DECserver 700

Site Preparation and Maintenance
(Hardware Owner's Manual)

February 1993

This manual, in conjunction with the *DECserver 700 Hardware Installation Card*, describes how to install the DECserver 700 network access server and how to verify its operation. This manual also describes the controls and indicators. This manual is intended for the hardware installer and the network manager.

Supersession/Update Information: This is a revised manual.

Software Version: DECserver Network Access Software V1.0

This manual applies to Version 1.0 of the DECserver Network Access Software and all subsequent maintenance releases up to the next major product release.

Part Number: EK-DSRVW-MG. B01

EK-DSRVW-MG. B01

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Contents

Preface

Hardware Overview

1.1 Models 1–1
1.2 Controls, Indicators, and Connectors 1–3
1.3 Understand the Software Loading 1–6
1.3.1 Loading from Flash RAM 1–6
1.3.2 Loading from the Network 1–6

Checking the Site

2.1 Physical Requirements 2–1
2.2 Environmental Requirements 2–2
2.3 Electrical Requirements 2–3

Cabling the Site

3.1	Preinstallation Checks	3–1
3.2	Installing the Ethernet Cables and Devices	3–2
3.2.1	Installing the Standard Ethernet Cables and Devices	3–2
3.2.2	Installing the 10BaseT Ethernet Cables and Devices	3–4
3.2.3	Installing the ThinWire Ethernet Cables and Devices	3–5
3.3	Installing Serial Cables and Devices on the DECserver 700-16	3–9
3.4	Installing Serial Cables and Devices on the DECserver 700-08	3–11
3.5	Cabling Requirements	3–12
3.5.1	Standard Ethernet Connection	3–13
3.5.2	10BaseT Ethernet Connection	3–14
3.5.3	ThinWire Ethernet Connection	3–14
3.6	Installing the DECserver 700 in a Rack	3–15

Connector and Cable Pin Descriptions

4.1	Connector Pin Descriptions	4–1
4.1.1	Standard Ethernet	4–2
4.1.2	10BaseT Ethernet	4–3
4.1.3	DECserver 700-08 Serial Line Ports	4–4
4.1.4	DECserver 700-16 Serial Line Ports	4–5
4.2	Cable Connections	4–6

Replacing and Adding Memory

5.1	Replacing a Faulty Single-In-Line Memory Module	5–1
5.2	Additional Memory Supported	5–2
5.3	Installing Extra Memory	5–4

Replacing and Adding Flash RAM

6.1	Replacing or Adding Flash RAM	6–1

What to Do If You Have Problems

7.1	Diagnosing DECserver 700 Problems	7–1
7.2	Seven-Segment Display Off and System OK LED Off	7–2
7.3	System OK LED Off/Seven-Segment Display Flashing "C", "d", or "n"	7–3
7.4	System OK LED Off/Seven-Segment Display Flashing	7–4
7.5	System OK LED Flashing	7–4
7.5.1	Error Message 952	7–5

Figures

1–1	DECserver 700-08 Rear View	1–2
1–2	DECserver 700-16 Rear View	1–3
1–3	DECserver 700 Front End	1–3
3–1	Standard Ethernet Coaxial Cable Connection	3–3
3–2	10BaseT Ethernet Connection	3–4
3–3	Connecting the DECserver 700 to ThinWire Ethernet Cable	3–5
3–4	ThinWire Ethernet Standalone Segment	3–7
3–5	DEMPR ThinWire Connection	3–8
3–6	DEMPR Connections	3–9
3–7	How to Fit the Brackets to Recess the DECserver 700	3–16
3–8	Removing the Brackets	3–17
4–1	Pin Numbers and Signals for Standard Ethernet Connector	4–2
4–2	Pin Numbers and Signals for 10BaseT Ethernet Connector	4–3
4–3	Pin Numbers and Signals for 25-Pin D-sub Connector	4–4
4–4	Pin Numbers and Signals for the MJ8 Connector	4–5
4–5	Adapters and Connectors Used with the DECserver 700	4–8
5–1	Removing the Brackets	5–5
5–2	Removing the Covers	5–6
5–3	Fitting the Anti-Static Kit	5–7
5–4	Locating the SIMs Connectors	5–8
5–5	Removing a Sim	5–9
5–6	Inserting the Replacement SIM	5–10
5–7	Adding an Additional SIM	5–11

5–8 Replacing the Covers 5–12
6–1 Locating the Flash RAM Card Connector 6–3
6–2 Inserting the Flash RAM Card 6–4

Tables

1–1 DECserver 700 Controls 1–4
1–2 DECserver 700 Indicators 1–4
1–3 Network Activity LED 1–5
1–4 DECserver 700 Connectors 1–5
2–1 Physical Specifications of the DECserver 700 2–1
2–2 Acoustics 2–2
2–3 Environmental Specifications of the DECserver 700 2–2
2–4 Electrical Requirements 2–3
2–5 Standard Ethernet/IEEE 802.3 Connector Output 2–3
3–1 Cables and Adapters for the DECserver 700-16 3–10
3–2 Cables and Adapters for the DECserver 700-08 3–11
3–3 Maximum Communications Distances — Ethernet 3–12
3–4 Maximum Cable Lengths1 — DECserver 700 to Devices 3–13
3–5 Installing the DECserver 700 Brackets 3–15
4–1 Cable Connections 4–6
7–1 Display/Indications 7–2
7–2 Network Activity LED 7–10

Preface

Intended Audience

This manual, in conjunction with the *DECserver 700 Hardware Installation Card*, is intended for the hardware installer. The installer is responsible for ensuring that the hardware is installed and tested. The *DECserver 700 Hardware Installation Card* shows how to install the DECserver™ 700 when the site is verified and the cables and devices are in place. This manual shows how to verify the site, install cables and devices, and troubleshoot the DECserver 700. The person installing the DECserver 700 software can then verify the system installation.

Structure of This Manual

This manual contains the following chapters:

- Chapter 1 — Provides an overview of the DECserver 700 features.
- Chapter 2 — Describes how to verify the site before installing the DECserver 700.
- Chapter 3 — Describes how to cable the site.
- Chapter 4 — Describes connector pins for the various server connectors and also describes various cables, adapters, and accessories used with the DECserver 700.
- Chapter 5 — Shows how to install extra memory and replace faulty memory .
- Chapter 6 — Shows how to update a DS700 with Flash RAM.
- Chapter 7 — Shows how to troubleshoot the DECserver 700.

Associated Documents

- *DECserver 700 Hardware Installation Card*

  Shows how to install the DECserver 700 when the site is verified and the cables and devices are in place.

- *DECserver Network Access Software Installation (op-sys)*

  Explains how to install the DECserver 700 distribution software, how to establish downline load hosts, and how to verify the DECserver 700 system installation. In the title, *(op-sys)* is the name of the load host operating system.

- *Network Access Server Problem Solving*

  Describes the software tools and techniques available to troubleshoot the server and also describes all error messages.

- *Network Access Server Management*

  Provides the procedures to perform various DECserver 700 management tasks.

- *Network Access Server Commands*

  Lists and describes all the DECserver 700 software commands.

- *DECconnect System Planning and Configuration Guide*

  Information on cabling and configuring of local area networks and using DECconnect system products.

- *The Ethernet: A Local Area Network: Data Link Layer and Physical Layer Specification*

  Lists standard Ethernet connectors and their signal specifications.

1

Hardware Overview

The DECserver 700 connects devices (such as printers, terminals, PCs, and modems) to local area networks (LANs). The DECserver 700 is Ethernet/IEEE 802.3-based and supports standard Ethernet/IEEE 802.3 and 10BaseT Ethernet/IEEE 802.3 directly, and ThinWire™ Ethernet/IEEE 802.3 through an adapter. The DECserver 700 can be installed on a desktop or in a 19-inch rack. The DECserver 700 supports Flash RAM capability and other nonvolatile forms of memory. This capability can be ordered separately and installed on the DECserver 700 in the field.

The DECserver 700 can download the software image from the network or from the Flash RAM option if installed. The Flash RAM option allows for a boot/power up without having to download the image through the network. The DECserver 700 will support up to 3 Mbytes of memory with the use of two single-in-line modules (SIMs). These SIMs can be installed as memory updates by the customer.

There are two DECserver 700 models:

- DECserver 700-08
- DECserver 700-16

1.1 Models

The DECserver 700-08 supports EIA-232-D/V.24/V.28 full modem control on eight 25-pin male D-connectors. Use this model to connect devices that require full duplex, asynchronous control (for example: modems).

Figure 1–1 shows a rear view of the DECserver 700-08. The DECserver 700-16 supports EIA-423-A and DEC 423 data-leads on 16 MJ8 connectors. Use this model to connect devices requiring data-leads for operation (for example: terminals, printers, and personal computers in terminal emulation mode). You can connect the DECserver to modems that do not require the full complement of signals provided by the DECserver 700-08, using special adapters (Section 3.3).

NOTE

Adapters H8585-AB and H8585-AC are not for connection to public networks in Sweden, Germany, or Japan.

Figure 1–1: DECserver 700-08 Rear View

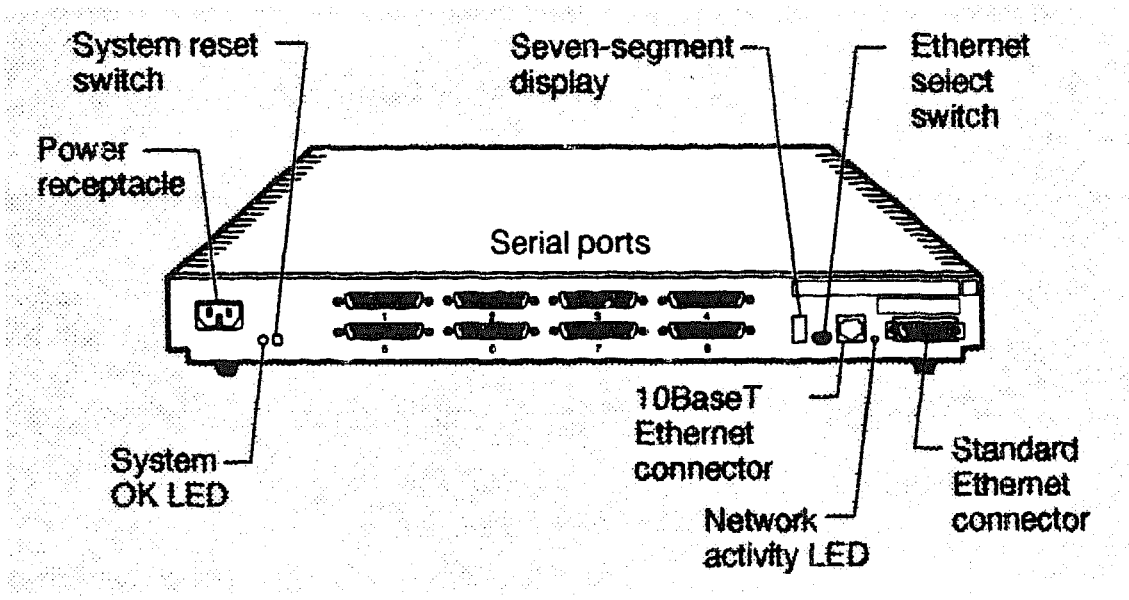

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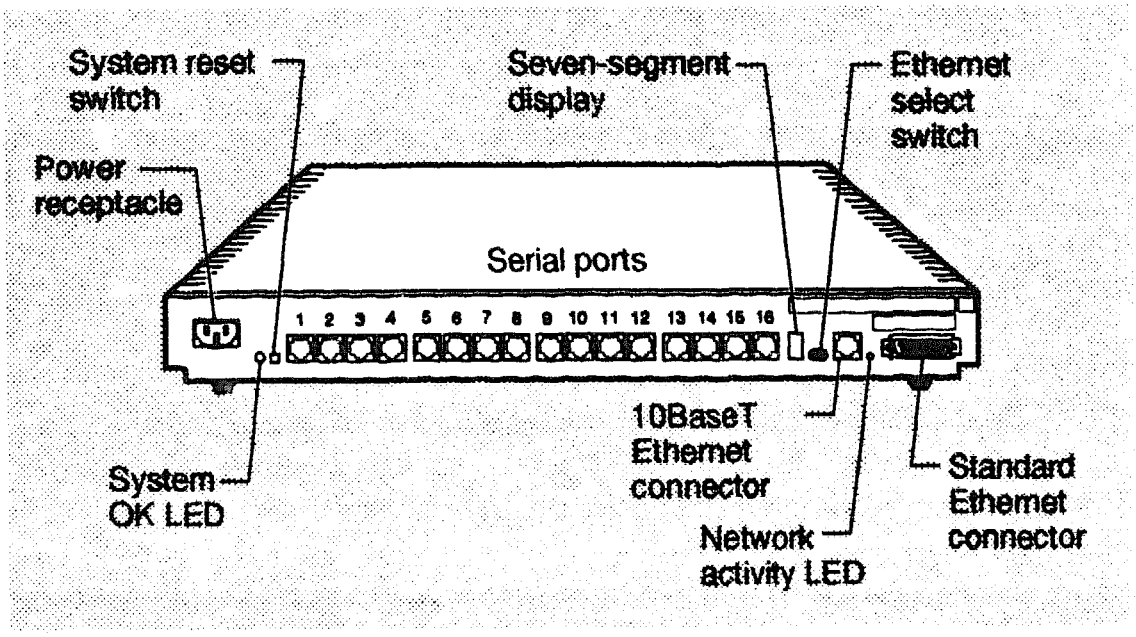
Figure 1–2 shows a rear view of the DECserver 700-16.

Figure 1–2: DECserver 700-16 Rear View



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1.2 Controls, Indicators, and Connectors

All of the DECserver 700 controls, indicators, and connectors are located on the rear of the DECserver 700 as shown in Figure 1–1 and Figure 1–2, with the exception of the System OK LED, which is duplicated on the front of the DECserver 700 (Figure 1–3).

