DECbridge 90
Owner's Manual

Order Number EK-DEWGB-OM-001

Digital Equipment Corporation

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About This Manual

This manual gives an overview of the DECbridge 90 and describes how to configure, install, operate, manage, and troubleshoot the DECbridge 90. This manual also gives the specifications and related documentation for the DECbridge 90.

Organization

This guide has five chapters, two appendices, and an index.

Chapter	Meaning
1	Provides an overview of the DECbridge 90, including features, description of front panel indicators, and configurations.
2	Provides configuration rules for the DECbridge 90.
3	Describes how to install the DECbridge 90.
4	Describes how to manage the DECbridge 90 through the Maintenance Operations Protocol or Network Control Program.
5	Describes how to troubleshoot the DECbridge 90.
Appendix A	Describes the physical dimensions; environmental, electrical, and power specifications.
Appendix B	Provides a list of related documentation and ordering information.

Conventions

Convention	Meaning
NOTE	Provides general information.
bold text	Bold text represents user input. For example:
	DECbridge> **Set Protocol**
parameters	Parameters are italicized. For example:
	SHOW PORT *slot number*
[]	Characters within brackets represent optional parameters. For example:
	SHOW PORT [*hub number, slot number*]

1
Overview

The DECbridge 90 offers a reliable, high-performance, easy-to-install means of connecting two local area networks (LANs). Configured as a standalone unit or in the DEChub 90 Ethernet backplane, the DECbridge 90 provides greater network reliability and efficiency by allowing the local area network to be partitioned into a number of smaller LANs. The DECbridge 90's main features are summarized below:

Features

- Easy-to-use

- Plug-and-go installation

- Activity LEDs for easy diagnosis

- Small in size

- Rack-mountable in DEChub 90 Ethernet backplane

- Frame filtering and frame forwarding at full network throughput

- Protocol filtering

- Support of spanning tree algorithm

- Management through MOP Console Carrier

- ThinWire and 15-pin AUI Ethernet interfaces

The DECbridge 90 is a specialized LAN device that connects two Ethernet or IEEE 802.3 LANs to form a single extended local area network (Figure 1–1). One LAN consists of a work group that may not exceed 200 stations in size. The other LAN is an extended local area network. The DECbridge 90 is an end-node bridge; therefore, no other bridges may be installed in the work group.

All stations connected within the extended LAN communicate with one another as if they were all on the same LAN. The connected LANs can be 15-pin AUI Ethernet (10Base5), ThinWire Ethernet (10Base2), or IEEE 802.3 compliant LANs, in any combination. Bridge operation is transparent to other stations on the LAN. No special software is required on any station.
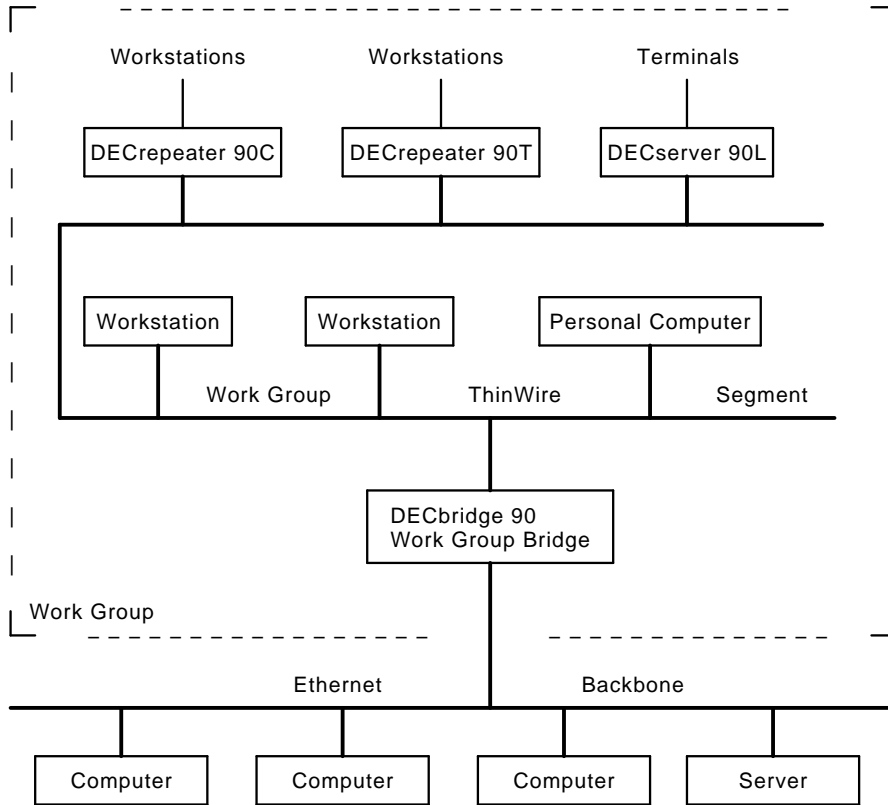
Figure 1–1   Sample DECbridge 90 Connection

DECbridge 90 Front Panel Lights and Switches

The DECbridge 90's front panel contains several lights (LEDs) that indicate the status of the DECbridge 90. The front panel also has two switches, one to select ThinWire or AUI connection, and the other to reset the password for the DECbridge 90. When you push the reset button, any existing password is nullified and the DECbridge 90 is accessible without a password until you define a new password.

Figure 1–2 describes the front panel indicator lights and switches. For an explanation of the DEFINE BRIDGE PASSWORD command, refer to the section, Descriptions of Commands, in Chapter 4.
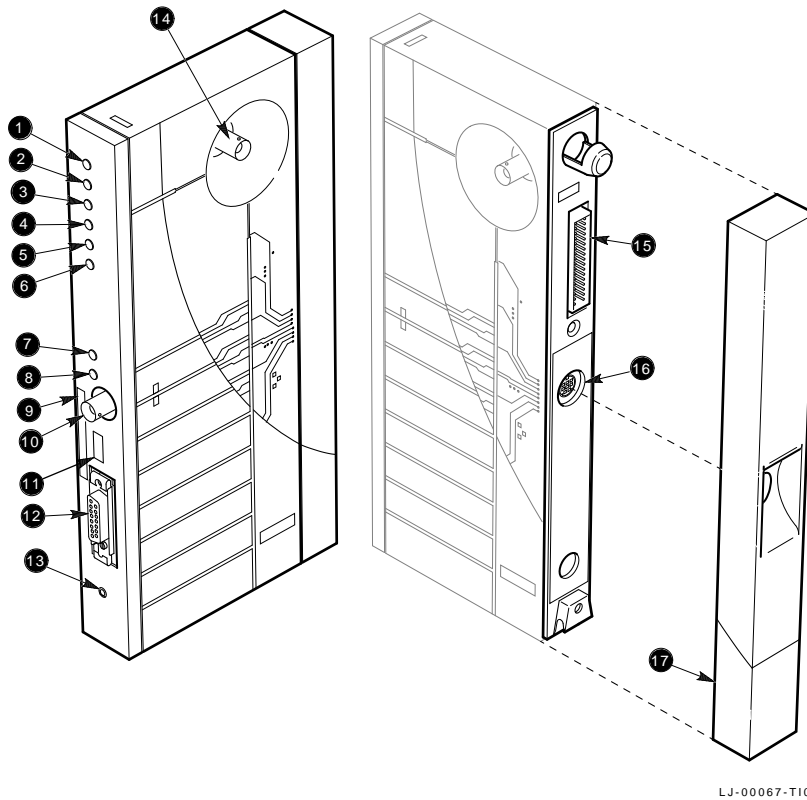
LJ-00067-TI0

Figure 1–2   Indicators and Connectors

❶   ⊘   **DC OK Indicator** - (Green) Turns on when power supply is providing power to the bridge.

❷   ◯   **System OK Indicator** - (Green) Turns on when bridge is powered up and reset and has successfully completed its self-test.

❸ **Work Group Port OK Indicator** - (Green) Turns on when bridge is powered up and reset and has successfully completed its work group port self-test. Does not turn on if a fault is detected on the port; does turn on when the fault has been cleared.

❹ **Work Group Port Activity Indicator** - (Green) Blinks when the LAN connected to the work group port is receiving messages, but does not blink when transmitting messages.

❺ **Bridge Forwarding State** - (Yellow) Turns on when bridge is not forwarding messages. Turns on for a short period of time during power up. Remains off during normal operation.

❻ **Maximum Work Group Size Exceeded Indicator** - (Yellow) Turns on when the maximum allowable size (200) of the work group has been exceeded.

❼ **Backbone Port OK Indicator** - (Green) Turns on when the bridge is powered up and reset and has successfully completed its backbone port self-test. Does not turn on if a fault is detected on the port; turns on when fault has been cleared.

❽ **Backbone Port Activity Indicator** - (Green) Blinks when there is activity on the LAN connected to the backbone port.

❾ **Ethernet Address** - Unique physical address of the bridge, comprised of six 2-digit hexadecimal numbers.

❿ **Backbone Port ThinWire Connector** - Provides ThinWire connection to backbone port of the DECbridge 90.

⓫ **ThinWire/AUI Selector** - Selects ThinWire or AUI connection to the backbone.

⓬ **Backbone Port AUI Connector** - Provides AUI connection to the backbone port of the DECbridge 90.

⓭ **Password Reset Switch** - Nullifies the password for the DECbridge 90. Bridge is accessible without a password until a new password is defined.

⓮ **Work Group Port ThinWire Connector** - Provides ThinWire connection to the work group port of the DECbridge 90.

