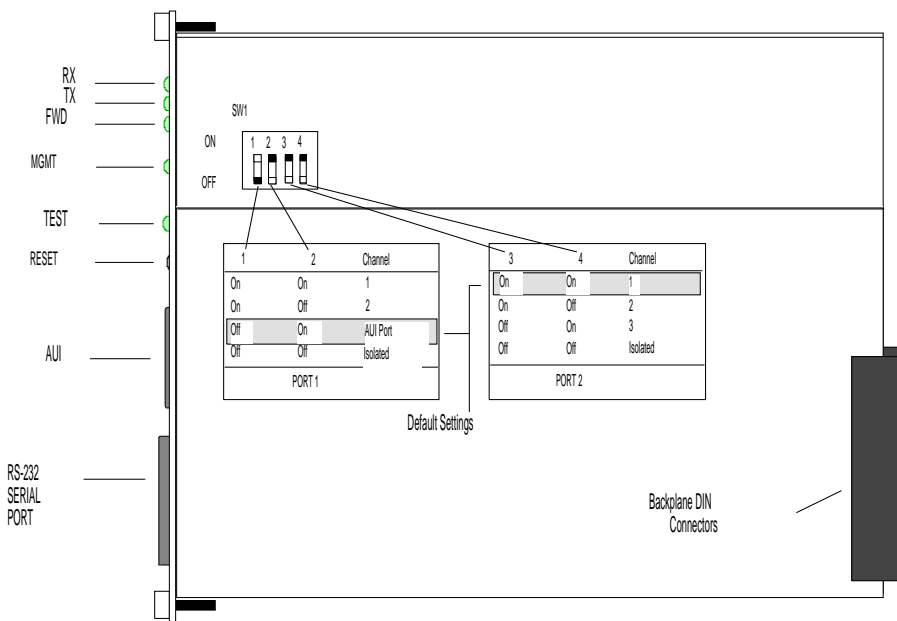
Figure 2-2. Bridge Module and Dip Switch Location

Channel-Select Switch Settings

All ONline media modules are equipped with the technology to work with the ONline System Concentrator's unique TriChannel™ Architecture. This architecture lets you assign the module to any of three channels on the ONline System Concentrator backplane. Refer to Chapter 1 in the *ONline System Concentrator Installation and Operation Guide* for a complete discussion of ONline's TriChannel Architecture.

The channel-select switches on the Bridge Module enable you to assign the module to bridge any two backplane channels, or to bridge one backplane channel to the AUI port on the front of the module. Both channels *must* be running Ethernet/IEEE 802.3.

Switch 1 is factory-set to the Off position and switches 2, 3, and 4 are factory-set to the On position. Therefore, the Bridge Module is initially configured to bridge the AUI port on the front of the module to backplane channel 1. The default settings are highlighted in the Table 2-2. To configure the module to bridge different channels, refer to the information in Table 2-2.

Table 2-2. Channel Select Dip Switch Settings

Port 1	Switch 1	Switch 2	Port 2	Switch 3	Switch 4
Channel 1	On	On	Channel 1	On	On
Channel 2	On	Off	Channel 2	On	Off
AUI Port	Off	On	Channel 3	Off	On
Isolated	Off	Off	Isolated	Off	Off

If you have an ONline network management module installed in your concentrator, you can remotely override these switch settings. Refer to the appropriate ONline Management Module Installation and Operation Guide for information on remotely managing the ports.

Related Features

The following sections describe functions that allow you to:

❑ check the module's channel assignment and LED functionality

❑ remotely manage the Bridge Module from another device

LED and Channel Verification

The ONline Controller Module is equipped with an LED check button on the front panel. The LED check button has two functions: it causes all LEDs in all modules in the concentrator to light, and it causes each module to identify the channel to which it is assigned. When you press this button, the module initiates a test to all modules in the concentrator. Any LED that does not light is defective.

After the five seconds elapse, the diagnostic continues with a channel check of all modules. Each Port Status LEDs should respond by blinking the number of times to correspond with the channel to which it is assigned. The channel check sequence repeats five times. Table 2-3 explains the channel check codes.

Table 2-3. Channel Check Codes

Port 1 LEDs	Port 1 Configuration	Port 2 LEDs	Port 2 Configuration
1 Blink	Port is configured for channel 1	1 Blink	Port is configured for channel 1
2 Blinks	Port is configured for channel 2	2 Blinks	Port is configured for channel 2
4 Blinks	Port is configured to the AUI connector	3 Blinks	Port is configured for channel 3
Off	Port is isolated	Off	Port is isolated

Remote Network Management

The ONline Ethernet Management Module (EMM) and ONline Token Ring Management Module (TRMM) provide remote network management capabilities for the ONline System Concentrator and its modules. These management modules also have the ability to override the channel-select dip switches on the Bridge Module. Refer to the appropriate ONline Management Module Installation and Operation Guide for additional information on network management features.

You can also log into the Bridge Module from a network management module, from another Bridge Module, or from a Midnight Bridge. This type of connection is called *inband* management. Once logged into this module you are able to make changes and show statistics as if you were locally connected to the module.

Installation Procedures

You do not need to power down the ONline System Concentrator to install the Bridge Module. You can insert the module while the concentrator is operating (this is called a *hot insertion*). The installation procedure is divided into the following steps:

❑ Pre-installation test

❑ Connecting a terminal

❑ Connecting the transceiver cable

❑ Selecting bridge and channel settings

Pre-Installation Test

When you install the Bridge Module into the concentrator, the unit performs a self-test to verify proper operation of the internal hardware and communication interfaces. To test the unit independently of network activity, follow these steps prior to plugging the module into the concentrator:

1. Install the provided Ethernet loopback connector to the AUI port on the module as shown in Figure 2-3.
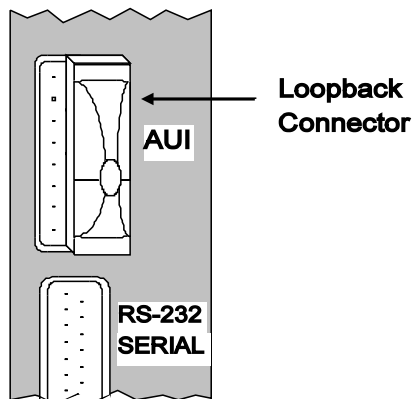
Figure 2-3. Connecting Loopback Connector

2. Remove two adjacent blank concentrator panels to expose two slots for the Bridge Module.

3. Insert the module into the board guides at the top and bottom of the slots and slide it into the concentrator. Make sure the connectors are well seated into the backplane of the concentrator.

Figure 2-4 shows the installation of the Bridge Module.
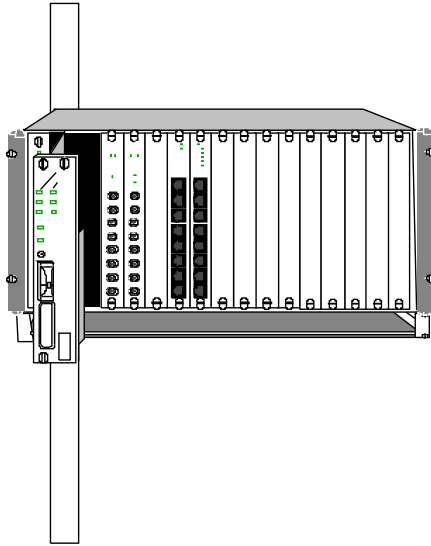
Figure 2-4. Installing the Bridge Module

4. Fasten the three spring-loaded screws on the front of the Bridge
   Module faceplate to the concentrator with your fingers to provide
   ground - do not overtighten.

As the Bridge Module performs its internal diagnostics, the Test LED on the
front panel remains lit. Various LED combinations appear during the
self-test. If the power-up self-test is successful, the Test LED goes off after
approximately 20 seconds and the module returns to the configuration set
up by the dip switches and the TX LED will blink.

If none of the module faceplate LEDs light or if the Test LED blinks, refer to
Table 2-4 for appropriate action.

Note: The loopback connector must be attached to the AUI port or the self-test will not function properly.

Table 2-4. Power-Up Problem Resolution

Problem	Possible Solutions
All indicators are off	Verify that the concentrator is receiving power.
	Press the LED/Channel Check button on the ONline Controller Module to check if the LEDs light.
	Pull the Bridge Module out using the module extractor and re-insert it into the concentrator.
The Test LED is blinking	Your unit failed the power-up self-test. Write down the LED blink sequence displayed on the front panel and refer to Appendix D to identify the error code.
	If you cannot correct the error at your site, contact 3Com Customer Support as explained in Appendix E.

If these alternatives fail to fix the problem, your unit is malfunctioning. Repack it in the shipping carton and contact your 3Com representative for corrective action.

5. Once the self-test is successful, remove the loopback connector and continue with the installation procedure.

Connecting a Terminal

You access Bridge Module management through the management interface - the RS-232 port on the front of the module. You can connect any device that presents an ASCII asynchronous interface, including terminals, PCs capable of terminal emulation, and modems.

Note: If the concentrator has an installed network management module, you can use the REMOTE_ LOGIN command to link to the Bridge Module to perform bridge management. Refer to the appropriate ONline Management Module Installation and Operation Guide for information on remote management.

For proper operation you need to make sure the terminal and Bridge Module are communicating at the same baud rate before connecting them. The Bridge Module has been factory-set to 9600 baud. You must initially configure your terminal to a 9600 baud rate so it can communicate with the module. Consult your terminal's user guide for instructions on how to set its baud rate. In addition, you must configure the terminal's parity, number of data bits, and stop bits to the Bridge Module factory defaults as shown in Table 2-5.

Table 2-5. Bridge Module Default Terminal Settings

Parameter	Factory Setting
Baud	9600
Data_bits	8
Parity	None
Stop_bits	2
Flow Control	XON/XOFF

Once you have configured your terminal to match the factory defaults of the Bridge Module, you can connect a cable from the terminal to the RS-232 port on the Bridge Module.

Connecting to the Bridge Module RS-232 Port

The RS-232 cable connects to the management interface on the Bridge Module front panel. Table 2-6 defines general cabling guidelines that apply for connecting various devices to the management interface..

Table 2-6. RS-232 Cable Guidelines

Device	Cable
Terminal	Female-to-female crossover Female-to-male crossover
Modem	Male-to-female straight-through
Terminal Server	Refer to Supplier Documentation

Note: The 3Com Firmware Distribution Kit (5000-FDK) provides a cable for connection to a PC or terminal.

Appendix C describes the proper pinouts for male-to-female, crossover RS-232 cable.

Connecting the Transceiver Cable

This section explains how to connect the transceiver cable to the AUI port on the Bridge Module. If you do not intend to use the AUI port to connect to a subnetwork, skip this section.

To install the transceiver cable, follow these steps while referring to Figure 2-5:

1. Push the slide latch to the up position.

2. Plug the transceiver cable into the jack.

3. Firmly push the slide latch down until it snaps into the locking position.

4. Gently pull on the connector to make sure the latch is secure.

3Com recommends strain relief for this cable to avoid placing undue stress on the connector.
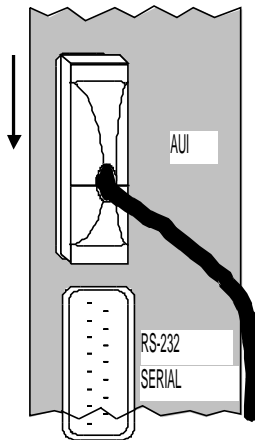
Figure 2-5. Connecting Transceiver Cable

Setting Bridge and Channel Parameters

Before selecting the channels that the module will bridge, verify that the transceiver cable connection (if used) is secure at both ends of the cable and that the transceiver is on a valid terminated segment. Then, follow the steps below to complete the installation.

1. If you plan to manage the Bridge Module through an SNMP workstation, you must set the following SNMP values: IP address, Community Table, Default Gateway, Subnetwork Mask, and Alert settings.

2. Set the address filtering attributes (hard-coded addresses that are not to be forwarded to, or that should always be forwarded to) using the SET FILTER command. At this time you should also set any other bridge settings that need to be changed before actually setting the channels to bridge, such as Spanning Tree parameters.

3. The default setting is for the Bridge Module to configure the channels from the dip switch settings at startup and when rebooted. If you set the channels through management (through a network management module or from Bridge Module Management) you need to issue the command as shown below to ensure that in the future, the Bridge Module configures from the values in memory:

```
OEBM>  set bridge dip_configuration disable  [ENTER]
OEBM>  save bridge  [ENTER]
```

4. Select the channels that the module will bridge using one of the three procedures explained below.

   a. Using a terminal attached to the Bridge Module, issue the SET BRIDGE CHANNEL command. For example, the commands SET BRIDGE CHANNEL PORT1 1 and SET BRIDGE CHANNEL PORT2 2 will bridge channels 1 and 2 on the concentrator backplane. Refer to Chapter 4 for a complete description of the SET BRIDGE CHANNEL command.

   b. Using a terminal attached to a network management module, issue the SET PORT NETWORK command. For example, the command below sets port 1 of a Bridge Module in slot 5 to backplane network 1. Refer to the appropriate ONline Management Module Installation and Operation Guide for a complete description of the SET PORT NETWORK command.

   ```
   EMM>  set port 5.1 network ethernet_1  [ENTER]
   ```

c. If you do not have a terminal connected to either the Bridge Module or to a management module, slide the module out from the concentrator (using the module extractor) and manually set the dip switches on the board to bridge two channels. Refer to Table 2-2 and Figure 2-2 in this chapter for an explanation of the dip switch settings.

5. Verify that the bridge is working properly by viewing the TX and RX LEDs. If there is traffic on the subnetworks, the transmit and receive LEDs on the front panel will be blinking. If there appears to be a problem, refer to Chapter 5, Troubleshooting.

Figure 2-6 shows an installed Bridge Module.
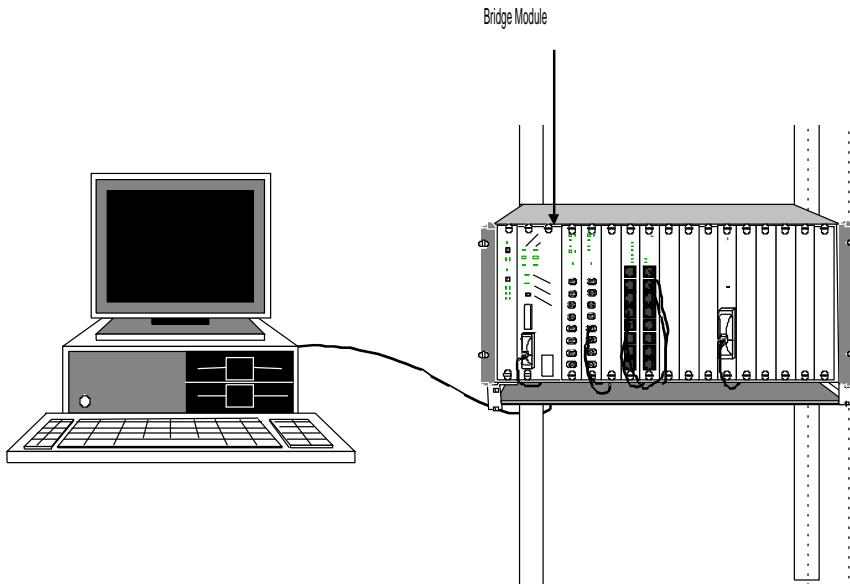
Figure 2-6. Installed Bridge Module

Confirming Bridge Operation

You confirm operation of the Bridge Module by sending packets between two Ethernet or two IEEE 802.3 nodes on separate subnetworks. Here are some suggested ways of doing this depending on your application:

❑ If your application uses MS-DOS networking software such as Digital Equipment's DECnet™-DOS or PCSA, Novell's NetWare, or 3Com's 3+, simply issue a DOS command when logged into your server directory.

❑ If your application accesses UNIX host computers using the TCP/IP protocol, attempt to establish a terminal connection using the Telnet protocol, or to transfer a file using the FTP protocol.

❑ If your application accesses DEC VAX™ hosts using LAT, attempt to establish a terminal connection.

❑ Issue the PING diagnostic command to verify whether the Bridge Module is active.

Follow the steps listed above to send packets across the Bridge Module and watch the front panel indicators to verify the packets are being transmitted and received.

3 *ManagementFunctions*

This chapter shows you how to get started once you have installed the Bridge Module in your concentrator and also explains the management capabilities of the Bridge Module.

You can use Bridge Management to:

❑ modify the configuration of your Bridge Module to suit your specific application

❑ customize filtering attributes

❑ display information about the network and local or remote bridge status

❑ display packet counters and network errors

❑ download new firmware to your Bridge Module (Chapter 6)

Using Bridge Management

This section explains how to access Bridge Management, enter and edit commands, get help, view, modify, and save parameters. This section also describes how to display status information about your network and your Bridge Module.

Note: Bridging software enables you to execute Management commands regardless of bridging activity. Therefore, bridging performance will be affected for the duration of the command execution.

Connecting to the Management Interface

Refer to the section titled "Connecting a Terminal" in Chapter 2 for instructions on connecting your terminal to the Management Interface (RS-232 port).

Entering and Editing Commands

You manage the Bridge Module by entering commands at the management prompt. The default management prompt is "OEBM>," but can be customized. Use the keys described in Table 3-1 when entering commands on the command line.

Caution: If the management prompt appears as ">>," it means that the current Flash EPROM is faulty and that the system is running off the Boot PROM (a subset of the operational code). Type the HELP command for information on the V1.3 command set. This command set will keep your bridge operational, but with reduced capabilities.

Contact 3Com Customer Support as outlined in Appendix E.

Table 3-1. Command Line Key Functions

Key	Function
[BS] or [Backspace]	Moves the cursor back one character and deletes that character.
[DEL] or [Delete]	Same as Backspace.
[ENTER]	Enters the command.
[SPACE]	Completes a command through *command completion.*
[CTRL-C]	Returns to a blank command line (management prompt) at any time.
[CTRL-R]	Retypes the previous command string on the command line.
?	Displays the available commands or command options.

Command Completion

Bridge Management accepts abbreviated command input through a feature called Command Completion. With Command Completion you need only type the minimum number of letters required to distinguish the command or argument from other acceptable choices and press the SPACE bar to complete the command. An example of command completion is shown below:

```
OEBM> sa       [SPACE]
```

After you press [SPACE], the command is completed as follows:

```
OEBM> save
```

If the letters you enter are not sufficient to determine a unique command, Bridge Management waits for you to enter more characters. For example,

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entering the letter S followed by [SPACE] is not sufficient for Bridge Management to determine which command you are issuing because there are three commands that start with S - SAVE, SET, and SHOW.

Getting Help

The HELP command displays a screen of general information on using Bridge Management. For example, type *help* at the command line, press [ENTER], and the following screen of help information displays.

```
OEBM> help  [ENTER]

Usage: help {command}
        {command}  :: Chipcom       |
                      clear       *|
                      help         |
                      logout       |
                      maintain    *|
                      monitor      |
                      ping         |
                      remote_login |
                      reset       *|
                      revert      *|
                      save        *|
                      set         *|
                      show         |

 Help provides useful information to remind a knowledgeable
 user of the meaning of commands.  The commands with an
 asterisk are administrator commands only.
```

If you press [ENTER] when an argument is expected, Bridge Management prompts for additional information. You can type a question mark (?) in response to any prompt to list acceptable commands, arguments, or parameter values.

The Bridge Module management interface provides you with commands that enable you to examine, modify, and save parameters. These commands and their use are described next.

Examining Parameters

The SHOW command lists the current value of any parameter you specify. For example, the SHOW SPANTREE command displays the current spanning tree parameters, as shown below.

```
OEBM> show spantree [ENTER]

Spanning Tree Parameters:
Mode                    Enabled
Bridge Priority         0
Path Cost Port 1        10
Path Cost Port 2        10
Hello Time (sec)        2
Forward Delay Time (sec) 15
Listen Time (sec)       20
Spantree Hello Address:  01-80-C2-00-00-00
```

The SHOW DEVICE command displays the current device parameters and values for the Bridge Module.

```
OEBM> show device  [ENTER]

ONline Ethernet Bridge Module (OEBM); SNMP Management
Name: OEBM

Boot EPROM Version:  v1.3    Serial Number: 330658  Restarts: 7
Flash EPROM Version: v2.0    Service Date:  / /

Location:
3rd Floor Engineering

                         Port 1                    Port 2

MAC Address:      08-00-8F-10-17-48        08-00-8F-10-17-49
IP address              127.0.0.1                 127.0.0.1
Subnet Mask            FF.FF.FF.00               FF.FF.FF.00
Default Gateway 0.0.0.0 0.0.0.0

For assistance contact:
Network Administrator

Diagnostics: ENABLED
SQE Mode: NORMAL
```

Modifying Parameters

Parameter values are stored in non-volatile memory on the Bridge Module. Your Bridge Module unit is shipped from the factory with specific default parameter values. Some of the default parameter settings are shown on the previous page in the example explaining the SHOW DEVICE command.

Use the SET command to modify parameter values. You must first type the administrator password when you log in to the management interface. The administrator password provides access to commands that allow you to modify the current bridge configuration.

Once you have entered the administrator password, you can change parameter values using the SET command. Listed below is an example of changing the Bridge Module terminal baud rate.

```
OEBM> set terminal baud 1200  [ENTER]
Terminal parameter changed
```

Once you have made all the parameter changes you want, you may want to issue the SAVE ALL command and then logout of administrator mode to prevent any unauthorized changes.

Saving Parameters

When you reboot the system, all parameters that can be set are reset to their saved values. Therefore, to save the new parameter values you changed and make them effective on the next reboot, you *must* issue the SAVE command before rebooting. Use the SAVE command to save parameter values for the following groups:

❏ All

❏ Alert

❏ Bridge

❏ Community

❏ Device

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❑ Filter

❑ Spantree

❑ Terminal

When you make configuration changes using the SET command, these changes are effective immediately but are not saved permanently. You must issue the SAVE command to keep the new configuration values. Only saved values are in effect upon reset of the module or concentrator.

Note: If a power failure occurs within the concentrator, all unsaved parameter values are lost.

Getting Started

This section briefly describes the steps to follow once the Bridge Module has been installed in the ONline System Concentrator and a terminal has been attached to its RS-232 port. Table 3-2 outlines these steps. The following section, Bridge Management Parameter Overview, describes each step in detail.