Figure 1–3: DECserver 700 Front End

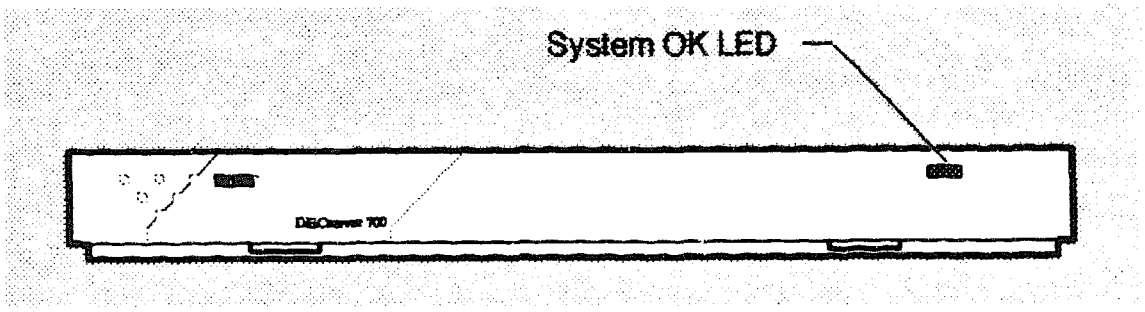

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Table 1–1 describes the DECserver 700 controls. Table 1–2 and Table 1–3 describe the indicators, and Table 1–4 describes the connectors. For more information on the connectors, refer to Chapter 4.

Table 1–1: DECserver 700 Controls

Control	Description
System reset switch	On power up, press this switch until E appears on the seven-segment display. This reloads the factory set parameters. During Flash load, pressing and holding the system reset switch will abort the Flash RAM load and force a network boot. Refer to Chapter 7 for more information.
Ethernet select switch	This switch selects either standard or 10BaseT Ethernet.

Table 1–2: DECserver 700 Indicators

Indicator	Display
System OK LED	Lights (green) when the DECserver 700 has passed self-test. Blinks when a nonfatal error occurs on self-test. When off, indicates that the DECserver 700 has failed self-test.
Network activity LED	Refer to Table 1–3.
Seven-segment display	Provides error and status information.

Table 1–3: Network Activity LED

Ethernet Selected	Connection Status	LED Display
10BaseT	Open/incorrectly terminated	OFF
	Correctly terminated / no network activity	ON
	Correctly terminated / network activity	Flashing (rate independent of network activity)
Standard Ethernet	Open	OFF
	Correctly connected / no network activity	OFF
	Correctly connected / network activity	Flashing or ON, depending on network activity

Table 1–4: DECserver 700 Connectors

Connector	Description
Serial port connectors (DECserver 700-08)	These eight 25-pin male D-connectors connect EIA-232-D devices to the DECserver 700.
Serial port connectors (DECserver 700-16)	These 16 female MJ8 connectors connect data-lead devices to the DECserver 700.
Standard Ethernet connector	This single 15-pin female D-connector connects to a standard Ethernet/IEEE 802.3 local area network using a transceiver cable.
10BaseT Ethernet connector	This single female MJ8 connector connects to a 10BaseT Ethernet/IEEE 802.3 local area network.
Power cord receptacle	The DECserver 700 power cord plugs into this receptacle.

1.3 Understand the Software Loading

This section describes the two methods that the DECserver 700 access to load the software.

1.3.1 Loading from Flash RAM

Once the DECserver 700 completes self-tests, the DECserver 700 checks for Flash RAM. If there is a valid Flash RAM, the DECserver 700 begins the boot sequence to load the software from Flash RAM. The seven-segment display will display three horizontal segments during this loading process.

If the DECserver 700 does not have Flash RAM, the DECserver 700 proceeds to a network load.

If a device is connected to the console port, the DECserver 700 can display status messages while the boot sequence is running. Status messages indicate the Ethernet address of the DECserver 700, the name of the load image it is looking for, and the stage of the boot process it is in.

1.3.2 Loading from the Network

If you do not want to load the software from Flash RAM, you can press the system reset switch during load from Flash RAM. When the system reset switch is pressed, the Flash RAM load will be aborted and the software is downline loaded from a load host.

When the DECserver 700 notices the system reset switch depressed during load from Flash RAM, it will rapidly blink the LED to acknowledge the pressed system reset switch (this may take several seconds). Once the LED begins rapidly blinking, you may release the system reset switch and the firmware will go on to a network boot sequence. For more information on display codes for Flash RAM, refer to section 7.7.

2

Checking the Site

The DECserver 700 can operate in an office environment and in a standard equipment rack located in a computer room or satellite equipment room. Regardless of where you install the DECserver 700, verify that all of the requirements in this section are met before beginning the installation.

2.1 Physical Requirements

Allow for 15 cm (6 in) of airspace around the DECserver 700 air vents. Table 2–1 shows the size and weight of the DECserver 700. Table 2–2 shows the acoustic parameters.

Table 2–1: Physical Specifications of the DECserver 700

Dimension	Measurement
Height	44 mm (1.73 in)
Width	442 mm (17.4 in)
Depth	282 mm (11.1 in)
Weight	2.5 kg (5.51 lbs)

Table 2–2: Acoustics

Parameter	Measurement
L_{WAd}[1]	4.1 bels (L_{WA} = 3.8 bels)
L_{pAm} (bystander)[1]	27 dBA

[1]Preliminary declared values per ISO 9296 and ISO 7779. Current values are available from Digital representatives.

2.2 Environmental Requirements

Environmental requirements for temperature and humidity must be within the ranges shown in Table 2–3.

Table 2–3: Environmental Specifications of the DECserver 700

Parameter	Minimum	Maximum
Temperature[1]		
Operating	5°C (41°F)	50°C (122°F)
Nonoperating	– 40°C (– 40°F)	66°C (151°F)
Maximum rate of temperature change per hour		20°C (36°F)
Altitude		
Operating		2438 m (8000 ft)
Nonoperating		4876 m (16000 ft)
Relative humidity		
Operating (noncondensing)	10%	95%
Nonoperating (noncondensing)	10%	95%

[1]For high altitude sites, decrease the operating temperature specification by 1.8°C for each 1000 m (1°F for each 1000 ft) above sea level.

2.3 Electrical Requirements

The power at the electrical outlet must match the requirements shown in Table 2–4.

The instructions assume that an appropriate AC power source is within 1.8 m (6.0 ft) of the DECserver 700.

Table 2–4: Electrical Requirements

Parameter	DECserver 700
Line voltage[1]	100 – 120 V rms/220 – 240 V rms
Frequency	50/60 Hz
Line current	1.4 A rms/.75 A rms
Power	92 W

[1]The DECserver 700 automatically selects the voltage range.

Table 2–5 shows the electrical output from the standard Ethernet/IEEE 802.3 connector.

Table 2–5: Standard Ethernet/IEEE 802.3 Connector Output

Parameter	DECserver 700
Voltage	+ 12 V DC
Current	.5 A Max

3

Cabling the Site

This chapter shows you how to install the cables and associated devices used by the DECserver 700.

3.1 Preinstallation Checks

Before beginning the DECserver 700 installation, use the following checklist to make sure that the site preparation is complete:

- Arrangements have been made to connect the DECserver 700 Ethernet port to an Ethernet interface device (if required). For standard Ethernet, the device can be a DELNI™ network concentrator or an Ethernet transceiver. For ThinWire Ethernet, the device can be a DEMPR™, DESPR, or ThinWire segment. For 10BaseT Ethernet, the device can be a DETPR.
- The Ethernet interface device is installed and the required cabling is in place, tested, and tagged.
- The rack-mount kit is installed (if required) as described in the *DECserver 700 Hardware Installation Card.*
- Cables of appropriate length are available for connecting the DECserver 700 to the Ethernet interface device.
- The devices (terminals, modems, personal computers, hosts) are ready to be connected.
- Cables of appropriate length and type are available for connection of serial devices.

- One terminal (asynchronous, DEC423 or EIA-232-D compatible) is available for hardware testing and system verification.

3.2 Installing the Ethernet Cables and Devices

You can connect the DECserver 700 to:

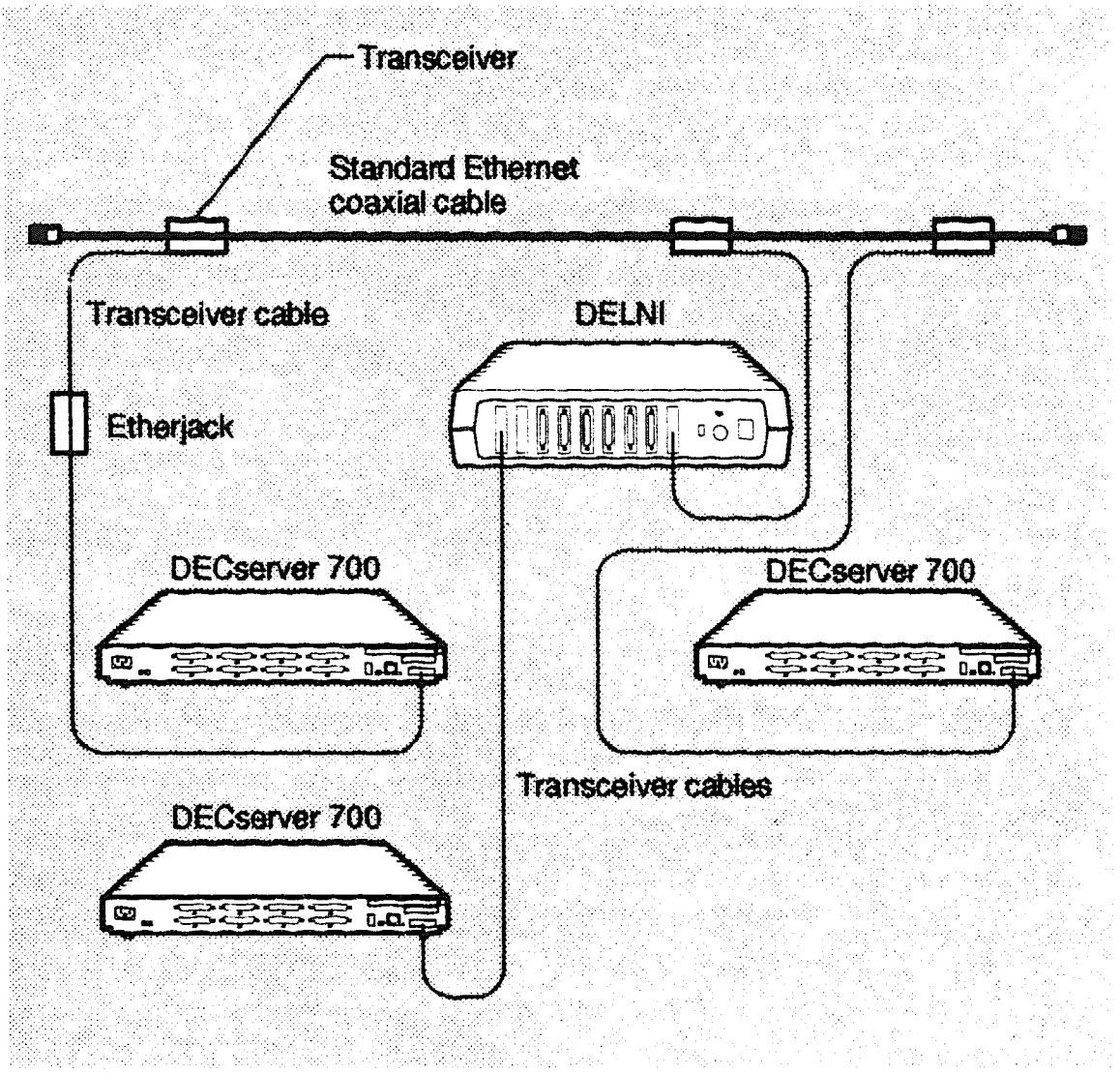
- Standard Ethernet/IEEE 802.3 network
- 10BaseT Ethernet/IEEE 802.3 network
- ThinWire Ethernet/IEEE 802.3 network using an external media access unit (MAU) such as a DESTA™

3.2.1 Installing the Standard Ethernet Cables and Devices

You can connect the DECserver 700 to the standard Ethernet/IEEE 802.3 network (Figure 3–1) by connecting to:

- Another transceiver cable section. (You connect to another section by using a Etherjack Junction Box.)
- A DELNI local area network.
- A transceiver on a standard Ethernet coaxial cable for Digital Equipment Corporation baseband networks.