⓯ **Backplane Connector** - Provides work group network connection to the DECbridge 90 when it is installed in the DEChub backplane.

⓰ **Power Connector** - Provides +5 and +12 volts from the DECbridge 90 power supply to the bridge.

⓱ **Cover** - Covers the backplane connector and mounting assembly.

2
Configuration Rules

The DECbridge 90 has a few configuration rules and guidelines that must be followed during installation and use.

Each LAN connected by the DECbridge 90 is required to be an IEEE 802.3 compliant CSMA/CD LAN. The backbone port of the DECbridge 90 provides both ThinWire Ethernet (10Base2) and AUI connections, as illustrated in Figure 2–1 and Figure 2–2. The work group port provides only a 10Base2 connection.

50-ohm
Terminator

Backbone

50-ohm
Terminator

System

System

System

Backbone Port
Thinwire Connection

Work
Group
Bridge

50-ohm
Terminator

50-ohm
Terminator

System

System

System
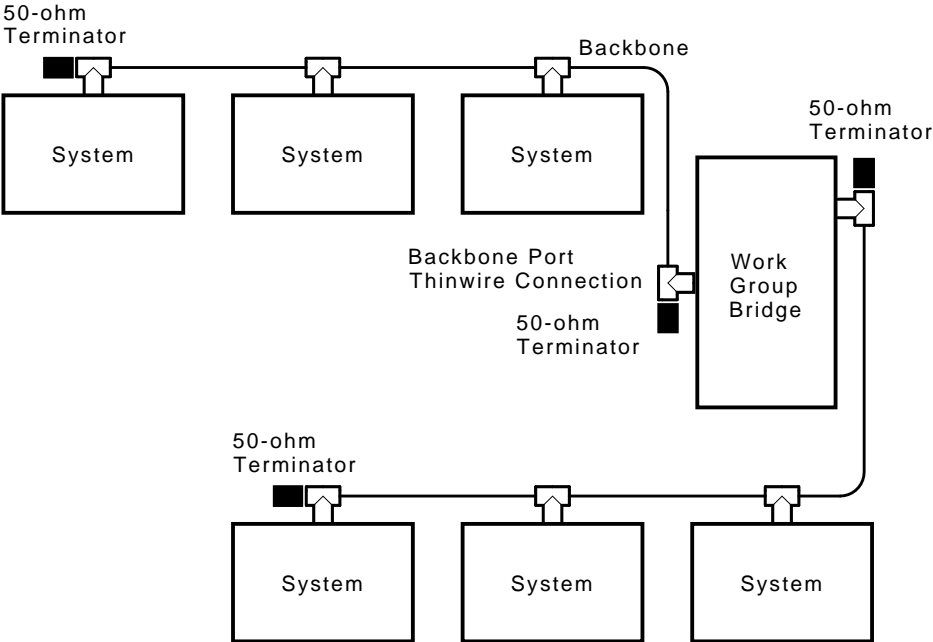
LJ-00247-TI0

Figure 2–1   DECbridge 90 Configured to ThinWire Backbone
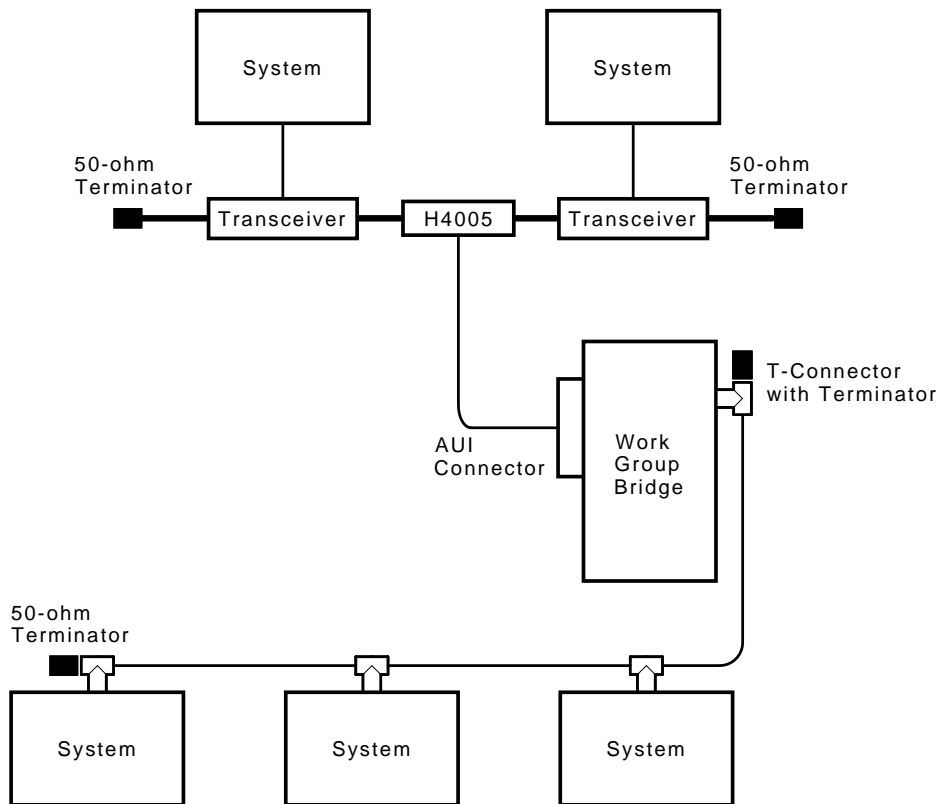
LJ-00244-TI0

Figure 2–2   DECbridge 90 Configured to AUI Backbone

Supported and Unsupported Configurations

Figure 2–3 illustrates the configuration rules for the work group size
and backbone connection on the DECbridge 90. Table 2–1 describes each
configuration rule.

Ethernet Backbone

WGB

WGB

Work Group

System | System

System | System | < 200 Stations

❶ **If there are more than 200 stations in a work group, separate into two work groups.**

Ethernet Backbone

WGB

Work Group

System | System | > 200 Stations

More than 200 stations in work group.

Ethernet Backbone

WGB

Work Group

System | System | System

❷ **Use only one bridge.**

Ethernet Backbone

WGB | Bridge

Work Group

System | System | System

Parallel configurations.
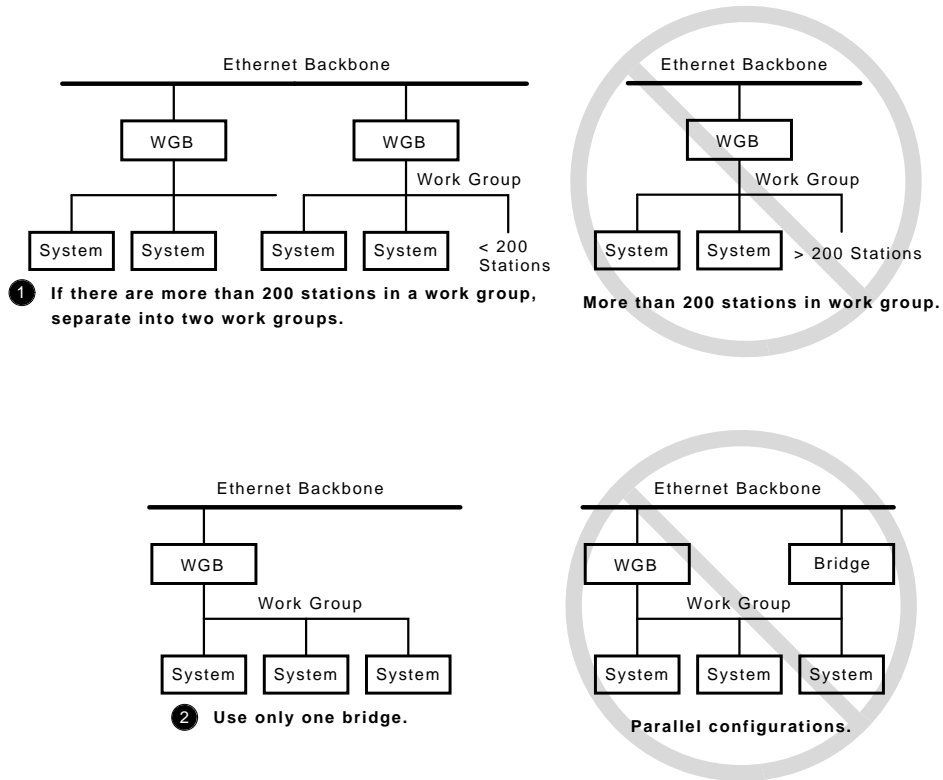
LJ-00322-TI0

Figure 2–3   Work Group Size and Backbone Configurations

Table 2–1   Group Size and Backplane Configuration Rules

Topic	Rule
❶Work group size	Work group size must not exceed 200 stations.
	If a work group increases to more than 200 stations, a separate work group with its own DECbridge 90 should be created.
❷Backbone connection	The bridge must be the only connection between the work group and the backbone. Traffic between two backbone networks may not traverse the work group, as some circumstances could cause the spanning tree algorithm to reconfigure, and the 200-station limit could be violated.

Figure 2–4 illustrates the configuration rules for the number of bridges and backplane installation on the DECbridge 90. Table 2–2 describes each configuration rule.

Work Group
WGB
Backbone
WGB
Work Group
System   System

3 No bridges in work group.

Ethernet Backbone
WGB
Work Group
System   Bridge
System   System

Bridge in work group.

Station
WGB
Bridge
Bridge
Bridge

Station
Bridge
Bridge

4 **Seven bridges or fewer.**

Station
Bridge
Bridge
Bridge
Bridge

Ethernet Backbone
Bridge   WGB
Bridge   Station

More than seven bridges between stations
on the Network.

