DECrepeater 90T and DECrepeater 90T+

Owner's Manual

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About this Manual

Introduction

This manual describes how to install, operate, and maintain the DECrepeater 90T and DECrepeater 90T+ repeaters. These repeaters are 9-port twisted-pair repeaters designed to function as standalone units or as managed units in the DEChub 90 backplane. The functionality of the DECrepeater 90T+ is the same as the DECrepeater 90T except that it supports shielded as well as unshielded twisted-pair cable.

In this manual, the term *repeater* may be used to denote both the DECrepeater 90T and the DECrepeater 90T+ repeaters. When information is unique to a specific repeater, the terms *DECrepeater 90T* and *DECrepeater 90T+* are used.

Organization

This manual contains five chapters and three appendices.

Chapter	Description
1	Provides an overview of the DECrepeater 90T and DECrepeater 90T+ and briefly describes the features of these repeaters.
2	Describes the configuration rules and conditions of operation for the DECrepeater 90T and DECrepeater 90T+ in a ThinWire Ethernet system or standard Ethernet network.
3	Describes how to install the DECrepeater 90T and DECrepeater 90T+.
4	Describes how to manage the DECrepeater 90T and DECrepeater 90T+ on a network.
5	Provides basic troubleshooting information.
Appendix A	Provides the physical dimensions, environmental (operating and shipping) specifications, electrical specifications, and a parts list.
Appendix B	Provides more detailed information about management issues.
Appendix C	Provides information about related documentation and ordering.

Conventions

The following conventions are used in this manual:

Convention	Meaning
Note	Provides general information.
❶	A number in a black circle in text refers to the corresponding number in an accompanying illustration.
[ ]	In command descriptions, brackets indicate optional elements.
Italic type	Italic type emphasizes important information, indicates complete titles of documents, and in command descriptions, indicates a variable that you supply.
SHOW ADDRESS	In text, commands are shown in all uppercase letters to differentiate them from regular text. For the VMS operating system, you can enter commands in either uppercase or lowercase letters. For the ULTRIX operating system, commands must be entered as indicated in the examples.
`DECbridge>`	Text that the system displays on the screen is shown in monospaced type.
`SHOW REPEATER 1`	Text that you enter is shown in bold monospaced type.
Return	A key name enclosed in a box indicates that you press that key.

1
Overview

Introduction

This chapter describes the DECrepeater 90T and DECrepeater 90T+ repeaters and briefly summarizes the features of these repeaters.

Description

The DECrepeater 90T and DECrepeater 90T+ are 9-port repeaters designed for the IEEE 802.3 standard CSMA/CD networks. The repeaters have one ThinWire port and eight twisted-pair ports. The ThinWire port complies with the IEEE 802.3 standard for 10Base2 networks; the twisted-pair ports comply with the IEEE 802.3 standard for 10BaseT networks.

The DECrepeater 90T twisted-pair ports support unshielded twisted-pair cable; the DECrepeater 90T+ twisted-pair ports support both shielded and unshielded twisted-pair cable. Installations that require a shielded 100-ohm twisted-pair cable use a shielded MJ connector. Installations that require a 160-ohm shielded media connection are accommodated by adding 10BaseT baluns. See Chapter 3, Installation, for more information about shielded twisted-pair environments.

The repeaters can operate in standalone configurations or as managed repeaters when installed in a DEChub 90 backplane with a DECbridge 90 series bridge.

Figure 1–1 shows a typical configuration of the DECrepeater 90T repeater in an Ethernet local area network (LAN).

Figure 1–1 Sample DECrepeater 90T Configuration

LJ-02765-TI0
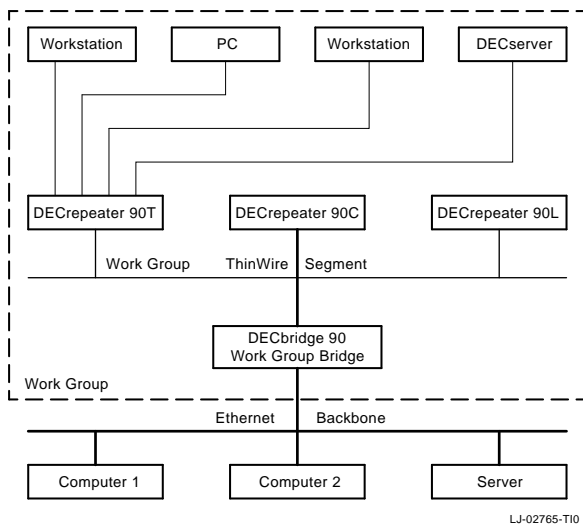
When operating as a standalone unit, the repeater is an unmanaged repeater with a separate power supply connected to the repeater by a cable with a 7-pin connector. The auto-ranging power supply is modular and accommodates either a North American 120-volt or an international 240-volt wall outlet.

Features

The following list summarizes the features of the DECrepeater 90T and DECrepeater 90T+ repeaters:

- One ThinWire (10Base2) port

- Eight twisted-pair (10BaseT) ports

- Standalone or installable in a DEChub 90 backplane

- Manageable when installed in a DEChub 90 backplane

For detailed information about how to configure the repeaters, see Chapter 2, Configuring the DECrepeater 90T and DECrepeater 90T+ Repeaters. For detailed information about how to install the repeaters, see Chapter 3, Installation.

LEDs and Connectors

The front panels on the DECrepeater 90T and DECrepeater 90T+ repeaters, although somewhat different in appearance, both contain the same indicator lights (LEDs) and connectors. These LEDs and connectors are shown in Figure 1–2 and Figure 1–3 and are described in Table 1–1.

Figure 1–2   DECrepeater 90T LEDs and Connectors
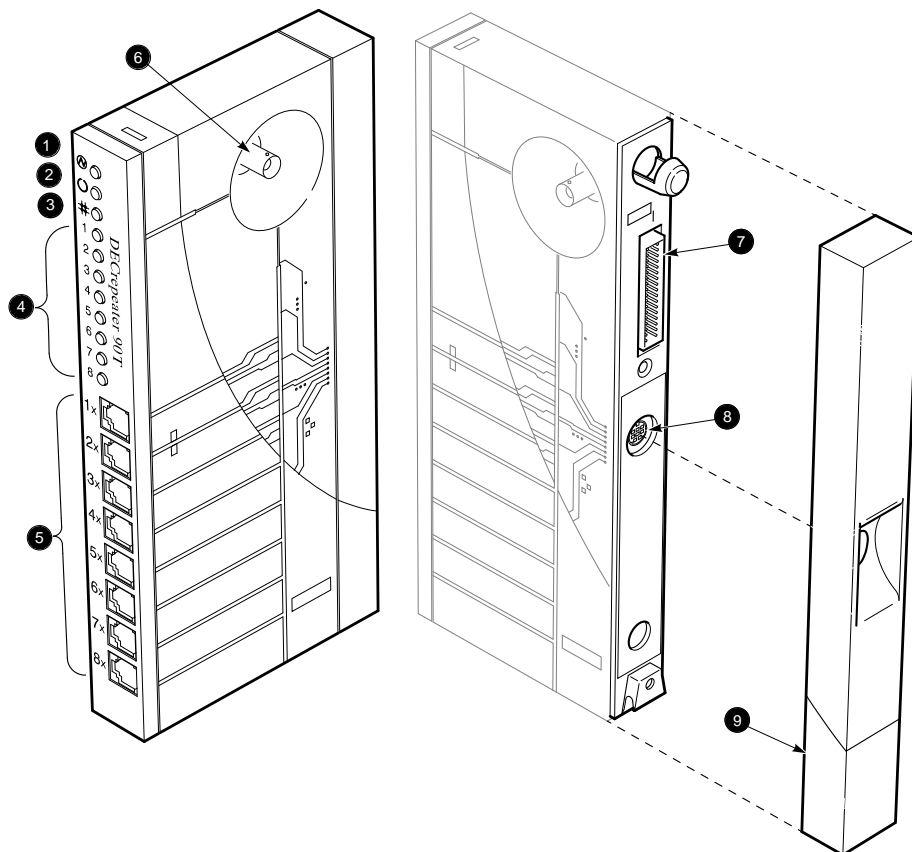
LJ-00543-TI0A

Figure 1–3   DECrepeater 90T+ LEDs and Connectors

LJ-02660-TI0

Table 1–1   DECrepeater 90T and DECrepeater 90T+ LEDs and Connectors

❶   **DC OK** monitors the voltage.
On: The +5.0 Vdc voltage is normal.
Off: The voltage is abnormal (as when a power failure occurs).