Table 3-2. Procedures for Getting Started

Procedure	Command	Priority
1. Configure your terminal to default Bridge Module communication settings	Refer to your terminal vendor's documentation	Mandatory
2. Configure the Bridge Module		
❑ Set administrator password	SET DEVICE PASSWORD ADMINISTRATOR	Mandatory

Table 3-2. Procedures for Getting Started (Continued)

Procedure	Command	Priority
❑ Set user passwords	SET DEVICE PASSWORD USER	Recommended
❑ Set the Bridge Module: Name, Management Prompt, Location Contact information	SET DEVICE NAME SET TERMINAL PROMPT SET DEVICE LOCATION SET DEVICE CONTACT	Recommended
❑ Set Terminal Timeout value	SET TERMINAL TIMEOUT	Recommended
3. Configure Bridge Module SNMP values:		
❑ Set the Bridge Module: IP Address, Community Table, Default Gateway, Subnetwork Mask, and Alert Settings	SET DEVICE IP_ADDRESS SET COMMUNITY SET DEVICE DEFAULT_GATEWAY SET DEVICE SUBNET_MASK SET ALERT	Mandatory if you plan to manage via SNMP or use the PING command
4. Configure Spanning Tree Parameters	SET SPANTREE…	Recommended
5. Save all configuration values you set	SAVE ALL	Mandatory

Bridge Management Parameter Overview

Bridge Management parameters fall into five general categories:

❑ Management Interface

❑ Remote Management

❑ Bridge Module Operation and Performance (Configuration)

❑ Filtering

❑ Statistics

The categories and specific parameters are discussed in the following sections. All commands, arguments, and parameters are listed with examples in Chapter 4.

Management Interface Parameters

The following three parameters control the configuration of the Bridge Management Interface:

❑ Terminal Settings

❑ Prompt

❑ Password

Note that the new parameters you set are effective immediately; however, you must use the SAVE command for the new parameters to remain effective after a system reboot. Remember that you must first use the administrator password to enable use of the SET command.

Configuring the Terminal

You must initially configure your terminal to the same parameter settings as the Bridge Module so the terminal and the bridge can communicate.

These parameters settings include the terminal's baud rate, data bits, parity, and stop bits. For example, the BAUD parameter determines the baud rate at which the RS-232 Bridge Management interface receives and transmits data.

Note: If you need to set the module baud rate to a rate slower than 9600 baud, use a terminal set to 9600 baud to first change the value. Once you change the baud rate for the module, the terminal loses the connection to the bridge because it is now set to a different speed. You must reset the terminal's baud rate to match the Bridge Module's new baud rate and then press [ENTER] to regain access to the module. You may then use the SAVE TERMINAL command to save the new baud rate.

Your terminal settings must match the bridge factory default values as shown in Table 3-3.

Table 3-3. Bridge Module Terminal Parameter Options and Factory Defaults

Parameter	Options	Factory Default
Baud	300, 1200, 2400, 4800, 9600	9600
Data_bits	7 or 8	8
Parity	odd, even, or none	none
Stop_bits	1 or 2	2

Once you have configured your terminal to match the factory defaults of the Bridge Module, press [ENTER] and the following header and password prompt are displayed:

```
copyright 1992 Chipcom Corporation
ONline Bridge Module (v2.x)
```

Press [ENTER] and the Password prompt is displayed.

```
Password:   [ENTER]
```

Initially the default password is a null string. You must enter a password within 10 seconds of receiving the Password: prompt or the terminal will display "Password timed out". If this happens, just press [ENTER] to receive the password prompt again. By pressing [ENTER] at the Password prompt, the following greeting and the management prompt is displayed.

```
Welcome to system administrator services on ONline.
OEBM>
```

You are now logged in as the administrator with full access to all commands.

Setting Bridge Module Terminal Options (Optional)

This section is optional and is only used if you need to connect another device to an Bridge Module that runs at a slower baud rate or different parity or data bits values than the factory settings. For example, if you plan on connecting a 4800 baud modem to an Bridge Module so that you can remotely manage the concentrator, you need to change the Bridge Module factory default baud rate from 9600 to 4800.

Enter the following command to change the baud rate to 4800:

```
OEBM> set terminal baud 4800          [ENTER]
```

Once you change the baud rate (or parity or data bits values), you lose your connection to the terminal immediately. Therefore, you must change the corresponding value on the terminal and then press the [ENTER] key to return to the OEBM> prompt and then SAVE the terminal settings.

Note: Terminal values you set using the SET command are not saved permanently until you issue the SAVE TERMINAL command. Once the values are saved, if you log out or even if the power fails, the saved values are retained.

Automatic Modem Hangup

If you use a modem to connect to the Bridge Module, you may want to use the SET TERMINAL HANGUP command to hang up the modem connection automatically when you log out of the Bridge Module. The factory default is disable, which does not automatically hang up a modem. The following example shows the command used to automatically hang up the modem once you log out of the Bridge Module.

```
OEBM> set terminal hangup enable          [ENTER]
```

Note: If you fail to hang up the modem connection, an unauthorized user may pick up the last login session.

Configuring the Bridge Module

Now that the terminal settings are complete, you can configure the Bridge Module in the concentrator. We recommend that you complete the following steps when you log in for the first time:

1. Establish passwords

2. Configure other Bridge Module parameters

3. Set Bridge Module SNMP values

Establishing Passwords

Bridge Management provides a password-protection capability that allows you to control access to certain commands and information. You must be in administrator mode to be able to change passwords. Note that when you first log in the default password is [ENTER]. This default password will provide you with administrator privileges.

Use the SET DEVICE command to modify passwords. Both the administrator and the user passwords can contain up to 15 characters. Alphanumeric and special characters are allowed, including [DEL] and [BS].

The Bridge Module has two levels of password control:

1. Administrator Password - the administrator password provides access to *all* Bridge Module commands, enabling both read and write configuration access.

2. User Password - the user password provides *limited* access to Bridge Module commands, enabling read access only.

Typing the HELP command will list the bridge command set with administrator commands designated by an asterisk (*) as shown earlier in this chapter.

Note: For security, the characters you enter in both the old and new password fields are not displayed on the screen.

The new passwords you set are in effect immediately, but you must use the SAVE DEVICE (or SAVE ALL) command to save the new passwords permanently.

Establishing the Administrator Password

Use the SET DEVICE PASSWORD ADMINISTRATOR command at the management prompt to establish the administrator password.

```
OEBM> set device password administrator          [ENTER]

Enter current administrator password: <current password>  [ENTER]
New password:  <new password>  [ENTER]
Verify:        <new password>  [ENTER]

Administrator password changed.
```

Establishing the User Password

Use the SET DEVICE PASSWORD USER command at the management prompt to establish a user password. Note that you must be logged in as the administrator to change the user password.

```
OEBM> set device password user        [ENTER]

Enter current administrator password:  <current password>  [ENTER]
New  password:     <new user password>  [ENTER]
Verify:            <new user  password>  [ENTER]

User password changed.
```

Configuring Other Bridge Module Parameters

The Bridge Module is factory set to certain default values that you may need to change before using the Bridge Module, for example the Bridge Module management prompt. If you are logged in as the administrator, you can use the SET command to change or add the following Bridge Module information:

❑ Bridge Module name (alias)

❑ Management prompt

❑ Contact name and location

❑ Terminal timeout value

❑ Concentrator Reboot Values

A full explanation of these values and how you set them is discussed in Chapter 4 under the applicable SET command.

Bridge Module Name (Alias)

To make communication with your remote Bridge Modules easier, we recommend that you assign a unique name to each Bridge Module. You can then use this name (instead of the IP address or Ethernet MAC address) to reference the appropriate Bridge Module. In this manner you can log into a remote Bridge Module by issuing the REMOTE_LOGIN NAME <Bridge Module Name> command. Use the SET DEVICE NAME command to assign a unique name to your Bridge Module.

Bridge Module Management Prompt

You can customize the management prompt to a string of up to 15 characters long. The default management prompt is the string " OEBM> ". A new prompt could also include the angle bracket (>) and the trailing space if desired.

Modify the management prompt by using the SET TERMINAL PROMPT command as shown below.

```
OEBM> set terminal prompt Bridge_A>  [ENTER]
Bridge_A>
```

3Com recommends that you set a unique management prompt for each Bridge Module in the network. Doing so helps identify the specific Bridge Module to which you are connected during remote management functions. Refer to the REMOTE_LOGIN and LOGOUT commands and the Remote Management section in this chapter for more information on remote management.

Note: 3Com recommends that you set the prompt to the same value as the Bridge Module name (alias).

Contact Name and Location

You should enter the name of an appropriate service contact and the concentrator location at this time to provide a handy reference should there be a network problem. Use the SET DEVICE LOCATION and SET DEVICE CONTACT commands to identify the location of the Bridge Module and the name of the person responsible for the Bridge Module.

Terminal Timeout

You should set the terminal timeout value to specify the amount of time your terminal will remain logged in without any keyboard activity. This feature is useful for keeping unauthorized users off the system if you leave your terminal without logging off. Once timeout has been set, the terminal automatically logs you off the system if there is no keyboard activity for the set period of time.

The default timeout value is 0, which means that no timeout has been set - you will never be logged off automatically. Use the SET TERMINAL TIMEOUT command to set the timeout period in minutes.

Concentrator Reboot Values

When the Bridge Module is reset (or rebooted) using the factory default settings, the module performs a full diagnostic check and then sets all parameters to the settings stored in its memory (except for channel configuration if dip configuration is enabled). You have the option to disable the diagnostics if you want the Bridge Module to boot up faster. You also have the option to have the Bridge Module initialize its channel configuration from memory (software settings) rather than its dip switch settings.

Use the SET DEVICE DIAGNOSTICS DISABLE command to bypass the diagnostics and the SET DEVICE DIP_CONFIGURATION DISABLE command to force initialization of the Bridge Module channel configuration from its memory settings.

Setting SNMP Values

If you plan to manage the Bridge Module through an SNMP workstation you must set the following attributes:

❑ IP Address

❑ Community Table

❑ Default Gateway

❑ Subnetwork Mask

❑ Alerts

IP Address

To manage via SNMP, every device on your network must have a unique IP address. Use the SET DEVICE IP_ADDRESS command to assign unique IP addresses to your Bridge Module ports. The following example shows the command to assign an IP address to port 1 of the Bridge Module.

```
OEBM> set device ip_address_port1 195.24.25.36        [ENTER]
```

Community Table

The community table defines which SNMP stations on the network can access and/or modify information from the Bridge Module, and which station(s) will receive traps generated from the Bridge Module. Use the SET COMMUNITY command to create a community table entry. For example, the following command adds a community name of NCS with IP address 195.337.36.58 to have read_write access:

```
OEBM> set community NCS 195.337.36.58 read_write     [ENTER]
```

You can use the SHOW COMMUNITY command to view the existing community entries.

Default Gateway

The default gateway is the IP address of the gateway that will receive and forward packets whose addresses are unknown to the local network. The default gateway is useful when sending Bridge Module alert packets to a manager workstation that is on a different network. For example, the following command specifies the gateway with the address 195.24.25.36 to be used as the default gateway for port 2 of the Bridge Module.

```
OEBM> set device default_gateway_port2 195.24.25.36    [ENTER]
```

Subnetwork Mask

The subnetwork mask is specific for each type of Internet class. In general, the subnetwork mask is a 32-bit IP address with all ones (1) in the network and subnetwork portions of the address and zeroes (0) in the host portion. The subnetwork mask is input as four pairs of hexadecimal digits separated by periods to represent the 32-bit binary address. For example, to set the subnetwork mask for a class C network you would enter the following command.

```
OEBM> set device subnet_mask_port1 FF.FF.FF.0    [ENTER]
```

The subnetwork mask for a class B network would be set using the following command.

```
OEBM> set device subnet_mask_port1 FF.FF.0.0    [ENTER]
```

Alert Settings

The SET ALERT command is used to enable or disable sending alerts to the SNMP management workstation. Refer to the SET ALERT command for information on the different types of alerts you can set. For example, the following command enables sending an alert when a configuration change is made to the concentrator or Spanning Tree topology change is detected.

```
OEBM> set alert change enable  [ENTER]
```

Remote Management

Remote Management is used to set and view parameter values for a remote Bridge Module, Midnight Bridge, or network management module. Once you are connected to a local bridge, you initiate remote management by issuing the REMOTE_LOGIN command, naming the remote device or IP address to which you want to connect, and specifying port 1 or port 2.

Note that issuing the REMOTE LOGIN command will affect bridging performance for the duration of the remote connection.

Once you are connected to a remote bridge, the management prompt you created for that bridge is displayed on your monitor. Therefore, each Bridge Module management prompt should be unique and reference the bridge name to remind you that you are connected to a remote bridge. Any parameter changes you make and any display type commands you issue when connected to the remote bridge are performed on the remote Bridge Module.

Disconnect from the remote Bridge Module by issuing the LOGOUT command.

Bridge Module Operation and Performance (Configuration)

Several bridge parameters affect the performance and operation of the Bridge Module. These parameters can be set during initial setup and can also be changed later during normal operation of the bridge using the management commands. The parameters in this category include:

❑ AGEING_TIME

❑ SPANTREE

AGEING_TIME

The AGEING_TIME parameter tells the Bridge Module when to "age out" (automatically remove) addresses from the *dynamic* filtering table (default ageing period is 5 minutes). Once you set this value, the bridge will remove addresses from the table when the node with the specific address fails to transmit for the age period. For example, the command below would age out an address once it was inactive for 17 minutes.

```
OEBM> set ageing_time 17 [ENTER]
```

Note that this command has no effect on addresses in the *static address table* filter table.

Spantree

The SET SPANTREE command controls all of the Spanning Tree configuration settings. These settings include:

- – bridge priority
- – forward delay time
- – hello and listen times
- – mode
- – the path cost for each port

Refer to the SET SPANTREE section in Chapter 4 for more information on the SPANTREE command. Refer to Appendix B for information on the Spanning Tree Algorithm and Protocol.

Filtering Parameters

Filtering is an important capability of the Bridge Module because it allows particular nodes to be isolated on different subnetworks. This feature keeps heavy traffic on one subnetwork from slowing down the entire network. There are two filtering tables that the bridge uses: the *dynamic filter table and the static address filter table*. The dynamic filter table is generated automatically by the bridge as explained below and the static address filter table is built using the SET FILTER command.

When attached to a subnetwork, the Bridge Module dynamically learns the addresses of the nodes on the subnetwork. The Bridge Module looks at the source address of each packet generated on the subnetwork and creates the dynamic filter table from these addresses.

When a packet is received by the Bridge Module, its destination address is compared to the addresses in the dynamic filter table. If the destination address is found in the dynamic filter table, the packet is determined to be local and the Bridge Module does not forward the packet to the other subnetwork. If the address is not in the dynamic filter table, the packet destination is assumed to be on a different subnetwork (or the destination node has not generated any traffic) and the bridge forwards the packet accordingly. (Use the SHOW FILTER DYNAMIC_ADDRESS_TABLE command to list all dynamic addresses known by each port.)

Static Address Filter Table

The SET, CLEAR, and SHOW commands allow you to establish, remove, and display permanent filtering attributes for specific nodes. The SET command establishes a permanent entry in the static address filter table: an entry which is never "aged out." This can improve network performance by controlling the flow of packets based on your specific network topology and traffic patterns.

For example, the following command tells the Bridge Module to never forward packets to destination address 0800-8F00-0123 on port 2 from any node connected to port 1.

```
OEBM> set filter static_address_table never_forward_to_port2
0800-8f00-0123  [ENTER]
```

Management Functions 3 - 21

Statistics Parameters

Bridge Management statistics provide useful information regarding traffic loading and error conditions. The following commands are used to display, monitor, and clear statistics:

- ❑ SHOW

- ❑ MONITOR

- ❑ CLEAR

These commands are discussed briefly in the following paragraphs. Chapter 4 provides complete description and examples of these commands.

SHOW

The SHOW command displays current bridge attributes. You must use one of the SHOW command parameters to display bridge attributes. Several of the SHOW command parameters have parameters of their own.

Refer to SHOW command section in Chapter 4 for descriptions of all of the SHOW command parameters.

MONITOR

The MONITOR command enables you to periodically display network statistics for the bridge ports based upon the monitor rate that you request. This command offers four options that display screens of statistics similar to the SHOW command option screens.

The MONITOR command option screens are updated (based upon the requested time) to show changes to the bridge as they occur. You may want to use this command to keep a continuous display as to the status of your Bridge Module and network once setup is complete.

Press the [CTRL-C] to discontinue the current MONITOR command and return to the management prompt.

The MONITOR command will, by default, monitor the bridge statistics and use a time value of 5 minutes if you press [ENTER] instead of inputting a time and an option in the command line.

Note that when executing the MONITOR command, bridging performance will be affected for the duration of the command. To minimize this impact, use the default value.

CLEAR

The CLEAR command resets statistics and fatal-error registers associated with the SHOW and MONITOR commands to zero. The CLEAR command has four parameters: community, counter, filter, and last_error. The community, counter, and filter parameters also have parameters of their own.

Logging Out

When you are done using the Bridge Module, SAVE all your changes and then log out to prevent unauthorized use of the module. You log out of the system using the LOGOUT command as shown below. If you have not made any unsaved changes prior to issuing this command, you will be logged out of the system and the following message will display:

```
OEBM> logout          [ENTER]
Bye
```

If you have made changes and you have not saved these changes, LOGOUT prompts you as follows:

```
OEBM> logout          [ENTER]
WARNING: Save unsaved changes before logout.
OEBM>
```

You must either SAVE or REVERT the changes you made to the system before you will be able to log out of the system.

4 Management Commands

This chapter provides a complete alphabetized listing of the ONline Ethernet Bridge Module commands. Each command description includes examples of command usage and their results. Table 4-1, beginning on page 4-3, is a reference chart of the commands, their parameters, and the page where they can be found.

Note that the Bridge Module software enables you to execute Management commands regardless of bridging activity. Therefore, bridging performance will be affected for the duration of the command execution.

Conventions

The following conventions are used in the command descriptions contained in this chapter:

The management prompt is indicated as "OEBM>."

User input is indicated as lower-case underlined text. For example, *show device* or *set terminal baud.*

Responses from the Bridge Module appear as they do on your terminal screen.

A variable that requires specific user input is indicated by lower case text surrounded by curly brackets. For example, {new password}. When you type in the variable, *do not* include the angle brackets as part of the variable string .

[ENTER] refers to a carriage return.

Typing a '?' at the end of a command line will list the possible completions for that command and then redisplay the command line. If you type a '?' after the last parameter setting for a command, the prompt "Confirm with a carriage return" is displayed.

If a command line is incomplete and you do not type a '?' to list possible completions for that command, you will be prompted to enter the next required parameter.

Note that when setting parameters, you must supply a variable or value for that parameter, if required. Only the PING and the MONITOR commands allow a carriage return to insert a default value. Refer to these individual commands in this chapter for their default values.

Command Summary

Table 4-1 displays a summary of Bridge Module commands, their parameters, and the page number where they are located in this chapter. This list is compiled by command type: General, Configuration, Status, Statistics, Maintenance, and Special.

It is important to note that there are specific Bridge Module commands that must be used with caution. If used improperly, these commands have the potential to disrupt the network. These commands are marked in Table 4-1 with an asterisk (*). Read the command descriptions carefully before executing any of these commands.

Table 4-1. Bridge Module Command Index

Command Type	Command	Parameters	Page
General	?	{Bridge command} ?	4 - 9
	HELP	{Bridge command}	4 - 19
	LOGOUT	none	4 - 22

Table 4-1. Bridge Module Command Index (Continued)

Command Type	Command	Parameters	Page
Configuration	CLEAR	community	4 - 12
		counter	4 - 13
		filter	4 - 14
		last_error	4 - 15
	REVERT	alert	4 - 33
		all *	4 - 33
		bridge *	4 - 33
		community *	4 - 33
		device *	4 - 33
		filter *	4 - 33
		spantree *	4 - 33
		terminal	4 - 33
	SAVE	alert	4 - 35
		all	4 - 35
		bridge	4 - 35
		community	4 - 35
		device	4 - 35
		filter	4 - 35
		spantree	4 - 35
		terminal	4 - 35
	SET ALERT	authentication	4 - 38

Table 4-1. Bridge Module Command Index (Continued)

Command Type	Command	Parameters	Page
Configuration (continued)		change	4 - 38
		hello	4 - 38
	SET BRIDGE	ageing_time	4 - 41
		channel *	4 - 42
		dip_configuration	4 - 43
		side_switch_mode	4 - 44
	SETCOMMUNITY	community name ip_ address access (all are required)	4 - 46
	SET DEVICE	contact	4 - 50
		default_gateway_port1	4 - 51
		default_gateway_port2	4 - 52
		diagnostics	4 - 53
		ip_address_port1 *	4 - 54
		ip_address_port2 *	4 - 55
		location	4 - 56
		name	4 - 57
		password	4 - 58
		sqe_mode	4 - 60
		subnet_mask_port1	4 - 61
		subnet_mask_port2	4 - 62
	SET FILTER	mode protocol_id_table	4 - 64

Table 4-1. Bridge Module Command Index (Continued)

Command Type	Command	Parameters	Page
Configuration (continued)	SET FILTER (cont.)	protocol_id_table	4 - 66
		static_address_table	4 - 67
	SET SPANTREE*	bridge_priority *	4 - 70
		forward_delay_time *	4 - 71
		hello_address *	4 - 73
		hello_time *	4 - 75
		listen_time *	4 - 77
		mode *	4 - 79
		path_cost_port1 *	4 - 80
		path_cost_port2 *	4 - 81
	SET TERMINAL	baud	4 - 83
		data_bits	4 - 85
		hangup	4 - 86
		parity	4 - 87
		prompt	4 - 88
		stop_bits	4 - 89
		timeout	4 - 90
Status	SHOW ALERT	none	4 - 93
	SHOW BRIDGE	none	4 - 94
	SHOW COMMUNITY	none	4 - 96
	SHOW COUNTER	bridge	4 - 98

Table 4-1. Bridge Module Command Index (Continued)

Command Type	Command	Parameters	Page
Status (continued)	SHOWCOUNTER (cont.)	ports	4 - 100
		protocols	4 - 104
		spantree	4 - 106
	SHOW DEVICE	none	4 - 108
	SHOW FILTER	dynamic_address_table	4-111
		mode	4-112
		protocol_id_table	4-113
		static_address_table	4-114
	SHOW LAST_ERROR	none	4-115
	SHOW SPANTREE	none	4 - 116
	SHOW TERMINAL	none	4-119
Statistics	MONITOR (mm:ss)	bridge	4 - 25
		ports	4 - 25
		protocols	4 - 25
		spantree	4 - 25

Table 4-1. Bridge Module Command Index (Continued)

Command Type	Command	Parameters	Page
Maintenance	MAINTAIN	download out_of_band	4 - 23
	PING	ip_address	4 - 28
	RESET DEVICE	name	4 - 28
		none	4 - 32
Special	FORCE	none	4 - 16
	REMOTE_LOGIN	ip_address	4 - 30
		mac_address	4 - 30
		name	4 - 30

?