LJ-00323-TI0
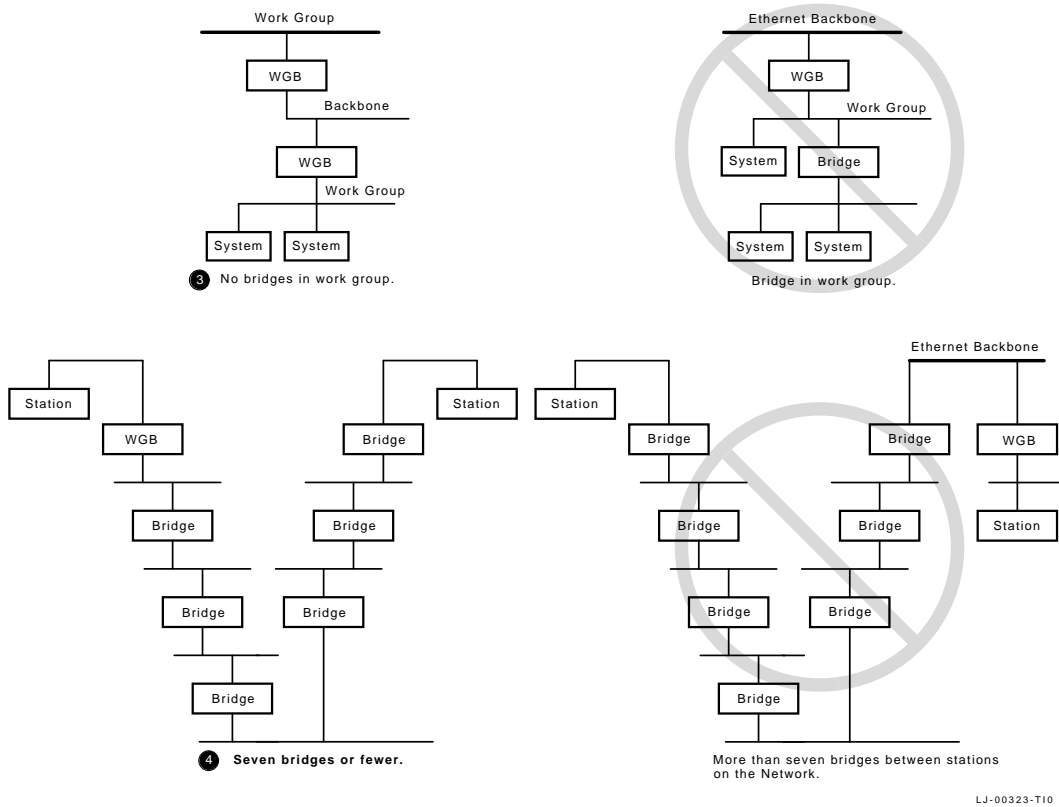
Figure 2–4   Bridge and Backplane Configurations

Table 2–2   Bridge and Backplane Configuration Rules

Topic	Rule
❸Number of bridges	The number of bridges between any two stations is limited to seven or fewer. This guideline, for networks with typical packet traffic loading, is a compromise of the many different protocols offered and used on Ethernet and IEEE 802.3 LANs.
❹Backplane installation	Only one DECbridge 90 per backplane.
	Only one DECbridge 90 in a work group.
	The DECbridge 90 should be installed in slot 8 of the backplane, next to the power supply.
	The DECbridge 90 configuration rules must be followed. The backplane and attached network segments become a "work group" network with no other bridges and there is a maximum of 200 Ethernet addresses allowed.

3
Installation

Before you install the DECbridge 90, it is recommended that you read this entire manual to become familiar with the DECbridge 90's features and configuration rules. If problems occur during installation, refer to Chapter 5, Troubleshooting. Appendix A provides additional information that may be useful during installation.

The DECbridge 90 may be installed on a desk top or table, mounted on a wall by its back cover, or installed in the DEChub 90 Ethernet backplane. The only tool required for installation is a screwdriver. The screwdriver is used to remove the back cover, which covers the backplane connector and mounting assembly, and to mount the bridge or the power supply on the wall.

Power Supply

The power supply (used only in standalone installations) is intended to be wall-mounted but may be used as a floor unit. The power supply is auto-ranging and supports voltages worldwide when the proper AC power cord is used. The AC power cord and its length will vary depending on the country package ordered.

Site Considerations

The DECbridge 90 and its power supply can be placed in various locations, including office areas, computer rooms, or wiring closets, as long as the environmental requirements are met. The requirements are given in Table A–2 in Appendix A.

When installing the DECbridge 90 on top of a desk or table, make sure air circulation around the DECbridge 90 does not become obstructed by papers or other materials. The DECbridge 90 is convectively cooled and requires a minimum of 10 cm (4 in) of space at both ends for adequate air flow.

Standalone Installation

If you are planning on installing the DECbridge 90 as a standalone installation, use the DEWGB-AA kit. The kit contents are listed in Appendix A. To install the DECbridge 90 as a standalone unit, perform the following procedures and refer to Figure 3–1.

NOTE
The ThinWire ports of the DECbridge 90 are not terminated internally. External 50-ohm terminations are required.

In choosing a location, make sure the power supply can be placed within 1.1 m (6 ft) of the DECbridge 90 and that the distance from the power supply to the AC outlet does not exceed 2.4 m (8 ft).
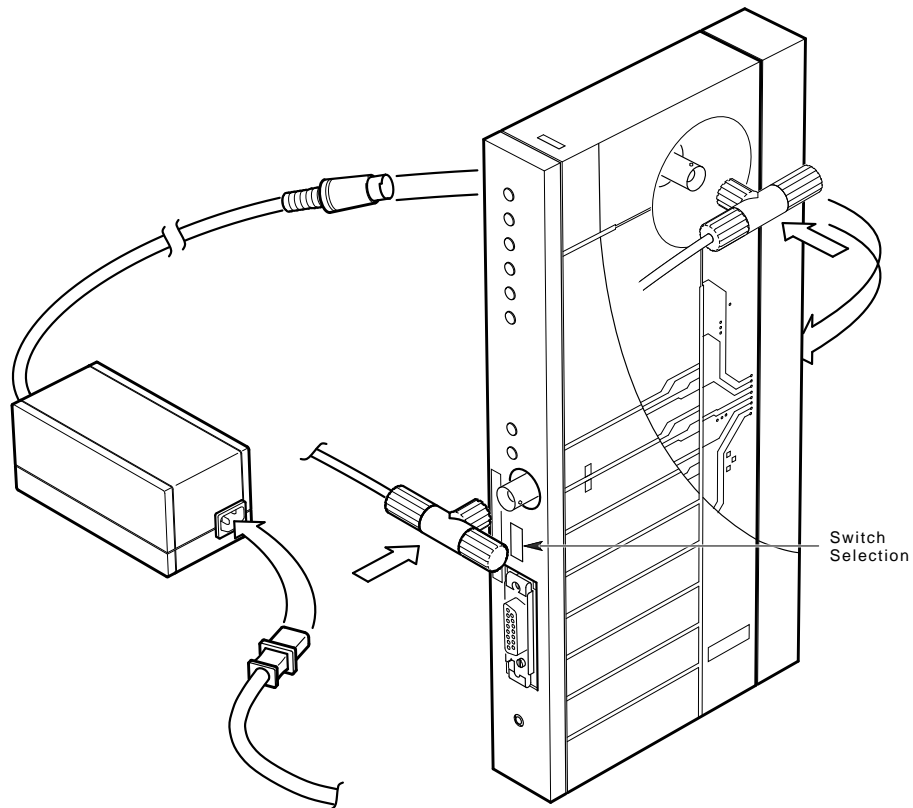
LJ-00068-TI0

Figure 3–1   Standalone Installation

Remove Cover (if necessary).

To remove the back cover of the DECbridge 90 (Figure 3–2):

1. Insert a small screwdriver into the top mounting hole in the cover.

2. Lift up on the latch.

3. While lifting up on the latch, pull the top of the cover away from the unit and down.

4. Use the mounting holes on the cover as a template to locate the mounting screws (not included).

5. Attach screws to the wall, leaving enough clearance to hang the bridge.

6. Attach the back cover to the bridge and hang the unit on the wall.
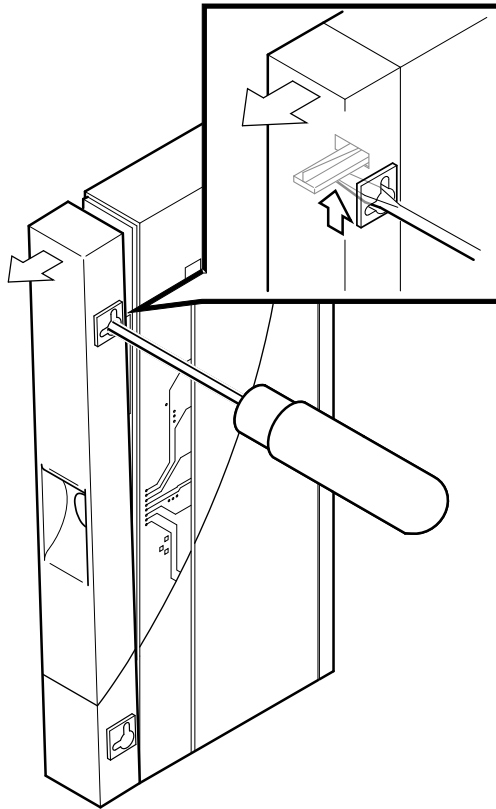
LJ-00320-TI0

Figure 3–2   Removing the Back Cover

Make Connections.