❷   **Network activity indicator** monitors the network activity.
On: There is network activity.
Off: There is no network activity.

❸   **Port 0 status indicator** monitors the status of port 0.
On: Port 0 is functional.
Off: Port 0 is not functioning or has been partitioned.
Flashing: Port 0 has been partitioned by management.

❹   **Status indicators** monitor the status activity of ports 1 to 8. The top
status LED represents port 1; the bottom LED represents port 8.
On: The port is functional.
Off: The port is not functioning or has been partitioned by management.
Flashing: The port has been partitioned by management.

❺   **Port 1X through 8X connectors (MJ)** connect workstations and PCs to
the repeater. These connectors have internal crossovers (indicated by the
X).

❻   **Port 0 network connector (BNC)** connects the repeater to the work
group ThinWire segment. Not used when the repeater is installed in the
DEChub 90 backplane.

❼   **Backplane connector** provides network and power connections to the
repeater when it is installed in the DEChub 90 backplane.

❽   **Power connector** receives +5.0 V from the repeater power supply. Not
used when the repeater is installed in the DEChub 90 backplane.

❾   **Back cover** covers the backplane connector and mounting assembly. (Use
with standalone units only.)

2

Configuring the DECrepeater 90T and DECrepeater 90T+ Repeaters

Introduction

This chapter contains some of the basic configuration rules and guidelines that must be followed to correctly install the typical DECrepeater 90T and DECrepeater 90T+ configurations. For more detailed information about installing IEEE 802.3 compliant multisegment LANs, refer to Section 13 of the IEEE 802.3i-1990 standard.

Configuration Rules

The two basic constraints in IEEE 802.3 LAN configurations are segment lengths and the number of repeaters between data terminal equipment (DTE). To ensure the proper operation of the IEEE 802.3 physical layer and access methodology, the network size must meet the round trip propagation delay budget.

Segment Length Constraints

Table 2–1 specifies the maximum segment lengths for ThinWire and twisted-pair cables.

Table 2–1 Segment Lengths

Media Type		Maximum Segment Length (Meters)
Mixing (coaxial)	10Base2 (ThinWire)	185
Link	10BaseT (twisted-pair)	100

Network Constraints

The overall network constraints are imposed by the following IEEE 802.3 rules:

1. The transmission path between any two DTEs may consist of up to five segments and four repeater sets.

    When a network consists of five segments and four repeater sets, a maximum of three of these segments may be mixing (coaxial) segments.

2. The total of all segments (up to five) shall not exceed 2500 meters.

The actual maximum segment length depends on the cable characteristics. Longer or shorter lengths are possible depending on the performance of the twisted-pair cable. A ThinWire segment may have a total of 30 transceivers. Port 0 has an integral transceiver.

3

Installation

Introduction

Before you install the DECrepeater 90T and DECrepeater 90T+ repeaters, you should read this entire manual to become familiar with the features and configuration rules of the repeaters. If problems occur during installation, refer to Chapter 5, Troubleshooting. For additional information that may be useful during installation, refer to Appendix A, Specifications and Parts List.

The repeaters may be installed on top of a desk or table, mounted on a wall by the back cover, or installed in a DEChub 90 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 repeater or the power supply on the wall.

Site Considerations

The repeaters and their power supplies can be placed in various locations, including office areas, computer rooms, or wiring closets, as long as the environmental requirements are met. These requirements are provided in Table A–2, Operating Environment, in Appendix A.

Standalone Installation

To install a DECrepeater 90T or DECrepeater 90T+ repeater on top of a desk or table, make sure that the air circulation around the repeater does not become obstructed by papers or other materials. Refer to the environmental specifications provided in Table A–2 in Appendix A.

Mount the DECrepeater 90T and DECrepeater 90T+ on a Wall

To install the DECrepeater 90T or DECrepeater 90T+ as a standalone wall-mount unit, use the following procedure:

1. Remove the cover (if necessary).

   a. Insert a small screwdriver into the top mounting hole on the cover (Figure 3–1).

   b. Lift the internal latch with the screwdriver, then pull the cover away and down from the top of the unit.

Figure 3–1 Removing the Back Cover
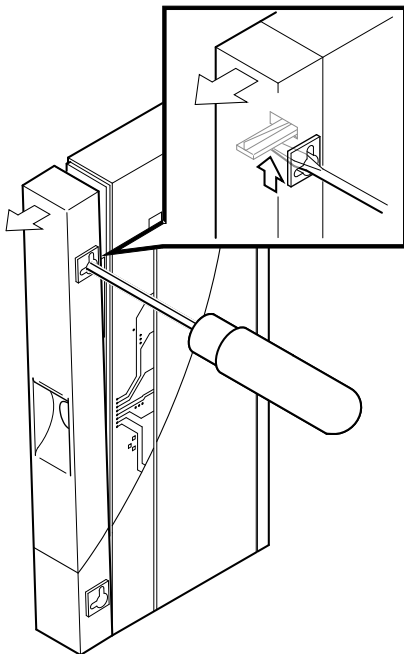
LJ-00320-TI0

2. Use the mounting holes on the back cover to determine the placement for the mounting screws on the wall (Figure 3–2).

3. Secure the back cover to the wall using the mounting screws.

Figure 3–2   Mounting Screws
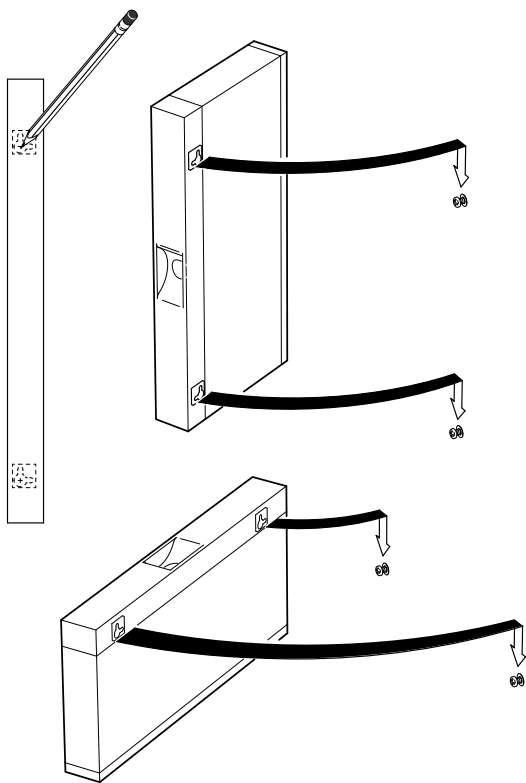
LJ-00701-TI0

The screws should be tight enough to provide resistance if you try to remove the back cover from the wall. However, do not make them so tight that the cover is distorted or cannot be removed from the wall.

4. Remove the back cover from the wall.

5. Attach the back cover to the repeater.

6. Mount the repeater onto the mounting screws.

Standalone Installation Connections

To make the standalone installation connections, use the following procedure and refer to Figure 3–3:

1. Connect the cable from the power supply to the 7-pin power connector on the repeater. Align the power symbol on the direct current (dc) power connector with the power symbol on the repeater and push the connector straight in.

2. Connect the repeater to the power source.

   For a 240-volt power outlet, connect the power supply cord to the modular power supply, then to the wall outlet.

   For a 120-volt power outlet, connect the power supply directly to the wall outlet.

   All the LEDs should turn on during initial power-up. After approximately .05 seconds, the network activity LED should turn off while the other LEDs remain on.

3. Connect the Ethernet ThinWire segment to a T-connector; connect the T-connector to the port 0 BNC network connector. Terminate the T-connector using a 50-ohm terminator or extend the Ethernet segment to the next device.

   The port 0 status activity LED should be on or flashing to indicate the amount of traffic on the network. The LED intensity varies with the amount of traffic: the more traffic, the brighter the LED appears.

4. Connect the twisted-pair cables to ports 1 to 8.

   The crossover twisted-pair cable function is built into the repeater. Use point-to-point wiring (with 8-pin MJ connectors) when connecting a device to the twisted-pair ports.

   The port LED should turn on when a port is correctly terminated and first receives network activity. Verify the operation of each port by sending information to the device being tested.

The repeater is now installed.