Figure 3–1: Standard Ethernet Coaxial Cable Connection



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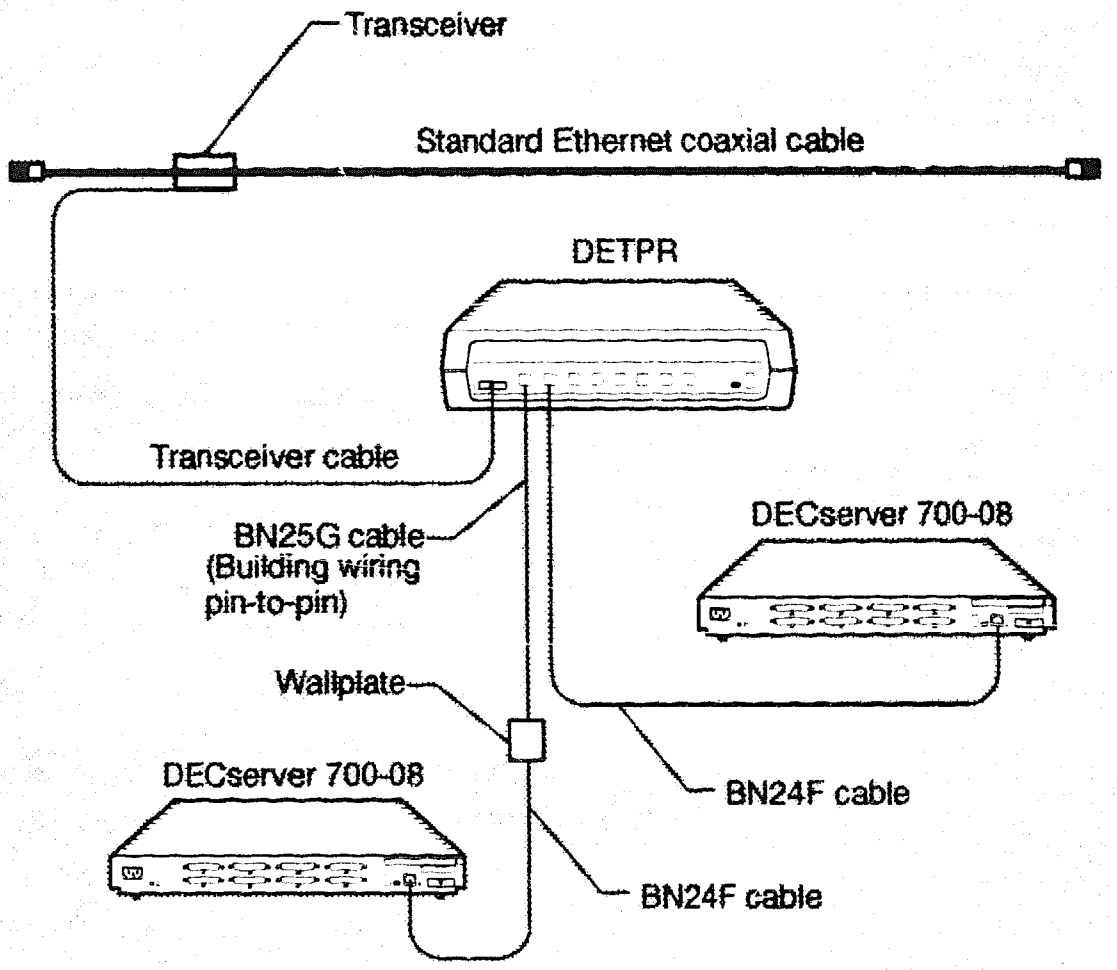
3.2.2 Installing the 10BaseT Ethernet Cables and Devices

You can connect the DECserver 700 to a DETPR (Figure 3–2) by using:

- BN24F cable for local wiring requiring crossover
- BN25G cable for pin-to-pin building wiring

Figure 3–2: 10BaseT Ethernet Connection



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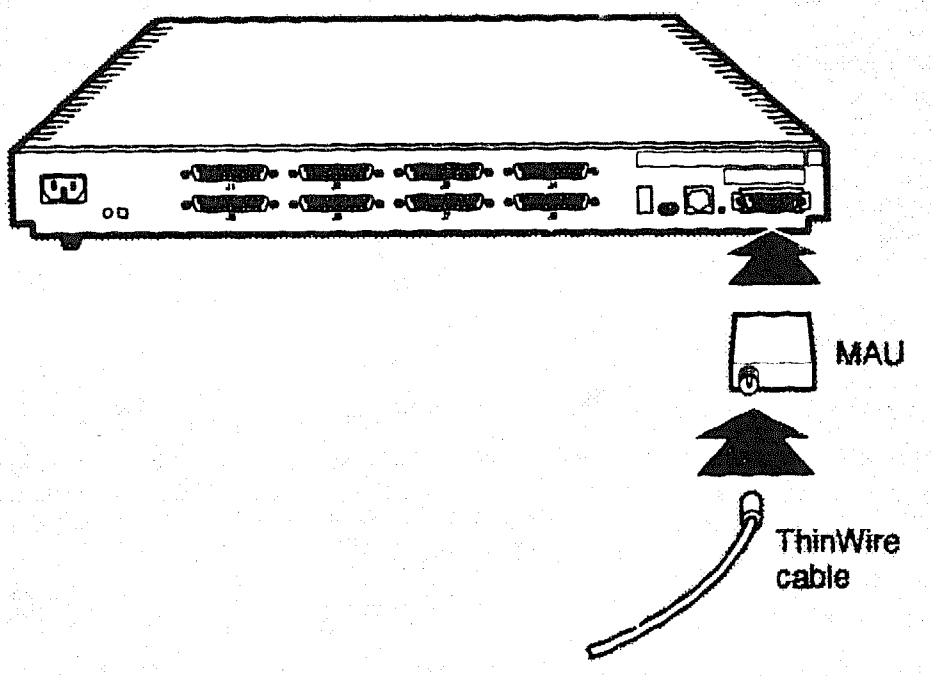
3.2.3 Installing the ThinWire Ethernet Cables and Devices

You can connect the DECserver 700 to a ThinWire Ethernet (Figure 3–3) as follows:

1. Connecting the MAU to the standard Ethernet connector
2. Connecting the ThinWire cable to the MAU

Figure 3–3: Connecting the DECserver 700 to ThinWire Ethernet Cable



Use a ThinWire coaxial cable to connect the DECserver 700 to the system in either of two ways:

- As part of a standalone ThinWire Ethernet coaxial cable segment
- As part of a DEMPR or DESPR ThinWire Ethernet coaxial cable segment

Figure 3–4 shows the DECserver 700 connected as part of a ThinWire Ethernet segment.

CAUTION

A ThinWire segment must begin and end in a 50-ohm terminator (H8225) as shown in Figure 3–4.

Figure 3–5 shows the DECserver 700 connected as part of a DEMPR ThinWire Ethernet segment.

NOTE

The DEMPR and DESTR terminate the line internally in 50 ohms so that it is not necessary to use a 50-ohm terminator (H8225). However, all unused lines on the DEMPR must have a 50-ohm terminator (H8225) installed as shown in Figure 3–6.

For further information on ThinWire Ethernet installation, refer to the *DECconnect System Planning and Configuration Guide* .

Figure 3–4: ThinWire Ethernet Standalone Segment

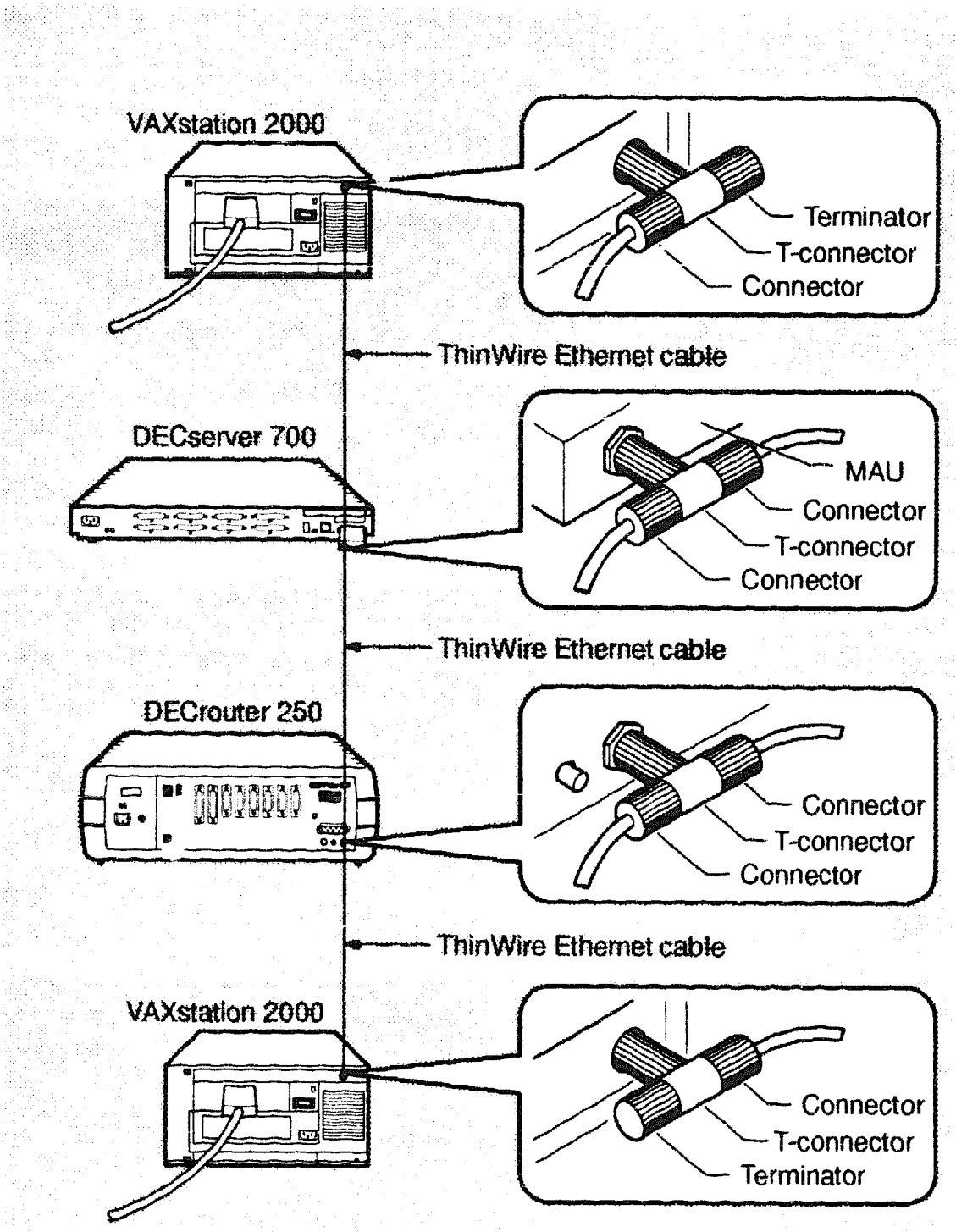


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Figure 3–5: DEMPR ThinWire Connection

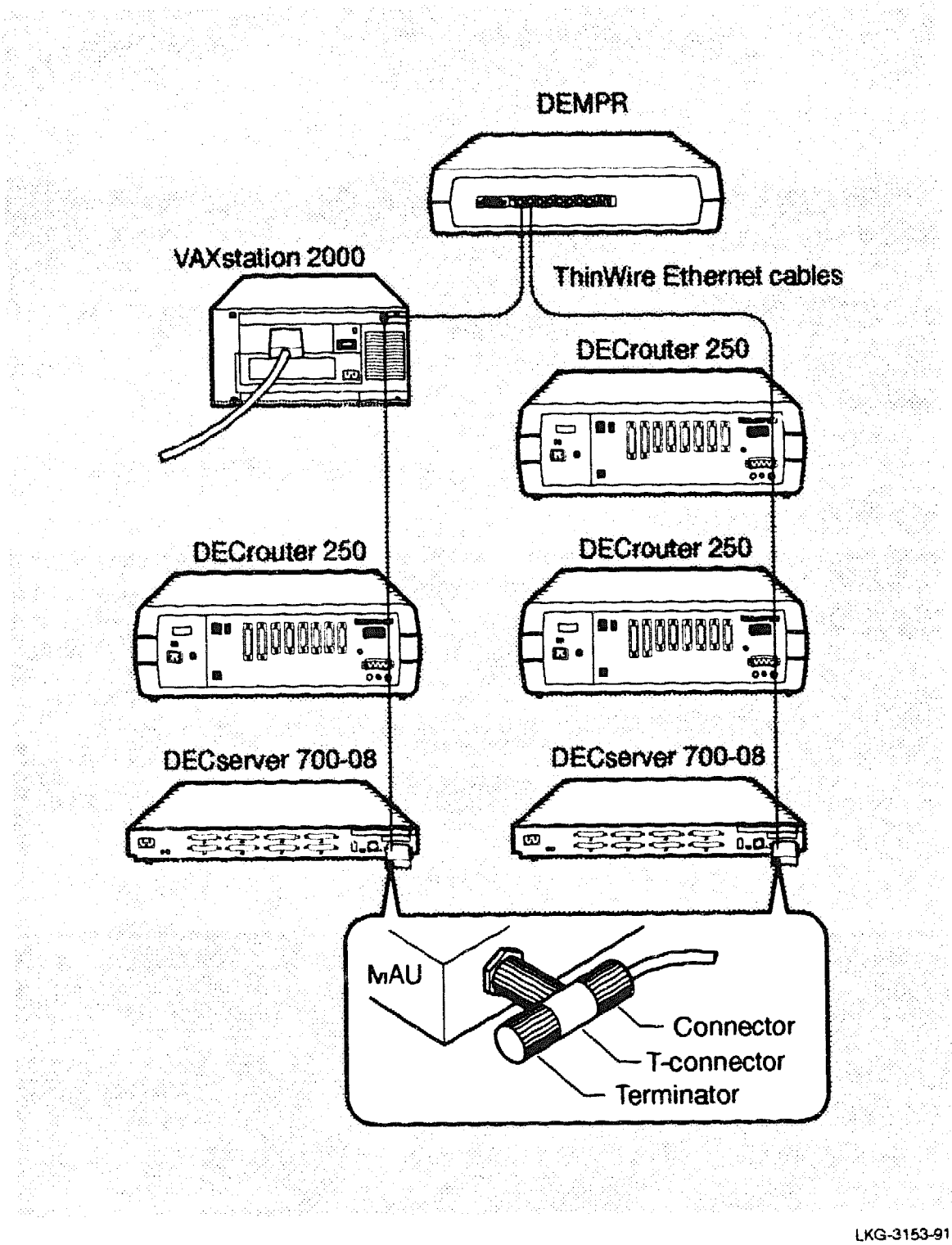
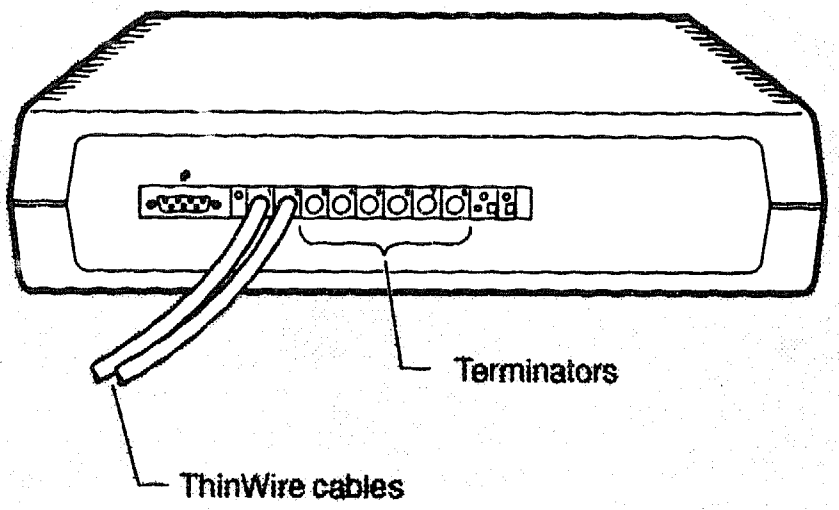


Figure 3–6: DEMPR Connections



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3.3 Installing Serial Cables and Devices on the DECserver 700-16

The DECserver 700-16 can be configured by the software to support one of the two sets of signals. One set consists of:

- Clear to send (CTS) — This is the default setting.
- Request to send (RTS) — This is the default setting.
- Data set ready (DSR) — This is the default setting.
- Data terminal ready (DTR) — This is the default setting.