1. Select ThinWire or AUI connection, depending on the backbone type, by sliding the ThinWire/AUI selector switch on the front panel toward the Backbone Port ThinWire connector or toward the Backbone Port AUI connector.

    When the AUI port is attached to a 10BROAD36 modem, the modem should be configured for local echo of transmissions.

    When connecting the transceiver cable:

    a. Push the slide latch to the right.

    b. Plug the transceiver cable into the connector.

    c. Push the slide latch to the left until it snaps into the locking position, securing the connector.

    d. Gently pull on the cable to make sure the latch is secure. Figure 3–3 illustrates proper connection of the transceiver cable.

LJ-00248-TI0
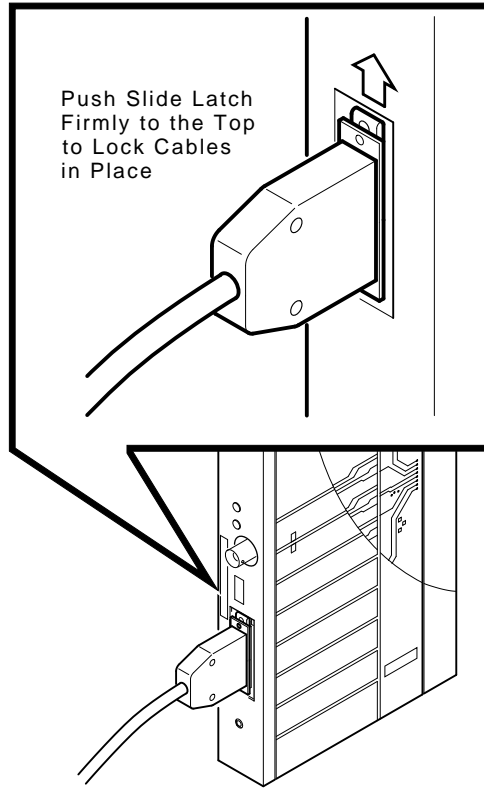
Figure 3–3   Connecting Transceiver Cables

When connecting to ThinWire, make sure cables are properly
terminated. Refer to Figure 3–4 and Figure 3–5 for guidelines on
termination of cables.

LJ-00243-TI0
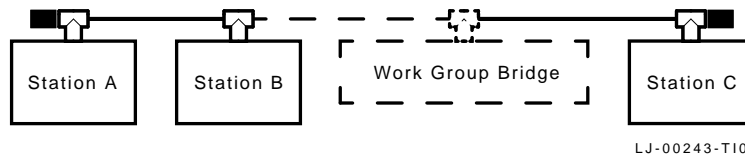
Figure 3–4   Connecting to the Middle of a ThinWire Segment

LJ-00242-TI0
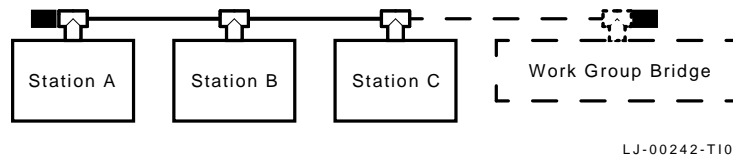
Figure 3–5   Connecting to the End of a ThinWire Segment

2. Connect the work group by attaching a segment of ThinWire cable to the ThinWire connector on the DECbridge 90.

3. Connect the power supply to the DECbridge. Place the power supply within 1.1 m (6 ft) of the DECbridge 90.

4. Attach the AC power cord to the power supply.

5. Plug the power supply into an AC outlet.

6. The DECbridge 90 will run a 10-second self-test during which all front panel lights will turn on. On successful completion of the test, the following lights will remain on: DC OK, System Port OK, and Work Group Port OK. The Bridge Forwarding State indicator will remain on for 30 seconds as the bridge learns the network configuration, and then the indicator will turn off.

NOTE
The DECbridge 90 does not detect a collision presence test failure in the transceiver.

Refer to Chapter 5, Troubleshooting if the DECbridge 90 indicators do not turn on.

DEChub 90 Backplane Installation

If you are planning on installing in the DEChub 90 Ethernet backplane, use the DEWGB-MA kit. The kit contents are listed in Appendix A. Refer to Figure 3–6 when installing the DECbridge 90 in the DEChub 90 Ethernet backplane.
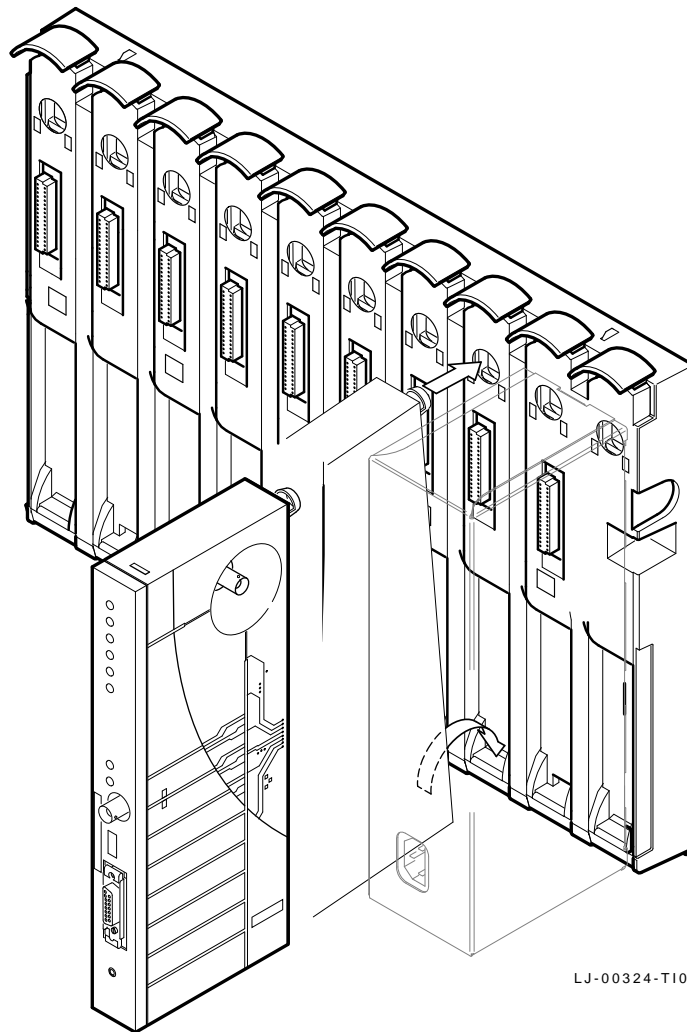
LJ-00324-TI0

**Figure 3–6   Installing the DECbridge into DEChub 90 Backplane Slot 8**

Remove Cover (if necessary).

To remove the back cover of the DECbridge 90 (Figure 3–2):

1. Insert a small screwdriver into the top mounting hole in the cover.

2. Lift up on the latch.

3. While lifting up on the latch, pull the top of the cover away from the unit and down.

4. Place the lower mounting tab, located on the back of the DECbridge 90, into slot **8** of the backplane.

5. Rock the bridge into place. An audible "click" is heard when the bridge is securely latched in the slot.

Make Connections.

1. Be sure the backplane is powered off.

2. Select ThinWire or AUI connection by sliding the ThinWire/AUI selector switch on the front panel toward the Backbone Port ThinWire connector or toward the Backbone Port AUI connector.

   When the AUI port is attached to a 10BROAD36 modem, the modem should be configured for local echo of transmissions.

   When connecting the transceiver cable:

   a. Push the slide latch to the right.

   b. Plug the transceiver cable into the connector.

   c. Push the slide latch to the left until it snaps into the locking position, securing the connector.

   d. Gently pull on the cable to make sure the latch is secure.

3. Connect to the backbone with an AUI 15-pin connector or ThinWire for backbone. See Figure 3–3, Figure 3–4, and Figure 3–5.

4. Power up the backplane.

5. With the backplane powered up, the DECbridge 90 will run a 10-second self-test during which all front panel lights will turn on.

Following successful completion of the test, these indicators will remain on: DC OK, System Port OK, and Backbone Port OK. The Bridge Forwarding State indicator will remain on for 30 seconds as the bridge learns the network configuration, and then the indicator will turn off.

The work group port is automatically connected once the DECbridge 90 is installed in the DEChub backplane. The backplane provides power to the bridge, so no other power supply is needed. Any other unit installed in the backplane is bridged automatically and is part of the work group.

NOTE
The DECbridge 90 does not detect a collision presence test failure in the transceiver.

Refer to Chapter 5, Troubleshooting if the DECbridge 90 indicators do not turn on.

4
Management

Managing the DECbridge 90

The DECbridge 90 is managed by Maintenance Operations Protocol (MOP), which allows advanced bridge features, such as protocol filtering, to be set up without any additional management software. Host system support, standard on all VMS installations, is required for MOP console carrier operation. On ULTRIX, the MOP option is a separate utility that may be installed from the original distribution media.

DECbridge 90 Operation

The DECbridge 90 is a packet store-and-forward device that receives all IEEE 802.3 and Ethernet packets and, if necessary, forwards them from one port to the other.

This capability enables the bridge to isolate high traffic areas from the rest of the LAN. For example, if the systems and servers in a cluster usually communicate with each other and rarely communicate with other systems on the LAN, the bridge keeps that traffic local, off the main LAN.