Figure 3–3   Standalone Installation

50-Ohm
Terminator

T-Connector

DECrepeater 90T

PC
or
Workstation
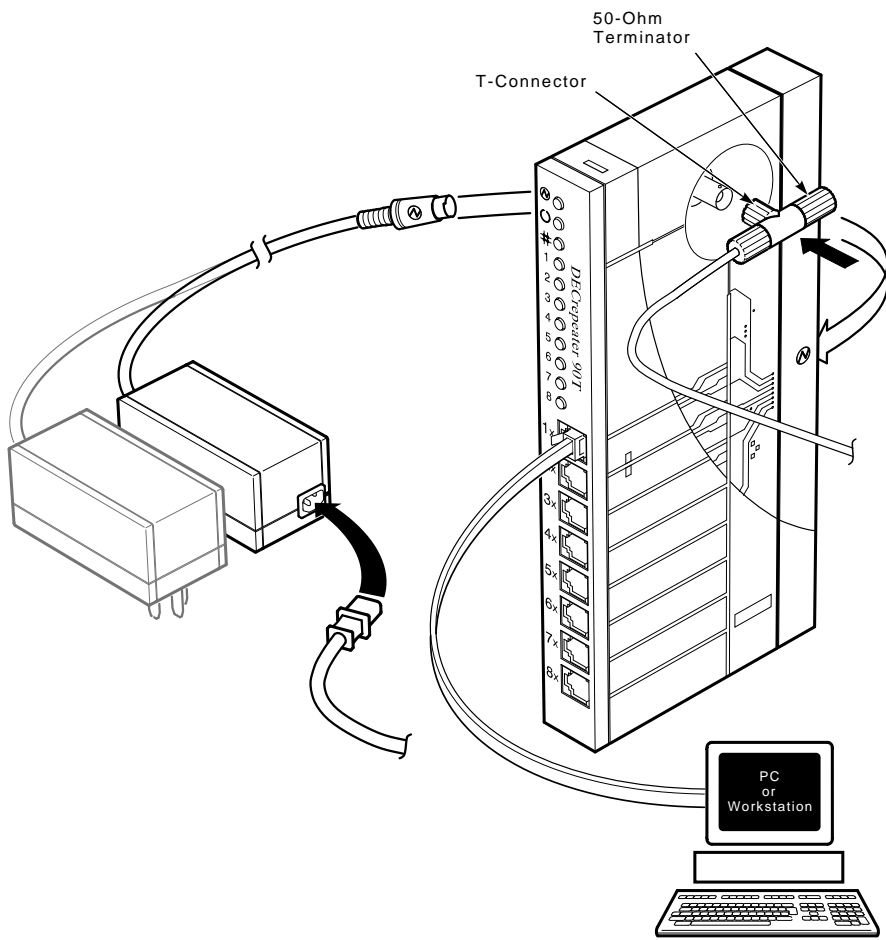
LJ-00703-TI0A

Backplane Installation

To install a DECrepeater 90T or DECrepeater 90T+ in a DEChub 90 backplane, use the following procedure:

1. Remove the back cover (if necessary).

   a. Insert a small screwdriver into the top mounting hole located on the cover.

   b. Lift the internal latch with the screwdriver and pull the cover away and down from the top of the unit (Figure 3–1).

2. Place the lower mounting tab, located on the back of the repeater, into the correct mounting slot on the backplane (Figure 3–4).

3. Rock the repeater into place. You will hear a click when the repeater is secured in the slot.

4. Supply power to the backplane if this is a new installation.

   The port 0 status activity LED should be on or flashing to indicate the amount of traffic on the network. The LED intensity varies with the amount of traffic: the more traffic, the brighter the LED appears.

   The port status LEDs for unconnected ports should turn off when network traffic is established.

The repeater is now installed.

_____ **Note** _____

The repeaters can be installed into or removed from the DEChub 90 backplane while power is supplied to the backplane. (This is referred to as a hot swap.)

_____

**Figure 3–4 Installing a DECrepeater 90T Repeater into the DEChub 90
Backplane**
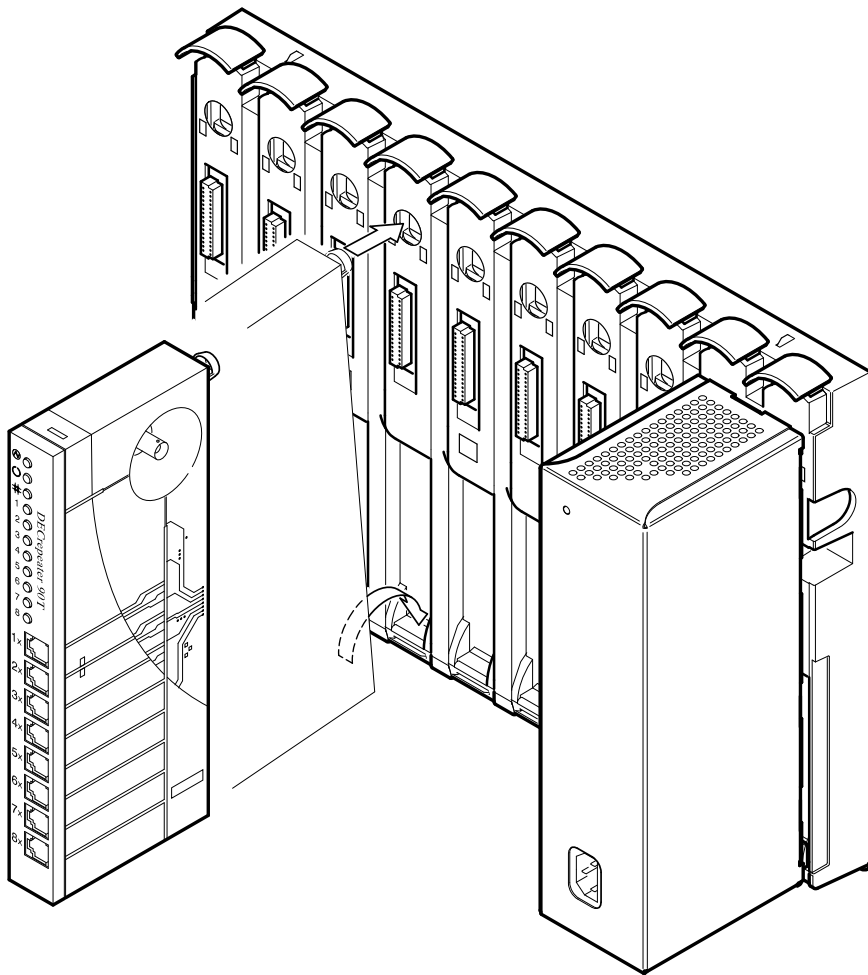
LJ-00704-TI0

Shielded Twisted-Pair Environments

The DECrepeater 90T+ accommodates environments where shielded twisted-pair 10BaseT installations are required. The DECrepeater 90T+ has shielded MJ connectors, but retain the 100-ohm impedance environment. For installations that require 160-ohm line impedances, connections to the repeater should be made through a 10BaseT balun.

The DECrepeater 90T+ shields are electrically common to earth ground connections in both standalone and backplane installations. The shielded connections at the user end of twisted-pair links should be impedance-coupled to earth ground to avoid direct current (dc) or low-frequency ground loop currents.

4

Managing the DECrepeater 90T and DECrepeater 90T+

Introduction

This chapter provides information about managing the DECrepeater 90T and DECrepeater 90T+ repeaters on a network using the Maintenance Operations Protocol (MOP) for VMS or ULTRIX operating systems. This chapter also describes the management functions, commands, techniques, and messages.

The repeaters are managed online using a DECbridge 90 series unit in a DEChub 90 backplane. All commands that affect the repeaters are part of the DECbridge 90 series command set.

Functions

Online management allows the user to perform the following functions:

- Identify all repeaters in the DEChub 90.

- Examine port status (enabled, disabled, properly operating, or inoperative) of repeater ports that share the DEChub 90 backplane with a bridge.

- Examine the work group address database entries 1 to 200, annotated with the repeater port to which each is attached, if any.

- Reset any repeater in the DEChub 90 backplane.

- Enable or disable a repeater port.

- Define the bridge password.

See the Description of Commands section of this chapter for more information about command syntax.