Use the ? command to list the available Bridge Module command choices
and parameter options.

Format

?

{command} ?

Parameters

Example

The following command displays the list of Bridge Module commands
available under the *administrator* password. Note that the ? character
does not display on the screen when typed, but is shown in the examples
for clarity.

```
OEBM> ?   [ENTER]
Possible completions:
clear
help
logout
maintain
monitor
ping
remote_login
reset
revert
save
set
show
```

Example

The following command displays the list of Bridge Module commands available under the *user* password. Note that the ? character does not display on the screen when typed, but is shown in the examples for clarity.

```
OEBM> ?  [ENTER]
Possible completions:
  help
  logout
  monitor
  ping
  remote_login
  show
```

Example

As shown below, you can use the ? command to view the available parameters for a command, as illustrated for the SAVE command.

```
OEBM> save ?  [ENTER]
Possible completions:
all
alert
bridge
community
device
filter
spantree
terminal
```

Description

As presented in the examples, the ? command is used to list the available Bridge Module command choices. In addition, it can be used as part of a command line to display a list of the possible completions for a specific command.

CLEAR COMMUNITY

Use the CLEAR COMMUNITY command to clear an entry from the community table. This command is only available in administrator mode.

Format

CLEAR COMMUNITY {community number}

Parameters

{community number} = 1 - 10 or all

Example

```
OEBM>  clear community 3   [ENTER]
Community 3 cleared
```

Description

The CLEAR COMMUNITY command enables you to clear an entry in the community table.

It is recommended that you use the CLEAR COMMUNITY command in conjunction with the SHOW COMMUNITY command to view the community table before you clear an entry from it.

The community table defines which SNMP stations on the network can access information from the Bridge Module and which station(s) will receive a trap generated from the Bridge Module.

CLEAR COUNTER

Use the CLEAR COUNTER command to clear all counters or a specific statistical counter. This command is only available in administrator mode.

Format

CLEAR COUNTER {counter type}

Parameters

{counter type} = all

> bridge
> ports
> protocols
> spantree

Example

```
OEBM>  clear counter bridge   [ENTER]
Done
```

Description

The CLEAR COUNTER command enables you to clear all counters or a specific statistical counter.

It is recommended that you use the CLEAR COUNTER command in conjunction with the SHOW COUNTER command to view statistics before you clear them.

CLEAR FILTER

Use the CLEAR FILTER command to clear an entry from the protocol id table or the static address table. This command is only available in administrator mode.

Format

CLEAR FILTER {parameter} {variable}

Parameters

{parameter} = protocol_id_table {protocol type}
              static_address_table {MAC address}

Example

```
OEBM>  clear filter protocol_id_table 0800    [ENTER]

Protocol ID deleted from filter table.
Do SAVE FILTER and RESET DEVICE to use changes.
```

Example

```
OEBM> clear filter static_address_table 03-00-06-07-17-01 [ENTER]

Address deleted from filter table.
Do SAVE FILTER and RESET DEVICE to use changes.
```

Description

The CLEAR FILTER command enables you to clear entries from the static address table and the protocol id table.

It is recommended that you use the CLEAR FILTER command in conjunction with the SHOW FILTER command to view filter table entries before you clear them.

You must issue the SAVE FILTER and RESET DEVICE commands after modifying the tables for the changes to take effect.

CLEAR LAST_ERROR

Use the CLEAR LAST_ERROR command to clear the file that contains information on the last fatal error that occurred at the Bridge Module. This command is only available in administrator mode.

Format

CLEAR LAST_ERROR

Parameters

Example

```
OEBM>  clear last_error   [ENTER]
Last fatal error cleared
```

Description

The CLEAR LAST_ERROR command clears the file that contains information on the last fatal error that occurred at the Bridge Module.

Use the CLEAR LAST_ERROR command in conjunction with the SHOW LAST_ERROR command to view a fatal error before you clear it.

FORCE

Use the FORCE command to override the current Bridge Module administrator password. It should only be used in the case when the password was illegally changed or forgotten. The FORCE command can only be entered at the login prompt.

Format

FORCE

Parameters

Description

The FORCE command enables you to force the administrator password back to its factory default (carriage return). This command can only be used at the login password prompt.

The FORCE command requires that you provide answers to two prompts about the LED sequence displayed on the front panel of the module before you can reset the administrator password - requiring you to be physically located at the concentrator where the module is installed.

To revert the current administrator password to its factory default (carriage return), you must interpret 2 hex digits from two consecutive LED displays at the Bridge Module front panel and enter these values at the login prompt. You have 30 seconds in which to enter the hex digits for each display.

When you respond to both prompts within their 30 second time limits and provide the correct interpretation of the displayed LED sequences, the Bridge Module displays the message "Access Accepted" and performs a reset. At the subsequent Password: prompt, press the ENTER key to access administrator mode on the bridge. You may then use the SET DEVICE PASSWORD ADMINISTRATOR command to establish a new administrator password.

If either response to the LED interpretation prompts is incorrect or you exceed the 30 second time limit, the bridge displays the message "Access Denied" and performs a reset with the current administrator password retained. You will then need to repeat the FORCE command to retry the LED interpretation.

Example
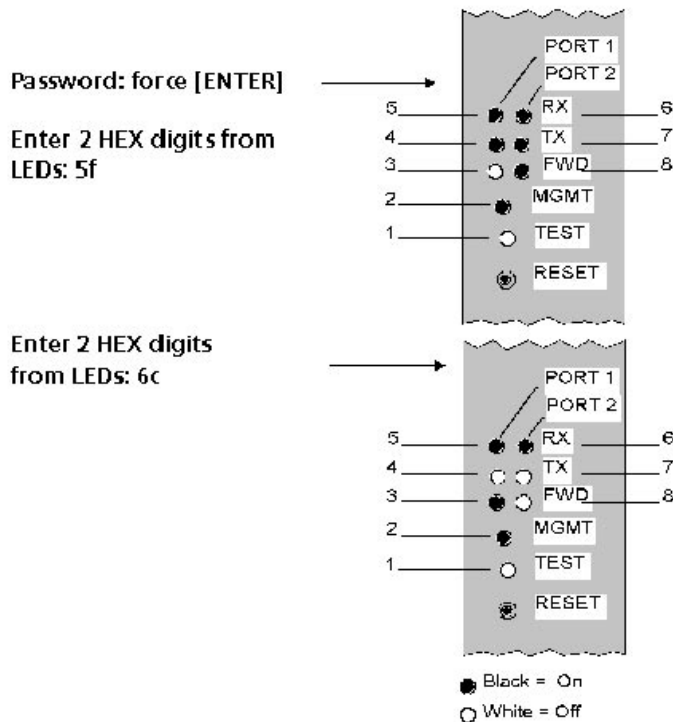
To successfully interpret the eight LED display, you must read the LEDs from 1 - 8 (refer to the illustration in the FORCE command example) with LED 1 representing the most significant (left-most) binary digit and LED 8 representing the least significant (right-most) binary digit. A solidly lit LED is translated into a 1 and an unlit LED is translated into a 0.

The 2-digit hexadecimal number represented by these eight binary digits must then be entered as the response to the bridge prompt. If you

successfully interpret the first LED pattern, a second pattern is displayed which you must also interpret. If you successfully interpret the second pattern, the bridge will reboot. At the Password: prompt you will be able to press carriage return to access administrator mode of the bridge.

As an example, the front panel LED sequence for the first illustration on the previous page translates into 01011111, which is 5f in hexadecimal notation. Likewise, the LED sequence for the second illustration translates into 01101100, which is 6c in hexadecimal notation.

HELP

Use the HELP command to get information concerning the meaning of the commands.

The HELP ? command will display a list of possible completions for the HELP command. When in user mode, this list will only contain the possible completions that a user may enter. When in administrator mode, this list will contain all possible command completions.

Format
HELP {command}

Parameters
{command} = Chipcom
        clear
        help
        logout
        maintain
        monitor
        ping
        remote_login
        reset
        revert
        save
        set
        show

Example

```
OEBM>  help  [ENTER]

Usage: help {command}
    {command}          Chipcom
                       clear *
                       help
                       logout
                       maintain *
                       monitor
```

```
                        ping
                        remote_login
                        reset *
                        revert *
                        save *
                        set *
                        show
Help provides useful information to remind a knowledgeable
user of the meaning of the commands.  The commands with an
asterisk are administrator commands only.
```

Example

```
OEBM>  help Chipcom  [ENTER]

Southborough Office Park
118 Turnpike Road
Southborough, MA 01772-1886

To call Chipcom Customer Support in the United States, call
800-228-6840 between the hours of 8:30 am and 5:00 pm, Eastern
Time.  Outside of the United States, call 508-460-8900 and ask
for extension 4340 or Tech Support.
```

Description

In addition to the HELP command functions described in the examples, the Bridge Module provides two additional features to assist you in selecting commands and arguments: command completion and the completion list.

Command Completion

Command completion eliminates the need to type the entire command or argument name. Pressing the SPACE bar after partially typing the command fills in the remainder of the command name. You must type enough letters for command completion to distinguish the command.

Completion List

A completion list displays a list of available choices with which to complete a command line. A completion list is obtainable at *any* point by typing "?." For example, when you type SET ?, the following completion list is displayed:

```
OEBM> set ?  [ENTER]
Possible Completions:
    alert
    bridge
    community
    device
    spantree
    terminal
```

LOGOUT

Use the LOGOUT command to end a local or remote login session.

Format

LOGOUT

Parameters

Example

Logging out from a local Bridge Module:

```
OEBM> logout     [ENTER]
Bye
```

Description

If you are logged into the local Bridge Module (the Bridge Module to which the terminal is connected), issuing the LOGOUT command ends the session.

If you are logged into a remote Bridge Module or other device (e.g., Midnight Bridge) and issue the LOGOUT command, the terminal session with the remote device is broken and resumed with the local Bridge Module.

MAINTAIN

Use the MAINTAIN command to enter maintenance mode. Maintenance mode allows you to download new software to the Bridge Module through the DOWNLOAD command. This command is only available in administrator mode.

Format

MAINTAIN {parameter}

Parameter

{parameter} = download out_of_band

Example

```
OEBM> maintain download out_of_band  [ENTER]
```

If you are sure you want to perform a download, you must enter the DOWNLOAD command again within 10 seconds. Otherwise, the download sequence will be aborted. You will then have to reenter the Download command to restart the process.

For a quick command reentry, press the [CTRL-R] sequence, which will retype the previous command string on the command line.

The system will prompt you twice for the password (carriage return). To perform the download, type [ENTER] at the password prompts as shown.

```
Please enter your password to begin the download procedure:
Password: [ENTER]
Please enter your password again
Password: [ENTER]
Preparing the bridge for download...
```

Description

The MAINTAIN DOWNLOAD OUT_OF_BAND command enables you to download new software to the Bridge Module via the terminal port. Note that you cannot enter the MAINTAIN command if you are connected to a remote Bridge Module through the REMOTE_LOGIN command.

The DOWNLOAD command will erase your current operational code. You will need the following items to replace the software:

1. 3Com Firmware Distribution Kit (part number 5000-FDK)

2. ONline Ethernet Bridge Module Update Distribution Kit (part number 5102B-UDKU-x.x or 5102B-UDKL-x.x)

Refer to Chapter 6 for a complete explanation of the download process.

MONITOR

Use the MONITOR command to periodically display statistical information. The statistics are reported periodically based upon the time that you request.

The MONITOR command parameter displays are the same as the SHOW command parameter displays, except that the MONITOR displays are updated based upon the time you request. Refer to the SHOW command section for explanations of the displays.

Note that while executing the MONITOR command, bridging performance will be affected for the duration of the command. It is recommended that you execute the MONITOR command for the default time period of five minutes or longer to minimize this impact.

Format

MONITOR {interval} {group}

Parameters

{interval} = 0:05 - 30:00 (default is 5:00)

{group} = bridge (default)
             ports
             protocols
             spantree

Example

This example displays Spanning Tree statistics every thirty seconds.

```
OEBM> monitor 0:30 spantree          [ENTER]

145 Seconds Since Clear          Port 1        Port 2
Spanning Tree State              FORWARDING    FORWARDING
Spanning Tree Frames Received    0             0
Spanning Tree Frames Transmitted 0             0

Port Independent Statistics
Topology Change Count            2
Seconds Since Topology Changed   114
```

```
Active Hello Time              2
Active Forward Delay           15
Active Listen Time             20

Press CTRL-C to exit.
```

Example

This example displays protocol statistics every 30 seconds.

```
OEBM> monitor 0:30 protocols      [ENTER]

3658 Seconds Since Clear        Port 1       Port 2
Unicast Packets Received        0            0
Non-Unicast Packets Received    0            0
Unicast Packets Transmitted     0            0
Non-Unicast Packets Transmitted 0            0

Press CTRL-C to exit.
```

Description

The MONITOR command periodically displays the network and bridging statistics for the channels to which the bridge is connected based on the number of minutes and seconds you assign.

The {interval} value can be a maximum of 30:00 minutes and a minimum of 0:05 seconds and is entered in the format *mm:ss* (e.g., 0:20 or 7:00). The default is 5 minutes. The default parameter to be monitored is bridge statistics.

Press the [CTRL-C] key combination to discontinue the statistics display and return to the management prompt.

PING

Use the PING command to verify whether a device is active.

Note that while executing the PING command, bridging performance will be affected for the duration of the command.

Format

PING {device name} {number of packets}

Parameters

{device name} = ip_address {Internet Protocol address}
                name {name of the device}

{number of packets} = 1 - 255 (default is 1 packet)

Example

Verify whether the device with the IP address (Internet Protocol address) 1.2.3.4 is active by having it echo two return packets:

```
OEBM> ping ip_address 1.2.3.4 2   [ENTER]

Starting ping ...
Ping completed with 2 packets received
```

Example

Verify whether the device with the name G421 is active by having it echo 10 return packets:

```
OEBM> ping name G421 10   [ENTER]

Starting ping ...
Ping completed with 10 packets received
```

Description

This command sends {n} number of ICMP (Internet Control Message Protocol) packets to the specified device and requests that the device send back the exact number of packets sent in the request (the default is 1 packet).

REMOTE_LOGIN

Use the REMOTE_LOGIN command to log into any remote Bridge Module or other manageable 3Com device on the network and manage it from the local terminal.

Note that while executing the REMOTE_LOGIN command, bridging performance will be affected for the duration of the command.

Format
REMOTE_LOGIN {device name} {variable} {port}

Parameters
{device name} = ip_address {Internet Protocol address}
                mac_address {Ethernet address}
                name {remote device name}

{port} = port1
         port2

Example
Log into the device with the IP address 1.2.3.4, which is on the port 1 side of the local Bridge Module:

```
OEBM> remote_login ip_address 1.2.3.4 port1   [ENTER]
```

Example
Log into the device with the MAC address 09-00-8F-00-00-10, which is on the port 2 side of the local Bridge Module:

```
OEBM> remote_login mac_address 09-00-8F-00-00-10 port2 [ENTER]
```

Example
Log into the device with the name G421, which is on the port 1 side of the local Bridge Module:

```
OEBM> remote_login name G421 port1   [ENTER]
```

Description

Use the REMOTE_LOGIN command and the address or name of the remote Bridge Module (or other manageable 3Com device) to which you want to connect. You must be connected, via a terminal, to a local Bridge Module before you can issue this command.

Once you are connected to the remote device, you must enter the correct password for that device. From that point on, all the commands you issue are for that device. Therefore, if you remotely log into a Midnight Bridge unit, you must use the Midnight Bridge command set to perform desired functions.

Use the LOGOUT command to end the session with the remote device and return to the local Bridge Module.

Note: You can only connect to one remote device at a time. If you wish to log into another device, you must log out of the first (returning to the local Bridge Module) and then log into the other device.

If you are having trouble logging into a remote device, make sure the device is connected to one of the bridge ports.

RESET DEVICE

Use the RESET DEVICE command to reset the Bridge Module. This command is only available in administrator mode.

Format

RESET DEVICE

Parameters

Example

```
OEBM> reset device  [ENTER]
Resetting device
```

Description

The RESET DEVICE command resets the Bridge Module. The setting for the diagnostics parameter determines whether diagnostics will execute during a reset. Use the SHOW DEVICE command to display the diagnostic parameter setting. Use the SET DEVICE DIAGNOSTIC command to enable or disable diagnostics.

Enabling diagnostics results in the diagnostics executing during a reset (i.e., a cold boot). Disabling diagnostics results in no diagnostics being executed during a reset (i.e., a soft boot).

The RESET DEVICE command has the same effect as pressing the Reset button on the bridge front panel.

When you reset the Bridge Module, traffic forwarding is briefly interrupted. You must log back in to the bridge once the reset is complete to execute additional commands.

Note that you must SAVE or REVERT unsaved changes before this command will execute.

REVERT

Use the REVERT command to return to the configuration settings that were in effect as of the last save.

This command is only available in administrator mode.

Format

REVERT {group}

Parameters

{group} = alert
           all
           bridge
           community
           device
           filter
           spantree
           terminal

Example

```
OEBM> revert alert      [ENTER]

Reverting alert configuration
```

Example

```
OEBM> revert all  [ENTER]

Reverting alert configuration
Reverting bridge configuration
Reverting community configuration
Reverting device configuration
Reverting filter configuration
Reverting spantree configuration
Reverting terminal configuration
```

Description

The REVERT command allows you to return to the last configuration value settings saved. For example, if you specify REVERT ALERT, any SET ALERT changes you made (after the last SAVE ALERT) are cancelled. In addition, REVERT ALERT only affects the ALERT parameter - all other groups are unchanged. Values affected by this command are those associated with the SET ALERT command.

As a result of issuing the REVERT ALL command, previous configuration values saved for Alert, Bridge, Community, Device, Filter, Spantree, and Terminal will be restored.

SAVE

Use the SAVE command to save the current configuration values established by the SET command. These configurations are saved in non-volatile EEPROM memory.

This command is only available in administrator mode.

Format

SAVE {group}

Parameters

{group} = alert
         all
         bridge
         community
         device
         filter
         spantree
         terminal

Example

```
OEBM>  save alert   [ENTER]
Saving alert configuration
```

Example

```
OEBM>  save all   [ENTER]
Saving alert configuration
Saving bridge configuration
Saving community configuration
Saving device configuration
Saving filter configuration
Saving spantree configuration
Saving terminal configuration
```

Description

Parameter values established by the SET command are effective immediately but are not automatically saved. Use the SAVE command to permanently save these values. Only saved values are in effect upon reset.

Issuing the SAVE ALL command saves all of the latest bridge configuration values established by the SET command for Alert, Bridge, Community, Device, Filter, Spantree, and Terminal parameters.

The SAVE ALERT, SAVE BRIDGE, SAVE COMMUNITY, SAVE DEVICE, SAVE FILTER, SAVE SPANTREE, and SAVE TERMINAL commands allow you to save the values set for the specific category without saving the other category settings.

SET

Use the SET command to change alert, bridge, community, device, spantree, and terminal attributes. The SET command requires a parameter to set specific attributes. This command is only available in administrator mode.

Format

SET {parameter}

Parameters

{parameter} = alert
             bridge
             community
             device
             spantree
             terminal

Description

The SET command enables you to change attributes for the alert, bridge, community, device, spantree, and terminal parameters.

To save changes in EEPROM memory, use the SAVE command. To return to the previously saved values, use the REVERT command.

The SET command parameters have parameters of their own. The following pages describe these parameters in detail.

SET ALERT

Use the SET ALERT command to enable or disable the notification of an alert statement (trap) from this Bridge Module to the designated trap receiver (SNMP workstation).

Format

SET ALERT {alert type} {setting}

Parameters

{alert type} = authentication
              change
              hello

{setting} = enable
            disable (default for all alert types)

Example

The following is an example of disabling the Hello alert, normally generated when a new Bridge Module is installed in the concentrator or when an existing Bridge Module is reset.

```
OEBM> set alert hello enable     [ENTER]
Alert HELLO set to ENABLE
```

Example

The following is an example of enabling the Change alert for any configuration change made to the Bridge Module.

```
OEBM> set alert change enable     [ENTER]
Alert CHANGE set to ENABLE
```

Description

You can have the Bridge Module send an alert (trap) to the SNMP-based management workstation (trap receiver) when any of the following three system events happen:

authentication - when a user tries to access the Bridge Module and the IP Address of their workstation or device is not listed in the community table with the proper access (i.e., read_only, read_write).

change - when any configuration or change is made to this concentrator.

hello - when an existing Bridge Module is reset in the concentrator. The alert is sent once every minute until the management workstation acknowledges the Bridge Module or for up to 4 hours and 15 minutes, at which time it shuts off automatically.

The default setting is *disable* for all three of these parameters. If you enable any of the parameters, an alert message is sent to the trap receiver as defined in the community table.

Note: If you are using an SNMP-based workstation, the workstation must be designated as the trap receiver through the community table (SET COMMUNITY command) for the traps to be sent to the appropriate location.

Alert messages from Spanning Tree configuration changes will always be sent to SNMP-based workstations designated as a trap receiver.

SET BRIDGE

Use the SET BRIDGE command to change the bridge specific configuration parameters.

Format

SET BRIDGE {parameter}

Parameters

{parameter} = ageing_time
              channel
              dip_configuration
              side_switch_mode

Description

The SET BRIDGE command enables you to change the bridge configuration.

The SET BRIDGE command parameters have parameters of their own. The following pages describe these parameters in detail.

SET BRIDGE AGEING_TIME

Use the SET BRIDGE AGEING_TIME command to set the rate at which addresses are aged out of the dynamic filtering table.

Format

SET BRIDGE AGEING_TIME {parameter}

Parameter

{parameter} = 1 - 16,666 minutes (default is 5 minutes)

Example

The following example SETs the bridge ageing_time parameter to 17 minutes.

```
OEBM>  set bridge ageing_time 17   [ENTER]
Ageing time parameter changed
```

Description

The SET BRIDGE AGEING_TIME command enables you to set the rate at which addresses are aged out of the dynamic address filtering table. If a node address has been in the table for one age period without any new activity from the node, it is removed.

A rate change will take effect immediately for your current session. Issue the SAVE BRIDGE command if you want the new rate to remain effective after the next boot.

Note: This parameter does not affect addresses that have been added to the static filter address table using the SET FILTER STATIC_ADDRESS_TABLE command.

SET BRIDGE CHANNEL

Use the SET BRIDGE CHANNEL command to select the two channels you want to bridge.

Note that this command must be used with caution. If used improperly, it has the potential to disrupt the network.