The decision to filter or forward packets is determined by the packet's destination address or protocol type as follows:

- **Destination Address Filtering** - the bridge, on receiving a packet, scans its address database, which contains node addresses from the work group port that are dynamically learned by the bridge. The packet's destination address is compared with known addresses in the work group. If no protocol-type filters are enabled for the packet, the bridge makes its decision to filter the packet based on the packet's destination address. Otherwise, the packet is subjected to protocol-type filtering.

- **Protocol Filtering** - the bridge may be configured to filter-selected protocols so that user-selected protocols can be isolated within or outside a specific work group.

Other DECbridge 90 functions include the following:

- **Protocol-transparent, multivendor communications** - the DECbridge 90 provides connectivity between two network segments regardless of vendor hardware or software, provided the hardware and software conform to IEEE 802.3 and Ethernet compliance requirements.

- **Connectivity** - the DECbridge 90 can be used on both IEEE 802.3 and Ethernet networks.

- **Backbone connection** - provides switch-selectable AUI or ThinWire connection to the backbone.

- **Integral ThinWire work group connection** - provides a physical and electrical interface to the work group ThinWire segment.

- **Automatic self-test** - automatically initiates a 10-second self-test of the DECbridge 90's basic functions when the bridge is powered up.

- **On-line diagnostics** - automated continuous testing of the DECbridge 90 hardware.

- **Loop Detection** - determines if there are any loops by communicating with other Digital or IEEE 802.1 compliant bridges in the network and configures appropriately to eliminate loops.

Spanning Tree Algorithm

The spanning tree is an automatic process used by all bridges in an extended LAN configuration to create a logical, loop-free network. The spanning tree is determined automatically by an algorithm resident in each bridge. No user action or network management is required to configure the network. If a loop is detected, the process computes and implements a loop-free network topology. This process prevents packets from circulating through the network indefinitely.

Spanning Tree Algorithm Properties

Although the bridges in an extended network can be placed in an
arbitrary fashion, the logical network that bridges automatically create
(due to the algorithm) is always a spanning tree with the following
properties:

- No loops.

- Only one path between any two bridges.

- All LANs are connected.

Refer to the *Bridge and Extended LAN Reference* (EK-DEBAM-HR) for
more detailed information about the spanning tree process.

MOP

Maintenance Operations Protocol (MOP) is a host-based protocol. Console
carrier is a component of MOP that accesses the user interface command
language embedded in the DECbridge 90. Console carrier provides the
ability to establish a single conversational terminal line link between a
terminal or workstation on the LAN and the DECbridge 90. It provides
only for the transmitting and receiving of keystrokes.

Functions

MOP console carrier management allows you to perform the following
functions:

- Examine the bridge characteristics of address entry age, forwarding
  state, firmware version, name of flash ROM image, and uptime.

- Examine the port characteristics of backbone and work group ports
  (hardware address, MOP counters, and bridge counters).

- Examine port status (management connected, management
  disconnected, properly operating, or broken) of both bridge ports
  and of repeater ports that share the DEChub 90 backplane with the
  bridge.

- Examine the work group address database entries 1 to 200.

- Examine the current or permanent protocol filter entries 1 to 16.

- Set protocol filters.

- Reset the bridge.

- Connect or disconnect a port (work group or backbone, or repeaters in
  the backplane).

- Set the bridge maximum address entry age, current or permanent.

- Define the bridge password.

Refer to the section, Description of Commands, in this chapter for additional information on command syntaxes.

Accessing MOP from VMS

On VMS, MOP console carrier is included as part of the Network Control Program (NCP) facility, which requires a DECnet license.

You do not need elevated user privileges to use NCP. To establish a console carrier session, you must know the Ethernet address of the bridge that is to be managed and the Ethernet name of the circuit that contains the bridge. A VMS system may have more than one Ethernet interface, therefore the circuit name is needed. The Ethernet address can be found on the label on the DECbridge 90's front panel. The following Ethernet circuit names, based on system type, apply:

- BI-based systems (VAX 6300, VAX 6400) = bna-0

- MicroVAX/3600/3900 = qna-0

- VAXstation 2000/3000 Series = sva-0

- VAX–11/780, VAX–11/785 (Unibus) = una-0

If the bridge address is 08-00-2b-01-23-45 and the Ethernet circuit name is sva-0, a typical VMS command line to establish the session from a VAXstation 3100 would be:

```
$  MCR NCP CONNECT VIA SVA-0 PHYSICAL ADDRESS 08-00-2b-01-23-45
```

When you have established connection, the screen will first display copyright information:

```
Copyright © Digital Equipment Corporation 1991.
```

The DECbridge 90 is not shipped with a pre-set password, so no password prompt is displayed when you connect for the first time. For secure operation of the DECbridge 90, you should define a password (with the Define Bridge Password command). The password prompt is represented by the pound sign (#). If you do not define a DECbridge 90 password, the password prompt is not displayed when logging in.

You may make three attempts to enter a password; if all three attempts fail, you must disconnect and try again.

Once the correct password is entered, or if there is no password, the
DECbridge console carrier management banner and prompt appear on the
screen:

```
DECbridge 90 V1.0 25-JAN-1991 08-00-2B-01-23-45
Flash EPROM V1.0 31-JAN-1991
DECbridge>
```

Once connected, the screen will display the following:

```
Console connected (press CTRL/D when finished)
```

If you have defined a password for the DECbridge 90, enter the password
at the password prompt (#). The screen will then display the following:

```
DECbridge 90 V1.0 25-JAN-1991 08-00-2B-01-23-45
Flash EPROM V1.0 31-JAN-1991
DECbridge>
```

If you need to access a specific bridge repeatedly, you can enter the
Ethernet address for it in the NCP database. This is usually done by
choosing an arbitrary address in area 13. Bridge names entered in the
NCP database may be a maximum of six characters. For example, if you
call your bridge DBRG1 on address 13.87 and access it from a VAX 6400
(where Ethernet circuit name is bna-0), you can set up the following:

```
$ NCP

NCP> DEFINE NODE DBRG1 ADDRESS 13.87 HARDWARE
08-00-2b-01-23-45 - SERVICE CIR BNA-0
NCP> SET NODE DBRG1 ALL
```

Now, you can simply type the following:

```
$ NCP CONNECT NODE DBRG1
```

Accessing MOP from ULTRIX

On ULTRIX, the console carrier is a separate utility included as part of
the MOP option. This option comes as part of the regular distribution, but
is not selected by default and is not included in the "Basic Installation." It
may, however, be installed from the original distribution media with the
"Setld" utility. You must be "superuser" to invoke console carrier.

Once the MOP option is installed, each bridge to be managed must be
given a name and a dummy node number with the "Addnode" utility:

```
# addnode 13.1 DBRG1
```

Once that is done, the link may be established at any time with the "ccr" command:

```
#    ccr -n DBRG1 -h 08-00-2b-01-23-45 -c sva-0
```

In the above example, the -h qualifier is followed by the station address of the DECbridge unit to be attached. The -c qualifier is followed by the name of the Ethernet circuit to use for the connection. Ethernet circuit names, according to system type, are as follows:

- BI-based systems (VAX 6300, VAX 6400) = bna-0

- MicroVAX/3600/3900 = qna-0

- VAXstation 2000/3000 Series = sva-0

- VAX–11/780, VAX–11/785 (Unibus) = una-0

Console Carrier User Interface

When you have established connection, the screen will first display copyright information:

```
Copyright © Digital Equipment Corporation 1991.
```

The DECbridge 90 is not shipped with a pre-set password, so no password prompt is displayed when you connect for the first time. For secure operation of the DECbridge 90, you should define a password (with the Define Bridge Password command).

The password prompt is represented by the pound sign (#). If you do not define a password, the password prompt is not displayed when logging in.

You may make three attempts to enter a password; if all three attempts fail, you must disconnect and try again.

Once the correct password is entered, or if there is no password, the DECbridge console carrier management banner and prompt appear on the screen:

```
DECbridge 90 V1.0 25-JAN-1991 08-00-2B-01-23-45
Flash EPROM V1.0 31-JAN-1991
DECbridge>
```

Console Carrier Command Language

With the exception of the help facility, the console carrier command language is similar to the DECserver command language. Typing a question mark (?) at any point in the command line will list the options available to you at that point in the command line. Unique abbreviations of commands are accepted. The command options are:

Define
Display
List
Set
Show
Test (for manufacturing use only)

Table 4–1   Summary of DECbridge 90 Commands

Command	Argument and Parameter
DEFINE*	BRIDGE AGE *age*

	BRIDGE HUB_MANAGEMENT
	    ENABLE
	    DISABLE

	BRIDGE PASSWORD

	BRIDGE SPANNING TREE
	    ENABLE
	    DISABLE

	PORT *port number*
	    ENABLE
	    DISABLE

	PROTOCOL *protocol number*
	    FILTER ALL *protocol identifier*
	    FILTER BACKBONE *protocol identifier*
	    FILTER GROUP *protocol identifier*
	    FILTER WORKGROUP *protocol identifier*
	    FORWARD *protocol identifier*
	    NONE

DISPLAY	No arguments or parameters are needed
LIST	BRIDGE

*Changes made with the DEFINE command change only the default settings, which are assumed on power up or reset. DEFINE commands do not change the currently active values. The SET commands change only the currently active values, but do not affect the defaults that are assumed on power up or reset.