Components Needed

You need the following components to manage a repeater online:

- DEChub 90 backplane

- DECbridge 90 work group bridge

- DECrepeater 90T or DECrepeater 90T+

Accessing MOP from VMS Systems

The MOP console carrier on a VMS operating system is included as part of
the Network Control Program (NCP) facility, which requires a DECnet license.
You do not need increased user privileges to use the NCP facility; however, to
establish a console carrier session, you must know the following:

- The Ethernet address of the bridge used for management

- The Ethernet name of the circuit containing the bridge

The circuit name is needed because a VMS operating system may have more than
one Ethernet interface. The Ethernet address is located on the front panel label
on a DECbridge 90 series unit.

Table 4–1 lists the Ethernet circuit names that apply. The Ethernet circuit names
are based on system type.

Table 4–1 Ethernet Circuit Names for Systems

System	Ethernet Circuit Name
VAX 6000 and VAX 9000 XMI computers	mna-0
BI based systems (VAX 6300 and VAX 6400 computers)	bna-0
VAX 4000 computer series	isa-0
MicroVAX systems and VAX 3600 and VAX 3900 computers	qna-0
VAXstation 2000 and VAXstation 3000 computer series	sva-0
VAX–11/780 and VAX–11/785 computers (UNIBUS)	una-0

Example:

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

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

When you establish the connection, the following message appears on the screen:

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

Accessing a Bridge Repeatedly

If you need to access a specific bridge repeatedly, you can enter the bridge Ethernet address in the NCP database by choosing an arbitrary address in area 13. Bridge names in the NCP database may have a maximum of six characters.

Example:

If you name your bridge DBRG1 on address 13.87 and access it from a VAX 6400 computer (the Ethernet circuit name is bna-0), you could use the following commands:

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

To access the bridge, enter the following:

```
$ NCP CONNECT NODE DBRG1  Return
```

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

To access the bridge, enter the following:

```
$ NCP CONNECT NODE DBRG1  Return
```

Accessing MOP from ULTRIX Systems

On ULTRIX operating systems, the console carrier is a separate utility included as part of the MOP option. This option is part of the regular distribution; however, it is not selected by default and is not included in the basic installation. You can install the MOP option from the original distribution media using the setld utility. You must have superuser privileges to invoke console carrier.

After the MOP option is installed, each bridge to be managed must be given a name and a dummy node number using the addnode utility. For example:

```
# addnode 13.1 DBRG1  Return
```

After the name and node number are assigned, you can establish the link at any time using the ccr command:

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

In this 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, based on system type, apply. Refer to Table 4–1 for circuit names.

Console Carrier User Interface

The DECbridge 90 is not shipped with a pre-set password; therefore, no password prompt appears on the screen when you connect for the first time. For secure operation of the DECbridge 90, you should define a password using the DEFINE BRIDGE PASSWORD command.

The password prompt is represented by the pound sign (#). If you do not define a password, then the password prompt does not appear on the screen when you log in.

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

After you enter the correct password, or if there is no password, the DECbridge console carrier management banner and prompt appears on the screen as follows:

```
Copyright © Digital Equipment Corporation 1991.

DEWGB V2.0 08-00-2B-2D-9B-81
EPROM V2.7 ©1991,92 Digital Equip Corp 25-JUN-92
DECbridge>
```

Console Carrier Command Language

You can type a question mark (?) at any point in the command line to display a list of the options available at that point in the command line. The system accepts unique command abbreviations.

Table 4–2 summarizes DECbridge commands that apply to the repeaters. For a complete list of commands, refer to the *DECbridge 90 Owner's Manual* or the *DECbridge 90FL Owner's Manual*.

Table 4–2 Summary of DECrepeater 90T and DECrepeater 90T+ Commands

Command	Argument and Parameter
DEFINE[1]	BRIDGE AGE *age*

	BRIDGE FLOOD
	    ENABLE
	    DISABLE

	BRIDGE HUB MANAGEMENT
	    ENABLE
	    DISABLE

	BRIDGE PASSWORD *password string*

	BRIDGE SPANNING TREE
	    ENABLE
	    DISABLE

	PORT *port number*
	    ENABLE
	    DISABLE

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

	REPEATER
LIST	BRIDGE
	PROTOCOL *protocol number*

SET[2]	BRIDGE HUB MANAGEMENT
	    ENABLE
	    DISABLE

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

	REPEATER *[[hub number,]slot number]RESET*
SHOW	ADDRESS *[start index,[stop index]*

---

[1]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.

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

(continued on next page)

**Table 4–2 (Cont.) Summary of DECrepeater 90T and DECrepeater 90T+
Commands**

Command	Argument and Parameter
	PORT *[hub number,]slot number,port number*
	REPEATER *[[hub number,]slot number]*

Description of Command Parameters

A *start index* or *stop index* for an address is a decimal index into the work group
forwarding database in the range of 1 to 200.

A *slot number* is a single number ranging from 1 to 8 that identifies a hub slot
containing a repeater. When two DEChub backplanes are connected together, the
hub number (1 or 2) is specified before the slot number. For example, the *hub slot
number* 2,4 refers to 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 with a maximum of 16 characters.

A *port number* is either a DECbridge 90 port, or the number of a port on a
repeater that is installed in the DEChub backplane with the bridge. The bridge
backbone port is 1. The work group port is 2. A repeater port is identified by a
hub slot number and the port number within the slot.

Description of Commands

This section describes the commands used with the DECrepeater 90T and DECrepeater 90T+ repeaters. The examples used to explain the commands are based on the configuration shown in Figure 4–1.

Figure 4–1 Sample Configuration
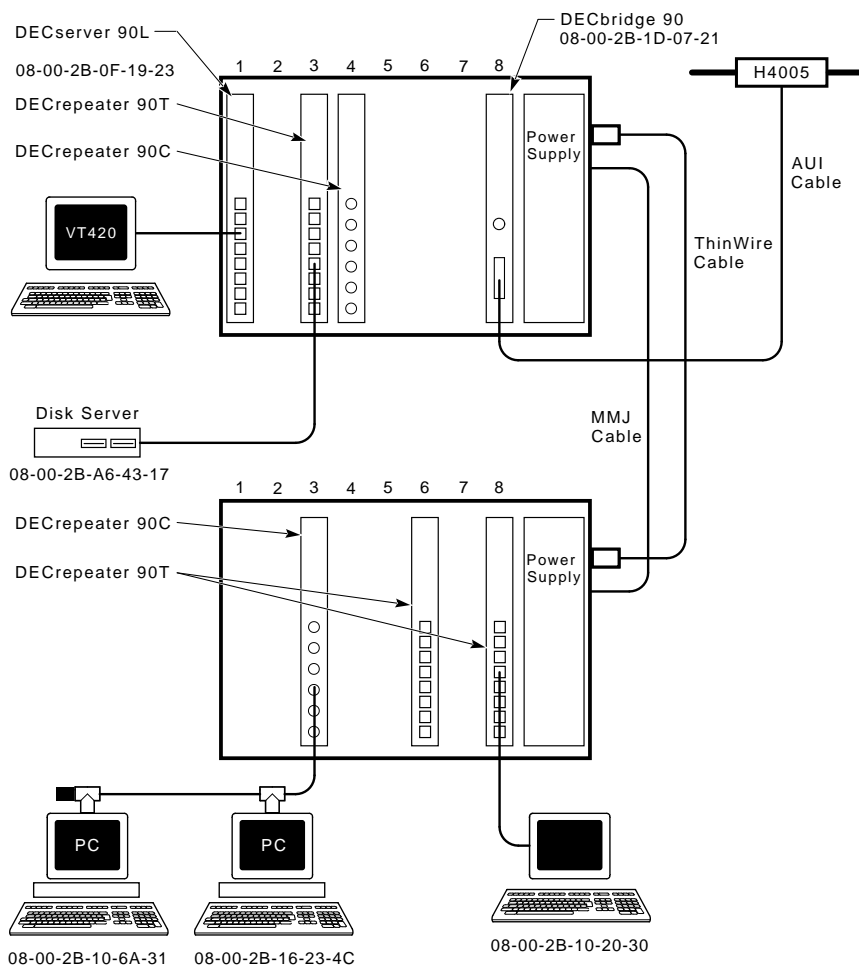
DEFINE BRIDGE HUB_MANAGEMENT DISABLE
SET BRIDGE HUB_MANAGEMENT DISABLE

Disables all repeater management through the DECbridge 90 unit for repeater units in the DEChub 90 backplane. When disabled, you receive an error message with the SHOW REPEATER, SET PORT, or SHOW PORT commands on repeater ports. You do not receive port number information from the SHOW ADDRESS command.