The second set consists of:

- Ring indicator (RI)
- Data signal rate selector (DSRS)
- Data carrier detect (DCD)

- Data terminal ready (DTR)

Before installing cables to the DECserver 700 ports, you must verify with the person managing the DECserver 700 what modem signals are supported. This information is necessary to determine what cables to use. For more information on the signals, refer to the *Network Access Server Management* manual.

Use the following cables to connect to the 8-pin modular jacks on the serial communication lines of the DECserver 700-16:

Table 3–1: Cables and Adapters for the DECserver 700-16

Cable and Adapters	Description
BN25G MP8 to MP8 Equipment Cable	Use this cable to connect to OPEN DECconnect.
BN24H MP8 to MMP6 (modified modular plug) Office Cable	Use this cable to connect to the 6-pin modified modular jack (MMJ) of a terminal or printer.
H8575-A (EIA-423-A to EIA-232-D) Adapter	Use this adapter and the BN24H cable to connect to 25-pin D-sub male connectors (for example: printers).
H8575-B Adapter	Use this adapter and the BN24H cable to connect to 9-pin D-sub male connectors.
H8571-D (EIA-423-A to EIA-232-D) Adapter	Use this adapter and the BN24H cable to connect to 25-pin D-sub female connectors.
H8584-AA MP8 to MMJ Adapter	Use this adapter to convert the DECserver 700 connector to DECserver 300 pin-out.
H8585-AA MJ8 to DB9 (female) Null-Modem Adapter	Use this adapter with the BN25G cable to convert the DECserver 700 connector to DB9 (female) connector for cabling to PC asynchronous ports.
H8585-AB* MJ8 to DB25 (male) Modem Adapter	Can be used with the BN25G cable to connect low speed modems to the DECserver 700. Refer to Chapter 4 for further information.
H8585-AC* MJ8 to DB25 (male) Modem Adapter	Can be used with the BN25G cable to connect high speed modems to DECserver 700. Refer to Chapter 4 for further information.

*Adapters H8585-AB and H8585-AC are not for connection to public networks in Sweden, Germany, or Japan

3.4 Installing Serial Cables and Devices on the DECserver 700-08

Use the following cables to connect EIA-232-D devices to the DECserver 700-08 25-pin D-connectors:

Table 3–2: Cables and Adapters for the DECserver 700-08

Cable	Description
BC17D Shielded Null-Modem Cable	Use this cable to connect asynchronous devices that use modem signals.
BC22D Shielded Null-Modem Cable	Use this cable to connect asynchronous devices that use data leads only.
BC22E or BC22F Shielded Straight-Through Modem Cable	Use either of these cables to connect asynchronous modems.
BC22R Shielded Null-Modem Cable	Use this cable to connect to non-Digital host systems, devices using CTS/RTS flow control, and data switches that require simulation of Ring Indicator (RI) and/or Carrier Detect (CD) signals.
H8575-A (EIA-423-A to EIA-232-D) Adapter	Use this adapter to connect to 25-pin D-sub male connectors (for example: printers).
H8575-B Adapter	Use this adapter to connect to 9-pin D-sub male connectors.
H8571-D (EIA-423-A to EIA-232-D) Adapter	Use this adapter to connect to 25-pin D-sub female connectors.
[1]V.24 to RS-232-C Adapter Part No.12-27591-01	Use this adapter to convert from V.24 to RS-232-C by eliminating the extra signals that exist in V.24. EIA-232-D has the same signals as V.24; therefore, no adapter is necessary.

[1] The V.24 to RS-232-C adapter must be fitted if the modem/eliminator has Data Signal Rate Selector (DCE) on pin 23. Failure to comply with this could result in damage to the interface module and modem or eliminator. If you are not sure what signals the modem or eliminator provides, contact Digital Customer Services, or fit the adapter connector as a precaution.

3.5 Cabling Requirements

Table 3–3 shows the maximum communication distances for different types of cable used between the DECserver 700 and the Ethernet device. Table 3–4 shows the maximum cable lengths for a number of data rates using DECserver 700 supported line protocols.

The cabling requirements of the DECserver 700 are shown in the following sections. Further information on cabling and configuring of local area networks and using DECconnect system products, is provided in the *DECconnect System Planning and Configuration Guide*.

Table 3–3: Maximum Communications Distances — Ethernet

From	To	Maximum Distance	Cable Type
DECserver 700	Transceiver	50 m (164 ft)	BNE3x-xx standard transceiver cable
DECserver 700	Transceiver	12.5 m (41 ft)	BNE4x-xx office transceiver cable
DECserver 700	DETPR	100 m (328 ft)	BN24F cable
[1]DECserver 700	DESPR/DEMPR	185 m (606 ft)	H8243-A cable

[1]No other device in ThinWire segment

Table 3–4: Maximum Cable Lengths[1] — DECserver 700 to Devices

Line Protocol	Data Rate (b/s)	Cable Length
EIA-432-A/V.10	4.8 K	500 m (1600 ft)
	9.6 K	280 m (900 ft)
	19.2 K	150 m (500 ft)
	38.4 K	85 m (280 ft)
	57.6 K	30 m (100 ft)
	115.2 K	12 m (40 ft
DEC 423	9.6 K	900 m (3000 ft)
	19.2 K	300 m (1000 ft)
	38.4 K	150 m (500 ft)
	57.6 K	60 m (200 ft)
	115.2 K	30 m (100 ft)
EIA-232-E/V.28	9.6 K	60 m (200 ft)
	19.2 K	30 m (100 ft)
	38.4 K	15 m (50 ft)
	57.6 K	6 m (20 ft)
	115.2 K	3 m (10 ft)

[1]For cable type H8245-A or H8246-B, 24 AWG, 4 pair, twisted pair

CAUTION

Do not use structured building wiring (for example Open DECconnect) or bundled type breakout cables at baud rates above 38.4 KB. Separate point to point cables are recommended at baud rates above 38.4 KB.

3.5.1 Standard Ethernet Connection

The transceiver cable must not exceed the maximum distances listed in Table 3-3.

3.5.2 10BaseT Ethernet Connection

The 10BaseT Ethernet installation must conform to the following configuration rules:

- The twisted-pair cable must not exceed the maximum distance listed in Table 3-3.
- No other signal should be used in the same cable sheath. For example, voice and data signals cannot be run within the same sheath.
- Unshielded twisted-pair cable must remain at least 30.48 cm (12 in) from any type of high-voltage power device or electrical noise source.

3.5.3 ThinWire Ethernet Connection

The ThinWire cable segment must conform to the following configuration rules:

- The maximum cable segment length must not exceed 185 m (606 ft).
- There must be a 50-ohm terminator at each end of the cable segment, unless the cable ends in a DEMPR or DESPR. Both these devices have built in 50-ohm terminators.
- There must be only one ground per cable segment.
- There must be at least 0.5 m (19 in) between T-connectors.
- The maximum number of stations, between terminators, must not exceed 30 stations.
- ThinWire cable segments must not be configured in a loop.
- ThinWire cable segments must not have any branch segments.

3.6 Installing the DECserver 700 in a Rack

You can rack mount the DECserver 700 any one of four ways (Table 3–5) depending on how you install the brackets.

Table 3–5: Installing the DECserver 700 Brackets

DECserver 700 Installation	Bracket Installation
1. Flush with rear facing outward	Flush with rear
2. Recessed 2.54 cm (1 in) with rear facing outward	Forward 2.54 cm (1 in) from rear
3. Flush with front facing outward	Flush with front
4. Recessed 2.54 cm (1 in) with front facing outward	Forward 2.54 cm (1 in) from rear

Figure 3–7 shows how to install the brackets in order to recess the DECserver 700.

Figure 3–8 shows how to remove the brackets.

CAUTION

The DECserver 700 can be wall mounted. If the DECserver is installed on a wall, the DECserver 700 must be installed with the port connectors pointing up or pointing down. Digital Equipment Corporation does not supply wall mounting hardware for the DECserver 700.

CAUTION

To prevent damage to the DECserver 700, it is recommended that you not ship the DECserver 700 mounted in a rack mounted cabinet.