Table 4–1 (Cont.)   Summary of DECbridge 90 Commands

Command	Argument and Parameter
	PROTOCOL *protocol number*
SET†	ALL
	BRIDGE AGE *age*
	BRIDGE RESET
	BRIDGE HUB_MANAGEMENT 　　ENABLE 　　DISABLE
	BRIDGE SPANNING TREE 　　ENABLE 　　DISABLE
	PORT *port number* 　　ENABLE 　　DISABLE
	PROTOCOL *protocol number* 　　FILTER ALL *protocol identifier* 　　FILTER BACKBONE *protocol identifier* 　　FILTER GROUP *protocol identifier* 　　FILTER WORKGROUP *protocol identifier* 　　FORWARD 　　NONE
	REPEATER
SHOW	ADDRESS *start index*
	BRIDGE
	PORT *port number*
	PROTOCOL *protocol number*
	REPEATER *hub slot number*

†The SET commands change only the currently active values, but do not affect the defaults that are assumed on power up or reset.

Descriptions of Command Parameters

An *address number* is a decimal index into the work group forwarding database in the range of 1 to 200.

An *age* is an address database entry lifetime in seconds in the range of 1 to 32767.

A *hub slot number* is either a single number in the range of 1 to 8 that identifies a hub slot containing a DECrepeater 90, or, when two DEChub units are connected together, *hub slot number* is a pair of numbers, the first being the hub number of 1 to 2, and the second the slot number within the hub of 1 to 8. For example, "2,4" designates the fourth slot from the left, in the second DEChub, which is the hub that does not contain the DECbridge 90.

A *password string* is a string of up to 16 characters.

A *protocol identifier* is a string of either two hex digit pairs to specify an Ethernet protocol, or a string of five hex digit pairs to specify an IEEE 802.3 SNAP SAP protocol ID.

A *protocol number* is a decimal index into the protocol database in the range of 1 to 16.

A *port number* is either a DECbridge 90 port, or the number of a port on a DECrepeater installed in the DEChub backplane with the bridge. The DECbridge backbone port is the single digit "1." The work group port is "2". A repeater port is identified by a *hub slot number* as described above, and the port number within the slot of 0 to 8. For example, "2,4" designates the fourth port on a repeater in slot 2, in the same hub as the DECbridge 90. "2,4,1" refers to the first port on a repeater in the fourth slot of the second hub.

Description of Commands

DEFINE BRIDGE AGE *age*
SET BRIDGE AGE *age*
Changes the maximum allowable age of an address entry. An address in the work group address database will be removed if no messages are received from the node for the amount of time specified by the age. The parameter *age* is given in seconds.

Changes made with DEFINE command will survive a reset or power failure; changes made with SET command will not.

DEFINE BRIDGE HUB_MANAGEMENT DISABLE
SET BRIDGE HUB_MANAGEMENT DISABLE

Disables all repeater management through the DECbridge 90 unit for
DECrepeater 90 units in the DEChub 90 backplane. When disabled, you
will not be able to use SHOW REPEATER, SET PORT or SHOW PORT
on repeater ports, and you will not get port number information from the
SHOW ADDRESS command.

DEFINE BRIDGE HUB_MANAGEMENT ENABLE
SET BRIDGE HUB_MANAGEMENT ENABLE

Reverses the effect of the SET or DEFINE BRIDGE HUB_
MANAGEMENT DISABLE commands.

DEFINE BRIDGE PASSWORD

Changes the password string. You are prompted twice for a new
password. The password may be up to 16 characters long and is not
displayed on the screen. This change will survive a reset. There is no
corresponding SET command.

MOP provides a mechanism for setting and checking passwords. This
mechanism is only intended to provide protection against accidental
tampering with parameters and is not intended as a security feature. No
attempt is made to prevent compromise of the password by malicious
users. The DECbridge 90 should not be used in applications that
absolutely depend on the prevention of any unauthorized modifications
to the parameters.

DEFINE BRIDGE SPANNING_TREE DISABLE
SET BRIDGE SPANNING_TREE DISABLE

Disables the use of the bridge spanning tree autoconfiguration algorithm
for your DECbridge 90 unit and prevents forwarding of any spanning
tree network messages. If spanning tree is disabled, the DECbridge
90 will not detect loops in the network bridge topology. If a loop is
configured while the spanning tree algorithm is disabled, the network
will be quickly saturated by the forwarding of messages around this loop.
For this reason, Digital recommends that the spanning tree algorithm be
enabled at all times.

DEFINE BRIDGE SPANNING_TREE ENABLE
SET BRIDGE SPANNING_TREE ENABLE

Reverses the effect of the SET or DEFINE BRIDGE SPANNING_TREE
DISABLE commands.

SET PORT *port number* **DISABLE**
DEFINE PORT *port number* **DISABLE**

Disables the ability to forward packets through the bridge by disabling
the specified port. The DEFINE command changes only the non-volatile
database; the SET command changes only the current state. Both ports
must be enabled before the bridge can begin forwarding messages. The
port numbers are "1" for the backbone port, and "2" for the work group
port.

SET PORT *port number* **ENABLE**
DEFINE PORT *port number* **ENABLE**

Reverses the effect of the SET or DEFINE PORT DISABLE command.
Both ports must be enabled before the bridge can begin forwarding. In
new units, the ports default to enabled.

SET PORT [*hub number,*] *slot number, port number* **DISABLE**

Disables the attachment of a specific repeater port in the DEChub
backplane. The port status indicator on the selected DECrepeater 90 will
flash, indicating that the port was disconnected by the network manager.
There is no equivalent DEFINE command for disabling repeater ports.

SET PORT [*hub number,*] *slot number, port number* **ENABLE**

Reverses the effect of SET PORT DISABLE for DECrepeater 90 ports.

SET PROTOCOL *protocol number* **FILTER ALL** *protocol identifier*
DEFINE PROTOCOL *protocol number* **FILTER ALL** *protocol identifier*

Sets the specified protocol type to be one of a limited number of protocol
types that are filtered, where all others are forwarded. All messages of
the given protocol identifier are filtered. If this command is accepted, the
bridge "invert protocol filter" mode is disabled, and the SET PROTOCOL
FORWARD command may no longer be used until all of these entries are
deleted with the SET PROTOCOL NONE command.

SET PROTOCOL *protocol number* **FILTER BACKBONE** *protocol identifier*
DEFINE PROTOCOL *protocol number* **FILTER BACKBONE** *protocol identifier*

Sets the specified protocol type such that messages individually addressed to stations are forwarded, and group addressed messages from the work group port are forwarded, but group addressed messages of this protocol will not enter the work group from the backbone. This command is not affected by the bridge "invert protocol filter" mode.

SET PROTOCOL *protocol number* **FILTER GROUP** *protocol identifier*
DEFINE PROTOCOL *protocol number* **FILTER GROUP** *protocol identifier*

Sets the specified protocol type such that messages individually addressed to stations are forwarded, but broadcast and group addressed messages of this protocol are filtered. This command is not affected by the bridge "invert protocol filter" mode.

SET PROTOCOL *protocol number* **FILTER WORKGROUP** *protocol identifier*
DEFINE PROTOCOL *protocol number* **FILTER WORKGROUP** *protocol identifier*

Sets the specified protocol type such that messages individually addressed to stations are forwarded, and group addressed messages from the backbone port are forwarded, but group addressed messages of this protocol will not enter the backbone from the work group. This command is not affected by the bridge "invert protocol filter" mode.

SET PROTOCOL *protocol number* **FORWARD** *protocol identifier*
DEFINE PROTOCOL *protocol number* **FORWARD** *protocol identifier*

Sets the specified protocol type to be one of a limited number of protocol types that are forwarded, where all others are filtered. If this command is accepted, the bridge is placed into "invert protocol filter" mode. This means the SET PROTOCOL FILTER ALL command may no longer be used until all forwarded protocol entries are removed. Use SET PROTOCOL NONE to delete protocol filters. Generally, use SET PROTOCOL FILTER ALL to stop unwanted protocols rather than to list explicitly the permitted protocols.

SET PROTOCOL *protocol number* **NONE**
DEFINE PROTOCOL *protocol number* **NONE**

Deletes a protocol filter entry from the protocol filter database. Note
that if the last FORWARD protocol is deleted, the bridge will go back to
forwarding all protocols.

DISPLAY

Toggles on and off the continuous port counter display. The screen is
cleared and the numbers re-displayed every 10 seconds thereafter, until
the DISPLAY command is issued again. The DISPLAY command output
looks like this:

```
Status of DECbridge 08-00-2B-1E-2C-0F  Uptime: 109,929.66 seconds
System buffer unavailable: 0           Work group size exceeded: 0
Backbone side:                         Work side:
Frames received: 266,788               Frames received: 3,233
Relayed to work group: 178,640         Relayed to backbone: 1
Received block check error: 0          Received block check error: 0
Received frame too long: 0             Received frame too long: 0
Frames sent: 7                         Frames sent: 182,476
Sent, initially deferred: 1            Sent, initially deferred: 96
Sent, single collision: 0              Frames sent, single collision: 2
Sent, multiple collisions: 0           Sent, multiple collisions: 0
Unsent, excessive collisions: 0        Unsent, excessive collisions: 0
Unsent, carrier check failed: 0        Unsent, carrier check failed: 0
Unsent, remote failure to defer: 0     Unsent, remote failure to defer: 0
Unsent, lifetime exceeded: 0           Unsent, lifetime exceeded: 0
DECbridge>
```

LIST BRIDGE

Displays the non-volatile bridge-wide parameters.

LIST PROTOCOL *protocol number*[, *protocol number*]

Shows either "unused," or the protocol type value, for every entry in the
non-volatile protocol database. This filter becomes the active filter when
the DECbridge 90 is reset.

SET ALL

Resets the protocol filters and bridge-wide parameters from the non-volatile database. Affects maximum age, preforwarding/blocking delay, all protocol filters, and port state.