DEFINE BRIDGE HUB_MANAGEMENT ENABLE
SET BRIDGE HUB_MANAGEMENT ENABLE

Reverses the affect of the SET or DEFINE BRIDGE HUB_MANAGEMENT DISABLE commands.

DEFINE BRIDGE PASSWORD *password string*

Lets you change the password string. You are prompted twice for a new password. The password may be a maximum of 16 characters and does not appear on the screen. The system saves the new password. There is no corresponding SET command because the DEFINE BRIDGE PASSWORD takes effect immediately.

The MOP option provides a mechanism for setting and checking passwords. This mechanism is 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.

LIST BRIDGE

Displays the nonvolatile bridge-wide parameters.

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 repeater flashes, indicating that the port was disconnected by the network manager. There is no equivalent DEFINE command for disabling repeater ports.

Example 1:

The expected response to a SET PORT DISABLE command for a repeater appears as follows:

```
DECbridge>SET PORT 1,3,2 DISABLE  Return
Hub 1 slot 3 port 2 segment counter 0 status: disabled
```

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

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

Example 2:

The expected response to a SET PORT ENABLE command for a repeater appears as follows:

```
DECbridge>SET PORT 1,3,2 ENABLE  Return
Hub 1 slot 3 port 2 segment counter 0 status: no carrier loopback
```

SET REPEATER [*hub number,*]*slot number* **RESET**

Resets a specific repeater. There is no output response to this command. All disabled ports are enabled.

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

Displays the station address in a selected range (1 to 200) of entries in the address database. The start index value always appears; however, other entries in the range appear only 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 unit is used with a DECrepeater 90T or
DECrepeater 90T+ repeater, the hub slot number and repeater port to which each
station is attached will also appear on the screen. 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 stations
that have been moved from one port to another. See Appendix B, Management
Details, for more information about the SHOW ADDRESS command.

Example 1:

The SHOW ADDRESS command displays all addresses contained within the
hub configuration. Address 5 and address 7 show the same hub, slot, and port
because both devices are daisy chained on the same port.

```
DECbridge>SHOW ADDRESS  Return
Address 1: 08-00-2B-0F-19-23
Address 2: 08-00-2B-10-20-30 hub 2 slot 8 port 4
Address 5: 08-00-2B-10-6A-31 hub 2 slot 3 port 3
Address 6: 08-00-2B-A6-43-17 hub 1 slot 3 port 5
Address 7: 08-00-2B-16-23-4C hub 2 slot 3 port 3
```

Example 2:

The expected response to a SHOW ADDRESS command to a nonexisting address
appears as follows:

```
DECbridge>SHOW ADDRESS 3  Return
Address 3: unused
```

Example 3:

The expected response of a SHOW ADDRESS command to a valid address
appears as follows:

```
DECbridge>SHOW ADDRESS 2  Return
Address 2: 08-00-2B-10-20-30 hub 2 slot 8 port 4
```

Example 4:

The expected response of a SHOW ADDRESS command for a range of addresses
appears as follows:

```
DECbridge>SHOW ADDRESS 2,6  Return
Address 2: 08-00-2B-10-20-30 hub 2 slot 8 port 4
Address 5: 08-00-2B-10-6A-31 hub 2 slot 3 port 3
Address 6: 08-00-2B-A6-43-17 hub 1 slot 3 port 5
```

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

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

Example 1:

The expected response to a SHOW PORT command appears as follows:

```
DECbridge>SHOW PORT 3,2 Return
Hub 1 slot 3 port 2 segment counter 0 status: disabled-no carrier
loopback
```

The hub was not defined in the command so the default (1) was used.

Example 2:

A SHOW PORT command for hub 2 appears as follows:

```
DECbridge>SHOW PORT 2,3,2 Return
Hub 2 slot 3 port 2 segment counter 0 status: operational
```

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 can be 1 or 2, and slot numbers can be 1 to 8. If you do not include parameters, information is shown for all repeaters in both hubs.

Example 1:

The expected response to a SHOW REPEATER command appears as follows:

```
DECbridge>SHOW REPEATER Return
Hub 1 slot 3 twisted pair, repeater, rev.1, 8 ports.
Hub 1 slot 4 ThinWire repeater, rev.1, 6 ports.
Hub 2 slot 3 ThinWire repeater, rev.1, 6 ports.
Hub 2 slot 6 twisted pair repeater, rev.1, 8 ports.
Hub 2 slot 8 twisted pair repeater, rev.1, 8 ports.
```

Note that the DECrepeater 90T or DECrepeater 90T+, and the DECrepeater 90C repeaters are installed in the hub.

Example 2:

The response to a SHOW REPEATER command to a slot that contains a device other than a repeater appears as follows:

```
DECbridge>SHOW REPEATER 1 Return
No repeater responds.
```

Example 3:

The response to a SHOW REPEATER command to an empty slot appears as
follows:

```
DECbridge>SHOW REPEATER 7 [Return]
No repeater responds.
```

Example 4:

The response to a SHOW REPEATER command for a particular repeater appears
as follows:

```
DECbridge>SHOW REPEATER 3 [Return]
Hub 1 slot 3 twisted pair, rev.1, 8 ports.
Hub 1 slot 3 port 0 segment counter 0 status: operational
Hub 1 slot 3 port 1 segment counter 1 status: no carrier loopback
Hub 1 slot 3 port 2 segment counter 0 status: disabled
Hub 1 slot 3 port 3 segment counter 0 status: operational
Hub 1 slot 3 port 4 segment counter 1 status: no carrier loopback
Hub 1 slot 3 port 5 segment counter 1 status: no carrier loopback
Hub 1 slot 3 port 6 segment counter 1 status: no carrier loopback
Hub 1 slot 3 port 7 segment counter 1 status: no carrier loopback
Hub 1 slot 3 port 8 segment counter 1 status: no carrier loopback
```

Example 5:

The response to a SHOW REPEATER command for hub 2 slot 3 appears as
follows:

```
DECbridge>SHOW REPEATER 2,3 [Return]
Hub 2 slot 3 ThinWire, rev.1, 6 ports.
Hub 2 slot 3 port 0 segment counter 0 status: operational
Hub 2 slot 3 port 1 segment counter 1 status: no carrier loopback
Hub 2 slot 3 port 2 segment counter 1 status: no carrier loopback
Hub 2 slot 3 port 3 segment counter 1 status: no carrier loopback
Hub 2 slot 3 port 4 segment counter 1 status: no carrier loopback
Hub 2 slot 3 port 5 segment counter 0 status: operational
Hub 2 slot 3 port 6 segment counter 1 status: no carrier loopback
```

Example 6:

The response to a SHOW REPEATER command when the DECbridge 90 is not
the hub manager or when the DECbridge 90 is still in the power-up stage appears
as follows:

```
DECbridge>SHOW REPEATER [Return]
The DECbridge 90 is not the designated hub manager.
```

There is a 60-second delay after power-up before the DECbridge 90 takes control
of the hub.

Typical Management Techniques

The DECrepeater 90T and DECrepeater 90T+ can be managed in the following ways:

- As standalone units using LEDs

  The repeaters come with LEDs that indicate system status in a standalone configuration.

- Online within a group of repeaters installed in a DEChub 90

  In a DEChub 90 environment, the repeaters may be managed using both LEDs and online management.

Remote Network Management with the DECbridge 90

You can manage the repeaters with a DECbridge 90 work group bridge and a DEChub 90 backplane. The DECbridge 90 unit communicates across the DEChub 90 backplane with any repeaters in the DEChub. You can also connect two DEChub 90 backplanes together and manage the repeaters in both DEChub 90 backplanes using one DECbridge 90 unit.

The DECbridge 90 unit communicates with the repeater units using unique signals on the DEChub 90 backplane. The two DEChub 90 backplanes are connected with two cables:

1. ThinWire coaxial cable to carry the work group Ethernet signals

2. DECconnect office cable to carry the management signals

Note

If two DEChub 90 backplanes are being managed by one bridge, the backplanes must be connected BNC to BNC using ThinWire cable (order number BC16M-*xx*) and a DECconnect office cable (order number BC16E-*xx*). (The *xx* in the order number represents the length.)