Format
SET BRIDGE CHANNEL {port} {channel}

Parameters
{port} = port1 {1, 2, front, isolated} (default is front)
        port2 {1, 2, 3, isolated} (default is 1)

Example
```
OEBM>  set bridge channel port1 isolated [ENTER]
Port 1 channel parameter changed
```

Description
The SET BRIDGE CHANNEL command allows you to set the bridge channels to the two channels you want to bridge.

SET BRIDGE DIP_CONFIGURATION

Use the SET BRIDGE DIP_CONFIGURATION command to determine whether the channels to which the Bridge Module is configured are read from the dip switch settings or from memory when the Bridge Module is reset or rebooted.

Note that this command must be used with caution. If used improperly, it has the potential to disrupt the network.

Format

SET BRIDGE DIP_CONFIGURATION {setting}

Parameters

{setting} = disable
          enable (default)

Example

```
OEBM>  set bridge dip_configuration disable  [ENTER]
Dip_configuration disabled
```

Description

The SET BRIDGE DIP_CONFIGURATION command determines whether the channels to which the Bridge Module is configured are read from the dip switch settings or from memory when the Bridge Module is reset or rebooted.

SET BRIDGE SIDE_SWITCH_MODE

Use the SET BRIDGE SIDE_SWITCH_MODE command to enable or disable the Bridge Module's ability to detect when an Ethernet address in the address table has switched from one port to the other.

Format

SET BRIDGE SIDE_SWITCH_MODE {setting}

Parameters

{setting} = disable
          enable (default)

Example

```
OEBM>  set bridge side_switch_mode disable  [ENTER]
Side_switch_mode disabled
```

Description

When enabled, the SET BRIDGE SIDE_SWITCH_MODE command enables the Bridge to detect when an Ethernet address that is currently identified in the Bridge's address table as being on one port side has been switched to the other port side. The Bridge can then automatically update its address table to accurately reflect the configuration change. Side Switching should be enabled in networking environments in which users are frequently switched between networks (for example, when using ONline Port-Switching modules).

When Side Switching is disabled, the Bridge does not recognize when an Ethernet address listed in the address table has switched from one port side to the other port side *until* the address gets aged out of the address table. You may want to disable Side Switching when network security is critical.

SET COMMUNITY

Use the SET COMMUNITY command to create an entry in the community table.

Format

SET COMMUNITY {community} {IP Address} {access}

Parameters

{community} = {community name} or all

{IP Address} = {IP Address} or all

{access} = trap, read_write, read_trap, read_only, or all

All three of the parameter variables are required in the SET COMMUNITY command line.

Example

The following example creates the community table entry called **admin** and specifies that the associated workstation (with IP address 2.13.34.24) has both read and write access to the Bridge Module variables (through SNMP) and will receive all traps from the Bridge Module.

```
OEBM> set community admin 2.13.34.24 all    [ENTER]
Community set
```

Example

The following example gives the workstation with IP address 12.45.65.34 the community name *super* and enables the person who uses the workstation read_write access to the Bridge Module variables (through SNMP).

```
OEBM> set community super 12.45.65.34 read_write  [ENTER]
Community set
```

Example

The following example creates the community table entry called **ncs** and specifies that all traps be sent to the IP address 1.2.3.4.

```
OEBM> set community ncs 1.2.3.4 trap  [ENTER]
Community set
```

Description

The SET COMMUNITY command enables you to create a new entry in the community table. Each community is granted the access you specify in the {access} parameter in the SET COMMUNITY command line. The access modes are:

trap access means that the device at the IP Address you specify will receive SNMP alerts from the Bridge Module.

read_write means that the device at the IP Address you specify can display information about the Bridge Module and can modify this information (via SNMP).

read_trap means that the device at the IP Address you specify can display information about the Bridge Module (via SNMP) and will receive SNMP alerts.

read_only means that the device at the IP Address you specify can display information about the Bridge Module (via SNMP).

all access means that the device at the IP Address you specify has read_write and trap access to the Bridge Module.

You can enter up to ten community table entries of up to 15 characters each. Note that the community name is case sensitive, i.e., *NCS* and *ncs* are different community names.

Refer to the SHOW COMMUNITY command to view the existing community table and the CLEAR COMMUNITY command to delete a community entry.

Note: When you use the IP Address entry of *all*, you cannot use *trap*, *read_trap*, or *all* access modes.

Management Commands 4 - 43

SET DEVICE

Use the SET DEVICE command to change the Bridge Module device configuration parameters.

Format

SET DEVICE {parameter}

Parameters

{parameter} = contact
default_gateway_port1
default_gateway_port2
diagnostics
ip_address_port1
ip_address_port2
location
name
password
sqe_mode
subnet_mask_port1
subnet_mask_port2

Description

The SET DEVICE command enables you change the Bridge Module configuration parameters. To make changes permanent, issue the SAVE DEVICE command. Use the SHOW DEVICE command to display the current configuration information.

Since the parameters you can use with the SET DEVICE command have parameters of their own, the following pages describe each parameter.

SET DEVICE CONTACT

Use the SET DEVICE CONTACT command to enter contact information, such as service contact's name, company, and telephone number.

Format

SET DEVICE CONTACT

Parameter

Example

```
OEBM> set device contact  [ENTER]
Enter one line of text:
>  Network Administrator x3658  [ENTER]
Contact changed
```

Description

The SET DEVICE CONTACT command enables you to enter contact information, such as service contact's name, company, and telephone number. Enter the command and press [ENTER]. You will be prompted to enter one line of text (free-formatted text of up to 78 alpha-numeric characters).

SET DEVICE DEFAULT_GATEWAY_PORT1

Use the SET DEVICE DEFAULT_GATEWAY_PORT1 command to set the IP address of the gateway that should be used when port 1 on the Bridge Module does not recognize the receiver address on the local network.

Format

SET DEVICE DEFAULT_GATEWAY_PORT1 {IP address}

Parameter

{IP address} = n.n.n.n

Example

```
OEBM> set device default_gateway_port1 1.2.3.4  [ENTER]
```

Description

The SET DEVICE DEFAULT_GATEWAY_PORT1 command enables you to set the IP address of the gateway that should be used when port 1 on the Bridge Module does not recognize the receiver address on the local network.

SET DEVICE DEFAULT_GATEWAY_PORT2

Use the SET DEVICE DEFAULT_GATEWAY_PORT2 command to set the IP address of the gateway that should be used when port 2 on the Bridge Module does not recognize the receiver address on the local network.

Format

SET DEVICE DEFAULT_GATEWAY_PORT2 {IP address}

Parameter

{IP address} = n.n.n.n

Example

```
OEBM> set device default_gateway_port2 1.2.3.4  [ENTER]
```

Description

The SET DEVICE DEFAULT_GATEWAY_PORT2 command enables you to set the IP address of the gateway that should be used when port 2 on the Bridge Module does not recognize the receiver address on the local network.

SET DEVICE DIAGNOSTICS

Use the SET DEVICE DIAGNOSTICS command to enable or disable diagnostics during start-up (or reboot) of the Bridge Module.

Refer to the RESET DEVICE command description for more information about the purpose of the Diagnostics parameter.

Format

SET DEVICE DIAGNOSTICS {setting}

Parameters

{setting} = disable
            enable (default)

Example

```
OEBM> set device diagnostics disable  [ENTER]
DIAGNOSTICS option disabled
```

Description

The SET DEVICE DIAGNOSTICS command allows you to enable or disable diagnostics during start-up (or reboot) of the Bridge Module.

SET DEVICE IP_ADDRESS_PORT1

Use the SET DEVICE IP_ADDRESS_PORT1 command to set the Internet Protocol address for port 1 on the Bridge Module.

Note that this command must be used with caution. If used improperly, it has the potential to disrupt the network.

Format

SET DEVICE IP_ADDRESS_PORT1 {IP address}

Parameter

{IP address} = n.n.n.n

Example

```
OEBM> set device ip_address_port1 145.36.17.58  [ENTER]
```

Description

The SET DEVICE IP_ADDRESS_PORT1 command enables you to set the Internet Protocol address for port 1 on the Bridge Module. The internet protocol address is entered as n.n.n.n. (four decimal numbers).

Check with your Network Administrator for the next available IP address that can be assigned to port 1 on your Bridge Module.

The factory default IP address for all Bridge Module ports is the loopback address (127.0.0.1).

SET DEVICE IP_ADDRESS_PORT2

Use the SET DEVICE IP_ADDRESS_PORT2 command to set the Internet Protocol address for port 2 on the Bridge Module.

Note that this command must be used with caution. If used improperly, it has the potential to disrupt the network.

Format

SET DEVICE IP_ADDRESS_PORT2 {IP address}

Parameter

{IP address} = n.n.n.n

Example

```
OEBM> set device ip_address_port2 145.36.17.60 [ENTER]
```

Description

The SET DEVICE IP_ADDRESS_PORT2 command enables you to set the Internet Protocol address for port 2 on the Bridge Module. The internet protocol address is entered as n.n.n.n. (four decimal numbers).

Check with your Network Administrator for the next available IP address that can be assigned to port 2 on your Bridge Module.

The factory default IP address all Bridge Module ports is the loopback address (127.0.0.1).

SET DEVICE LOCATION

Use the SET DEVICE LOCATION command to describe the physical location of the ONline System Concentrator in which the Bridge Module is installed.

Format

SET DEVICE LOCATION

Parameters

Example

```
OEBM> set device location  [ENTER]
Enter one line of text:

>
```

Type in the physical location of your concentrator.

```
> Third floor Eng. Lab  [ENTER]
Device location changed
```

Description

The SET DEVICE LOCATION command enables you to describe the physical location of the ONline System Concentrator in which the Bridge Module is installed. Enter the command and press [ENTER]. You will be prompted to enter one line of text (free-formatted text of up to 78 alpha-numeric characters).

SET DEVICE NAME

Use the SET DEVICE NAME command to assign the Bridge Module a name that can be used to identify it in addition to its IP address.

Format

SET DEVICE NAME {device name}

Parameter

{device name} = name up to 31 characters

Example

```
OEBM> set device name OEBM3   [ENTER]
Device name changed
```

Description

The SET DEVICE NAME command enables you to assign the Bridge Module a name that can be used to identify it in addition to its IP address. The name you enter is free-format up to 31 alphanumeric characters.

You can then use this name when remotely accessing the Bridge Module using the REMOTE_LOGIN NAME {name} command instead of using the IP or Ethernet address.

It is recommended that you make the device name and the terminal prompt for the Bridge Module the same (refer to the SET TERMINAL PROMPT command) so that during remote login sessions, you will know whether you are in a local or remote session.

SET DEVICE PASSWORD

Use the SET DEVICE PASSWORD command to establish administrator and user passwords for the Bridge Module.

Format

SET DEVICE PASSWORD {group}

Parameters

{group} = administrator
           user

Example

```
OEBM> set device password administrator   [ENTER]
```

You are prompted as follows:

```
Enter current administrator password: current password [ENTER]
New password:  new password  [ENTER]
Verify: new password  [ENTER]
Administrator password changed.
```

Description

The SET DEVICE PASSWORD command enables you to establish administrator and user passwords for the Bridge Module.

The Bridge Module provides password protection to control access to commands and information. Passwords may contain up to 15 alphanumeric characters and, for security reasons, are not shown on the terminal screen when entered.

When you issue the SET DEVICE PASSWORD command you are first prompted for the current administrator password, then the new administrator or user password, then a verification of the new password.

The administrator password gives the system administrator access to all of the Bridge Module commands. The user password provides access to commands that do not modify any bridge values or parameters, such as those that allow the user to view status, get help, and logout.

Note that the new passwords are effective immediately. You must issue the SAVE DEVICE command for the new passwords to be permanently saved.

SET DEVICE SQE_MODE

Use the SET DEVICE SQE_MODE command to display SQE (heartbeat) failures on the output from the MONITOR and SHOW commands.

Format

SET DEVICE SQE_MODE {parameter}

Parameters

{parameter} = normal (default)
                ignore

Example

```
OEBM> set device sqe_mode ignore   [ENTER]
SQE Mode parameter changed
```

Description

The SET DEVICE SQE_MODE command enables you to display SQE (heartbeat) failures on the output from the MONITOR and SHOW commands.

The default setting is Normal, where SQE failures are displayed. The other SQE_MODE parameter is Ignore. Set SQE_MODE to Ignore if the front panel AUI port is to be used with non-SQE transceivers.

SET DEVICE SUBNET_MASK_PORT1

Use the SET DEVICE SUBNET_MASK_PORT1 command to specify the subnetwork mask for your type of Internet class.

Format

SET DEVICE SUBNET_MASK_PORT1 {mask}

Parameters

{mask} = 4-byte hex address

Example

```
OEBM> set device subnet_mask_port1 FF.FF.FF.0   [ENTER]
Device subnet mask changed.
```

Description

The SET DEVICE SUBNET_MASK_PORT1 command enables you to specify the subnetwork mask for your type of Internet class. In general, the subnetwork mask is a 32-bit IP address with all ones in the network and subnet portions of the address and zeroes in the host portion.

For example, if the address of your Bridge Module is 151.104.6.10 (which is a Class B network 151.104.0.0) and your company has elected to use the third byte as the subnet identifier (in this example 6), the subnet mask is 255.255.255.0 (ff.ff.ff.00 in hexadecimal representation).

SET DEVICE SUBNET_MASK_PORT2

Use the SET DEVICE SUBNET_MASK_PORT2 command to specify the subnetwork mask for your type of Internet class.

Format

SET DEVICE SUBNET_MASK_PORT2 {mask}

Parameters

{mask} = 4-byte hex address

Example

```
OEBM> set device subnet_mask_port2 FF.FF.FF.0   [ENTER]
```

Description

The SET DEVICE SUBNET_MASK_PORT2 command enables you to specify the subnetwork mask for your type of Internet class. In general, the subnetwork mask is a 32-bit IP address with all ones in the network and subnet portions of the address and zeroes in the host portion.

For example, if the address of your Bridge Module is 151.104.6.10 (which is a Class B network 151.104.0.0) and your company has elected to use the third byte as the subnet identifier (in this example 6), the subnet mask is 255.255.255.0 (ff.ff.ff.00 in hexadecimal representation).

SET FILTER

Use the SET FILTER command to add a protocol ID to the protocol ID table, set the mode of the protocol ID table, and add an address to the static address table.

The SET FILTER commands are only available in administrator mode.

Format

SET FILTER {parameter}

Parameter

{parameter} = mode protocol_id_table
                        protocol_id_table
                        static_address_table

Description

The SET FILTER command enables you to add a protocol ID to the protocol ID table, set the mode of the protocol ID table, and add an address to the static address table.

Since the parameters you can use with the SET FILTER command have parameters of their own, the following pages describe each parameter.

SET FILTER MODE PROTOCOL_ID_TABLE

Use the SET FILTER MODEPROTOCOL_ID_TABLE command to set the mode in which entries of the protocol id table will be used.

Format

SET FILTER MODE PROTOCOL_ID_TABLE {mode}

Parameters

{mode} = disable (default)
        filter
        forward

Example

This example sets the protocol ID table to filter mode.

```
OEBM> set filter mode protocol_id_table filter  [ENTER]
```

Description

The SET FILTER MODE PROTOCOL_ID_TABLE command enables you to set the mode in which entries in the protocol id table will be used.

Each packet received by the bridge goes through the destination address filter of the bridging process. If the packet is to be forwarded and the mode of the protocol ID table is *forward* or *filter*, an additional filter process is applied to all packets.

The Ethernet protocol type of the packet is compared against the contents of the protocol type ID table. For example, if a match is found and the mode is *forward*, then the packet is forwarded and transmitted out the other port of the Bridge Module. If no match is found and the mode is *forward,* the packet is discarded. If a match is found and the mode is *filter,* the packet is also discarded. If a match is found and the mode is *filter,* the packet is bridged and transmitted out the other port of the bridge.

SET FILTER PROTOCOL_ID_TABLE

Use the SET FILTER PROTOCOL_ID_TABLE command to add a protocol ID to the protocol id table.

Format

SET FILTER PROTOCOL_ID_TABLE {protocol ID}

Parameter

{protocol ID} = protocol ID in hex notation

Example

This example adds the protocol value 08-00, which is the DoD Internet (TCP/IP), to the protocol id table.

```
OEBM> set filter protocol_id_table 08-00 [ENTER]
Protocol ID added to Protocol ID table
```

Description

The SET FILTER PROTOCOL_ID_TABLE command enables you to add a protocol ID to the protocol id table.

In conjunction with the SET FILTER MODE command, you can elect to allow or disallow specific Ethernet protocols from being bridged.

SET FILTER STATIC_ADDRESS_TABLE

Use the SET FILTER STATIC_ADDRESS_TABLE command to add node addresses to the static address table.

Format

SET FILTER STATIC_ADDRESS_TABLE {variable}
{MAC address}

Parameters

{variable} = always_forward
           never_forward_to_port1
           never_forward_to_port2

{MAC address} = XX-XX-XX-XX-XX-XX

Example

```
OEBM>set filter static_address_table never_forward_to_port1 [ENTER]

Enter MAC Address:  03-00-06-07-17-01  [ENTER]

Address added to filter table.

Do SAVE FILTER and RESET DEVICE to use changes.
```

Description

The SET FILTER STATIC_ADDRESS_TABLE command enables you to add node addresses to the static address table.

Always_Forward Parameter

Specifying the Always_Forward parameter with a subsequent MAC address will result in all received frames with the specified MAC address as the destination address being bridged (to the other bridge port) by the Bridge Module.

Never_Forward_To_Port1 Parameter

Specifying the Never_Forward_To_Port1 parameter with a subsequent MAC address will result in all frames received at port 2 of the Bridge Module with the specified MAC address as the destination address being discarded by the Bridge Module rather than being bridged to port 1.

Never_Forward_To_Port2 Parameter

Similarly, specifying the Never_Forward_To_Port2 parameter with a subsequent MAC address will result in all frames received at port 1 being discarded if the destination address matches the specified MAC address.

Once you have selected the parameter you want to use, enter a hexadecimal MAC address in the following format:

XX-XX-XX-XX-XX-XX

Note that these address changes do not take effect until the changes are saved and Bridge Module is reset. Therefore, it is recommended that you enter the SAVE FILTER and RESET DEVICE commands after modifying the static address table so that these changes take effect as soon as possible.

SET SPANTREE

Use the SET SPANTREE command to change the Spanning Tree configuration parameters of the local Bridge Module.

Format

SET SPANTREE {parameter}

Parameters

{parameter} = bridge_priority   listen_time
                forward_delay_time   mode
                hello_address   path_cost_port1
                hello_time   path_cost_port2

Description

The SET SPANTREE command enables you to change the Spanning Tree configuration parameters of the local Bridge Module. These configuration parameters will become active if this Bridge Module becomes the Root bridge for the network.

Note that the values assigned to forward_delay_time, hello_time, and listen_time using the SET SPANTREE command are active and in effect *only* when the local Bridge Module is the root of the Spanning Tree. Otherwise, when the local bridge is a non-root bridge the Root Bridge imposes its values for forward_delay_time, hello_address, hello_time, and listen_time throughout the network (including the local bridge) for as long as that bridge continues to be the Root Bridge.

The SET SPANTREE command parameters have parameters of their own. The following pages describe these parameters in detail.

SET SPANTREE BRIDGE_PRIORITY

Use the SET SPANTREE BRIDGE_PRIORITY command to change the Spanning Tree priority of the local Bridge Module.

Format

SET SPANTREE BRIDGE_PRIORITY {variable}

Parameters

{variable} = 0 - 65535 (default is 128)

Example

```
OEBM>  set spantree bridge_priority 117  [ENTER]
Spanning tree parameter changed
```

Description

The SET SPANTREE BRIDGE_PRIORITY command enables you to change the Spanning Tree priority of the local Bridge Module.

The bridge priority is used with the bridge Ethernet Address to determine which bridge becomes the Root Bridge in the network. The *full* bridge priority is the numeric value that consists of (Bridge Priority)/(Bridge Ethernet Address), for example, 128/08008F00A103. Since the bridge priority is the first part of this number, lowering this value has a dramatic effect on whether the bridge is the Root Bridge or not.

The Root Bridge controls the active Forward Delay_Time, Hello_Address, Hello_Time, and Listen_Time parameters used by all bridges that are active in the Spanning Tree topology. The 3Com factory setting for the bridge priority is 128 to reduce the chance that this bridge will have the lowest number and so become root. It is suggested that you do not change this value unless you want to force this bridge to be the root.

SET SPANTREE FORWARD_DELAY_TIME

Use the SET SPANTREE FORWARD_DELAY_TIME command to set the amount of time bridges wait in each of the states when moving from Listening to Forwarding mode.

This value will take effect for the overall network when this bridge becomes the Root Bridge.

Format

SET SPANTREE FORWARD_DELAY_TIME {variable}

Parameters

{variable} = 4 - 30 seconds (default is 15 seconds)

See Note for range restrictions.

Example

```
OEBM>  set spantree forward_delay_time 27  [ENTER]
Spanning tree parameters changed
```

Description

The SET SPANTREE FORWARD_DELAY_TIME command enables you to set the amount of time the bridge waits in each of the states when moving from Listening to Forwarding mode. This command setting takes effect only if this bridge becomes the Root Bridge. The modes that are affected by this parameter are Listening and Learning.

For example, using the default time of 15 seconds, a backup bridge (in a Blocking state) requires a total of 30 seconds to take over as the designated bridge once it has determined that the primary (or designated) bridge has failed: 15 seconds in the Listening state, 15 seconds in the Learning state, and then the Forwarding of packets starts again.

As a reminder, this parameter at the local Bridge Module has no effect on the operation of the network until the local bridge becomes the Root Bridge. While the local bridge is a non-root bridge, it will function using the Root Bridge's value for this parameter.

Note: If you choose to modify the spantree parameter default values for *forward_delay_time*, *hello_time*, or *listen_time*, you must use the following two formulas to calculate new values:

1. $2 * (forward\_delay\_time - 1.0 \text{ seconds}) \geq listen\_time$

2. $listen\_time \geq 2 * (hello\_time + 1.0 \text{ seconds})$

The following two examples use the formulas with parameter default values to calculate new values.

1. $2 * (15 \text{ seconds} - 1.0 \text{ seconds}) = 28 \text{ seconds} \geq 20 \text{ seconds}$.   Since 28 seconds is greater than the listen_time default value of 20 seconds, this setting is valid.

2. $20 \text{ seconds} \geq 2 * (2 \text{ seconds} + 1.0 \text{ second}) = 6 \text{ seconds}$
   Since 20 seconds is greater than 6 seconds, this setting is valid.