SET BRIDGE AGE
SET PASSWORD

See entries under DEFINE BRIDGE AGE and DEFINE BRIDGE PASSWORD.

SET BRIDGE RESET

Performs the equivalent of turning the bridge off and back on again.

SHOW ADDRESS [*start index*[, *stop index*]]

For the selected range of entries in the address database, displays the station address in that entry. The indexes range from 1 to 200. The start index is always displayed, but other entries in the range are only displayed if they are not empty. Addresses in this database are all in the work group. If indexes are omitted, the addresses of all stations in the work group are listed. When the DECbridge 90 is used with DECrepeater 90C or 90T, the hub slot number and repeater port to which each station is attached are also displayed. The first digit is "1" when the bridge is in normal mode. Note that it may take several minutes for the SHOW ADDRESS command to accurately reflect the correct repeater port number for stations recently added to the network or moved from one port to another. If the first digit is "3", the bridge is using "invert protocol filter" mode. Refer to the DEFINE PROTOCOL command descriptions for more details.

SHOW BRIDGE

Displays bridge firmware revision numbers, station address, uptime, current maximum age, current console carrier owner, bridge state, system buffer unavailable count, work group size, the number of times the Flash EPROM has been erased, and all bridge-wide spanning tree parameters.

The bridge states are as follows:

    17,37 - Forwarding
    16,36 - Preforwarding
    15,35 - Blocking (configuration error)
    12,32 - Disabled (one or both ports disabled)
    13,33 - Broken (one or both ports failing loopback test)

The initial digit is "1" when the bridge state is normal. If the first digit is "3", the bridge is using "invert protocol filter" mode. Refer to the DEFINE PROTOCOL command descriptions for more details.

SHOW PORT *port number*

Displays all the MOP counters, bridge counters, and spanning tree state kept by the DECbridge 90. Port 1 is the backbone port; port 2 is the work group port. The spanning tree port states are encoded as follows:

    0 Disabled
    1 Listening
    2 Learning
    3 Forwarding
    4 Blocking
    5 Broken

SHOW PORT [*hub number,*] *slot number*, *port number*

Shows whether the port is enabled or disabled and the operational status of the port. Hub numbers may be "1" or "2"; slot numbers may be 1 to 8. For the DECrepeater 90T, port numbers are 1 to 8; for the DECrepeater 90C, port numbers are 1 to 6.

SHOW PROTOCOL [*start number*[, *stop number*]]

Shows either EMPTY, or the current protocol type, value, and current forwarding status of each entry in the range given. Numbers range from 1 to 16. If numbers are omitted in the command, all 16 protocol filters are displayed. The LIST command shows the filters that are loaded when the DECbridge 90 is reset.

SHOW REPEATER [[*hub slot number*,] *slot number*]

Shows the type of repeater and the port status for each port on that repeater. The hub number may be 1 or 2, and slot numbers are in the range of 1 to 8. If no parameters are given, the status is displayed for all repeaters in both hubs.

TEST *test number*

Invokes a set of self tests (manufacturing use only).

Protocol Filtering Examples

The following examples illustrate some of the ways protocol filtering can be used with the DECbridge 90. For reference, the Digital Ethernet protocol type values are as follows:

    60-01 MOP remote boot
    60-02 MOP console carrier, counters, and system identification
    60-03 DECnet
    60-04 LAT
    60-05 Diagnostics
    60-06 Customer-specific
    60-07 Local Area VAXcluster
    80-38 Bridge management

Example 1: Keeping VAXcluster traffic out of your work group.

If you have an entire Local Area VAXcluster (LAVc) on the work group side of the DECbridge 90, you can define the filtering with the following command:

```
DECbridge>   DEFINE PROTOCOL 0 FILTER ALL 60-07
```

This prevents any cluster traffic from entering or leaving the work group. Specifically, this means your cluster traffic will not be seen on the backbone, and no other cluster traffic will be seen on your own work group.

If the external cluster traffic is substantial, this could improve your local network performance. This also makes it more difficult for others on the network to monitor your cluster traffic and eliminates the need to make your cluster ID different from others on the same extended LAN.

Example 2: Keeping other groups' boot requests out of your group.

MOP remote boot requests come from LAVc satellite systems, DECservers, VAX/ELN systems, and other sources, when they need to have their software reloaded from a boot server. Boot request messages begin with group addressed messages. If line service is enabled in NCP, this creates extra processes on VMS which, if your node is not a designated boot node for the requester, slow down your system. This is particularly true after a building-wide power shutdown. It is desirable to filter out these boot requests but still be able to boot nodes in your own work group.

To stop all boot requests:

```
DECbridge>   DEFINE PROTOCOL 1 FILTER ALL 60-01
```

However, this would not work if you had DECservers or other systems inside your work group, and the designated boot servers are outside your work group. To accommodate this situation, you can enter this command:

```
DECbridge>   DEFINE PROTOCOL 1 FILTER BACKBONE 60-01
```

Now nodes inside your work group may issue boot requests and have them forwarded to a boot server outside the work group. Additionally, the boot requests from outside will be blocked at the bridge and will not slow down nodes inside the work group. **Example 3:** Controlling LAT access

The LAT protocol uses a group addressed message for service nodes to announce their availability to the DECserver units. The one-way group address filter in the DECbridge allows additional control to access to nodes in the work group. To allow users in your work group to access all network-wide services but to limit access within the work group to only those DECservers that are in the same work group, do the following:

```
DECbridge>   DEFINE PROTOCOL 2 FILTER WORKGROUP 60-04
```

Service announcements that are generated by nodes in the work group are blocked by the DECbridge, and will not be seen by DECserver units on the rest of the network. Service announcements arriving from the outside network are allowed into the work group, so your own DECservers can still connect to services offered by others.

Error Messages

Table 4–2 lists the DECbridge 90 error messages and a description of each message.

Table 4–2   DECbridge 90 Error Messages

Error Message	Description
Address <n>: unused address	Indicates that the address number <n> does not contain a station address.
Confirmation error	Password not changed.
DECbridge 90 is not the designated hub manager	Indicates that the DECbridge 90 was not the designated hub manager when SHOW PORT or SHOW REPEATER command was issued. This occurs when:
	The bridge is reset and, for 60 seconds, the DECbridge is not the hub manager.
	Another DECbridge unit is acting as the current hub manager.
	A fault exists in the MMJ cable or connections between two DEChub backplanes, or in the power supply of one of the DEChub units, that prevents repeater management communication.
EEPROM failure, SET ALL not performed	Indicates that EEPROM did not pass the self-test diagnostic. The DECbridge 90 unit should be serviced. Information in the permanent configuration database may not be valid and DEFINE commands may not have the intended effect. The unit will continue to operate using the default parameters, or with parameters issued with the SET command.
Enter maximum address age from 2 to 65534 seconds	Indicates invalid address age was provided with SET BRIDGE AGE or DEFINE BRIDGE AGE commands. Enter a number between 2 and 65534 seconds.
Ethernet protocol xx-xx or IEEE PID xx-xx-xx-xx-xx	Indicates that the protocol type parameter provided to SET PROTOCOL or to DEFINE PROTOCOL command was not a sequence of either two or five hexadecimal digit pairs.

Table 4–2 (Cont.)   DECbridge 90 Error Messages

Error Message	Description
FILTER ALL protocols must be removed before defining any FORWARD command	Indicates an attempt to configure contradictory protocol filtering rules in the permanent database. Before the DECbridge 90 will accept a filter request, you must type LIST PROTOCOL to identify protocol filters marked as "FILTER ALL," and remove them with DEFINE PROTOCOL <n> NONE command.
FILTER ALL protocols must be removed before setting any FORWARD command	Indicates an attempt to configure contradictory protocol filtering rules in the permanent database. Before the DECbridge 90 will accept a filter request, you must type LIST PROTOCOL to identify protocol filters marked as "FILTER ALL," and remove them with SET PROTOCOL <n> NONE command.
FORWARD protocols must be removed defining any FILTER ALL command	Indicates an attempt to configure contradictory protocol filtering rules in the current database. Before the DECbridge 90 will accept a filter request, you must type SHOW PROTOCOL to identify protocol filters marked as "FORWARD," and remove them with DEFINE PROTOCOL <n> NONE command.
FORWARD protocols must be removed setting any FILTER ALL	Indicates an attempt to configure contradictory protocol filtering rules in the current database. Before the DECbridge 90 will accept a filter request, you must type SHOW PROTOCOL to identify protocol filters marked as "FORWARD," and remove them with SET PROTOCOL <n> NONE command.
Hub management disabled	Indicates that SHOW PORT or SHOW REPEATER was issued to a DECbridge 90 for which repeater management is disabled. Enable repeater management with the SET BRIDGE HUB_MANAGEMENT ENABLE command before trying again.
Hub number and slot number [[hub], slot]. Hub is 1 or 2, slot is 1-15	Indicates one or more parameters provided to SHOW REPEATER was out of range. Hub number must be either 1 or 2; slot number must be between 1 and 15.
Hub <h> slot <s> - port number out of range	Use SHOW REPEATER to determine the number of ports for the device, and specify a port number within that range.