Management Disconnect

A port can be partitioned at any time by the management protocol. The management protocol can be used only for the repeater ports mounted in the DEChub 90 backplane and connected to a DECbridge 90. When a port is disconnected by the management protocol, it can be reconnected either by turning the power off and then on again, or by using the management protocol. If the port LED flashes approximately twice a second, the port is partitioned by the management protocol.

Whether your configuration is a standalone or a DEChub 90 installation, you should create a network topology map to help facilitate management tasks.

Figure 4–2 shows an example of a typical network topology map.

Figure 4–2 Typical Network Topology Map

DEChub 90

Slot 1	DECrepeater 90T	Slot 2	DECrepeater 90C	Slot 8	DECbridge 90
Port 1	Node - Address - Username	Port 1	Node - Address - Username	Port 1	Address
Port 2	Node - Address - Username	Port 2	Node - Address - Username		
Port 3	Node - Address - Username	Port 3	Node - Address - Username		
Port 4	Node - Address - Username	Port 4	Node - Address - Username		
Port 5	Node - Address - Username	Port 5	Node - Address - Username		
Port 6	Node - Address - Username	Port 6	Node - Address - Username		
Port 7	Node - Address - Username				
Port 8	Node - Address - Username				

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Management Session

To perform online management commands, establish a MOP console carrier session with the bridge from any remote node. After you connect to the bridge, the following prompt appears on the screen:

```
DECbridge>
```

When a bridge goes through a power cycle or is reset, the bridge begins to poll repeaters for status. This process includes a special algorithm to determine which repeater ports have stations that are attached. The time to complete this algorithm depends on the number of repeaters and the network activity. You should allow time before proceeding to manage the hub. For the same reason, it can take time for the system to report on stations or repeaters that are moved in the hub. See Appendix B, Management Details, for more information.

Example of a Typical Management Session

The following steps show how you can use the SHOW REPEATER and SHOW ADDRESS commands in a typical management session.

1. Determine what repeaters are in the hub.

   ```
   DECbridge>SHOW REPEATER  Return
   Hub 1 slot 5 ThinWire repeater, rev.0, 6 ports.
   ```

   In this example, there is a ThinWire repeater (DECrepeater 90C) in the same hub (hub 1) as the bridge (if this is a 2-hub configuration). The repeater is in slot 5 with six ThinWire ports.

2. Determine what stations are connected to the repeaters in the hub.

```
DECbridge>SHOW ADDRESS [Return]
Address 1: 08-00-2B-19-94-FB
Address 2: 08-00-2B-1E-2D-0C hub 1 slot 5 port 3
```

This indicates that a station with address 08-00-2B-1E-2D-0C is connected to the repeater in slot 5 on port 3. At this point, without physical examination, you have enough information to construct a network map.

3. Determine the status of all ports on the repeater.

```
DECbridge>SHOW REPEATER 5 [Return]
Hub 1 slot 5 twisted pair, rev.1, 6 ports.
Hub 1 slot 5 port 0 segment counter 0 status: operational
Hub 1 slot 5 port 1 segment counter 0 status: excessive collisions
Hub 1 slot 5 port 2 segment counter 0 status: excessive length collision
Hub 1 slot 5 port 3 segment counter 0 status: operational
Hub 1 slot 5 port 4 segment counter 0 status: excessive length collision
Hub 1 slot 5 port 5 segment counter 0 status: excessive length collision
Hub 1 slot 5 port 6 segment counter 0 status: excessive length collision
Hub 1 slot 5 port 7 segment counter 0 status: excessive length collision
Hub 1 slot 5 port 8 segment counter 0 status: excessive length collision
```

Continue to use the SHOW REPEATER command for each port on the repeater.

If Problems are Reported

Table 4–3 describes the status messages and the most common causes.

Table 4–3 Status Messages and Causes

Message	Most Common Cause
Operational	Cable connected, everything OK.
Excessive length collision	Cable fault, usually either a port that is not connected to anything or an open cable. In the case of 10BaseT, the remote station may be powered down (no link beat).
Excessive collisions	Cable fault, usually either a port that is not connected to anything or an open cable. In the case of 10BaseT, the remote station may be powered down (no link beat).
No carrier loopback	Cable fault, usually a shorted cable.
Transmit carrier drop out	Cable fault, usually a shorted cable.

Table 4–3 (Cont.)   Status Messages and Causes

Message	Most Common Cause
Jabber	Stations connected to this port continue to transmit; expect a faulty station.

The operational condition is normal. All other conditions cause the repeater to automatically partition the port. When the condition clears, the repeater automatically reconnects the port and reports it as operational unless it is partitioned by management.

To help solve intermittent problems, the repeater reports a segmentation count. This count runs from 0 to 15 and then latches at 15. Every time you enter the SHOW REPEATER command, this count is set to zero.

If this count is not zero, you can tell that a port has partitioned since the last SHOW REPEATER command. This partitioning occurs normally if users turn stations on and off, or if cables are connected and disconnected from the repeater during installation and reconfiguration. If none of these normal causes have occurred, there may be an intermittent problem with cabling or attached stations.

To Disable a Port

The following command allows the hub manager to disable a particular port on a repeater. This may be useful if stations attached to that port are causing network difficulties.

```
DECbridge>SET PORT 5,1 DISABLE  Return
Hub 1 slot 5 port 1 segment counter 0 status: disabled-no carrier
loopback
```

To Reset the Repeater

The following command resets the repeater to power-up condition. This includes restoring any ports that have been partitioned by the hub manager as well as resetting the segmentation counters.

```
DECbridge>SET REPEATER 5 RESET  Return
```

Error Messages

Table 4–4 describes the DECbridge 90 messages. For a complete list of messages, refer to either the *DECbridge 90 Owner's Manual* or the *DECbridge 90FL Owner's Manual*.

Table 4–4   DECbridge 90 Messages

Error Message	Description
Address n: unused	Address number n does not contain a station address.
Confirmation error - password not changed	The second entry or verification of the new password of the DEFINE BRIDGE PASSWORD command did not match the first entry.
DECbridge 90 is not the designated hub manager	The DECbridge 90 was not the designated hub manager when either the 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 BC16E cable or in the connections between two DEChub backplanes. • A fault exists in the power supply of one of the DEChub backplanes. This prevents repeater management communication.
Hub management disabled	A SHOW PORT or SHOW REPEATER command 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	One or more parameters of the SHOW REPEATER command were out of range. The hub number must be either 1 or 2. The slot number must be between 1 and 15.
Hub h slot s - port number out of range	The port number of the SHOW PORT command was out of range for the device in hub h slot s. Use the SHOW REPEATER command to determine the number of ports for the device and to specify a port number within that range.

<div align="right">(continued on next page)</div>

Table 4–4 (Cont.) DECbridge 90 Messages

Error Message	Description
Hub *h* slot *s* not a repeater	The device does not use the same management protocol as the repeaters. The device ports, if any, cannot be managed by the DECbridge 90 unit.
Hub *h* slot *s* unrecognized type	The repeater type in hub *h* slot *s* is not known to the DECbridge 90. The repeater ports can still be managed with the DECbridge 90.
No repeater responds	There is no repeater installed in the requested hub slots, or the repeater is not functioning.
No such port	The bridge port number of the SHOW PORT command was invalid. Valid numbers are 1 and 2.
Password too long - not changed	A password longer than 16 characters was given to the DEFINE BRIDGE PASSWORD command.
Port number [[hub,]slot,]port	One of the parameters of a SET PORT or DEFINE PORT command was not a valid hub, slot, or port number.
Station address number [first [,last]] in range 1-200	One or more parameters of the SHOW ADDRESS command was invalid. The valid range is 1 to 200.
Unsupported by this hardware revision	This occurs when you attempt to execute a SET or DEFINE BRIDGE FLOOD command on a bridge with a firmware revision of 1 (DECbridge 90 V1.4) but have loaded V2.5 or a later version flash EPROM. The old hardware revision does not support flood mode. These version numbers appear in the MOP console connection banner.
???	A command or parameter was not recognized. Press the question mark (?) key to display valid commands.
180501	A loopback diagnostic has run and passed on the backbone port. If the backbone port is not receiving any messages, this diagnostic is run every 10 minutes.
180201	A loopback diagnostic has 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.
1805:00-00-00-00 01	A loopback diagnostic has run and failed on the backbone port. The diagnostic is tried every 5 seconds until the test passes.
1802:00-00-00-00 01	A loopback diagnostic has run and failed on the work group port. The diagnostic is tried every 5 seconds until the test passes.