SET SPANTREE HELLO_ADDRESS

Use the SET SPANTREE HELLO_ADDRESS command to modify the MAC address which the Bridge Module uses for its spanning tree hello address.

Format

SET SPANTREE HELLO_ADDRESS {MAC address}

Parameters

{MAC address} = XX-XX-XX-XX-XX-XX

Example

```
OEBM>  set spantree hello_address 08-00-8f-10-13-56  [ENTER]
Spanning tree parameters changed
```

Description

The SET SPANTREE HELLO_ADDRESS command enables you to change the MAC address which the Bridge Module uses for its spanning tree hello address. Modifying the spanning tree hello address enables you to create multiple spanning tree multicast domains.

The MAC address for this command must be entered in the following format:

XX-XX-XX-XX-XX-XX

Note that this address *must* be a multicast address. Any address other than a multicast address will not be accepted.

Note: Using an address (other than the default spanning tree hello address 01-80-C2-00-00-00) from the IEEE 802.1(d) reserved multicast addresses as the new spantree hello address may cause subsequent network problems in a bridged subnetwork. This is because all IEEE 802.1(d)-compliant bridges in your network will not bridge these IEEE 802.1(d) reserved multicast addresses.

SET SPANTREE HELLO_TIME

Use the SET SPANTREE HELLO_TIME command to change how often the local bridge sends out a hello packet when it becomes the Root Bridge.

This value will take effect for the overall network when this bridge becomes the Root Bridge.

Format

SET SPANTREE HELLO_TIME {variable}

Parameters

{variable} = 1 - 10 (default is 2 seconds)

See Note for range restrictions.

Example

```
OEBM>  set spantree hello_time 7  [ENTER]
Spanning tree parameters changed
```

Description

The SET SPANTREE HELLO_TIME command enables you to change how often the local bridge sends out a hello packet when it becomes the Root Bridge. This packet is sent to all other Ethernet Bridges to let them know the root is still active.

As a reminder, this parameter at the local Bridge Module has no effect on the operation of the network until the local bridge becomes the Root Bridge. While the local bridge is a non-root bridge, it will function using the Root Bridge's value for this parameter.

If you choose to modify the spantree parameter default values for *forward_delay_time*, *hello_time*, or *listen_time*, you must use the following two formulas to calculate new values:

1. 2 * (*forward_delay_time* - 1.0 seconds) $\geq$ *listen_time*

2. *listen_time* $\geq$ 2 * (*hello_time* + 1.0 seconds)

The following two examples use the formulas with parameter default values to calculate new values.

1. 2 * (*15 seconds* - 1.0 seconds) = 28 seconds $\geq$ 20 seconds. Since 28 seconds is greater than the listen_time default value of 20 seconds, this setting is valid.

2. *20 seconds* $\geq$ 2 * (*2 seconds* + 1.0 second) = 6 seconds Since 20 seconds is greater than 6 seconds, this setting is valid.

SET SPANTREE LISTEN_TIME

Use the SET SPANTREE LISTEN_TIME command to specify how long bridges will wait for the Root Bridge to send out a hello packet.

This value will take effect for the overall network when this bridge becomes the Root Bridge.

Format

SET SPANTREE LISTEN_TIME {variable}

Parameters

{variable} = 6 - 40 (default is 20 seconds)

See Note for range restrictions.

Example

```
OEBM>  set spantree listen_time 7  [ENTER]
Spanning tree parameter changed.
```

Description

The SET SPANTREE LISTEN_TIME command enables you to specify how long the bridge will wait for the Root Bridge to send out a hello packet. If a bridge does not receive the packet within the time set with this parameter, it will assume the root is not active and begin calling out that it is now the Root Bridge. It is suggested that you make this value larger if you have a low-speed or very wide-area network.

As a reminder, this parameter at the local Bridge Module has no effect on the operation of the network until the local bridge becomes the Root Bridge. While the local bridge is a non-root bridge, it will function using the Root Bridge's value for this parameter.

Note: If you choose to modify the spantree parameter default values for *forward_delay_time*, *hello_time*, or *listen_time*, you must use the following two formulas to calculate new values:

1. 2 * (*forward_delay_time* - 1.0 seconds) $\geq$ *listen_time*

2. *listen_time* $\geq$ 2 * (*hello_time* + 1.0 seconds)

The following two examples use the formulas with parameter default values to calculate new values.

1. 2 * (*15 seconds* - 1.0 seconds) = 28 seconds $\geq$ 20 seconds. Since 28 seconds is greater than the listen_time default value of 20 seconds, this setting is valid.

2. *20 seconds* $\geq$ 2 * (*2 seconds* + 1.0 second) = 6 seconds Since 20 seconds is greater than 6 seconds, this setting is valid.

SET SPANTREE MODE

Use the SET SPANTREE MODE command to enable or disable the Spanning Tree Algorithm and Protocol (STAP).

Format

SET SPANTREE MODE {setting}

Parameters

{setting} = disable
          enable (default)

Example

```
OEBM>  set spantree mode disable  [ENTER]
Spanning tree parameter changed
```

Description

The SET SPANTREE MODE command allows you to enable or disable the Spanning Tree Algorithm and Protocol (STAP).

3Com recommends that for stable fault tolerant network topologies, the Spanning Tree mode remain enabled.

SET SPANTREE PATH_COST_PORT1

Use the SET SPANTREE PATH_COST_PORT1 command to change the path cost of port 1 on the local Bridge Module.

Format

SET SPANTREE PATH_COST_PORT1 {variable}

Parameters

{variable} = 1 - 65535 (default is 10)

Example

```
OEBM>  set spantree path_cost_port1 17  [ENTER]
Spanning tree parameter changed
```

Description

The SET SPANTREE PATH_COST_PORT1 command enables you to change the path cost of port 1 on the local Bridge Module.

The Spanning Tree Protocol seeks to minimize the path cost between each bridge and the Root Bridge (called the root path cost). The "root path cost" represents the distance between this bridge and the Root Bridge, and should be a lower value as the distance is lessened.

Modifying the value for the port 1 path cost at the local bridge may cause bridges "beneath" the local bridge in the Spanning Tree to change their path to the Root Bridge depending on the benefit or drawback of going through the local bridge.

Changing values may also result in a port currently in Blocking state on the local bridge to transition into Forwarding state and vice versa if the cost associated with the once Blocking port is now lower.

SET SPANTREE PATH_COST_PORT2

Use the SET SPANTREE PATH_COST_PORT2 command to change the path cost of port 2 on the local Bridge Module.

Format

SET SPANTREE PATH_COST_PORT2 {variable}

Parameters

{variable} = 1 - 65535 (default is 10)

Example

```
OEBM>  set spantree path_cost_port2 36  [ENTER]
Spanning tree parameter changed
```

Description

The SET SPANTREE PATH_COST_PORT2 command enables you to change the path cost of port 2 on the local Bridge Module.

The Spanning Tree Protocol seeks to minimize the path cost between each bridge and the Root Bridge (called the root path cost). The "root path cost" represents the distance between this bridge and the root bridge, and should be a lower value as the distance is lessened.

Modifying the value for the port 2 path cost at the local bridge may cause bridges "beneath" the local bridge in the Spanning Tree to change their path to the root bridge depending on the benefit or drawback of going through the local bridge.

Changing values may also result in a port currently in Blocking state on the local bridge to transition into Forwarding state and vice versa if the cost associated with the once Blocking port is now lower.

SET TERMINAL

Use the SET TERMINAL command to change the TERMINAL parameters for the Bridge Module. These configurations enable the Bridge Module to communicate with the terminal to which it is connected.

Format

SET TERMINAL {parameter}

Parameters

{parameter} = baud
data bits
hangup
parity
prompt
stop_bits
timeout

Description

The SET TERMINAL commands enable you to change the terminal configuration for the Bridge Module.

The SET TERMINAL command parameters have parameters of their own. The following pages describe these parameters in detail.

SET TERMINAL BAUD

Use the SET TERMINAL BAUD command to establish the appropriate baud rate at which the Bridge Module receives and transmits data to your terminal or modem.

Format

SET TERMINAL BAUD {baud rate}

Parameters

{baud rate} = 300, 1200, 2400, 4800, or 9600 (default is 9600)

Example

This example changes the baud rate to 4800 baud.

```
OEBM> set terminal baud 4800        [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL BAUD command enables you to establish the appropriate baud rate at which the Bridge Module receives and transmits data to your terminal or modem.

Check the baud rate of the device before connecting a terminal or modem to the Bridge Module. Your device and the Bridge Module must be set at the same baud rate in order to communicate.

If you need to set the Bridge Module to communicate with a device that has a baud rate lower than 9600 baud, use the following procedure:

1. Connect a terminal (set to 9600 baud) to the Bridge Module (via the RS-232 front panel serial port) and log on to the bridge.

2. Issue the SET TERMINAL BAUD command to set the Bridge Module terminal port baud rate to your specifications. Once you set this lower rate, you will lose your connection to the Bridge Module since your terminal is set to a different rate.

3. Remove the terminal connection, change the terminal's baud rate, and reconnect the terminal to the serial port to resume your connection to the Bridge Module.

SET TERMINAL DATA_BITS

Use the SET TERMINAL DATA_BITS command to set the number of data bits used by your terminal.

Format

SET TERMINAL DATA_BITS {data bits}

Parameters

{data bits} = 7
              8 (default)

Example

This example changes the data bits to 7.

```
OEBM> set terminal data_bits 7      [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL DATA_BITS command enables you to set the number of data bits used by your terminal.

Note that if your terminal or modem and the Bridge Module do not have the same data bit setting you will not be able to log in.

The procedure to change the baud rate can also be used to modify terminal data bits.

SET TERMINAL HANGUP

Use the SET TERMINAL HANGUP command to configure how a modem connection is terminated when the LOGOUT command is entered during a modem session.

Format

SET TERMINAL HANGUP {setting}

Parameters

{setting} = disable (default)
            enable

Example

```
OEBM> set terminal hangup enable [ENTER]
Terminal parameter change
```

Description

The SET TERMINAL HANGUP command enables you to configure how a modem connection is terminated when the LOGOUT command is entered during a modem session.

If the HANGUP setting is enabled and you log out of the system, the modem is automatically disconnected, closing down that connection.

The modem is also disconnected if this setting is enabled and you leave your terminal unattended for the amount of time established by the terminal TIMEOUT command. If the HANGUP setting is disabled and you log out of the system, the modem is disconnected only when you explicitly hang up the modem.

Note: If you do not hang up the modem, an unauthorized user may pick up the last login session.

SET TERMINAL PARITY

Use the SET TERMINAL PARITY command to set the parity to match the parity setting used by your terminal.

Format

SET TERMINAL PARITY {parity}

Parameters

{parity} = even
        none (default)
        odd

Example

This example changes the terminal parity to even.

```
OEBM> set terminal parity even      [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL PARITY command enables you to set the parity to match the parity setting used by your terminal.

Note that your Bridge Module terminal port and your terminal or modem must have the same parity setting, or you will not be able to log in.

The procedure to change the baud rate can also be used to modify terminal parity.

SET TERMINAL PROMPT

Use the SET TERMINAL PROMPT command to customize the management prompt that displays on your terminal when connected to a local Bridge Module.

Format

SET TERMINAL PROMPT {prompt}

Parameters

{prompt} = terminal prompt up to 15 characters

Example

This example changes the terminal prompt to OEBM3>.

```
OEBM> set terminal prompt OEBM3>      [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL PROMPT command enables you to customize the management prompt that displays on your terminal when connected to a local Bridge Module.

This command allows you to customize your management prompt with a string of up to 15 characters in length. You must include all the characters in the new prompt, including the angle bracket (>) if desired.

Note: 3Com recommends that you make the terminal prompt and the device name the same for your particular Bridge Module. In this manner, if you are remotely connected to this bridge, the prompt will help to indicate that there is a remote connection established.

SET TERMINAL STOP_BITS

Use the SET TERMINAL STOP_BITS command to establish the number of stop bits between characters when communicating between your terminal and the Bridge Module.

Format

SET TERMINAL STOP_BITS {stop bits}

Parameters

{stop bits} = 1
              2 (default)

Example

This example changes the Bridge Module stop bits parameter to 1.

```
OEBM> set terminal stop_bits 1        [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL STOP_BITS command enables you to establish the number of stop bits between characters when communicating between your terminal and the Bridge Module.

The Bridge Module is factory-set to 2 stop bits to signal the end of a character being received and to reset the line to an idle state. If your terminal and the Bridge Module do not have the same stop bits setting, you may lose characters as the terminal receives them from the Bridge Module.

SET TERMINAL TIMEOUT

Use the SET TERMINAL TIMEOUT command to set the amount of time that your terminal may be unattended before being logged off from the Bridge Module.

Format

SET TERMINAL TIMEOUT {minutes}

Parameters

{minutes} = minutes from 1 - 30
0 (zero - for no timeout)

Example

This example changes the Bridge Module timeout parameter to 3 minutes.

```
OEBM> set terminal timeout 3      [ENTER]
Terminal parameter changed
```

Description

The SET TERMINAL TIMEOUT command enables you to set the amount of time that your terminal may be unattended before being logged off from the Bridge Module.

Once timeout has been set, you are given that amount of time in which to respond to a screen prompt. If you do not respond within the set amount of time, the messages "Parser timed out" and "WARNING: Unsaved changes lost" are displayed. The terminal then beeps, and you are logged out of the system. The MONITOR command will not be interrupted by a non-zero timeout parameter.

Note: If a modem connection is in progress and the HANGUP command is enabled, the modem will also be disconnected upon a timeout.

If TIMEOUT has been set for a remote Bridge Module and the time expires, you will be logged out of the remote bridge and returned to the local bridge connection.

SHOW

Use the SHOW command to list the current bridge attributes. The SHOW command requires a parameter to display bridge attributes.

Format

SHOW {parameter}

Parameters

{parameter} = alert
bridge
community
counter
device
filter
last_error
spantree
terminal

Description

The SHOW command displays the current configuration settings for the Bridge Module. The commands to set these configurations are described in the SET command section.

Since the parameters you can use with the SHOW command have parameters of their own, the following pages describe each parameter.

SHOW ALERT

Use the SHOW ALERT command to display alert configuration settings.

Format

SHOW ALERT

Parameters

Example

```
OEBM>  show alert   [ENTER>
Alert AUTHENTICATION  set to ENABLE
Alert CHANGE          set to ENABLE
Alert HELLO           set to ENABLE
```

Description

The SHOW ALERT command displays current alert configuration settings.
These settings are described in the SET ALERT commands section.

SHOW BRIDGE

Use the SHOW BRIDGE command to display bridge parameters and their current values.

Format

SHOW BRIDGE

Parameters

Example

```
OEBM> show bridge   [ENTER]

Bridge Parameters:

Ageing Time:       5
Dip Configuration: ENABLED
Current Status:    Normal
Protocols Supported: Console Terminal
                     Chipcom Remote Console
                     SNMP

Per Port Information:

                  Current     Memory     Dip
Port 1 Channel:      1           1          1
Port 2 Channel:      2           2          2
```

Description

The SHOW BRIDGE command displays bridge parameters and their current values.

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Table 4-2 describes the SHOW BRIDGE parameters.

Table 4-2. SHOW BRIDGE Command Attributes

Attribute	Description
Ageing Time	The rate at which addresses are aged out of the dynamic filtering table.
Dip Configuration	Determines whether the channel configuration is read from the dip switch settings or memory upon bridge reset.
Current Status	The current state of the Bridge Module.
Protocols Supported	The protocols that the Bridge Module supports.
Port 1/2 Channel: Current	The channels to which port 1 and port 2 of the Bridge Module are currently bridging.
Port 1/2 Channel: Memory	The channels to which port 1 and port 2 of the Bridge Module are configured according to the values stored in memory. These are the channels which will be bridged if the Bridge Module is reset and the Dip Configuration parameter is disabled.
Port 1/2 Channel: Dip	The channels which port 1 and port 2 are configured according to the dip switch settings. These are the channels which will be bridged if the Bridge Module is reset and the Dip Configuration parameter is enabled.

SHOW COMMUNITY

Use the SHOW COMMUNITY command to list the current community table for the Bridge Module.

Format

SHOW COMMUNITY

Parameters

Example

```
OEBM> show community        [ENTER]

 Index    Community Name    IP Address    Access
 _____    _____    _____    _____

   1      user1             13.24.38.54   Read
   2      ncs               13.24.35.41   All
   3      super             13.24.43.83   Read
   4      admin             13.24.56.98   Read/Write
   5      [empty]
   6      [empty]
   7      [empty]
   8      [empty]
   9      [empty]
  10      [empty]
```

Description

The SHOW COMMUNITY command displays the current community settings for the Bridge Module. Note that the IP Address ***.***.***.*** means all users.

SHOW COUNTER

Use the SHOW COUNTER command to display the statistical counters for the bridge, ports, protocols, and spanning tree.

Format

SHOW COUNTER {parameter}

Parameters

{parameter} = bridge
                 ports
                 protocols
                 spantree

Description

The SHOW COUNTER command displays the statistical counters for the bridge, ports, protocols, and spanning tree.

Since the description for each SHOW COUNTER parameter includes sample output and a table, each parameter is described in the following pages for greater clarity.

SHOW COUNTER BRIDGE

Use the SHOW COUNTER BRIDGE command to display the statistical counters for the bridged packets.

Format

SHOW COUNTER BRIDGE

Parameters

Example

```
OEBM> show counter bridge   [ENTER]

   3658 Seconds Since Clear       Port 1       Port 2
Spanning Tree State               FORWARDING   FORWARDING
Frames Received for Bridging      10032        9736
Frames Transmitted by Bridging    9727         10027
Frames Discarded by Filtering     1108         0
```

Description

The SHOW COUNTER BRIDGE command displays the statistical counters for the bridged packets.

Table 4-3 describes the SHOW COUNTER BRIDGE attributes.

Table 4-3. SHOW COUNTER BRIDGE Command Attributes

Attribute	Description
Seconds Since Clear	The time since the Bridge Module was either reset or the CLEAR command was issued for this group of statistics.
Spanning Tree State	Current Spanning Tree state of this Bridge Module port: Forwarding, Learning, Listening, Blocking, or Disabled.
Frames Received for Bridging	Number of frames received from the network by this Bridge Module port.
Frames Transmitted by Bridging	Number of frames transmitted onto the network by this Bridge Module port.
Frames Discarded by Filtering	Number of frames received from this network and discarded by the filtering processes of this Bridge Module port.

SHOW COUNTER PORTS

Use the SHOW COUNTER PORTS command to display the statistical counters for the Bridge Module ports.

Format

SHOW COUNTER PORTS

Parameters

Example

```
OEBM> show counter ports    [ENTER]

   67 Seconds Since Clear        Port 1   Port 2
Frames Received                  219      242
Bytes Received                   20973    2688
Frames Transmitted               2        197
Bytes Transmitted                128      14896
Transmissions Initially Deferred 0        0
Transmissions Retried Once       0        0
Transmissions Multiply Retried   0        0
Excessive Collisions             0        0
Received Framing Error           0        0
Received Frame Check (FCS) Error 0        0
Receiver Overflows               0        0
Receiver Buffer Error            0        0
Babble Failures                  0        0
Receiver Missed Frames           0        0
SQE (Heartbeat) Failures         0        0
Transmitter Underflowed          0        0
Late Collisions                  0        0
Transmitter Lost Carrier         0        0
```

Description

The SHOW COUNTER PORTS command displays the statistical counters for the Bridge Module ports.

Table 4-4 describes the SHOW COUNTER PORTS attributes.

Table 4-4. SHOW COUNTER PORTS Command Attributes

Attribute	Description
Seconds Since Clear	The time since the local bridge was either reset or the CLEAR command was issued for this group of statistics.
Frames Received	Number of frames received from the network by this Bridge Module port.
Bytes Received	Number of bytes received from the network by this Bridge Module port. Dividing this number by the number of frames received will give an average frame size received.
Frames Transmitted	Number of frames transmitted onto the network by this Bridge Module port.
Bytes Transmitted	Number of bytes transmitted onto the network by this Bridge Module port. Dividing this number by the number of frames transmitted will give an average frame size transmitted.
Transmissions Initially Deferred	Number of transmissions deferred because the network was busy.
Transmissions Retried Once	Number of transmissions retried once because of collisions.
Transmissions Multiply Retried	Number of transmissions retried more than once because of a collision (does not include counts from above statistics)

Table 4-4. SHOW COUNTER PORTS Command Attributes

Attribute	Description
Excessive Collisions	Number of packets the bridge discarded because it could not transmit onto the Ethernet without seeing a collision 16 times in a row.
Received Framing Error	Number of Ethernet packets received without proper framing.
Received Frame Check (FCS) Error	Number of Ethernet packets received with bad FCS (Frame Check Sequence) — usually these and framing errors are seen together.
Received Overflows	This can occur when packets arrive from one port faster than they can be output on the other port. As network size increases, the likelihood of these errors increases. They are not fatal errors.
Received Buffer Error	This error occurs on the receive end when the Ethernet chip wants to chain data buffers and does not own the next buffer.
Babble Failures	Number of times the bridge told the Ethernet chip to send out an illegally long Ethernet packet.
Receiver Missed Frames	Number of times the receiver missed a frame. This can occur when packets arrive from one port faster than they can be output on the other port. As network size increases, the likelihood of these errors increases. They are not fatal errors.

Table 4-4. SHOW COUNTER PORTS Command Attributes

Attribute	Description
SQE (Heartbeat) Failures (You can disable this attribute using the SET DEVICE SQE_MODE command)	Number of times the frame was transmitted without successful SQE (heartbeat). This is not a fatal error. It may occur when SQE is turned off at the transceiver.
Transmitter Underflowed	Number of times a frame transmit aborted because the Ethernet Controller could not access memory.
Late Collisions	Number of collisions after the slot-time of the channel has expired.
Transmitter Lost Carrier	Number of times a frame was sent and there was an open tap into the Ethernet (AUI port disconnected).

SHOW COUNTER PROTOCOLS

Use the SHOW COUNTER PROTOCOL command to display the statistical counters for the Bridge Module protocols. These counters reflect the amount of traffic on the network.

Format

SHOW COUNTER PROTOCOLS

Parameters

Example

```
OEBM> show counter protocols   [ENTER]