Figure 3–7: How to Fit the Brackets to Recess the DECserver 700

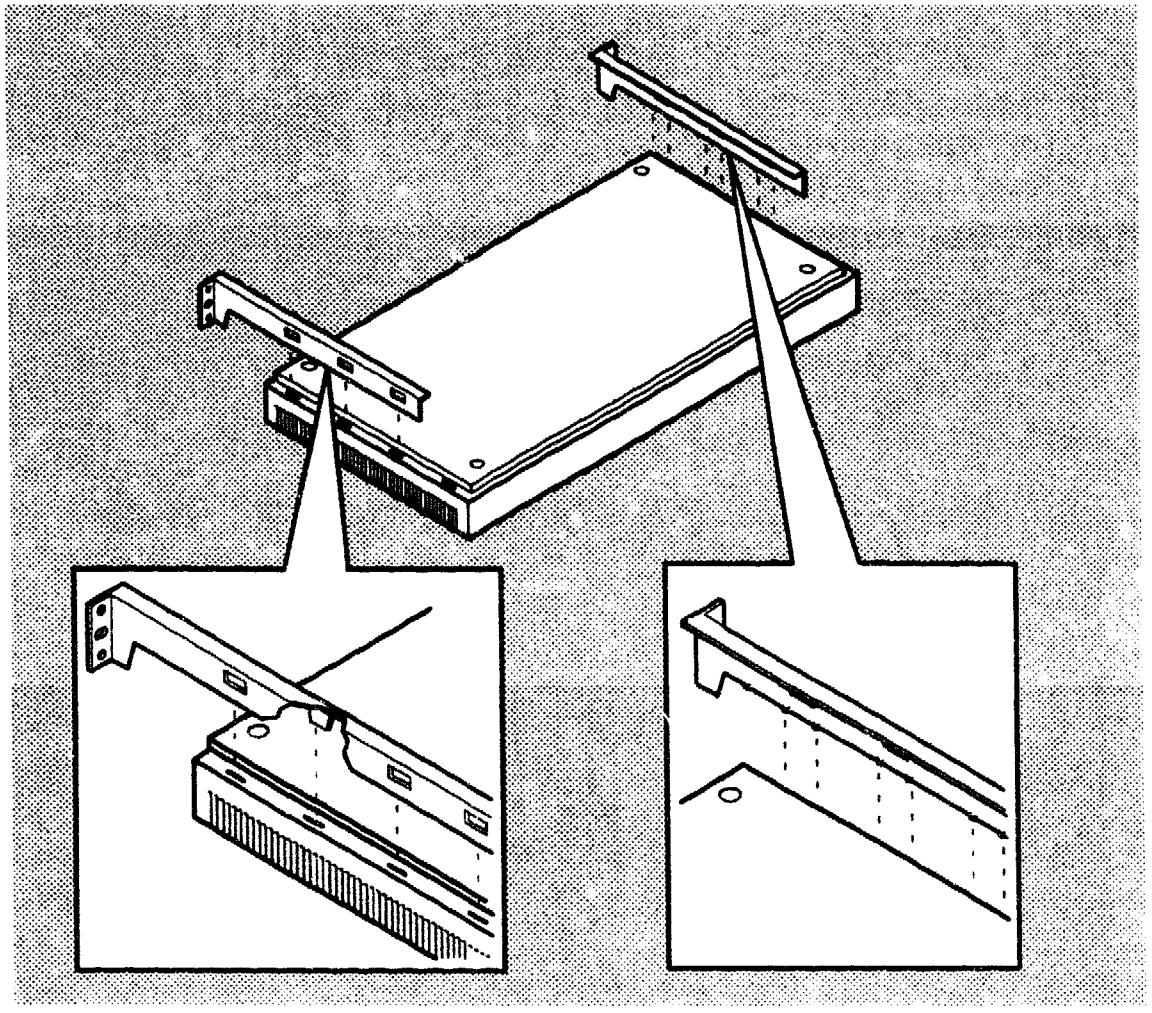

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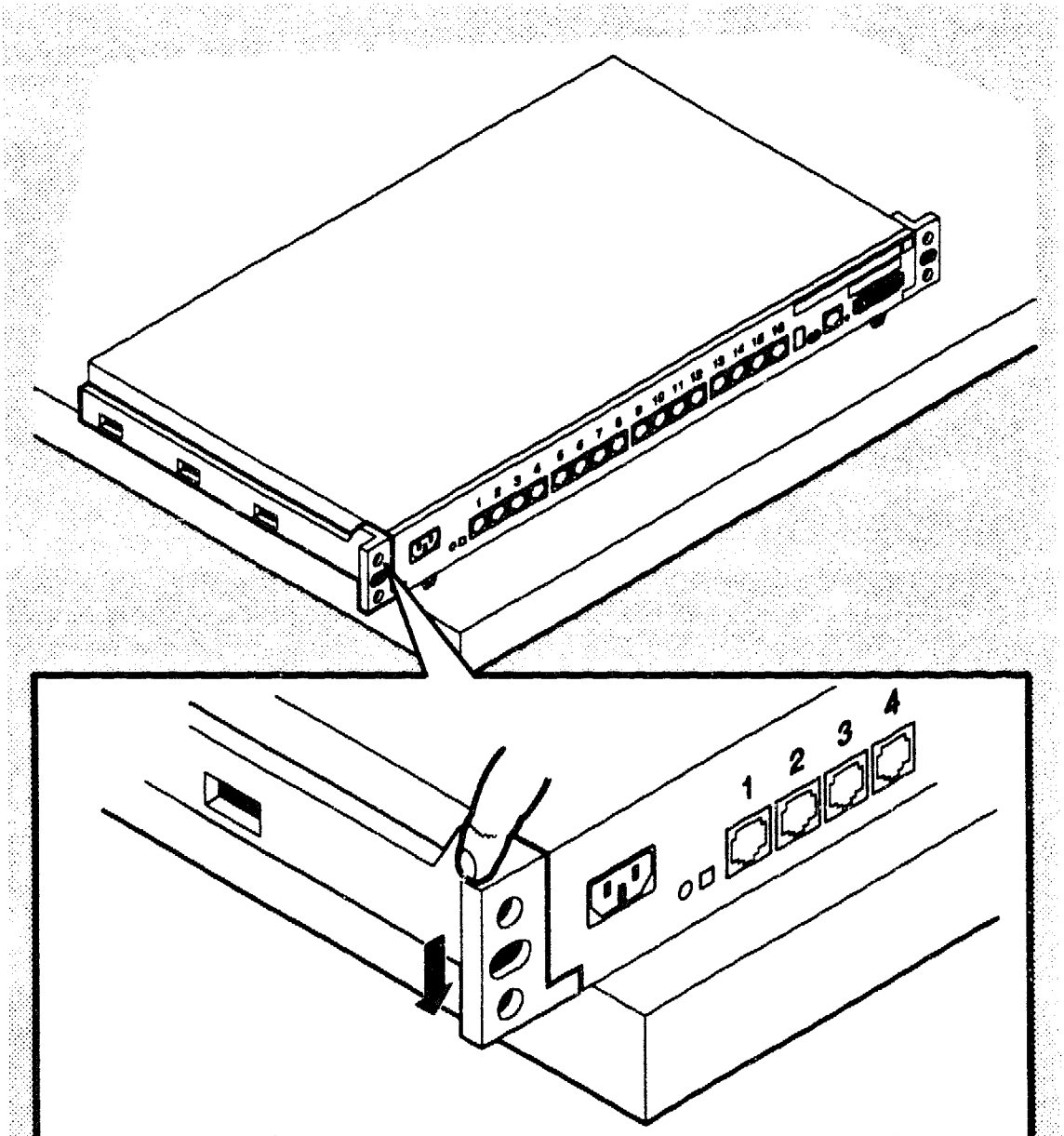
Figure 3–8: Removing the Brackets



1. Place the DECserver 700 on a table top with the bracket overhanging the edge.
2. Place your thumb or finger on the bracket, where indicated.
3. Push the bracket down and out.

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4

Connector and Cable Pin Descriptions

This chapter describes the pins of the DECserver 700 hardware connectors and the cables used to interface to the DECserver 700 hardware. Wiring diagrams of the individual cables are included to help you in troubleshooting and cable building.

4.1 Connector Pin Descriptions

This section describes the pins for the following DECserver 700 connectors:

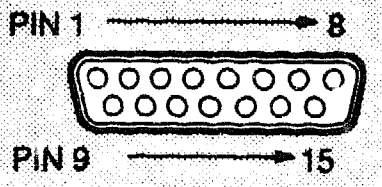
- Standard Ethernet/IEEE 802.3 transceiver interface
- 10BaseT Ethernet/IEEE 802.3 transceiver interface
- DECserver 700-08 serial port connectors
- DECserver 700-16 serial port connectors

4.1.1 Standard Ethernet

The standard Ethernet connector matches the signal specifications described in *The Ethernet: A Local Area Network: Data Link Layer and Physical Layer Specification.*

Figure 4-1 shows how the pins are numbered on a standard Ethernet transceiver interface connector and lists the signals for the standard Ethernet connector pins.

Figure 4–1: Pin Numbers and Signals for Standard Ethernet Connector



Pin Number	Signal Name
1	Shield
2	Collision Presence +
3	Transmit +
4	Reserved
5	Receive +
6	+12 Volt Power return
7	Reserved
8	Reserved
9	Collision Presence –
10	Transmit –
11	Reserved
12	Receive –
13	+12 Volt Power
14	Reserved
15	Reserved

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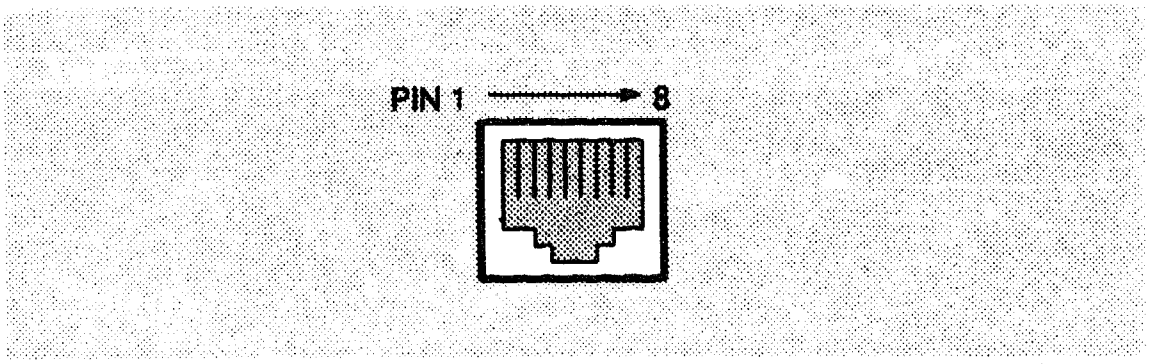
4.1.2 10BaseT Ethernet

The 10BaseT Ethernet connector is an 8-pin modular jack (MJ8). Figure 4-2 shows how the pins are numbered on a 10BaseT Ethernet connector and lists the signals for the 10BaseT Ethernet connector.

Figure 4–2: Pin Numbers and Signals for 10BaseT Ethernet Connector



Pin Number	Signal Name
1	Transmit +
2	Transmit –
3	Receive +
4	Reserved
5	Reserved
6	Receive –
7	Reserved
8	Reserved

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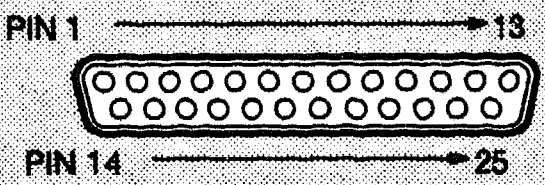
4.1.3 DECserver 700-08 Serial Line Ports

The DECserver 700-08 uses a 25-pin D-sub connector on the serial line ports. Figure 4-3 shows how the connector pins are numbered and describes the signals on each pin.

Figure 4–3: Pin Numbers and Signals for 25-Pin D-sub Connector



Pin Number	Signal Description	Signal name	EIA-232-D	V.24
2	Transmitted data	TXD	BA	103
3	Received data	RXD	BB	104
4	Request to send	RTS	CA	105
5	Ready for sending	CTS	CB	106
6	Data set ready	DSR	CC	107
7	Signal ground	GND	AB	102
8	Data channel received line signal detector	DCD	CF	109
12	Data signal rate selector (DCE)	SMI	CI	112
20	Data terminal ready	DTR	CD	108/2
22	Ring indicator	RI	CE	125
23	Data signal rate selector (DTE)	DSRS	CH	111

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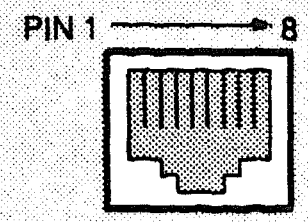
4.1.4 DECserver 700-16 Serial Line Ports

The DECserver 700-16 uses an MJ8 connector on the serial ports. Figure 4-4 shows how the pins are numbered on an MJ8 connector and lists the signals on the pins. You can set pins 4, 5, and 8 to either CTS, RTS, DSR or RI, DSRS, DCD. (Refer to Section 3.3.)

Figure 4–4: Pin Numbers and Signals for the MJ8 Connector



Pin Number	Signal Name	*Software Default	*Software Alternative
1	RXD GND		
2	RXD		
3	TXD GND		
4	CTS or RI (selected by software)	CTS	RI
5	RTS or DSRS (selected by software)	RTS	DSRS
6	TXD		
7	DTR		
8	DSR or DCD (selected by software)	DSR	DCD

*To change default values, refer to the *Network Access Server Management* manual.

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4.2 Cable Connections

The following table describes the cable connections that are compatible with the DECserver 700 Ethernet and serial line connectors. Wiring diagrams of individual cables are provided for use in troubleshooting and cable building.

Table 4–1: Cable Connections

Cable Type	Description
10BaseT Ethernet Cable	The 10BaseT Ethernet cable uses a 8-pin modular plug on each end.
BC17D Shielded Null-Modem Cable	The BC17D is a 10-wire cable with a 25-pin D-connector on each end. Can be used with DECserver 700-8.
BC22D Shielded Null-Modem Cable	The BC22D is a 6-wire cable with a 25-pin D-connector on each end. Can be used with DECserver 700-8.
BC22E/F Shielded Straight-Through Modem Cable	The BC22E or BC22F is a 25-wire cable with a male 25-pin D-connector on one end and a female 25-pin D-connector on the other end. Can be used with DECserver 700-8.
BC22R Shielded Null-Modem Cable	The BC22R has a male 25-pin D-connector on one end and a female 25-pin D-connector on the other end. Can be used with DECserver 700-8.
V.24 to RS-232-C Adapter Part # 12-27591-01	Use the V.24/RS-232-C adapter (12-27591-01) to convert the 25-pin D-connectors to RS-232-C format. The adapter works by passing through the RS-232-C signals and blocking the others. EIA-232-D has the same signals as V.24; therefore, no adapter is necessary. Can be used with DECserver 700-8. **CAUTION** The V.24 to RS-232-C adapter must be fitted if the modem/eliminator has Data Signal Rate Selector (DCE) on pin 23. Failure to comply with this could result in damage to the interface module and modem or eliminator. If you are not sure what signals the modem or eliminator provides, contact Digital Customer Services, or fit the adapter connector as a precaution.

Table 4-1 (Cont.): Cable Connections

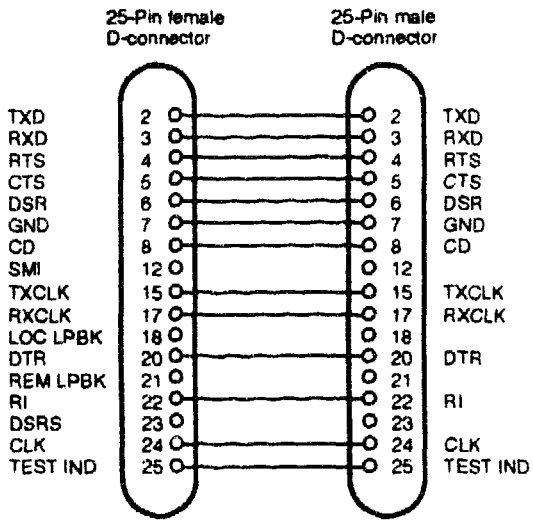
Cable Type	Description
BN25G MP8 to MP8 Equipment Cable	The BN25G is a four twisted-pair cable with standard 8-pin modular plugs. Can be used with the DECserver 700-16.
H8584-AA MP8 to MMJ Adapter	The H8584-AA MP8 to MMJ adapter is used to convert a serial port to a DECserver 300 terminal server configuration. Can be used with the DECserver 700-16.
H8585-AA MJ8 to DB9 Null-Modem Adapter	The H8585-AA MJ8 to DB9 null-modem adapter is used to convert the serial port to a DB9 female connector for asynchronous connection to a PC port. Can be used with the DECserver 700-16.
BN24H MP8 to MP6 Office Cable	The BN24H is a three twisted-pair cable with a standard 8-pin modular plug on one end and a 6-pin modular plug on the other. Can be used with the DECserver 700-16.
H8585-AB MJ8 to DB25 Modem Adapter	The H8585-AB MJ8 to DB25 low speed modem adapter is used to convert a serial port to the DB25 configuration. Can be used with the DECserver 700-16.
H8585-AC MJ8 to DB25 Modem Adapter	The H8585-AC MJ8 to DB25 high speed modem adapter is used to convert a serial port to the DB25 configuration. Can be used with the DECserver 700-16.

NOTE

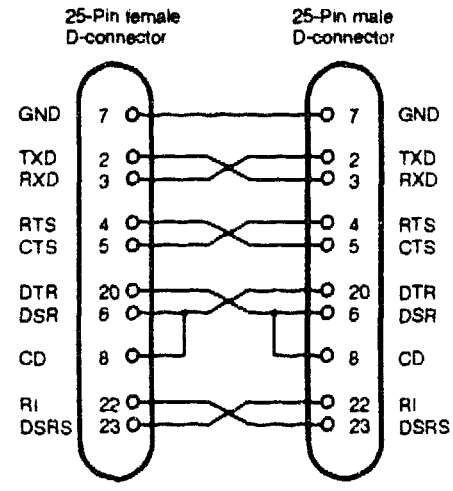
Adapters H8585-AB and H8585-AC are not for connection to public networks in Sweden, Germany, or Japan. For a list of signals supported by the DECserver 700-16, refer to Section 3.3.