Standalone Configuration Management

The recommended process for managing a small standalone network is as follows:

1. Maintain records indicating which stations are connected to each port on each repeater. It may be helpful to draw a network topology map (Figure 4–2).

2. Observe the LEDs on the repeater for network status. Refer to Table 1–1 for a description of each LED and its function.

Note

After you power up a standalone repeater, all LEDs, except the network activity LED, stay on if there are no active connections, or if there is no hardware or network activity. After an active station is connected to one of the ports, the LED for the active port stays on and all other ports turn off.

5

Troubleshooting

Introduction

This chapter provides troubleshooting information for the DECrepeater 90T
and DECrepeater 90T+ when used as standalone units or when installed in the
DEChub 90 backplane.

Before you start to troubleshoot a problem:

1. Verify the installation of the repeater. The installation must meet the
   configuration rules provided in Chapter 2, Configuring the DECrepeater 90T
   and DECrepeater 90T+ Repeaters.

2. Note the fault condition.

3. Isolate the problem.

Port Partitioning

Any messages or data packets received from any port by the repeater are
transmitted to all ports. The port status LEDs display the following port
partition status:

On	The port is not partitioned.
Off	The port is autopartitioned.
Flashing	The port is partitioned by management.

Each port is automatically controlled by the repeater function and can be
partitioned for any of the reasons listed in Table 5–1.

Table 5–1 DECrepeater 90T and DECrepeater 90T+ Status Indicators

LED	Fault	Non-Fault
Port 0 off	Open cables Shorted cables Cables not properly connected Cables not properly terminated	Port not connected.
Ports 0 to 8 flashing	–	Partitioned by management.
Ports 1 to 8 off	Open cables Shorted cables Cables not properly terminated	Port not connected.

DECrepeater 90T and DECrepeater 90T+ Standalone Troubleshooting

To troubleshoot a DECrepeater 90T or DECrepeater 90T+ standalone installation, refer to Table 5–2 for a list of possible error conditions and the corrective action.

Table 5–2 Troubleshooting a DECrepeater 90T and DECrepeater 90T+ Standalone Unit

If...	Then...	Do this...
All LEDs are off.	Check the ac power connection.	Check that the power supply is properly plugged into the power outlet. Check the power to the power outlet.
	Check the power supply.	Check the 7-pin connector at the repeater unit. If the connections are okay, replace either the power supply (for 120 V operation) or both the power supply cord and power supply (for 220 V operation).
The network activity LED is off.	There is low network activity or no network activity.	Ensure that network activity is present.

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**Table 5–2 (Cont.)   Troubleshooting a DECrepeater 90T and DECrepeater 90T+
Standalone Unit**

If...	Then...	Do this...
	If the network activity LED still fails to light	Turn the repeater off and on by unplugging and replugging the power supply in. Check that the network activity LED comes on momentarily.
	If the network activity LED lights momentarily, the LED portion of testing has passed. If the network LED fails to light	Replace the repeater.
The port status LED is off.	Ensure that the cable has activity on it. If the LED still fails to light	Switch to an unused port or replace the repeater.
All port LEDs are off.	A connection has not been made.	Remove all network connections. Turn the repeater off and on by unplugging and replugging the power supply. All LED indicators turn on. Only the network activity LED turns off.
	If any LED other than the network activity LED turns off, the repeater has failed this part of the self-test.	Replace the repeater.
	If all LEDs except the network activity LED are on, this portion of the self-test has passed.	Connect a known active ThinWire network segment to the repeater. The status LED for the connected port will stay on while all status LEDs for the unconnected ports should turn off as soon as the first connection to the active segment is made.

Table 5–2 (Cont.) Troubleshooting a DECrepeater 90T and DECrepeater 90T+ Standalone Unit

If...	Then...	Do this...
	If the status LED for the connected port stays on and the status LED for the unconnected ports stay off, then the connected port is okay.	Continue installing the other network cables for each port that you are going to use.
	If the status LED for the unconnected ports do not turn off while the LED for the connected port remains on, there is a possible problem with the cable or that port.	Try another port. If the same conditions exist, check for a cable problem by connecting a good cable with a good device at the other end.
	If the same condition exists when a good cable is plugged in	Replace the repeater.
	Continue installing other network cables for each port that you are going to use.	The indicator LED for each properly terminated port should turn on.
	If the LED for each properly terminated port remains off when a cable is connected, the repeater is defective.	Replace the repeater.

DECrepeater 90T and DECrepeater 90T+ Backplane Troubleshooting

To troubleshoot a DECrepeater 90T or DECrepeater 90T+ installed in a DEChub 90 configuration, refer to Table 5–3 for a list of possible error conditions and the corrective action.

Table 5–3   Troubleshooting a DECrepeater 90T and DECrepeater 90T+ in a DEChub 90 Backplane

If...	Then...	Do this...
The power LED is off.	The repeater does not have the correct operating voltage.	Check the power LED on the DEChub 90 power supply.
	If the power LED on the DEChub 90 is off, there is a problem with the DEChub 90 power supply.	See the troubleshooting procedures in the *DEChub 90 Owner's Manual*.
	If the power LED on the DEChub 90 power supply is on, check if other component power LEDs are off? If other components LEDs are on, the repeater has a power problem.	Reseat the repeater in either the same slot or another slot.
	If the power LED on the DEChub 90 power supply is on, check if other component power LEDs are off. If other component LEDs are off, the DEChub 90 has a power problem.	See the troubleshooting procedures in the *DEChub 90 Owner's Manual*.
	If the power LED turns on when reseated in the same slot, the repeater was not properly seated.	Make sure that the repeater is properly seated in the slot.

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Table 5–3 (Cont.)   Troubleshooting a DECrepeater 90T and DECrepeater 90T+ in a DEChub 90 Backplane

If...	Then...	Do this...
	If the power LED turns on when reseated in another slot, the problem is with the DEChub 90.	See the troubleshooting procedures in the *DEChub 90 Owner's Manual*.
	If the repeater does not turn on in a known good slot, the repeater is defective.	Replace the repeater.
The port 0 network activity LED is off.	The repeater or any other unit in the DEChub 90 may not be connected to an active segment.	Connect a known active segment to any unit in the DEChub 90.
	If the repeater is connected to a known active segment and the port 0 LED is off, the repeater is defective.	Replace the repeater.
The port 0 network activity LED is on.	This portion of the self-test ran successfully.	Check that the LED for each port with a connected cable is on.
The port 0 network activity LED is on.	If the LED for the connected cable is off, the repeater does not acknowledge the connection to its port.	Plug the cable into another port.
	If the condition still exists, verify that the cable and station are good. If the cable and station are good	Replace the repeater.
	If the port LED turns on, the port is okay.	No action is required.

A
Specifications and Parts List

Introduction

This appendix provides the specifications and a parts list for the DECrepeater 90T and DECrepeater 90T+ repeaters.

Specifications for the repeaters are divided into the following categories:

- Physical dimensions

- Environmental (operating and shipping) specifications

- Power specifications

Physical Dimensions

Table A–1 lists the physical dimensions of the repeaters.

Table A–1 Physical Dimensions

Dimension	Measurement
Height	3.5 cm (1.4 in)
Width	28.0 cm (11.0 in)
Depth	14.0 cm (5.5 in)
Weight	.77 kg (1.7 lb)

Environmental Specifications

Table A–2 lists the operating environment specifications for the repeaters.

Table A–2 Operating Environment

Condition	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% (noncondensing)
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 DECrepeater 90T and DECrepeater 90T+ are designed to operate in an office environment or equipment room environment such as telephone closets or satellite equipment rooms. The repeaters are not intended to operate in an air plenum.

Table A–3 lists the shipping environment specifications for the repeaters.

Table A–3 Shipping Environment

Condition	Value
Temperature	-40°C to 66°C (-40°F to 151°F)
Relative humidity	10% to 95% (noncondensing)
Altitude	Sea level to 4.9 km (16,000 ft)

Power Specifications

Table A–4 lists the power specifications for the repeaters.

Table A–4   Power Specifications

Specification	Value
Voltage (domestic)	104 Vac to 128 Vac (nominal 120 Vac)
Voltage (international)	208 Vac to 256 Vac (nominal 240 Vac)
AC cord length	6 ft
Current at 120 V	.25 A
Current at 240 V	.125 A
Frequency	50 Hz to 60 Hz
Power consumption	9 W
Output voltage	5.1 Vdc
DC cord length	8 ft
Output current	1.8 A

The repeaters feature either a self-contained power supply or self-contained power supply and power cord option.