   827 Seconds Since Clear        Port 1      Port 2
Unicast Packets Received          0           0
Non-Unicast Packets Received      0           0
Unicast Packets Transmitted       0           0
Non-Unicast Packets Transmitted  0           0
Description
```

The SHOW COUNTER PROTOCOLS command displays the statistical counters for the Bridge Module protocols.

These counters reflect the amount of traffic processed by the bridge as an end station in the attached networks. This traffic will be composed of remote_login sessions, SNMP frames, PING messages, and ARP frames.

Table 4-5 describes the SHOW COUNTER PROTOCOLS attributes.

Table 4-5. SHOW COUNTER PROTOCOLS Command Attributes

Attribute	Description
Seconds Since Clear	The time since the Bridge Module was either reset or the CLEAR command was issued for this group of statistics.
Unicast Packets Received	Number of packets received for which this bridge is an end station on the attached networks.
Non-Unicast Packets Received	Number of packets received for which this bridge is an end station on the attached networks.
Unicast Packets Transmitted	Number of packets generated (to a specific MAC address) by this bridge as an end station, either in response to received packets or as a result of a Management command (i.e., PING).
Non-Unicast Packets Transmitted	Number of Broadcast and Multicast packets generated by this bridge as an end station, either in response to received packets or as a result of a Management command (i.e., PING).

SHOW COUNTER SPANTREE

Use the SHOW COUNTER SPANTREE command to display the statistical counters for the Bridge Module spantree parameters.

Format

SHOW COUNTER SPANTREE

Parameters

Example

```
OEBM> show counter spantree   [ENTER]

    811 Seconds Since Clear       Port 1        Port 2
Spanning Tree State               FORWARDING    FORWARDING
Spanning Tree Frames Received     0             177
Spanning Tree Frames Transmitted  177           0

Port Independent Statistics
Topology Change Count             3
Seconds Since Topology Changed    1736
Active Hello Time                 7
Active Forward Delay              11
Active Listen Time                27
This bridge is the root bridge
```

Description

The SHOW COUNTER SPANTREE command displays the statistical counters for Spanning Tree. If Spanning Tree is disabled, this screen will be blank.

Table 4-6 describes the SHOW COUNTER SPANTREE attributes.

Table 4-6. SHOW COUNTER SPANTREE Command Attributes

Attribute	Description
Seconds Since Clear	The time since the Bridge Module was either reset or the CLEAR command was issued for this group of statistics.
Spanning Tree State	Current spantree state of the Bridge Module port: Forwarding, Learning, Listening, Blocking, or Disabled.
Spanning Tree Frames Received	Number of Spanning Tree frames received from the network by this Bridge Module port.
Spanning Tree Frames Transmitted	Number of Spanning Tree frames transmitted onto the network by this Bridge Module port.
Topology Change Count	Count of Spanning Tree topology changes detected by this bridge.
Seconds Since Topology Changed	Time since the last topology change was detected by this bridge.
Active Hello Time	Hello time specified by the current Root Bridge.
Active Forward Delay	Forward delay time specified by the current Root Bridge.
Active Listen Time	Listen time specified by the current Root Bridge.
Message to indicate if this bridge is the Root Bridge.	This bridge is the Root Bridge.

SHOW DEVICE

Use the SHOW DEVICE command to display device-related information.

Format

SHOW DEVICE

Parameters

Example

```
OEBM>  show device  [ENTER]

ONline Ethernet Bridge Module (Bridge Module); SNMP
Management
Name: Bridge3

Boot EPROM Version:v1.3     Serial#:3658     Restarts:9
Flash EPROM Version: v2.00  Service Date: / /

Location:
Third Floor Engineering


                     Port 1               Port 2
MAC Address:       08-00-8F-10-13-48   08-00-8F-10-13-49
IP Address:        127.1.2.3           127.1.2.3
Subnet Mask        FF.FF.FF.00         FF.FF.FF.00
Default Gateway    0.0.0.0             0.0.0.0

For assistance contact:  Network Administrator

Diagnostics: ENABLED
SQE_Mode: NORMAL
```

Description

The SHOW DEVICE command displays the firmware version of the Bridge Module and other device related information.

Table 4-7 describes the command attributes.

Table 4-7. SHOW DEVICE Command Attributes

Attribute	Description
MAC Address	Unique 48-bit address assigned to this interface.
IP Address	IP address currently assigned to the Bridge ports.
Subnet Mask	Subnetwork mask specified for the network Internet class.
Default Gateway	IP address of the default gateway for packets with an unknown destination IP address.

SHOW FILTER

Use the SHOW FILTER command parameters to display the entries in the dynamic address filter table, the contents or mode of the protocol ID table, and the contents of the static address table.

Format

SHOW FILTER {parameter}

Parameters

{parameter} = dynamic_address_table
 mode
 protocol id_table
 static_address_table

Description

The SHOW FILTER command displays the entries in the dynamic address filter table, the contents or mode of the protocol ID table, and the contents of the static address table.

For clarity, the SET FILTER command parameters are described in the following pages.

SHOW FILTER DYNAMIC_ADDRESS_TABLE

Use the SHOW FILTER DYNAMIC_ADDRESS_TABLE command to display active entries in the dynamic address filter table at each of the bridge ports.

Format

SHOW FILTER DYNAMIC_ADDRESS_TABLE {port}

Parameters

{port} = port1
        port2

Example

The following example displays the active entries in the dynamic filter table for port 1.

```
OEBM>  show filter dynamic_address_table port1  [ENTER]


00-00-0C-00-AD-E3                 00-00-0C-00-EE-07
00-00-0C-01-17-6E                 00-00-B5-08-03-57
02-60-8C-0D-E1-AF                 02-60-8C-OE-89-E9
02-60-8C-3F-48-8B                 02-60-8C-3C-CA-D9
```

Description

The SHOW FILTER command displays all dynamic entries since the last reset which have not been "aged out". Note that for ports that have no addresses in the dynamic filtering table, the message "0 dynamic entries" is displayed.

SHOW FILTER MODE

Use the SHOW FILTER MODE command to display the current protocol id table filtering mode.

Format

SHOW FILTER MODE

Parameters

Example

```
OEBM>  show filter mode   [ENTER]
Filtering Mode:
Protocol ID table mode is FILTER
```

Description

The SHOW FILTER MODE command displays the current protocol id table filtering mode. Filtering modes are either disabled, filter, or forward.

SHOW FILTER PROTOCOL_ID_TABLE

Use the SHOW FILTER PROTOCOL_ID_TABLE command to display the contents of the protocol id table.

Format

SHOW FILTER PROTOCOL_ID_TABLE

Parameters

Example

```
OEBM> show filter protocol_id_table   [ENTER]
Filtering Mode:
Protocol ID table mode is FILTER
08-06   08-05
```

Description

The SHOW FILTER PROTOCOL_ID_TABLE command displays the contents of the protocol id table.

SHOW FILTER STATIC_ADDRESS_TABLE

Use the SHOW FILTER STATIC_ADDRESS_TABLE command to display the the MAC addresses in the static address table configured with the filter type you specify.

Format

SHOW FILTER STATIC_ADDRESS_TABLE {variable}

Parameters

{variable} = always_forward
             never_forward_to_port1
             never_forward_to_port2

Example

This example shows the command used with the *always_forward* parameter.

```
OEBM> show filter static_address_table always_forward  [ENTER]
No entries of this address filter type found.
```

Description

The SHOW FILTER STATIC ADDRESS_TABLE command displays the MAC addresses in the static address table configured with the filter type you specify.

SHOW LAST_ERROR

Use the SHOW LAST_ERROR command to display information on the last
fatal error that occurred at the local bridge.

Format

SHOW LAST_ERROR

Parameters

Example

```
OEBM>  show last_error  [ENTER]

Display of Last Error - Flash Version: v2.00
Crash reason:  Address Error

   -0-       -1-       -2-       -3-       -4-       -5-       -6-
A=0047D35E 004773E4 00402D04 00000000 00000000 00000000 0047D3C4

D=00000001 00200000 000000FF 00000009 00000000 00000000 00000000

PC = 014B30   SR = 2000
Stack Dump


47D308 4E 76 00 00 00 01 4E 75 - 20 00 00 01 4B 30 00 00.Nv.Nu..K0.
47D318 00 00 00 00 00 00 00 00 - 0B B8 00 47 D3 5E 00 00.Copyright.
47D328 00 00 00 00 00 00 00 00 - 00 00 00 01 00 00 00 00.3Com...
47D338 00 00 00 FF 00 00 00 00 - 00 00 00 00 00 00 00 00.Corporatio
47D348 00 00 00 66 00 00 0A 20 - 63 6F 70 79 72 69 67 61.n.1991....
47D358 74 20 31 39 39 31 20 43 - 68 69 70 63 6F 6D 20 43.ONline....
47D368 6F 72 70 6F 72 61 74 69 - 6F 6E oA 20 4F 4E 6C 69...Bridge..
47D378 6E 65 20 42 72 69 64 67 - 65 20 4D 6F 64 75 6C 65...module..
```

Description

The SHOW LAST_ERROR command displays information on the last fatal
error that occurred. This information may indicate a problem with the
Bridge Module. Log the error information and track the problem. If you
receive fatal errors frequently, call 3Com Technical Support as outlined in
the Technical Assistance section at the end of Chapter 5.

SHOW SPANTREE

Use the SHOW SPANTREE command to display the current Spanning Tree information for the local bridge.

Note that the values listed for forward_delay_time, hello_time, and listen_time are active and in effect ONLY when the local bridge is the root of the Spanning Tree.

Format

SHOW SPANTREE

Parameters

Example

```
OEBM>  show spantree   [ENTER]
Spanning Tree Parameters:
Mode                     enabled
Bridge Priority          125
Path Cost Port 1         10
Path Cost Port 2         10
Hello Time (sec)         10
Forward Delay Time (sec) 12
Listen Time (sec)        22
Spantree Hello Address:  01-70-C2-00-00-00
```

Description

The SHOW SPANTREE command displays current Spanning Tree configuration information.

These parameters are described in detail in the SET SPANTREE section.

Note that the values listed for forward_delay_time, hello_time, and listen_time are active and in effect ONLY when the local bridge is the root of the Spanning Tree. Otherwise, the local bridge, as a non-root bridge, will operate using the values imposed for these parameters by the current Root Bridge.

These values (the ones imposed by the current Root Bridge) are displayed with the MONITOR SPANTREE command as the active HELLO_TIME, active FORWARD_DELAY_TIME, and active LISTEN_TIME.

Table 4-8 describes the SHOW SPANTREE command attributes.

Table 4-8. SHOW SPANTREE Command Attributes

Attribute	Description
Bridge Priority	The priority of this bridge. The bridge priority is used with the bridge Ethernet address to determine which bridge becomes the Root Bridge in the network.
Path Cost Port1 Path Cost Port2	The value of this parameter determines the path cost of port 1 or port 2 on the Bridge Module. The Spanning Tree Protocol seeks to minimize the path cost between the bridge and the Root Bridge (called the root path cost). The cost should be a lower value as the distance between the bridge and the Root Bridge is lessened.
Hello Time (sec)	The rate (in seconds) at which this bridge, when it is the Root Bridge, will send out a Multicast address packet (hello packet). This packet is sent to all other Ethernet Bridges to let them know the root is still active.
Forward Delay Time (sec)	The amount of time (in seconds) that bridges will wait in each Spanning Tree state when moving from Listening to Forwarding mode when this bridge is root. The modes that are affected by this parameter are Listening and Learning.

Table 4-8. SHOW SPANTREE Command Attributes (Continued)

Attribute	Description
Listen Time (sec)	The amount of time (in seconds) that bridges will wait for the Root Bridge to send out its Multicast address packet (hello packet) when this bridge is root.
Spantree Hello Address	This is the destination address of the Root Bridge's Muticast address packet (hello packet). This packet is sent to all other bridges to let them know the root is still active.

SHOW TERMINAL

Use the SHOW TERMINAL command to display the terminal configuration.

Format
SHOW TERMINAL

Parameters
none

Example

```
OEBM> show terminal       [ENTER]
Terminal Parameters:

Baud          9600
Data bits     8
Parity        NONE
Stop bits     2
Timeout time  0
Hangup        DISABLE
Type          DUMB
```

Description
The SHOW TERMINAL command displays the current terminal parameters.

5 *Troubleshooting*

This chapter provides useful information for diagnosing unexpected results when using the Bridge Module. It is divided into the following sections:

❑ Applying Power

❑ Power-Up Self-Test

❑ Management Interface

❑ Bridge Operation

❑ Technical Assistance

Applying Power

Under normal conditions, when you install the Bridge Module, the TEST LED lights and the TX and RX LEDs illuminate different patterns. Table 5-1 lists some of the common problems that may arise when installing your Bridge Module, and their solutions

.

Table 5-1. Applying Power Suggestions

Problem	Troubleshooting Suggestions
All indicators are off.	Check that the concentrator is receiving power.
	Press the LED check button on the Controller Module to verify that the LED is not burned out. All the LEDs should light.
	Verify that the Bridge Module is installed correctly by following the installation instructions in Chapter 2.
	Pull the Bridge Module out and then slide it back in, or install the module in another pair of concentrator slots.
	Press the Reset button on the Bridge Module.
	Try downloading a new copy of the firmware as described in Chapter 6. If downloading firmware doesn't solve the problem, contact 3Com Customer Support as outlined in the end of this chapter.

PowerUp Self-Test

Under normal conditions, the TEST LED stays on during the power-up self-test (about 20 seconds) and then turns off. If the TEST LED continues blinking, refer to Table 5-2 for possible solutions

.

Table 5-2. Power-Up Self-Test Suggestions

Problem	Troubleshooting Suggestions
The test indicator continues blinking.	Press the RESET button on the front panel to restart the power-up sequence. If the result is the same, try the next step.
	Make sure the AUI loopback connector or transceiver cable is securely attached to the AUI port.
	If transceiver cable is attached to the AUI port, check the following:
	❑ Make sure the transceiver and transceiver cable are compatible (see Appendix C).
	❑ Make sure the transceiver is receiving power through the transceiver cable. Many transceiver models have power indicators.
	❑ Make sure the transceiver is properly connected to the Ethernet/IEEE 802.3 cable.
	❑ Make sure the Ethernet/IEEE 802.3 cable plant is configured correctly, e.g., both ends are terminated with 50 ohms.

If all these conditions are met and you still cannot get your Bridge Module to operate, refer to Appendix E for Technical Assistance.

Management Interface

Follow the directions in Chapter 2 for attaching your terminal to the Bridge Management Interface. Under normal conditions, the prompt, "OEBM>" appears on the screen once you press [ENTER]. Table 5-3 lists some common Management Interface problems that may occur when the Bridge Module is first set up to communicate with the terminal.

Table 5-3. Management Interface Suggestions

Problem	Troubleshooting Suggestions
Nothing appears on the screen.	Make sure the RS-232 cable meets the specifications listed in Appendix C.
	Make sure the cable is securely connected to both devices.
	Verify that the baud rates, data bits, and parity match for the terminal and the Bridge Module.
Characters appear on the screen, but are garbled.	Check the values of the communication parameters of both the Bridge Module and the terminal.
The SET command doesn't work.	Use the administrator password when logging on to the bridge. This activates the SET command. (Note that the MGMT LED turns on.)
The password doesn't work or you forgot the password.	Use the FORCE command to override password protection.
When you use abbreviated input, pressing [SPACE] does not complete the input.	Ensure that you entered enough characters for the Management interface to distinguish between different commands and options.

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Table 5-3. Management Interface Suggestions (Continued)

Problem	Troubleshooting Suggestions
The management prompt on the screen is not as you set it.	The Bridge Module is connected to a remote device or you did not save the new prompt. Refer to the REMOTE_LOGIN and LOGOUT commands in Chapter 4.
The prompt >> appears on the screen.	The bridge is operating out of the Boot PROM code for the Bridge Module. The Boot PROM code contains a subset of the operating code that is contained on the Flash EPROM. Refer to Chapter 6, *Firmware Download Instructions*, for directions on booting up to the Flash EPROM version of the bridge code.

Bridge Operation

Once your Bridge has passed the self-test and appears to be working, you may have some operating questions or problems. Listed below are some common bridge operation problems and their solutions.

If you can't establish a connection between a node on the port 1 subnetwork and one on the port 2 subnetwork, make sure the network software running on both nodes is compatible. You should also view the FWD LED status on the front panel. This LED should be lit when port 1 and port 2 are communicating.

Technical Assistance

You can receive assistance for installing and troubleshooting the Bridge Module by calling either your 3Com reseller or 3Com Technical Support. Be prepared to supply a representative with the following information:

❑ Bridge serial number and Ethernet addresses

❑ Description of the problem

❑ Steps you have taken to try and correct the problem

❑ Type and software version of the ONline network management module being used

❑ Version of software installed on your Bridge Module

❑ Status of the front panel LEDs

❑ Screen information (if available)

❑ Configuration of your concentrator

(you may find it helpful to refer to the Slot Usage Chart in Appendix B of the *ONline System Concentrator Installation and Operation Guide* for a record of this information)

Refer to Appendix E for instructions on contacting Technical Support for your product..

6 *Firmware Download Instructions*

This chapter explains how to download new software to the Flash EPROM in your ONline Ethernet Bridge Module. New software is provided to registered owners by 3Com Corporation when new features or enhancements are available for the module. Contact your 3Com representative for information and pricing on upgrades.

Download Requirements

The following requirements must be met before you can download software:

❑ You must have the 3Com Firmware Distribution Kit (Part Number 5000-FDK), including:

– ProComm Reference Manual (from Datastorm Technologies, Inc.)

– ProComm diskettes (5 1/4" and 3 1/2" disks)

– ProComm software license

– 3Com diskettes (5 1/4" and 3 1/2" disks)

– 10 ft. RS-232 cable

– 25-pin to 9-pin adapter

❑ You must have the ONline Ethernet Bridge Module Update Distribution Kit from 3Com (Part Number 5102B-UDK-x.x). The Update Kit has two versions - limited and unlimited.

The limited version (5102B-UDKL-x.x) allows you to update one Bridge Module per site and includes:

– One set of 3Com diskettes (includes a 5 1/4" diskette and a 3 1/2" diskette)

– 3Com software license

– Installation instructions and a new user manual

– Release Notes

The unlimited version (5102B-UDKU-x.x) allows you to update an unlimited number of modules and includes:

– Two sets of 3Com diskettes (each set includes a 5 1/4" diskette and a 3 1/2" diskette)

– 3Com software license

– Installation instructions and four new user manuals

– Release Notes

❑ IBM PC/AT or compatible with either one high-density diskette drive and a hard drive or two high-density diskette drives

❑ 640K of available RAM on the PC

Caution: The PC used to download the new software must not be running any background RAM processes, such as electronic mail systems, because they will interfere with the download procedure.

Download Background Information

The Firmware Distribution Kit (FDK) is supplied from 3Com to make system upgrades fast and easy for all 3Com products that are equipped with Flash

EPROMs. The first time you update the firmware requires that you purchase both an FDK and a UDK. All updates after that time require that you have the new version of the UDK (and the original FDK).

When 3Com issues a software upgrade, the upgrade is sent on diskette (UDK) to all registered users. The upgrade takes only ten or fifteen minutes, after which time the Bridge Module will be up and running the new version of software.

Download Instructions

The instructions for downloading new software to the Bridge Module are divided into the following steps:

❑ Install the ProComm Software

❑ Connect the RS-232 Cable

❑ Download the new Bridge Module Software

Install the ProComm Software

This step installs and configures ProComm software on your PC hard disk or onto the FDK diskette. The files are installed in the subdirectory PROCOMM on either the hard drive or on the FDK diskette. Follow the instructions below:

1. Remove the shrink-wrap from the ProComm package and remove the ProComm Distribution Diskette.

2. Make a backup copy of both the ProComm diskette and the 3Com provided diskette (the FDK diskette).

3. Place the 3Com diskette in the floppy drive and change to that drive by typing **a:** or **b:**.

4. Type the command **FDK** and press [ENTER] to display the initial installation screen as shown in Figure 6-1.

```
************************************************************************
*                         3Com CORPORATION                           *
* Firmware Distribution Kit        Copyright 199X 3Com Corporation    *
*                                                                     *
* This Firmware Distribution Kit will install and configure ProComm,  *
* a terminal emulation program, on you computer's hard disk or on a   *
* second floppy drive.  The program will reside in the directory      *
* called PROCOMM.  Make sure you have the PROCOMM Distribution        *
* Diskette and the 3Com Firmware Distribution Diskette ready at all   *
* times during the installation.                                      *
************************************************************************

  Enter the Source Drive :
  Enter the Destination Drive :
  Enter the COM Port (1-4) :
  Start the Installation

  ┌─────────────────────────────────────────────────────────────────┐
  │ Press ENTER to accept the current drive selections and start      │
  │ the ProComm Installation.                                         │
  └─────────────────────────────────────────────────────────────────┘

↓, TAB:  Next Field  ↑: Previous Filed   Enter: Accept    ESC: Quit →
```

Figure 6-1. Initial Installation Screen

5. Enter the letter of the source drive where you will be inserting the ProComm diskette following the "Enter the Source Drive:" prompt. For a hard drive installation, this is the drive where the current 3Com FDK diskette is installed. For a floppy disk installation, this is the second disk drive. Then press the Down Arrow key (↓) or [TAB] to move the cursor to the next field.

6. Enter the letter of the destination drive where you want ProComm to be installed following the "Enter the Destination Drive:" prompt. For a hard drive installation, this is either *c* or *d*. For a floppy disk installation, this is the drive where the FDK disk is installed, either *a* or *b*. Then press the Down Arrow key (↓) or [TAB] to move to the next field.

7. Enter the number of the communications port (COM1, COM2, etc.) to which you will be connecting the RS-232 cable on the PC to perform the software download following the "Enter the COM Port (1-4):" prompt. Then press the Down Arrow key ($\downarrow$) or [TAB] to move to the next field.

Note: If you are performing a *two-floppy installation*, follow Step 8. If you are performing a *floppy-to-hard drive installation*, follow Steps 9 and 10.

8. Press [ENTER] if the source and destination drive identifiers and the COM port selection are correct. Then, insert the ProComm diskette in the appropr-iate drive and press [ENTER] to install and configure ProComm directly on the FDK diskette. The floppy installation is complete when the message "INSTALLATION COMPLETE" displays. Label the FDK diskette as now having ProComm installed so you can locate this diskette when necessary.

9. Press [ENTER] if the source and destination drive identifiers and the COM port selection are correct and the installation process begins. Insert the ProComm diskette into the diskette drive when prompted as shown in Figure 6-2.