Figure 4–5: Adapters and Connectors Used with the DECserver 700

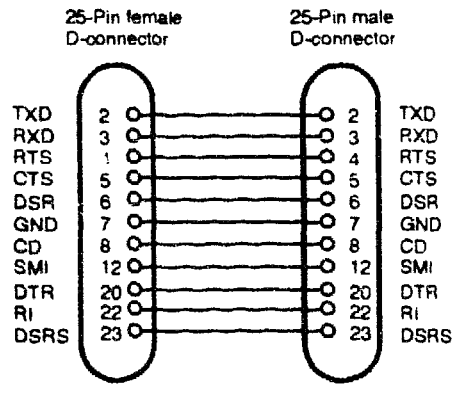
V.24/RS-232-C Adapter



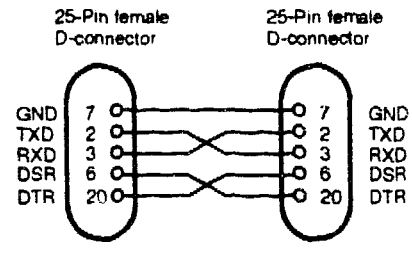
BC22R Shielded Null-Modem



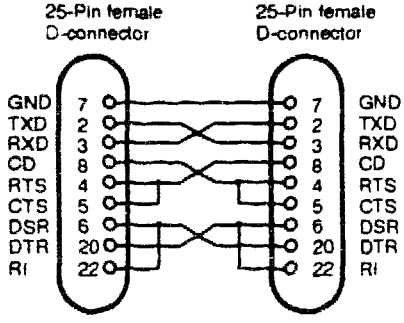
BC22E or BC22F Shielded Straight-Through Modem Cable



BC22D Shielded Null-Modem



BC17D Shielded Null-Modem



BN24F 10BaseT Ethernet Cable

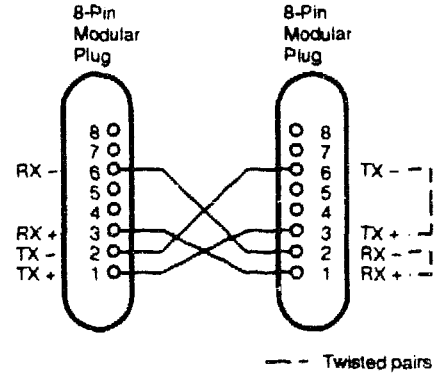


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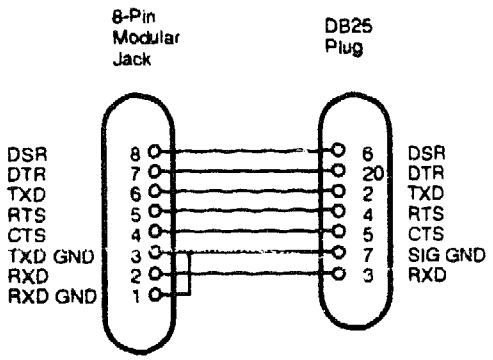
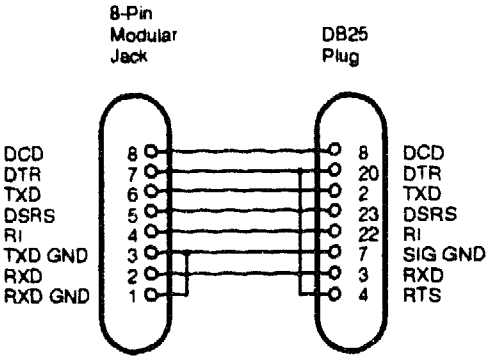
Figure 4–5 (Cont.): Adapters and Connectors used with the DECserver 700

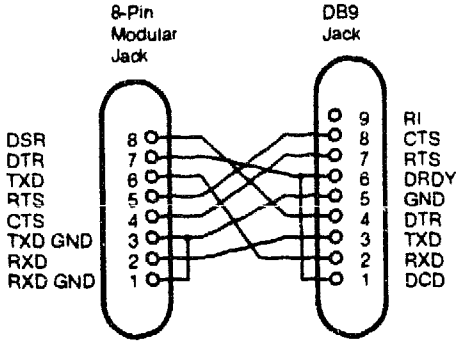
H8585-AC MJ8 to DB25 Modem Adapter



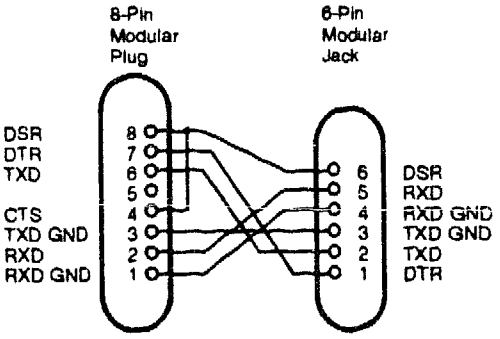
H8585-AB MJ8 to DB25 Modem Adapter



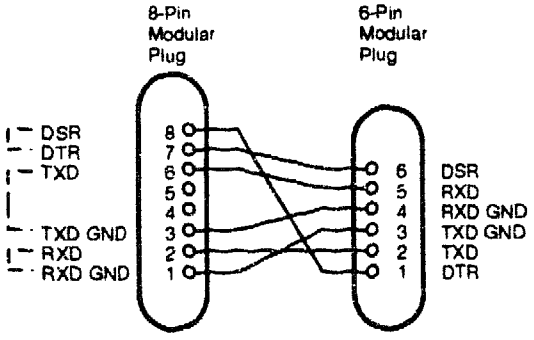
H8585-AA MJ8 to DB9 Null-Modem Adapter



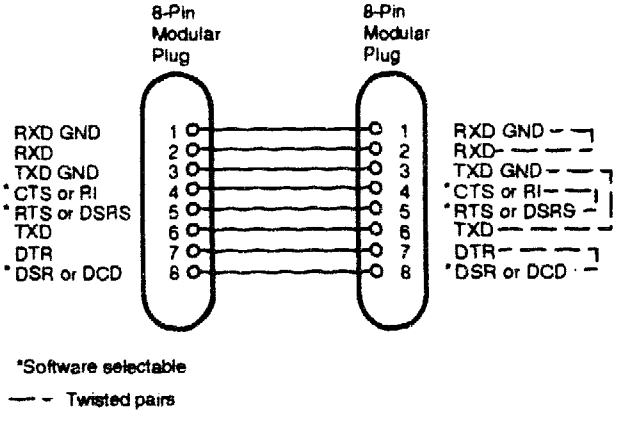
H8584-AA MP8 to MMJ Adapter



BN24H MP8 to MP6 Office Cable



BN25G MP8 to MP8 Equipment Cable



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5

Replacing and Adding Memory

This chapter shows how to replace a faulty single-in-line memory module (SIM) and add additional memory.

CAUTION

SIMs are sensitive to static and and are packed in anti-static packaging. Electro Static Discharge (ESD) can cause failure of electronic components and can reduce the long term reliability of the DECserver 700. Digital Equipment Corporation recommends you use the anti-static kit (Part No. 29-26246-00) or ESD wrist strap (Part No. 12-36157-01) when handling SIMs.

5.1 Replacing a Faulty Single-In-Line Memory Module

To replace a SIM:

1. Disconnect all cables from the DECserver 700.
2. Remove the DECserver 700 brackets, if fitted (Figure 5–1).
3. Remove the DECserver 700 cover (Figure 5–2).
4. Fit the anti-static kit (Figure 5–3).
5. Locate the SIM connectors (Figure 5–4).
6. Remove the faulty SIM (Figure 5–5).
7. Insert the replacement SIM in the connector (Figure 5–6).

8. Remove the anti-static kit.
9. Replace the cover (Figure 5–8).
10. Connect a terminal to the DECserver 700 (Section 7.5).
11. Reconnect the cables and test the DECserver 700 (refer to the *DECserver 700 Hardware Installation Card*).

NOTE

If the SIM memory is faulty, the DECserver 700 flashes "C" if the faulty SIM is in connector 1 and "d" if the faulty SIM is in connector 2. If you install the wrong type SIM, the DECserver 700 flashes "n". Remove or replace the SIM to repair the DECserver 700.

12. Check status message 960 to verify memory size:

```
Local -960- Available memory 4 Mbytes
```

5.2 Additional Memory Supported

You can increase the memory of your DECserver 700 by adding extra single-in-line memory modules (SIMs). The DECserver 700 contains 4 Mbytes of SIM memory. However, future releases of DECserver 700 software may contain additional functions that require more SIM memory. You can install the additional SIM memory on site. Adding an additional 1 Mbyte will increase the memory to 5 Mbytes and adding an additional 4 Mbytes SIM will increase the memory to the maximum of 8 Mbytes.

The DECserver 700 supports:

- 1 Mbyte SIMs (256K x 36) DEC Part No 20-35191-05, Order Number MS40-WA
- 4 Mbytes SIMs (1M x 36) DEC Part No 20-37656-05, Order Number MS40-WB

There are two SIM connectors on the DECserver 700 printed circuit board. One of the connectors contains the factory installed 4 Mbytes SIM (Figure 5–4).

The DECserver 700 supports only SIMs with the following access times:

- 80 nano seconds
- 70 nano seconds

The DECserver 700 supports only SIMs in the following configurations:

- 4 Mbytes (one 4 Mbytes SIM in any connector)
- 5 Mbytes (one 1 Mbyte in one connector and one 4 Mbytes in the other connector)
- 8 Mbytes (one 4 Mbytes SIM per connector)

NOTE

The DECserver 700 supports only 36 bit wide SIMs. If you are not using Digital Equipment Corporation SIMs MS40-WA or MS40-WB, check the specification of your SIM to verify that it is 36 bit wide. SIMs that are not 36 bit wide will not work but may not be detected by the DECserver 700 diagnostics.

5.3 Installing Extra Memory

To install a SIM:

1. Disc nnect all cables from the DECserver 700.
2. Remove the DECserver 700 brackets, if fitted (Figure 5–1).
3. Remove the DECserver 700 cover (Figure 5–2).
4. Fit the anti-static kit (Figure 5–3).
5. Locate the SIM connectors (Figure 5–4).
6. Remove the SIM from its wrappings and keep the memory label for step 10.
7. Insert the extra SIM in the connector (Figure 5–7).
8. Remove the anti-static kit.
9. Replace the cover (Figure 5–8).
10. Stick the memory label on the back of the DECserver 700.
11. Connect a terminal to the DECserver 700 (Section 7.5).
12. Reconnect the cables and test the DECserver 700 (refer to the *DECserver 700 Hardware Installation Card*).

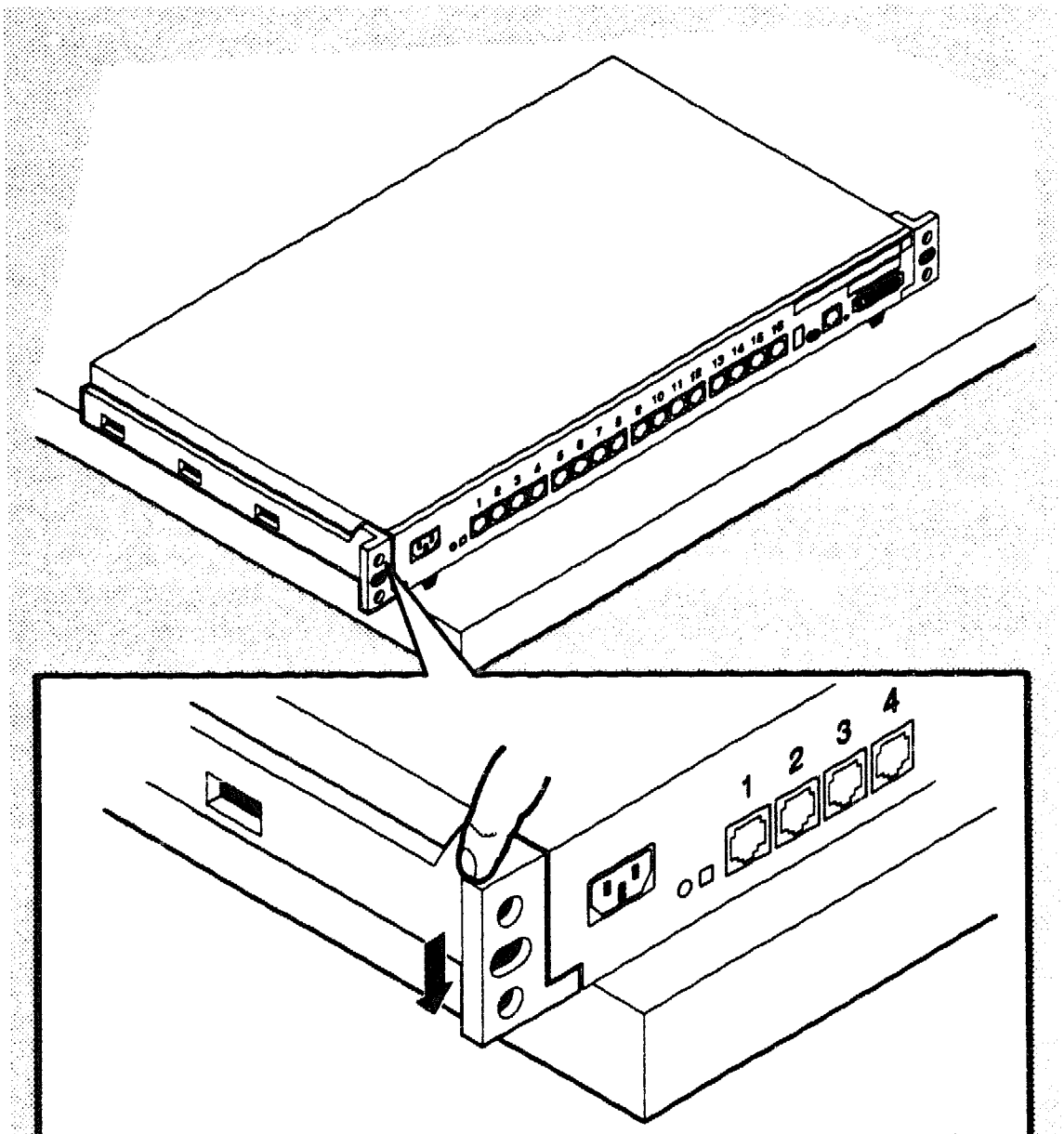
NOTE

If the SIM memory is faulty, the DECserver 700 flashes "C" if the faulty SIM is in connector 1 and "d" if the faulty SIM is in connector 2. If you install the wrong type SIM, the DECserver 700 flashes "n". Remove or replace the SIM to repair the DECserver 700.

13. Check status message 960 to verify memory size:

```
Local -960- Available memory 4 Mbytes
```

Figure 5–1: Removing the Brackets



1. Place the DECserver 700 on a table top with the bracket overhanging the edge.
2. Place your thumb or finger on the bracket, where indicated.
3. Push the bracket down and out.