Table 4–2 (Cont.)   DECbridge 90 Error Messages

Error Message	Description
Hub <h> slot <s> not a repeater	Indicates that the device does not use the same management protocol as the DECrepeater 90C and DECrepeater 90T, and its ports, if any, cannot be managed by the DECbridge 90.
Hub <h> slot <s> unrecognized type	Indicates that repeater type in hub <h> slot <s> is not known to the DECbridge 90, but the repeater ports can still be managed with the DECbridge 90.
No repeater responds	Indicates there is no repeater installed in the requested hub slots, or the repeater is not functioning.
No such port	Indicates bridge port number provided to SHOW PORT was out of the range of 1 to 2.
Password too long - not changed	Indicates that a password of more than 16 characters was given to the DEFINE BRIDGE PASSWORD command.
Port number [[hub,]slot,]port	Indicates one of the parameters to a SET PORT or DEFINE PORT command was not a valid hub, slot, or port number.
Protocol type number [first [,last]] in range 1-16	Indicates one or more parameters provided to the SHOW PROTOCOL, SET PROTOCOL, and DEFINE PROTOCOL command was out of the range 1 to 16.
Repeater port does not exist or is out of range	Indicates that the parameter provided to SET PORT was not a valid port number. Use the SHOW REPEATER command to determine which hub slots contain repeaters, and the number of ports on each repeater.
Station address number [first [,last]] in range 1-200	Indicates one or more parameters provided to the SHOW PROTOCOL command was out of the range 1 to 200.
???	Indicates that a command or parameter was not recognized. Type ? to display valid commands.
180501	Appears whenever a loopback diagnostic is run and passed on the backbone port. If the backbone port is not receiving any messages, this diagnostic is run every 10 minutes.
180201	Appears whenever a loopback diagnostic is run and passed on the work group port. If the work group port is not receiving any messages, this diagnostic is run every 10 minutes.

Table 4–2 (Cont.)   DECbridge 90 Error Messages

Error Message	Description
1805:00-00-00-00 01	Appears whenever a loopback diagnostic is run and fails on the backbone port. The diagnostic is tried every five seconds until the test passes.
1802:00-00-00-00 01	Appears whenever a loopback diagnostic is run and fails on the work group port. The diagnostic is tried every five seconds until the test passes.

5
Troubleshooting

This chapter describes how to troubleshoot the DECbridge 90. The indicators on the DECbridge 90's front panel are used to troubleshoot bridge and work group problems. Figure 1–2 in Chapter 1 shows the location of the indicator lights and connectors on the DECbridge 90. To troubleshoot a unit:

1. Verify the installation of the bridge.

   – Ensure that the installation meets the configuration requirements given in Chapter 2.

2. Check all power and Ethernet connections.

3. Isolate the problem. When isolating a problem, examine the following:

   – Backbone

   – Connection to the backbone

   – Work group

   – Connection to the work group

   – DECbridge 90

   – Power supply

Table 5–1 lists the possible error conditions and the corrective action.

Table 5–1   Activity Indicators (LEDs)

LED	State	Indications	Corrective Action
DC OK	ON	Bridge's power supply is working.	None.
	OFF	Bridge's power supply is not working or there is transceiver problems.	Go to Table 5-2.
System OK	ON	Bridge is powered up and has passed the self-test.	None.
	OFF	Bridge is faulty.	Go to Table 5-2.
Work Group Port OK	ON	Bridge is powered up and has passed the self-test.	None.
	OFF	Cables are not properly terminated[2].	Refer to Chapter 2.
Work Group Port Activity	ON[1]	Indicates activity on the LAN.	None.
Bridge Forwarding State	ON	Bridge is not forwarding.	Remains on for 30 seconds after power up.
	OFF	Bridge is forwarding.	None.
Configuration Error	ON	More than 200 stations are connected to the DECbridge 90.	Review configuration rules in Chapter 2.
	OFF	Work group size is fine.	None.
Backbone Port OK	ON	Backbone port self-test is completed.	None.
	OFF	Cables are not properly terminated[2] or there is a network fault on the backbone wires.	Refer to backplane installation procedures in Chapter 3.
Backbone Port Activity	ON[1]	There is activity on the LAN.	None.

[1]Can be on, off, or blinking depending on the amount of network traffic.

[2]ThinWire ports of the DECbridge 90 are not terminated internally. External 50-ohm terminations are required.

Table 5–2 lists some possible problems and the suggested corrective
action.

Table 5–2   Simple Troubleshooting

Problem	Suggested Corrective Action
All LEDs off /Power is not reaching the DECbridge 90	Secure the power cable at the bridge and at the wall outlet.
	Check the wall outlet using another appliance or light, or plug the bridge's power cord into another outlet. If no power is available, check the wall outlet's circuit breaker.
	Replace a defective bridge power cable with a new cable.
	Check for a short circuit in the AUI transceiver cable. Remove power from the DECbridge 90 and remove the transceiver cable, and reconnect power to the DECbridge. If the power light now comes on, repair the transceiver or transceiver cable.
	If the fault persists, more extensive troubleshooting is required. Notify the system/network manager.
DC OK off, any other LED on	If AUI cable is attached, check transceiver cable or transceiver for short circuits.
	If connected to the DEChub 90 backplane, make sure the DECbridge is in slot 8.
	If the problem still exists, notify the system/network manager that the power supply must be replaced.
Bridge Forwarding LED on	Indicator normally remains on for 30 seconds after power up while bridge learns network configuration, and then the indicator turns off. If the indicator remains on, be sure both Work Group Port OK and Backbone Port OK indicators are on. If they are not on, verify cable terminations.
	Check the work group to be sure there are no redundant paths into the work group, per configuration rules in Chapter 2.

Table 5–2 (Cont.)   Simple Troubleshooting

Problem	Suggested Corrective Action
Station in backbone cannot communicate to station in the work group	Be sure Bridge Forwarding State light is off.
	Be sure the protocol in use is not being filtered.
	The receiving station has never transmitted a message, or has not transmitted a message in the last 15 minutes. Stations in the work group must transmit at least one message every 15 minutes to remain in the DECbridge 90 address table. This is the "address age" time, and may be lengthened with management. (All Digital stations transmit a periodic I.D. every 8-12 minutes.)
A station in the work group cannot communicate to a station in the backbone	Be sure the Bridge Forwarding State LED is off.
	Be sure the protocol in use is not being filtered.
DECbridge 90 does not work in the backplane	Verify that bridge is installed in slot 8 of the backplane.

Customer Services Option

If you need additional assistance in troubleshooting the DECbridge 90 or if you need to replace the unit, call your local Digital Customer Services representative or vendor.

A
Specifications and Parts List

Specifications for the DECbridge 90 are divided into the following categories:

• Physical dimensions

• Environmental specifications

• Power specifications

Table A–1 lists the physical dimensions of the DECbridge 90.

Table A–1   Physical Dimensions

Dimension	Value
Height	3.175 cm (1.25 in)
Width	27.305 cm (10.75 in)
Depth	14.605 cm (5.75 in)
Weight	.45 kg (1 lb)

Table A–2 lists the operating environment specifications for the DECbridge 90.

Table A–2   Operating Environment

Item	Value
Temperature	5° C to 50° C (41 ° F to 122° F)
Maximum rate of change	20° C/hr (36° F/hr)
Relative humidity	10% to 95% (non-condensing)
Wet-bulb temperature	32° C (90° F) maximum
Dew point	2° C (36° F) minimum
Altitude	Sea level to 2.4 km (8000 ft)
Air flow	Convectively cooled. A minimum of 10 cm (4 in) of space must be provided on both ends of the unit for adequate air flow.

The DECbridge 90 is designed to operate in an office environment. It cannot be installed in an air plenum.

Table A–3 lists the shipping environment specifications for the DECbridge 90.

Table A–3   Shipping Environment

Item	Value
Temperature	-40° C to 66° C (-40 ° F to 151° F)
Relative humidity	10% to 95% (non-condensing)
Altitude	Sea level to 4.9 km (16000 ft)

Table A–4 lists the power specifications for the DECbridge 90.

Table A–4   Power Specifications

Item	Value
Voltage (Domestic)	104 Vac to 128 Vac (nominal 120 Vac)
Voltage (International)	208 Vac to 256 Vac (nominal 240 Vac)
Current at 120 volts	.56 amps
Current at 240 volts	.56 amps
Frequency	50 Hz to 60 Hz
Power Consumption	6.43 watts

Parts List

Table A–5 lists the kit contents for a standalone installation.

Table A–5   Standalone Installation Kit Contents

Part	Order Number
DECbridge 90 Kit:	DEWGB-AA
• Power supply with 2.4 m (8 ft) DC cable attached (H7827-AA)	
• AC power cord	
• DECbridge 90 (DEWGB-MA)	
• Owner's Manual (EK-DEWGB)	

Table A–6 lists the kit contents for the installation in a DEChub 90 Ethernet backplane.

Table A–6   DEChub 90 Ethernet Backplane Installation Kit Contents

Part	Order Number
DECbridge 90 kit:	DEWGB-MA
• DECbridge 90	
• Owner's Manual (EK-DEWGB)	

B
Related Documentation

Document Title	Order Number
Bridge and Extended LAN Reference	EK-DEBAM-HR
DECconnect System Facilities Cabling Installation Guide	EK-DECSY-FC
DECconnect System Planning and Configuration Guide	EK-DECSY-CG
DEChub 90 Owner's Manual	EK-DEHUB-OM
Network Troubleshooting Guide	EK-339AA-GD
Networks and Communications Product Documentation	EK-NACPD-RE
Remote Bridge Management Software Guide	AA-FY93C-TE

Ordering Information

Customers may order documents by phone or mail.

Continental USA and Puerto Rico

Call 800-258-1710 or mail to:

Digital Equipment Corporation
Peripherals and Supplies Group
P.O. Box CS2008
Nashua, NH 03061

New Hampshire, Alaska, and Hawaii

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