```
********************************************************************
*                      3Com CORPORATION                           *
*                                                                  *
* Firmware Distribution Kit     Copyright 199X 3Com Corporation    *
*                                                                  *
* This Firmware Distribution Kit will install and configure        *
* ProComm, a terminal emulation program, on you computer's hard    *
* disk or on a second floppy drive.  The program will reside in the*
* directory called PROCOMM.  Make sure you have the PROCOMM        *
* Distribution Diskette and the 3Com Firmware Distribution Diskette *
* ready at all times during the installation.                      *
********************************************************************


┌──────────────────────────────────────────────────────────────┐
│ Insert the ProComm Distribution Diskette in Drive A            │
│ Press any key to continue...                                   │
└──────────────────────────────────────────────────────────────┘
```

Figure 6-2. ProComm Installation Screen

Note: If the message "ProComm directory already exists, overwrite files?" displays, you have the choice of overwriting the files or quitting the installation. If you enter Y to overwrite the files, the existing ProComm files are deleted and then the new files are copied to the selected drive.

10. Once ProComm is installed on the hard drive, you will be prompted to swap in the 3Com FDK diskette as shown in Figure 6-3. Make sure you place the correct diskette in the disk drive before pressing [ENTER].

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```
*********************************************************************
*                          3Com CORPORATION                        *
*                                                                   *
* Firmware Distribution Kit        Copyright 199X 3Com Corporation  *
*                                                                   *
* This Firmware Distribution Kit will install and configure ProComm,*
* a terminal emulation program, on you computer's hard disk or on a *
* second floppy drive.  The program will reside in the directory    *
* called PROCOMM.  Make sure you have the PROCOMM Distribution       *
* Diskette and the 3Com Firmware Distribution Diskette ready at all  *
* times during the installation.                                     *
*********************************************************************
```

Figure 6-3. Post-ProComm Installation Screen

This last step of the installation loads the ProComm configuration file. The configuration file sets the parameters that are used by ProComm to communicate with the Bridge Module. The parameters are as follows:

Note: Baud   = 9600

Data Bits   = 8

Stop Bits   = 2

Parity   = None

COM Port   = (Port number selected in Step 7)

Connect the RS-232 Cable

This step connects your PC to the Bridge Module so you can download the software to the Flash EPROM. Follow the instructions below:

1. Connect the provided RS-232 cable to the Bridge Module RS-232 serial port connector on the front panel of the module.

2. Connect the other end of the cable to the serial port on your PC (using the provided 9- to 25-pin adapter if necessary). Make sure you connect the cable to the communications port you specified in the ProComm install instructions.

Download the New Bridge Module Software

This step copies the new Bridge Module software (UDK) to the Flash EPROM on the Bridge Module. Note that this procedure creates a file called *profile.cmd* in the PROCOMM directory. If you currently have a file with that name, rename it before the UDK download so that it does not get overwritten.

Warning: Do not interrupt power to the concentrator during the download process.

Follow the instructions below:

1. Make a backup copy of the 3Com UDK diskette.

2. Place the 3Com diskette in the floppy drive and change to that drive by typing **a:** or **b:**.

3. Type the command **UDK** and press [ENTER] to display the initial installation screen as shown in Figure 6-4:

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```
***********************************************************************
*                                                                     *
*                        3Com CORPORATION                             *
* Update Distribution Kit          Copyright 199X 3Com Corporation     *
*                                                                     *
* This Update Distribution Kit will start ProCommso you can           *
* download new software to your 3Com device.  Make sure you follow    *
* the instructions carefully to avoid downloading the wrong file      *
* to your device.  Downloading the wrong file may damage the          *
* device.                                                             *
*                                                                     *
***********************************************************************

        Enter the Source Drive :  a
        Enter the ProCcomm Drive :     c
        Start Procomm

  ┌─────────────────────────────────────────────────────────────────┐
  │  Press ENTER to accept the current drive selections and start     │
  │  ProComm.                                                         │
  └─────────────────────────────────────────────────────────────────┘

  TAB:  Next Field  ↑: Previous Filed   Enter: Accept    ESC: Quit →
```

Figure 6-4. Initial UDK Installation Screen

4. Enter the letter of the source drive where you inserted the 3Com
    diskette following the "Enter the Source Drive:" prompt. Then press
    the Down Arrow key (↓) or [TAB] to move the cursor to the next field.

5. Enter the letter of the drive where ProComm has been installed
    following the "Enter the Destination where ProComm resides:"
    prompt. For a hard drive installation, this is usually **c** or **d**. For a floppy
    disk installation, this is the drive where the FDK disk is installed, either
    a or **b**. Then press the Down Arrow key (↓) or [TAB] to move to the
    next field.

6. If the source and destination drive identifiers are correct, press
    [ENTER] to begin the installation process. The first screen that
    appears is the ProComm Header Screen, as shown in Figure 6-5.

Firmware Download Instructions 6 - 9
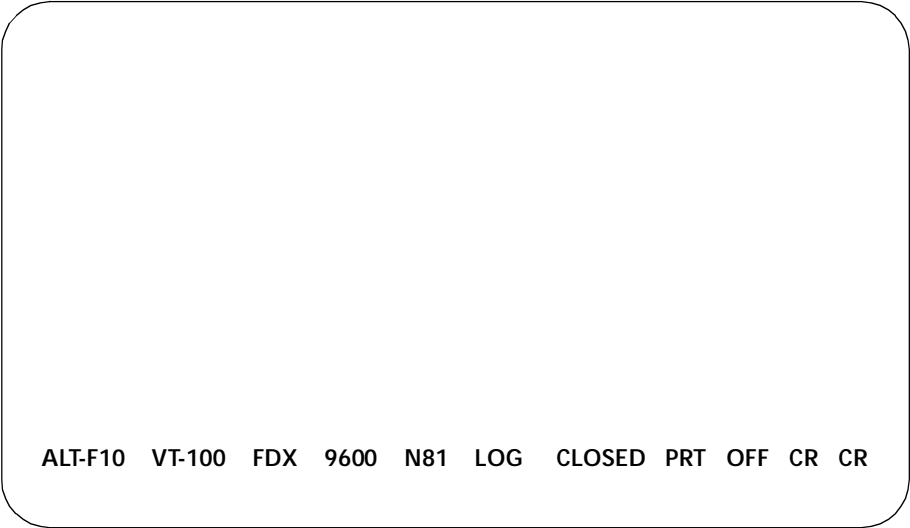
```
PROCOMM (R)

                    Version 2.4.3

Copyright (C) 1985-1988 DATASTORM TECHNOLOGIES,INC. All Rights Reserved

ProComm is user supported software.  It is not free, and it is not in
the public domain.  You are granted a limited license to use ProComm
for a trial period.  If you decide to continue using ProComm, you must
register by sending $50 for registration, disk and manual to the
address below.  (Missouri residents please add 6.475% sales tax.)
DATASTORM also publises PROCOMM PLUS.  PROCOMM PLUS takes all of the
features of ProComm and adds a greatly expanded "point and shoot"
dialing directories, keyboard re-mapping, user setable COM ports,
enhanced Host Mode with electronoic mail, context sensitive help, 375
page manual, voice technical support, and much more.  Contact your
local dealer or call DATASTORM for more information.

DATASTORM TECHNOLOGIES, INC. PO Box 1471, Columbia, MO 65205
314.443.3282
```

Figure 6-5. ProComm Header Screen

> 7. Press [ENTER] at this screen. The ProComm Status Line Screen
>   appears, as shown in Figure 6-6.

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ALT-F10   VT-100   FDX   9600   N81   LOG   CLOSED   PRT   OFF   CR   CR

Figure 6-6. ProComm Status Line Screen

8.   Press [ENTER] to display the Password: prompt, and then log in to the system with the administrator password. (Note that the MGMT LED on the faceplate of the unit will light up.)

Note: Before you start the download procedure it is important to note that the system will prompt you *twice* for the Download command. You must enter the Download command within 10 seconds of the prompts or the following message is displayed and the download process is aborted:

```
The Download command was not entered within 10 seconds.
Please enter the Download command again.
```

For a quick command reentry, press [CTRL-R]. This command retypes the previous command string. If the download times-out before you can enter the key sequence, repeat the Download command and try again.

Firmware Download Instructions 6 - 11

9. Type the following DOWNLOAD command and press [ENTER].

```
OEBM> maintain download out_of_band    [ENTER]

Warning:
Download will erase your current operational code. You
will need the following to replace the software:

1. PC running Procomm communications software

2. 3Com ONline Bridge Module software media

If you are sure to want to do a download, enter the
Download command again within 10 seconds. Otherwise, this
    sequence will be aborted.

OEBM>
```

10. Type [CTRL-R] within 10 seconds to reenter the complete Download command.

11. The system will prompt you twice for the password (carriage return) before the Download process will begin. Press [ENTER] at the Password: prompts.

```
Please enter your password to begin the Download process
Password: [ENTER]

Please enter you password again
Password: [ENTER]

Preparing the bridge for download...
```

12. Once the message "Please enter the download sequence: <ALT> <F5> <filename> <CR>" displays, press the key combination [ALT-F5]. The ProComm Pop-Up Menu Screen displays, as shown in Figure 6-7.

```
┌─────────────────────────────────────────────────────────────────────┐
│                                              ┌──Command FIles──┐     │
│   ┌──────────────────────────────────────┐   │  OEBMV212.CMD   │     │
│   │  Command file:                       │   │                 │     │
│   └──────────────────────────────────────┘   │                 │     │
│                                               │                 │     │
│                                               │                 │     │
│                                               │                 │     │
│   Password:                                   └─────────────────┘     │
│   OEBM> maintain download out_of_band                                 │
│   Please enter your password to begin the download process           │
│   Password:                                                           │
│   Please enter your password again                                    │
│   Password:                                                           │
│   Preparing the brindge for download...                               │
│   Please enter the download sequence: <ALT> <F5> <filename> <CR>      │
│   ➤                                                                   │
│                                                                       │
│   ALT-F10  VT-100  FDX  9600  N81  LOG  CLOSED  PRT  OFF  CR  CR       │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```
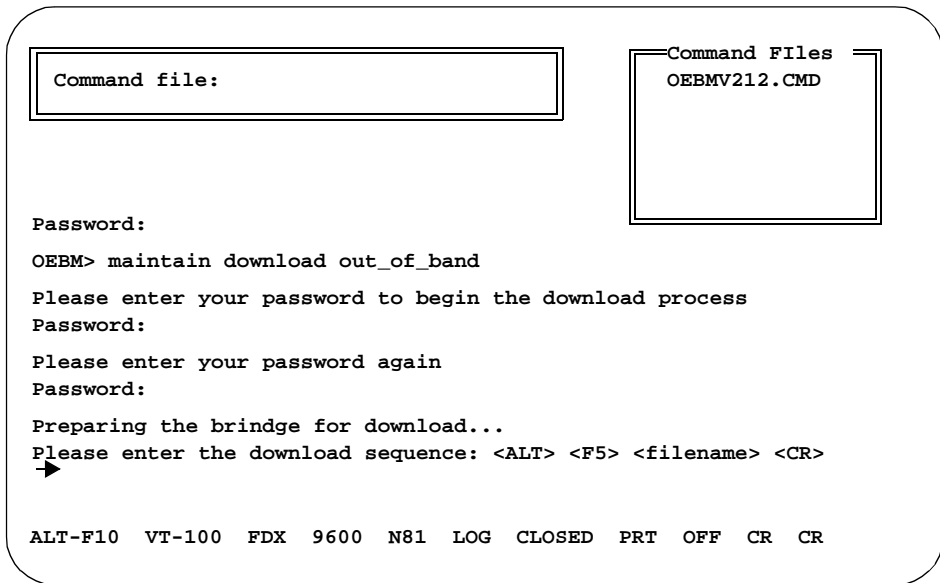
Figure 6-7. ProComm Pop-Up Menu Screen

13. Press [ENTER] to download the **OEBx_xx.CMD** file to the Flash
    EPROM (where x_xx is the software version). This process takes
    approximately ten to eleven minutes at 9600 baud. If you use a
    slower baud rate, the download will take much longer.

    As the download proceeds, the screen shown in Figure 6-8 is
    displayed.

Firmware Download Instructions 6 - 13

```
                                    PROTOCOL:          XMODEM
                                    FILE NAME:         oebmv212.bin
                                    FILE SIZE:         xxxxx
                                    BLOCK CHECK:       CRC
                                    TRANSFER TIME:     xx:xx
                                    BYTES TRANSFERRED: xxxx
                                    BLOCKS TRANSFERRED xxxx
                                    BLOCKS IN FILE:    xxxx
                                    ERROR COUNT:       0
                                    LAST MESSAGE: NONE


 OEBM> Maintain download out_of_band

 Please enter your passworkd to begin the download process
 Password:

 Please enter your password again
 Password:

 Preparing the brindge for download...           ➡
```

Figure 6-8. ProComm Download Screen

When the download completes successfully, a message displays to that effect and the Bridge Module boots up under the new Flash EPROM code and displays the ONline Ethernet Bridge Module header.

If error messages are displayed on the screen, refer to the Troubleshooting section later in this chapter.

14. The download procedure is now complete. Press the key sequence [ALT-X] and the " EXIT TO DOS? (Y/N)" prompt displays, as shown in Figure 6-9.

```
┌─────────────────────────────────────────────────────────┐
│                                                           │
│   ┌──────────────────────────────┐                        │
│   │ EXIT TO DOS? (Y/N)           │                        │
│   └──────────────────────────────┘                        │
│                                                           │
│      ➡                                                     │
│                                                           │
│                                                           │
│                                                           │
│                                                           │
└─────────────────────────────────────────────────────────┘
```
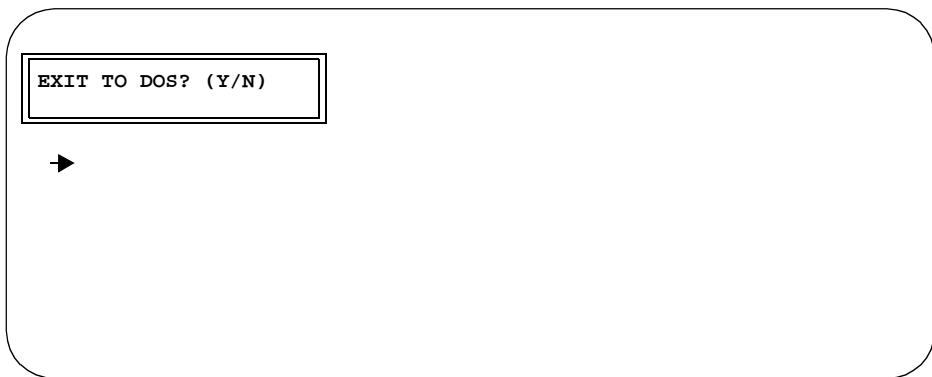
Figure 6-9. Exit ProComm Screen

15. Enter Y to exit from ProComm.

16. Disconnect the cable from the PC and the Bridge Module. The module is now updated with the new software.

Troubleshooting

This section discusses possible problems you may encounter during the download process. The problems are divided into ProComm Problems and Bridge Module Problems.

ProComm Problems

If the problem is not listed in the Bridge Module Problems section below, refer to the *ProComm Reference Manual,* Appendix C, Answers To

Commonly Asked Questions, Appendix G, and Chapter 7. Refer also to Table 6-1 which lists common UDK error messages.

Table 6-1. UDK Error Messages

Message	Troubleshooting Suggestion
Invalid Source or ProComm Drive Specifications	The drive letter entered where the UDK program may find the 3Com distribution diskette, or ProComm is invalid. The drive letter entered for the 3Com distribution diskette must be 'A' or 'B'. The drive letter entered where the UDK may find ProComm cannot be the same as the drive letter entered to find the 3Com distribution diskette.
Specified Source Drive is inaccessible, Drive latch closed?	The specified drive letter for the UDK program to find the download files is inaccessible. Verify the floppy drive exists, the diskette is inserted, and the drive latch is closed.
Specified ProComm Drive is inaccessible	The specified drive letter where the UDK program is to find ProComm is inaccessible. Verify the specified drive exists and ProComm is installed on it.
You must have ProComm to successfully download Installation Terminated, press any key to exit	The UDK program is unable to locate a ProComm subdirectory on the specified destination drive. Verify that a directory called \PROCOMM exists on the destination drive and that the ProComm files are in it.

Table 6-1. UDK Error Messages (Continued)

Message	Troubleshooting Suggestion
Fatal Error: Insufficient Available Memory to run ProComm	A minimum of 200k bytes of free memory is necessary to successfully run ProComm and to do the download. Decreasing the number of Terminate and Stay Resident Programs present while running the UDK program will free memory.
Fatal Error: Unable to run ProComm or ProComm not found	The ProComm subdirectory on the destination drive either does not contain ProComm or ProComm has been corrupted. Verify that the ProComm files exist on the destination drive in the subdirectory \PROCOMM.

Bridge Module Problems

Bridge Module problems during the download cause an error statement to be displayed on the screen. Common error messages and their meanings are discussed in Table 6-2.

Table 6-2. Bridge Module Download Error Messages

Problem	Troubleshooting Suggestion
Maximum bad CRC	Check RS-232 cable and retry. If the problem persists, call 3Com Support.
Max timeouts	User did not start the download quickly enough, try again.
Incorrect code type	Check that you used the correct diskette and try again. If the problem persists, call 3Com Support.

Table 6-2. Bridge Module Download Error Messages (Continued)

Problem	Troubleshooting Suggestion
Packet out of sequence	Try again. If the problem persists, call 3Com Support.
Incorrect code version	Try again. If the problem persists, call 3Com Support.
Flash EPROM overflow	Try again. If the problem persists, call 3Com Support.
Flash EPROM program error	Try again. If the problem persists, call 3Com Support.
Flash EPROM erase error	Try again. If the problem persists, call 3Com Support.
DRAM write error, could not write to DRAM	Try again. If the problem persists, call 3Com Support.
DRAM verify error, could not read DRAM	Try again. If the problem persists, call 3Com Support.
DRAM CRC error during CRC check failed write to DRAM	Try again. If the problem persists, call 3Com Support.
FEPROM CRC download CRC check failed during download	Try again. If the problem persists, call 3Com Support.
FEPROM initialization error, could not initialize Flash	Try again. If the problem persists, call 3Com Support.
FEPROM CRC write error CRC check failed during write	Try again. If the problem persists, call 3Com Support.

A *Specifications*

This appendix lists specifications for the ONline Ethernet Bridge Module. There are five subsections:

❑   General Specifications

❑   Electrical Specifications

❑   Environmental Specifications

❑   Mechanical Specifications

❑   Hardware Specifications

General Specifications

Baseband Connection: Ethernet or IEEE 802.3 AUI

Backplane Interface: Two 96-pin edge connectors, compatible with the 3Com ONline System Concentrators

Management Connection: RS-232-C, Asynchronous, 300-9600 bps

Cable Interface: One 15-pin D-subminiature, female Ethernet V2.0 or IEEE
802.3 AUI
One male 25-pin D-subminiature, RS-232-C, DTE

Interconnect Characteristics

Supports IEEE 802.1(d) Spanning Tree Protocol

Filter Rate: 20,000 packets per second

Forward Rate: 10,000 packets per second

Data Rate (maximum throughput): 9.7 Mbps

Filtering Table: Maximum of 8,000 entries

Packet Format: Any valid IEEE 802.3 or Ethernet frame from minimum of
64 octets to maximum of 1518 octets.

Electrical Specifications

Power Requirements: +5V ± 5%,+12V ± 5%, -12V ± 5%
3.0 Amp for 5V, 0.06 Amp for +12V, 0.03 Amp for -12V

Fuse: 4.0 Amp Fast Blow for 5V
2.0 Amp Fast Blow for +12V
2.0 Amp Fast Blow for - 12V

Power Consumption: 16 Watts

Environmental Specifications

Operating Temperature: 0° to 50° C (32° to 122° F)

Storage Temperature: -30° to 65° C (-22° to 149° F)

Humidity: less than 95%, non-condensing

BTU/hour: 51.2

Mechanical Specifications

Dimensions: 2.0" W x 10.25" L x 8.5" H
            (5.08 cm x 26.04 cm x 21.6 cm)

Weight: 2.0 lbs (0.91 kg.)

Hardware Specifications

Memory

512 Kbytes of "0-Wait State" SRAM (expandable to 1 megabyte)

256 Kbytes of "Flash" PROM (Field Reprogrammable PROM)

64 Kbytes of Boot EPROM

8 Kbytes of EEPROM (Electronically Erasable PROM)

Special Circuits

ONline Management Interface

B Spanning Tree Discussion

This appendix briefly discusses the Spanning Tree Algorithm and Protocol (STAP) and how it is used with the Bridge Module. For greater detail about the internal workings of STAP, consult source books designed for this type of information, such as the IEEE Draft Standard 802.1(d).

Spanning Tree Terminology

The following terms are used in this appendix:

Root Bridge - The Root Bridge is at the top of the tree structure and is determined by having the lowest bridge priority/bridge address. Set the bridge priority through the management commands. Since this value is of higher precedence than the bridge address, it should be set carefully to make sure the correct bridge has assumed root status.

Designated Bridge - The bridge responsible for forwarding packets for that LAN. It is determined by having the lowest "root path cost" for that LAN.

Bridge Address - The Ethernet Address for that Bridge Module.

Root Path Cost - The distance between a bridge and the root bridge is called the root path cost. The summation of all the port costs of the root ports of the designated bridges between the bridge and root.

Root Port - The port on the bridge with the lowest "root path cost"; the port closest to the root bridge.

Bridge Operating States:

Forwarding - Active state where the bridge is forwarding packets and an active member of the network as a designated bridge.

Learning - Intermediate state before "forwarding" where the bridge is learning the Address Filtering information.

Listening - Intermediate state between "blocking" and "learning" where the bridge is just monitoring the network.

Blocking - Inactive state where the bridge is only participating in STAP enough to know when it should move into the "forwarding" state.

Disabled - Inactive state where the bridge is not participating in the network.

Spanning Tree Overview

The Spanning Tree Algorithm Protocol (STAP) is a method by which bridges in a connected network configure themselves so as to prevent loops in the network. The ports on the bridges that are determined to be redundant are placed into Blocking state, only to be used in case the primary bridge fails. Consequently, this protocol provides a way of automatically backing up network connections.