Table A–5 lists the voltage and current specifications for the repeaters.

Table A–5   DECrepeater 90T and DECrepeater 90T+ Input

Specification	Value
Input voltage	4.75 to 5.25 Vdc
Input current	1.7 A

MJ Pin Assignments

The following table lists the MJ pin assignments:

Pin	Signal
1	RD+
2	RD-
3	TD+
4	Not used
5	Not used
6	TD-
7	Not used
8	Earth ground for DECrepeater 90T Not used for DECrepeater 90T+

———————————————— **MJ Connector Shield** ————————————————

The DECrepeater 90T+ supports earth ground shield connection by using a shielded MJ connector and plug. The MJ connector shield provides connection between the overall cable shield and the repeater analog ground, which is dc common to earth ground. The shield of the MJ socket is not connected in unshielded environments.

Parts List

Table A–6 lists the replacement parts for the repeaters.

Table A–6 Parts List

Replacement Part	Part Number
DECrepeater 90T (unshielded)	DETMR-MA
DECrepeater 90T+ (shielded and unshielded)	DETMR-MB
Power supply (110 Vac)	H7082-AA
Power supply (220 Vac)	H7082-BA

B
Management Details

Introduction

This appendix supplements the management information in Chapter 4, Managing the DECrepeater 90T and DECrepeater 90T+. It provides the following information for managing the repeaters in a DEChub backplane:

- Designating a hub manager
- Annotating the bridge address table
- Using the work group bridge address table for work group management

Designating a Hub Manager

The protocol used on the DEChub management bus allows for only a single manager unit to access the management bus. When a DECbridge 90 series unit is first powered up or reset, the bridge waits 60 seconds before it is established as the designated hub manager. This delay ensures that there is no other manager unit in use in the hub.

During the 60 seconds, you cannot remotely manage the repeaters. This restriction does not apply to the repeaters themselves. A repeater installed into the hub is immediately manageable by whatever unit is currently the designated hub manager.

If you receive the following message after a DECbridge unit has been running for 60 seconds, then there is something wrong.

```
The DECbridge unit is not the designated hub manager.
```

When this message appears, check the following:

- If you are using two hubs, then ensure that the MMJ cable is wired correctly, and that it is not shorted or broken.
- If you are using only one hub, then ensure that the MMJ connector is disconnected.

Only one DECbridge unit is allowed in the hub. If more than one is installed, only one is able to manage the repeaters. The other unit issues this message.

If you do *not* want a specific DECbridge 90 series unit to be the designated hub manager, use the DEFINE BRIDGE HUB_MANAGEMENT DISABLE command to disable the hub management features.

You can use the SHOW REPEATER and SET PORT or SHOW PORT commands without restriction after the DECbridge unit is the designated hub manager. There is, however, an additional delay before the SHOW ADDRESS command has complete information.

The DEFINE commands do not take effect until the next SET ALL or SET BRIDGE RESET commands are used. To have the command take effect immediately, you must also issue the corresponding SET command.

Annotating the Bridge Address Table

The DECbridge 90 series unit SHOW ADDRESS command lists the repeater slot number and port number for every station in the work group that is connected to the same DEChub with a repeater. However, when changes are made to the network topology, there is a time lapse before the changes appear in the bridge address table. The algorithm for creating this information for every station in the work group is as follows:

- Tell the repeaters to wait for a message from this station.

- Wait as long as 90 seconds for the station to transmit a message.

- Ask the repeaters what port the message came from.

If a station does not transmit a message within 90 seconds, then the algorithm proceeds to the next station. In a typical network situation, this information is complete in a few minutes. After a bridge is newly installed or reset, this information should be complete after approximately 10 minutes of operation.

If some stations do not transmit messages often, then the DECbridge can hang on those stations as long as 90 seconds each before going to the next one. If you add a station or move it to another port, then it could take about 10 minutes before the SHOW ADDRESS command recognizes this move.

If you remove a station from the network entirely, then it should take a full address age time (default is 30 minutes) for the DECbridge unit to notice the removal. If you remove several stations at once, then the DECbridge unit hangs on each of these stations for 90 seconds, until they age out of the bridge address database. In this case, it usually takes the full address age time (30 minutes) before the port number annotations are complete.

As a worst case example, if it takes 60 seconds for each of the recommended 200 stations to transmit a message, then it could take 200 minutes to complete the address database annotations. However, the DECbridge 90 unit tries to expedite the transmission as follows:

- If the station remains quiet after waiting 30 seconds for a message, then the DECbridge 90 attempts to generate a response using the IEEE XID request.

- If the IEEE XID request fails, then the DECbridge unit tries a MOP system-ID request.

For these reasons, the DECbridge unit never hangs for more than 30 seconds on an IEEE conforming station, or for more than 60 seconds on any Digital station that pre-dates the IEEE specifications. If you are monitoring messages and protocols on your work group Ethernet, then you occasionally see these messages.

Using the WGB Address Table for Work Group Management

The work group bridge Ethernet address table is dynamic: Ethernet addresses are added to the table when a device first transmits on the network; addresses are removed when a device does not retransmit for a user-specified period, from 1 to 32767 seconds (about 10 hours). The default is 15 minutes. When a device is learned or relearned after it has timed out, the address is listed in the lowest empty entry of the address table.

This continuous learning, timeout, and relearning of the Ethernet addresses means that devices in a particular work group may or may not be in the address table at any moment. If they are in the address table, then they may not be in a consistent database location. Devices such as personal computers or laptop computers, that are removed and reconnected elsewhere, time out from the address table. When the device is reconnected, the addresses for these devices are stored in a different address table location.

Because the address table is so dynamic, the network manager cannot easily compare printouts of the work group bridge address table to determine workgroup changes on a day-to-day or week-to-week basis.

C
Documentation and Ordering

Introduction

This appendix provides information about related documentation and ordering.

Related Documentation

You can order the following documents from Digital:

Document Title	Order Number
DECbridge 90 Owner's Manual	EK-DEWGB-OM
DECbridge 90FL Owner's Manual	EK-DEWGF-OM
DEChub 90 Owner's Manual	EK-DEHUB-OM
Open DECconnect Building Wiring Components and Application Catalog	EB-K2407-42
DECconnect System Planning and Configuration Guide	EK-DECSY-CG

Ordering Information

You can order options and documentation by mail, phone, or electronically.

Need Help?

If you need help deciding which documentation best meets your needs, please call 800–DIGITAL (800–344–4825) and press 2 for technical assistance.

Electronic Orders

To place an order through your account at the Electronic Store, dial 800–234–1998, using a modem set to 2400 or 9600 baud. You must use a VT terminal or terminal emulator set at 8 bits, no parity. If you need help, call 800–DIGITAL (800–344–4825) and ask for an Electronic Store specialist.

Telephone or Direct Mail Orders

You can order documentation by phone or direct mail.

If You Are From . . .	Call . . .	Or Write . . .
U.S.A.	DECdirect Phone: 800–DIGITAL (800–344–4825) FAX: (603) 884–5597	Digital Equipment Corporation P.O. Box CS2008 Nashua, NH 03061
Puerto Rico	Phone: (809) 781–0505 FAX: (809) 749–8377	Digital Equipment Caribbean, Inc. 3 Digital Plaza, 1st Street Suite 200 Metro Office Park San Juan, Puerto Rico 00920
Canada	Phone: 800–267–6215 FAX: (613) 592–1946	Digital Equipment of Canada Ltd. 100 Herzberg Road Kanata, Ontario, Canada K2K 2A6 Attn: DECdirect Sales
International	—	Local Digital subsidiary or approved distributor

Digital Personnel

You can order documentation by electronic mail. Contact the following organizations for instructions:

If You Need . . .	Call . . .	Contact . . .
Software documentation[1]	DTN: 241–3023 (508) 874–3023	Software Supply Business Digital Equipment Corporation 1 Digital Drive Westminster, MA 01473
Hardware documentation	DTN: 234–4325 (508) 351–4325 FAX: (508) 351–4467	Publishing & Circulation Services Digital Equipment Corporation NRO2-2/I5 444 Whitney Street Northboro, MA 01532

[1]Call to request an Internal Software Order Form (EN–01740–07).

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