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Figure 5–2: Removing the Covers

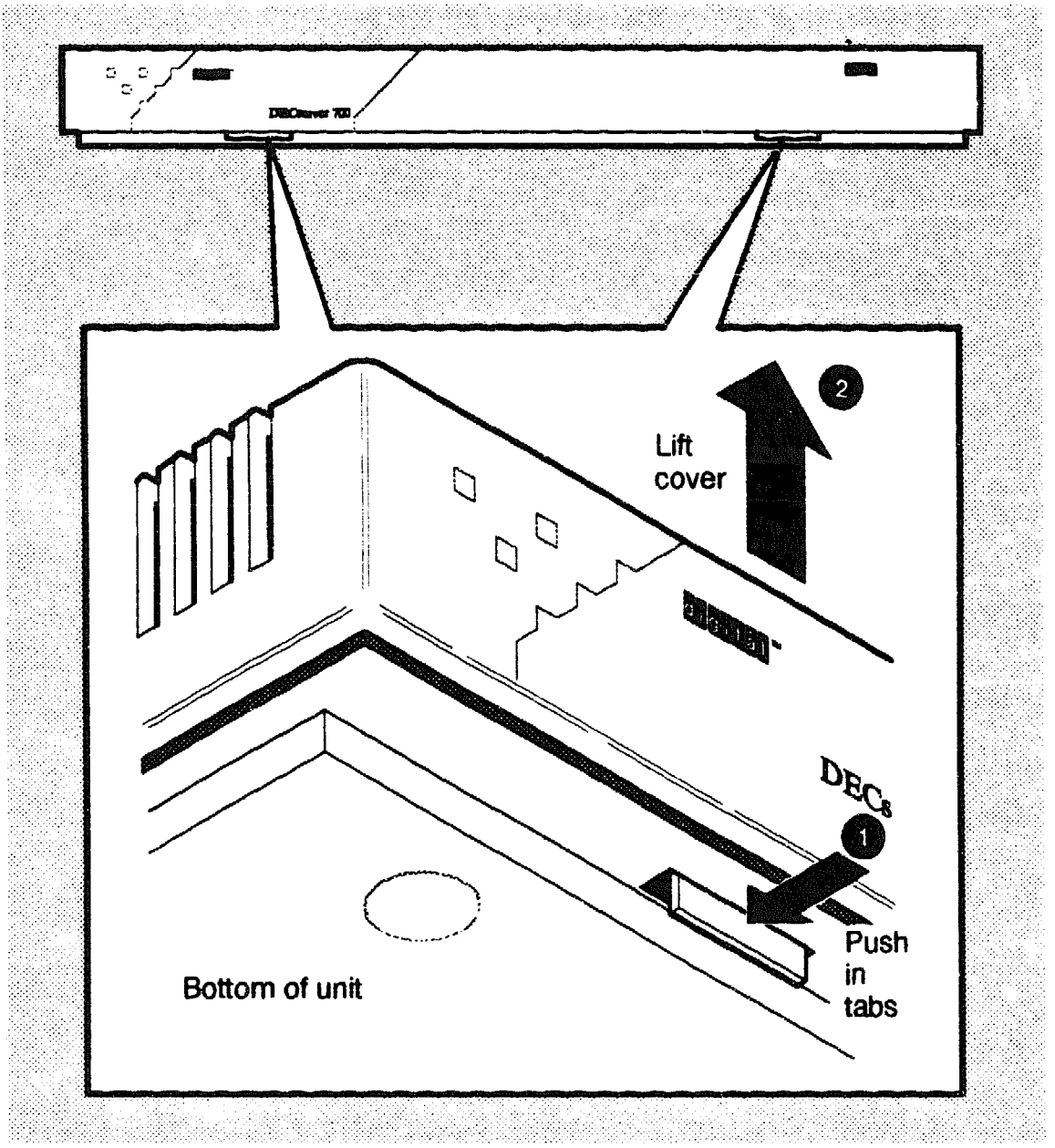

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Figure 5–3: Fitting the Anti-Static Kit