By controlling which ports on which bridges are active or inactive, the STAP transforms the network into a tree architecture, eliminating logical loops in the network. The dotted lines in Figure B-1 show the ports that have been selected as inactive by the STAP.
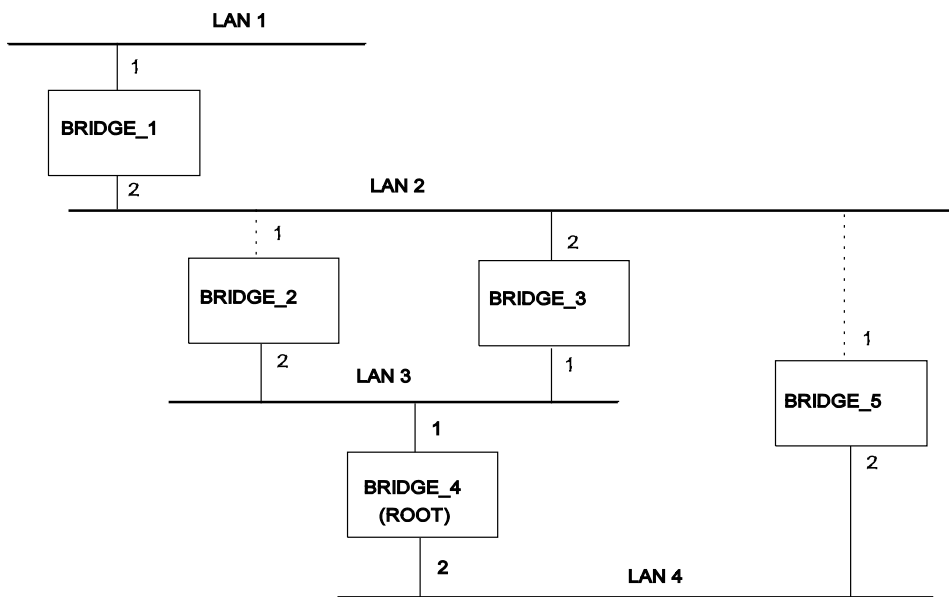
Figure B-1. Spanning Tree Network Architecture

When a bridge is installed into a network, it assumes that it is the root of the network until it is told otherwise. We will call this bridge BRIDGE_3. Thinking it is root, BRIDGE_3 transmits packets onto all the networks to which it is connected, letting adjacent bridges know that it believes it is root. If an adjacent bridge sees that there is a bridge more deserving of the title root bridge of the Spanning Tree (i.e., having a lower "bridge address"), that bridge will inform BRIDGE_3 and it will no longer claim to be root.

BRIDGE_3 has another chance to enter the hierarchy by becoming one of the designated bridges. Each LAN has a designated bridge whose role is to transfer information between that LAN and the root. BRIDGE_3 asks all the adjacent bridges, except those on its root port, whether it can become the designated bridge for any of those neighbor's LANs. If BRIDGE_3 is closer to the root than any of the neighboring bridges on a particular LAN, then it will become the designated bridge for that LAN. BRIDGE_3 is the

designated bridge for the sample shown in Figure B-1 as it forwards information from LAN 1 and LAN 2 to the Root Bridge (BRIDGE_4).

If BRIDGE_3 is told that it is not the designated bridge, it will go into blocking state. In blocking state the bridge monitors the network but is not involved in forwarding packets. BRIDGE_3 then would only become the designated bridge with a change in the network, for example, if the designated bridge fails or another bridge is added to the network that would change the root path cost for BRIDGE_3.

Spanning Tree Example

Figure B-2 shows a Spanning Tree configuration with multiple Bridge Modules.
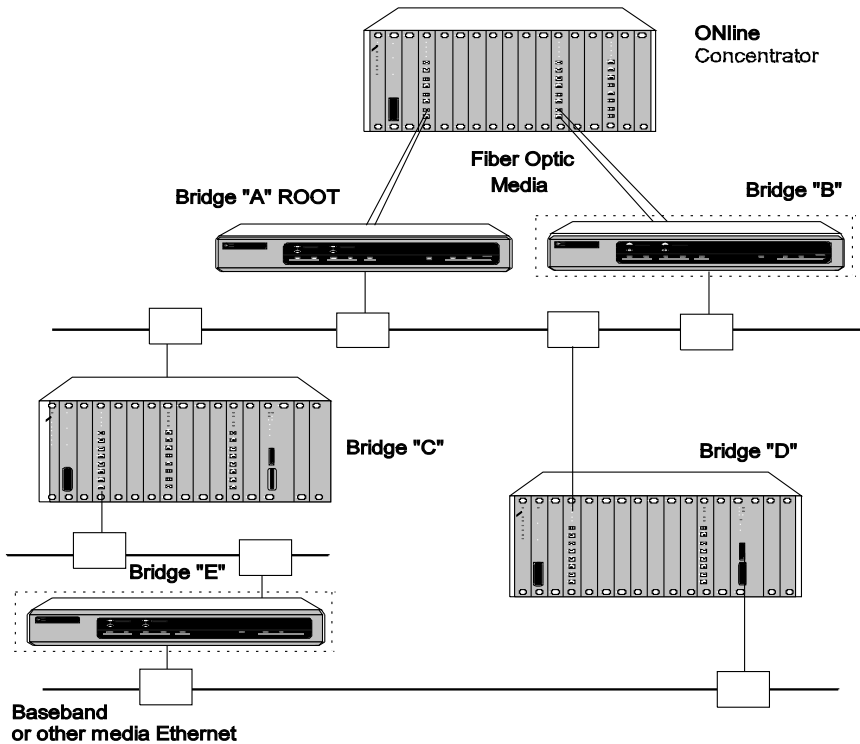
Figure B-2. Configuration With Multiple Bridge Modules

The Midnight Bridge called Bridge A is determined to be the Root Bridge in this configuration. Bridge B and Bridge E are in blocking state as they were determined to be redundant in this network.

C Cable Pinouts

This appendix describes the cable pinouts for both transceiver cables and RS-232 cables. Also described in this appendix are some common problems you may encounter with your transceiver cables and some suggested solutions.

This appendix is divided into the following sections:

❑ Transceiver Cables

  – Transceiver Cable Differences

❑ Cable Configuration Rules

  – Cable Configuration

  – Troubleshooting Transceiver Cables

❑ RS-232 Cables

Transceiver Cables

Figure C-1 illustrates the AUI connector on the front panel of the Bridge Module and Table C-1 shows the proper pinouts for Ethernet V2.0, V1.0, and IEEE 802.3 AUI cables.
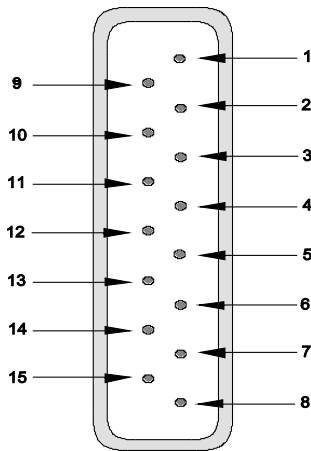
Figure C-1. Bridge Module Female AUI Connector

Table C-1. AUI Cable Pin Chart

Pin	IEEE 802.3	V2.0, V1.0
1	CI-S	Shield
2	CI-A	Collision Presence +
3	DO-A	Transmit +
4	DI-S	Reserved
5	DI-A	Receive +
6	V_c	Power Return
7	CO-A }	Reserved
8	CO-S }	Reserved
9	CI-B	Collision Presence -
10	DO-B	Transmit -
11	DO-S	Reserved

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Table C-1. AUI Cable Pin Chart (Continued)

12	DI-B	Receive -
13	VP	Power +
14	VS	Reserved
15	C0-B	Reserved
Shell	Protective ground	Shield terminated to connector shell

Transceiver Cable Differences

Because AUI Transceiver cables may be built to any of three Ethernet standards (V1.0, V2.0, and IEEE 802.3), signal differences may occur between different types of transceiver cables. These three standards also affect the shielding and grounding of the cables and the size of the wires used in the cables.

Shielding and Grounding

The most significant difference among AUI cables occurs in the shielding and grounding of the individual signal and power pairs. IEEE 802.3 and Ethernet V2.0 specify a requirement for signal isolation due to AC-coupling of the AUI connection, whereas the V1.0 standard does not include this requirement.

The three standards specify different techniques for shielding and grounding:

IEEE 802.3

All shields of the individual signal and power pairs are connected to pin 4. The overall AUI cable shield is connected to the AUI connector shell to provide a cable ground. Pin 1 is not used.

V2.0

All shields are connected to pin 1 and the AUI connector shell. Pin 4 is not used. Most Ethernet cables are built this way.

V1.0

Shielding of individual signal or power pairs is not required, since most V1.0 con-trollers and transceivers are DC-coupled. The overall AUI cable shield provides for shielding and grounding and is connected to pin 1 and the AUI connector shell.

In practice, most Ethernet V1.0 equipment uses version 2.0 cables due to cross-talk problems caused by the lack of individual shielding of the pairs in version 1.0 cables.

Wire Sizes

The three versions of AUI cables also use different wire sizes for the signal and power pairs. Table C-2 describes the wiring used by each type of transceiver cable.

Table C-2. Transceiver Cable Wire Sizes

Cable Type	Signal Pair	Power Pair
V1.0	AWG #22	AWG #20
V2.0 and IEEE 802.3	AWG #20	AWG #20
Non-standard "Office" cable *	AWG #24 *	AWG #24 *
* more flexible, but is limited to 5.0 meters in length.		

Signal deterioration along the signal pairs is most likely to happen as the AUI cable approaches the maximum length of 40 meters. This signal deterioration is due to the filtering action of the cable. IEEE 802.3 AUI cables are designed to reduce this effect.

Also, since 802.3 AUI cables provide a ground shield isolated from the signal and power pair's shields, these cables provide additional noise immunity in noisy operating environments.

Cable Configuration Rules

Refer to the following configuration rules when configuring your network.

1. If the Bridge Module is to be connected to an IEEE 802.3 transceiver, such as DEC's DESTA™, the transceiver cable must be IEEE 802.3 compliant.

2. If the Bridge Module is to be connected to a non-IEEE 802.3 transceiver, such as DEC's H4000™, the transceiver cable can be either Ethernet V2.0 or IEEE 802.3 compliant.

3. IEEE 802.3 transceiver cables and Ethernet transceiver cables cannot be interconnected.

4. A transceiver cable between an Bridge Module and a transceiver cannot exceed 38 meters (125 feet). This accounts for the Bridge Module internal cable equivalency of 2 meters (6.5 feet).

5. If you use office transceiver cable, it should not exceed the maximum transceiver cable distance of 12 meters (39.4 feet).

6. If the configuration includes any other device with internal cabling equivalency, subtract that amount from the 38-meter maximum. For example, when connecting the Bridge Module to a configuration that includes a DELNI, allow 5 meters of cabling equivalency loss for the DELNI.

Cable Configuration

Make sure the transceiver cable does not exceed the maximum lengths described in Table C-3. Also, follow the configuration rules listed below.

Table C-3. Maximum Cable Lengths

From	To	Cable Type	Maximum Cable Length
Baseband Transceiver	Bridge Module	Ethernet V2.0 or IEEE 802.3	38 m (125 ft)
Baseband Transceiver	Bridge Module	Office Transceiver Cable (High Attenuation)	12 m (39.4 ft) See Cable Rules

Troubleshooting Transceiver Cables

This section describes some of the more common problems you may encounter with transceiver cables and some possible solutions.

Symptoms of Bad Transceiver Cables

❑   False or excessive collisions

❑   Jabber condition on Bridge Module

❑   Receive Errors (CRC and Alignment)

❑   Severe degradation of system performance

Causes

❑   Improper grounding (pin 1 vs. pin 4).

❑   Bad ground:

- – Shell connector not crimped onto AUI cable braid.
- – Ribbon cables in computers not shielded or improperly mounted.

❑ Broken pair wires or unseated AUI connector pin.

❑ Improper pairing:
  - – Verify that signal and power wires are paired, that is, Transmit + paired with Transmit -, etc.

❑ Individual pairs not individually shielded (Ethernet V1.0 type cable).

Recommendations

❑ The Bridge Module is fully compatible with IEEE 802.3 and Ethernet V2.0. The use of Ethernet V1.0 AUI cables and transceivers is not recommended.

❑ The Bridge Module accepts either 802.3 or V2.0 AUI cables. The proper AUI cable should be used for the appropriate transceiver being used. That is, if an 802.3 transceiver is used, then use an 802.3 AUI cable.

RS-232 Cables

When you first connect your terminal to the Bridge Module management interface, make sure it is properly set for asynchronous serial communication. Figure C-2 illustrates the RS-232 connector on the front panel of the Bridge Module and shows the proper pinouts for a crossover RS-232 cable (either female-female or female-male). Table C-4 shows the proper pinouts for the RS-232 cable.
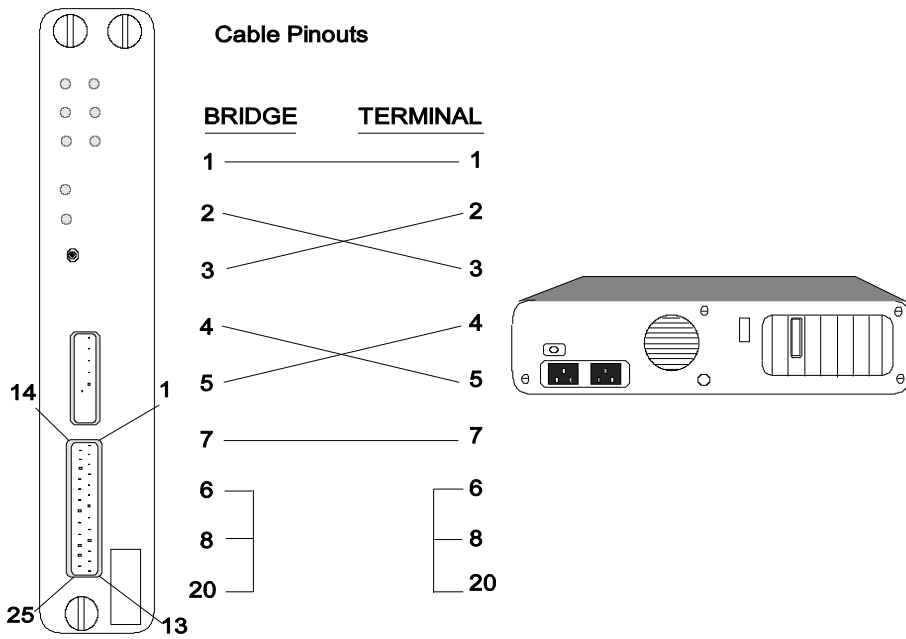
Figure C-2. Management Interface RS-232 Connector and Cable Pinouts

Table C-4. RS-232 Cable Pin Chart

Pin	DTE
1	Chassis Ground
← 2	Transmitted Data
← 3	Received Data
→ 4	Request To Send (Active Low +12.0V)
← 5	Clear To Send
7	Signal Ground
→ 20	Data Terminal Ready (Active High +12.0V)

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D Power-Up Self-Test

This appendix describes the diagnostic tests run by the Bridge Module upon power up. This section also explains how to start the Bridge Module self-test and how to interpret LED and screen displays that result from the various tests. The last section explains what to do if an error does occur.

Initiating Self-Test

The self-test diagnostic sequence begins any time you perform one of the following actions:

❑ Plug the module into a powered (live) concentrator

❑ Cycle power on the concentrator

❑ Press the Reset button on the module front panel

❑ Enter the RESET command at the Management prompt

Front Panel LED Display

Under normal conditions, the entire self-test sequence is completed in twenty seconds or less. At the end of the sequence, all LEDs are OFF. If the

self-test routine results in an error condition, the TEST indicator blinks and the remaining LEDs display a code indicating which specific test was running when the error occurred.

The LED error display uses the top six LEDs on the front panel to create the Diagnostic Code. These codes are binary representations, where ON is a 1 and OFF is a 0. All of the codes and a brief description are listed in Table D-1.

For example, suppose the TEST indicator blinks and the front panel indicators appear as follows:

```
Port 2 FWD  . . . . . . . . . .ON   (1)
Port 2 TX   . . . . . . . . . .OFF  (0)
Port 2 RX  OFF  (0)
Port 1 RX  OFF  (0)
Port 1 TX   . . . . . . . . . .OFF  (0)
Port 1 FWD  . . . . . . . . . .OFF  (0)
MGMT        . . . . . . . . . .OFF
TEST        . . . . . . . . .Blinking
```
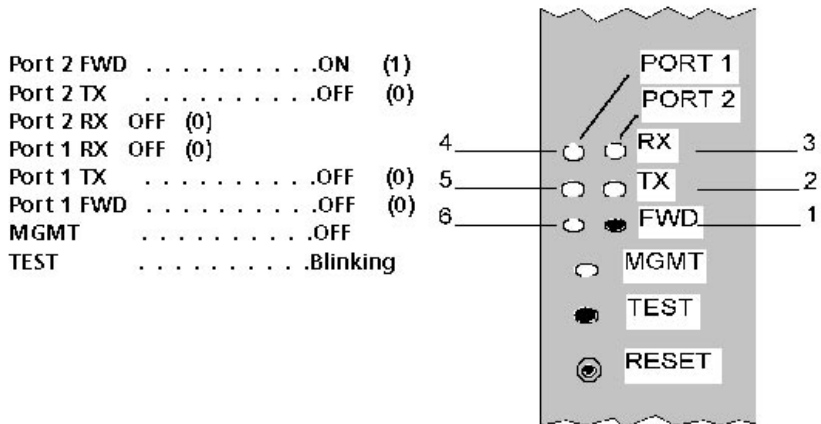
The first six LEDs represent the Diagnostic Code, which is "100000". According to Table D-1, the error occurred within the ROM Test.

Table 4-1.   Diagnostic Code Reference

Code	Test
0 0 0 0 0 0	CPU
1 0 0 0 0 0	ROM
0 1 0 0 0 0	Initial Stack

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Table 4-1.   Diagnostic Code Reference (Continued)

Code	Test
1 1 0 0 0 0	BER (Bus Error Logic)
0 0 1 0 0 0	MFP (Multi-Function Peripheral)
1 0 1 0 0 0	NMI (Non-Maskable Interrupt)
0 1 1 0 0 0	EEPROM
1 1 1 0 0 0	TTY
0 0 0 1 0 0	User
1 0 0 1 0 0	RAM
0 1 0 1 0 0	LANCE1 INTERNAL
1 1 0 1 0 0	LANCE1 Data Transfer
0 0 1 0 0 1	LANCE1 Media
1 0 1 0 0 1	LANCE2 Internal
0 1 1 0 0 1	LANCE2 Data Transfer
1 1 1 0 0 1	LANCE2 Media
0 0 0 0 1 0	Flash
1 0 0 0 1 0	Reset
0 1 0 0 1 0	AF INT (Address Filter Interface)
1 1 0 0 1 0	AF Diagnostic (Address Filter Board Test)

Screen Display

If a terminal is attached to the Management interface, additional
information is displayed on the screen during self-test. As each diagnostic
routine begins, a message appears indicating the name of the routine,

followed by a left parentheses. These messages start about halfway through the self-test after preliminary functionality is verified.

For example, when the LANCE 802.3 port test starts, the following appears on the screen:

lance_1(

When the routine is completed successfully, a right parentheses appears, followed by the next routine. For example, when the LANCE routine is completed and the LANCEMEDIA routine begins, the screen display is as follows:

lance_1 (0123)

lancemedia_1(

When the entire self-test routine is completed, the Bridge Module identification header is displayed.

When an error occurs, additional information may appear on the screen depending on the routine running at the time. Be sure you record this information before calling Customer Support, as described below.

When an Error Occurs

If an error occurs during the Bridge Module self-test, follow these steps:

1. Record the following information:

    Diagnostic Code and Subtest Code (all LED values)

    Screen display information (if available)

    Bridge Module serial number and Ethernet address

    Date and time

2. Refer to Chapter 5, Troubleshooting, for information on diagnosing error conditions.

If you are unable to correct the condition based on the information in Chapter 5, contact 3Com Customer Support as explained in the Technical Assistance section in Appendix E. Please have the recorded information available when you call.

E Technical Support

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

- ❑ On-line Technical Support

- ❑ Support from Your Network Supplier

- ❑ Support from 3Com

- ❑ Returning Products for Repair

- ❑ Accessing the 3Com MIB

- ❑ 3Com Technical Publications

On-line Technical Support

3Com offers worldwide product support through the following on-line systems:

- ❑ Email Technical Service

- ❑ World Wide Web Site

Email Technical Support

You can contact the Integrated Systems Division (formerly Chipcom) on the Internet for technical support using the e-mail address techsupp@chipcom.com.

World Wide Web Site

You can access the latest networking information on the 3Com World Wide Web site by entering our URL into your Internet browser:

`http://www.3Com.com/`

This service features news and information about 3Com products, customer service and support, the 3Com latest news releases, selected articles from 3TECH™, the 3Com award-winning technical journal, and more.

You can contact the Integrated Systems Division on the World Wide Web by entering our URL into your Internet browser:

`http://www.chipcom.com/`

There are links between both WWW pages to view information from all 3Com divisions.

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.

For direct access to customer service for Integrated Systems Division products in:

❑ U.S.A. and Canada - call (800) 724-2447

❑ Asia Pacific - call (508) 787-5151

❑ Europe - refer to the table below. For European countries not listed, call 31 30 60 299 00

Country	Telephone Number	Country	Telephone Number
Belgium	0800 71429	Netherlands	06 0227788
Denmark	800 17309	Norway	800 11376
Finland	0800 113153	Spain	900 983125
France	05 917959	Sweden	020 795482
Germany	0130 821502	U.K.	0800 966197
Ireland	1 800 553117	U.S.	800 876-3266
Italy	1678 79489		

For access to customer service for all 3Com products, call (800) 876-3266.

You can also contact the Integrated Systems Division (ISD) on the Internet by using the e-mail address techsupp@chipcom.com.

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 for Integrated Systems Division products (formerly Chipcom), use the following numbers.

Country	Telephone Number	Fax Number
U.S. and Canada	(800) 724-2447	(508) 787-3400
Europe	(44) (1442) 275860	No Fax
Asia Pacific	(508) 787-5296	(508) 787-3400

Accessing the 3Com MIB

The 3Com Management Information Base (MIB) for the Integrated Systems Division describes commands that enable you to manage 3Com SNMP-based products. The MIB is available over the Internet on an anonymous FTP server. Updates to these MIBs are released as new 3Com products are introduced.

To access Internet versions:

1. FTP to `ftp.chipcom.com` (151.104.9.65).

2. Enter the login name `anonymous`.

3. Enter your full Internet e-mail address as the password (for example, `jdoe@company.com`).

4. Change to the mib or schema directory using the `cd /pub/mibs` or `cd /pub/mibs/schemas` command.

5. To view the 3Com MIB, OID, or schema entries, enter the `dir` command.

   ❑ To pause the display, press [CTRL-S].

   ❑ To continue the display, press [CTRL-Q].

6. Copy the MIB, OID, or schema files to your current directory using the appropriate command (for example, `get chipcom.mib`).

7. To exit the FTP session, invoke the `quit` command.

3Com Technical Publications

If you have comments or questions on 3Com Integrated Systems Division Technical Publications documents, please contact the Technical Publications group by FAX (508) 229-1551.

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