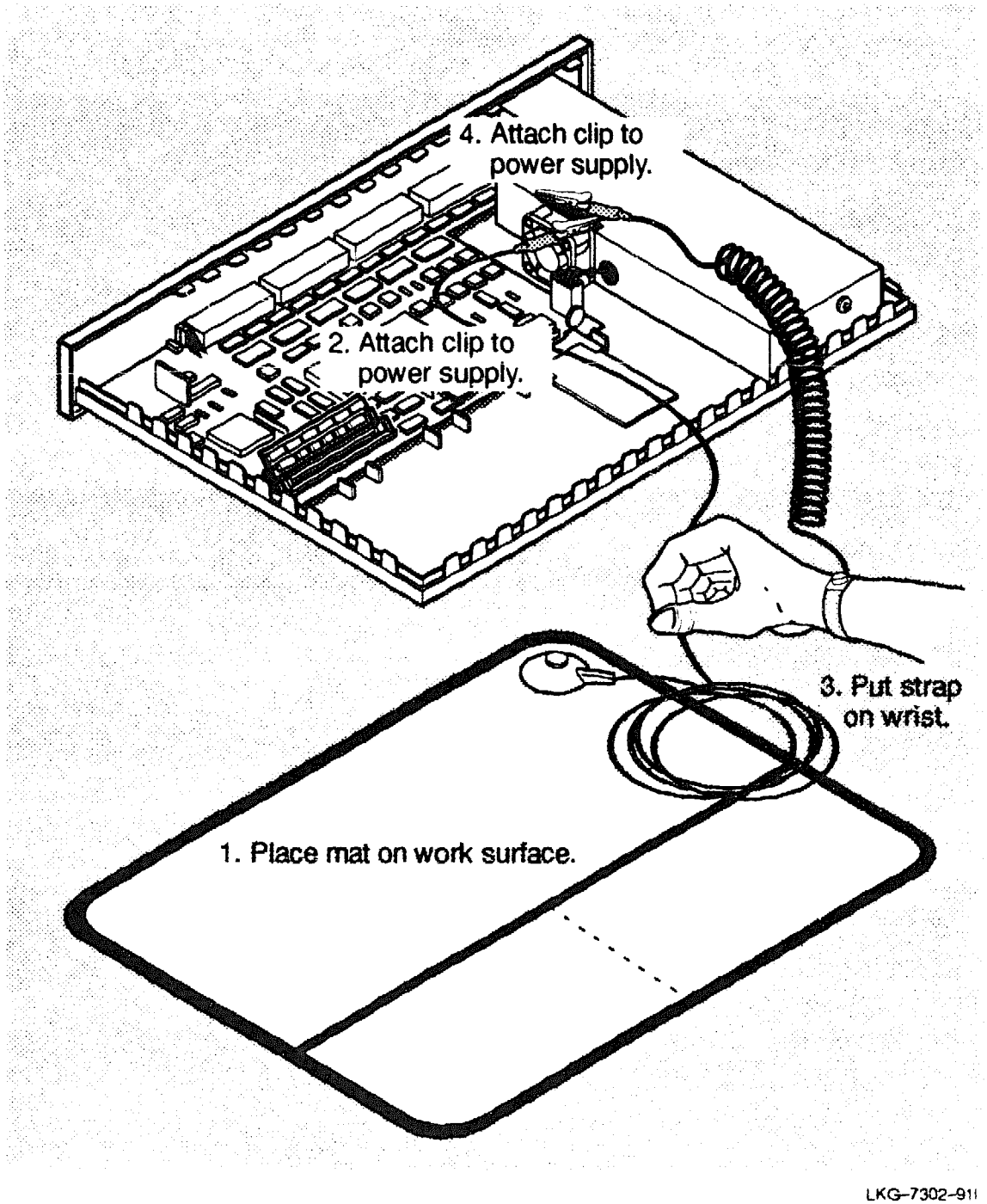

Figure 5–4: Locating the SIMs Connectors

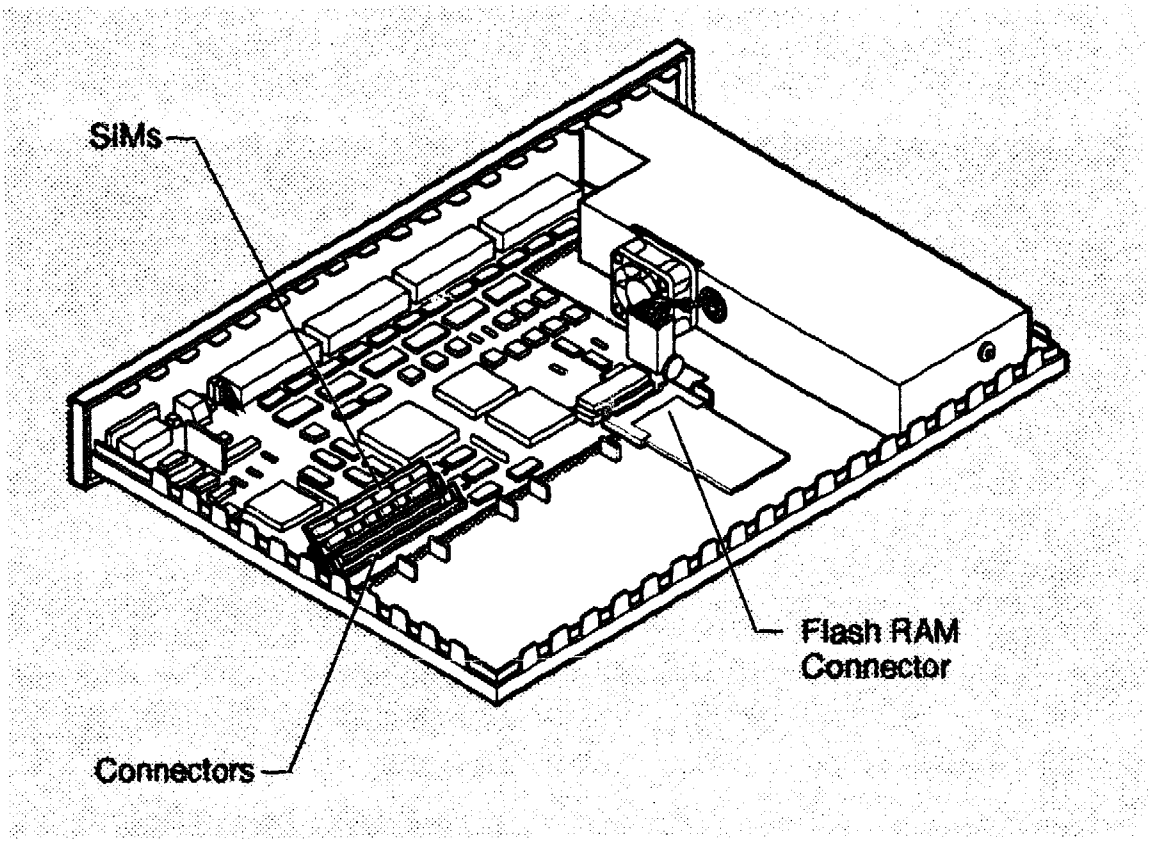

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Figure 5–5: Removing a SIM

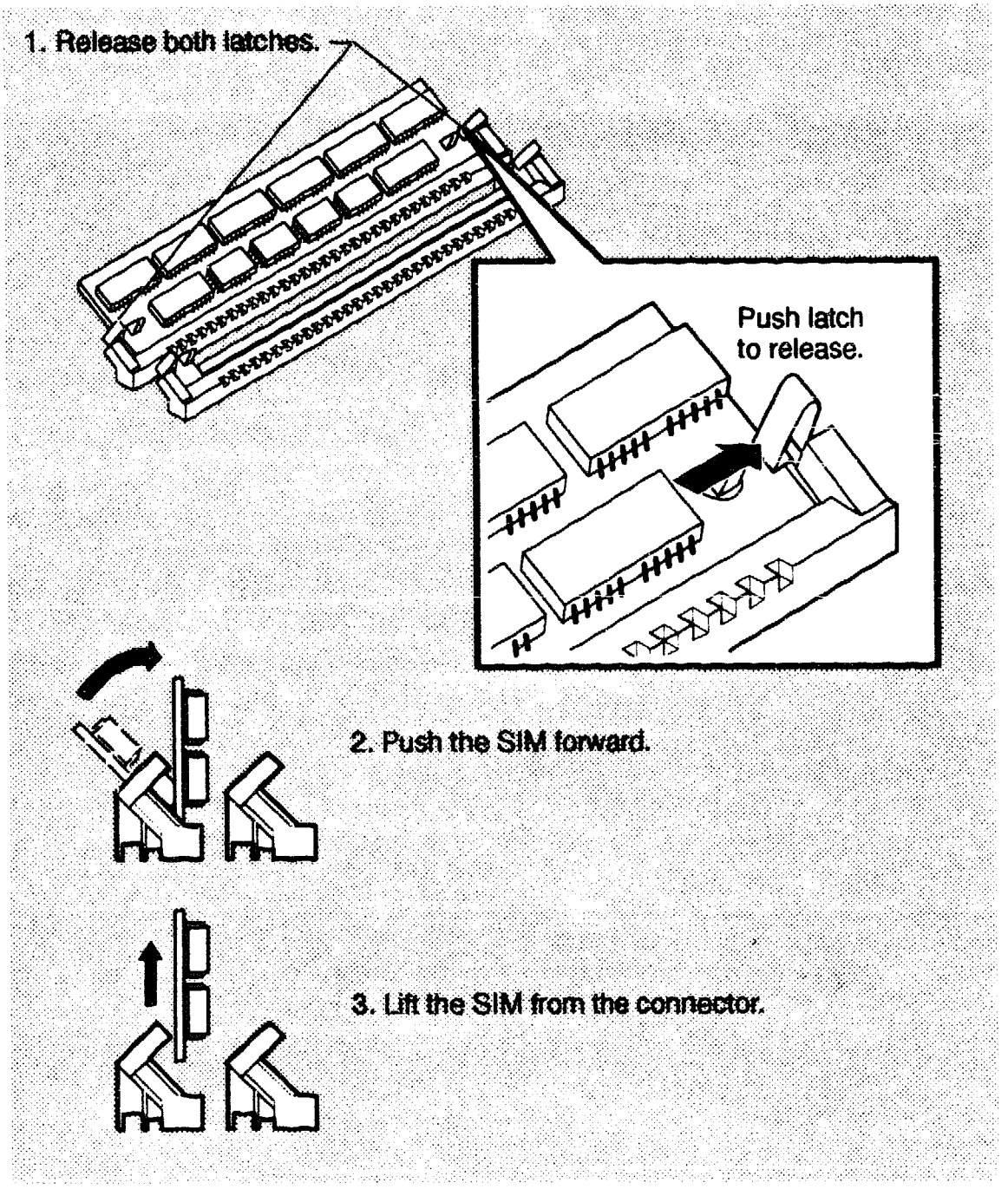


Figure 5–6: Inserting the Replacement SIM

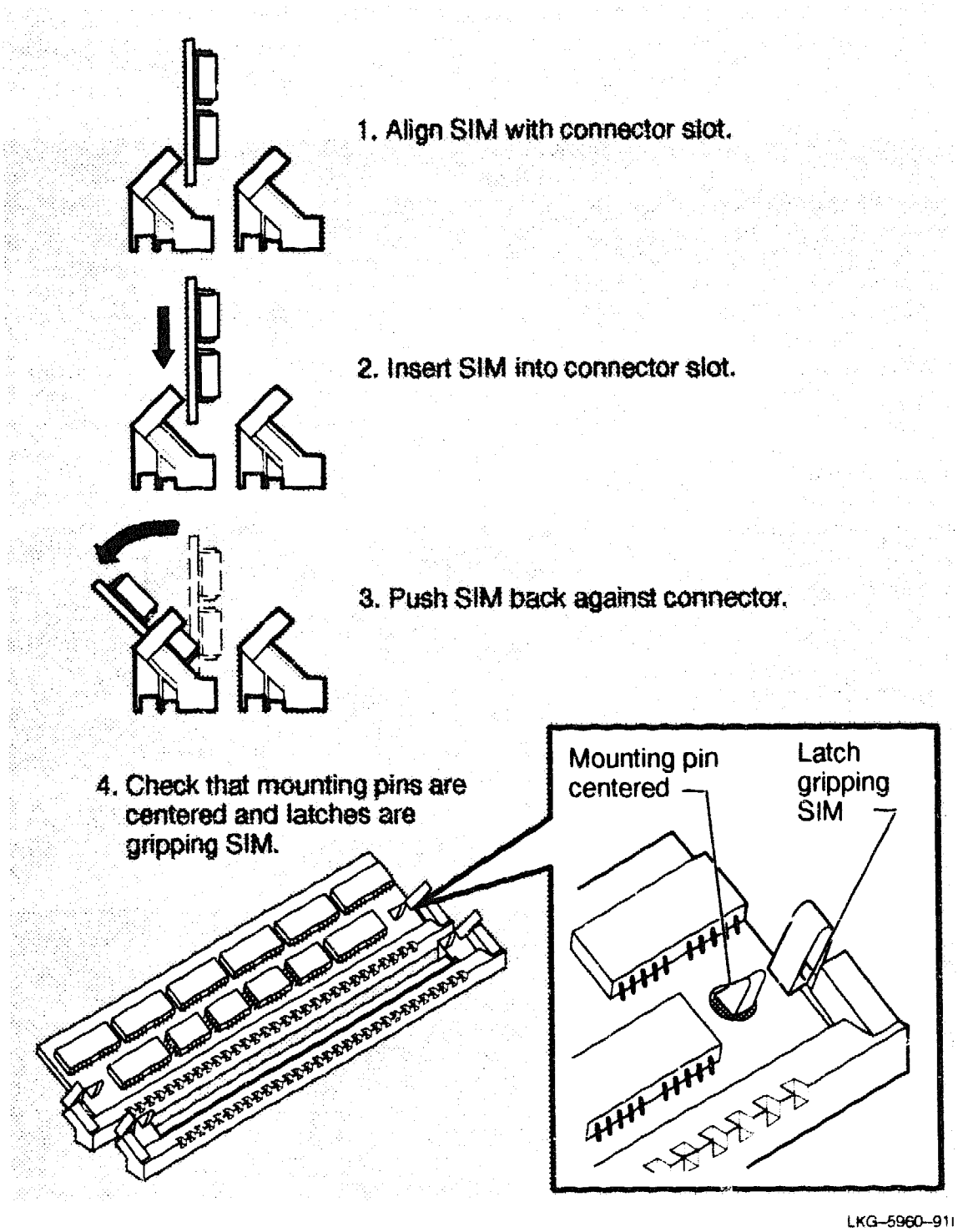


Figure 5–7: Adding an Additional SIM

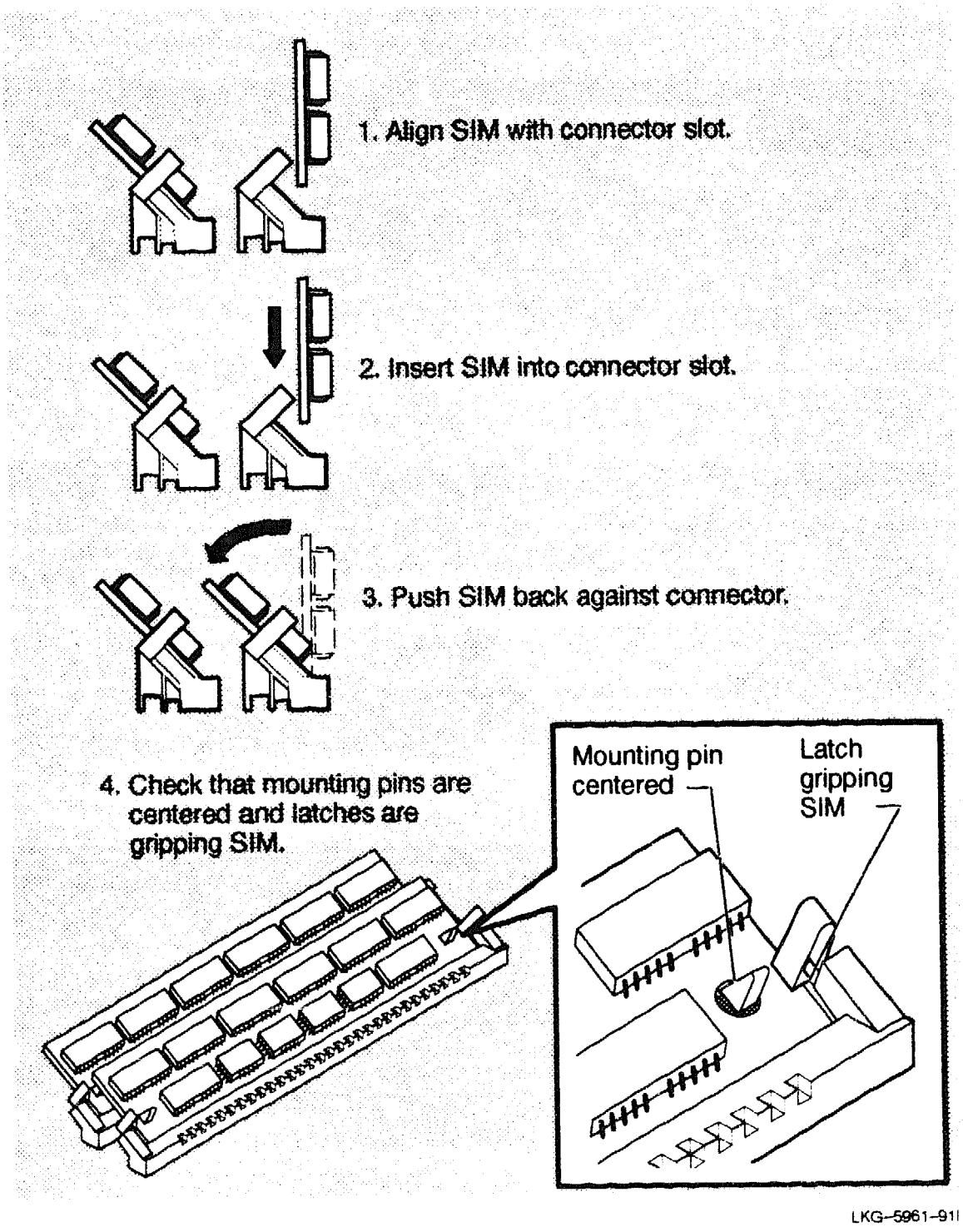
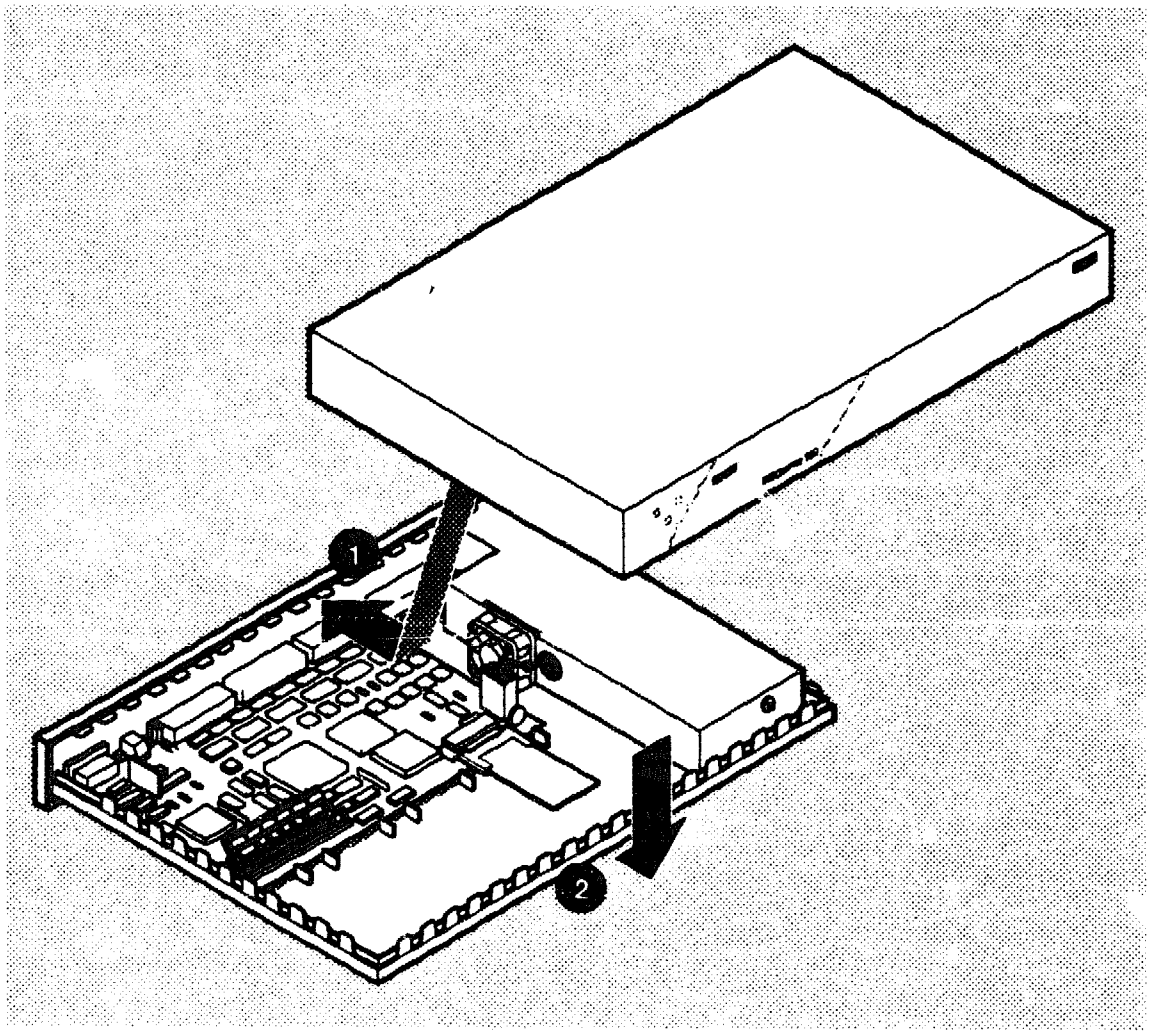


Figure 5–8: Replacing the Covers



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6

Replacing and Adding Flash RAM

This chapter shows how to replace or update a DECserver 700 Flash RAM Card.

NOTE

Electrostatic Discharge (ESD) can cause failure of electronic components and can reduce the long term reliability of the DECserver 700. Digital Equipment Corporation recommends you use the anti-static kit (Part No. 29-26246-00) or ESD wrist strap (Part No. 12-36157-01) when installing a Flash RAM Card.

6.1 Replacing or Adding Flash RAM

To replace or install the Flash RAM Card:

1. Disconnect all cables from the DECserver 700.
2. Remove the DECserver 700 brackets, if fitted (Figure 5–1).
3. Remove the DECserver 700 cover (Figure 5–2).
4. Fit the anti-static kit (Figure 5–3).
5. Locate the Flash RAM connector or remove the faulty Flash RAM Card (Figure 6-1).

6. Insert the replacement or Flash RAM Card update in the connector (Figure 6-2).

NOTE

The Flash RAM socket is keyed. Ensure that you follow the instructions located on the Flash RAM card when installing.

7. Remove the anti-static kit.
8. Replace the cover (Figure 5–8).
9. Connect a terminal to the DECserver 700 (Section 7.5).
10. Reconnect the cables and test the DECserver 700 (refer to the *DECserver 700 Hardware Installation Card*).
11. Check the status of the Flash RAM card by using the SHOW MEMORY CONFIGURATION command.

Example

```
Local> SHOW MEMORY CONFIGURATION

Dynamic RAM:                    4M bytes

Non-Volatile RAM:               32K bytes

Flash RAM:
  Installed:                    Yes
  Total size:                   4M bytes
  Boot block:                   Valid
  Load image:
   Name:                        WWENC1
   Size:                        967756 bytes
   Version:                     DECserver 700-16 V1.0 BL34A-2C
```

NOTE

If Flash RAM is installed, but its boot block is invalid, then the total memory size will be displayed as zero.

Your Flash RAM can also be updated with the INITIALIZE command. This command copies the load image to Flash RAM. For more information about the SHOW MEMORY CONFIGURATION or the INITIALIZE command, refer to the *Network Access Server Management* or *Network Access Server Commands* manual.

Figure 6–1: Locating the Flash RAM Card Connector

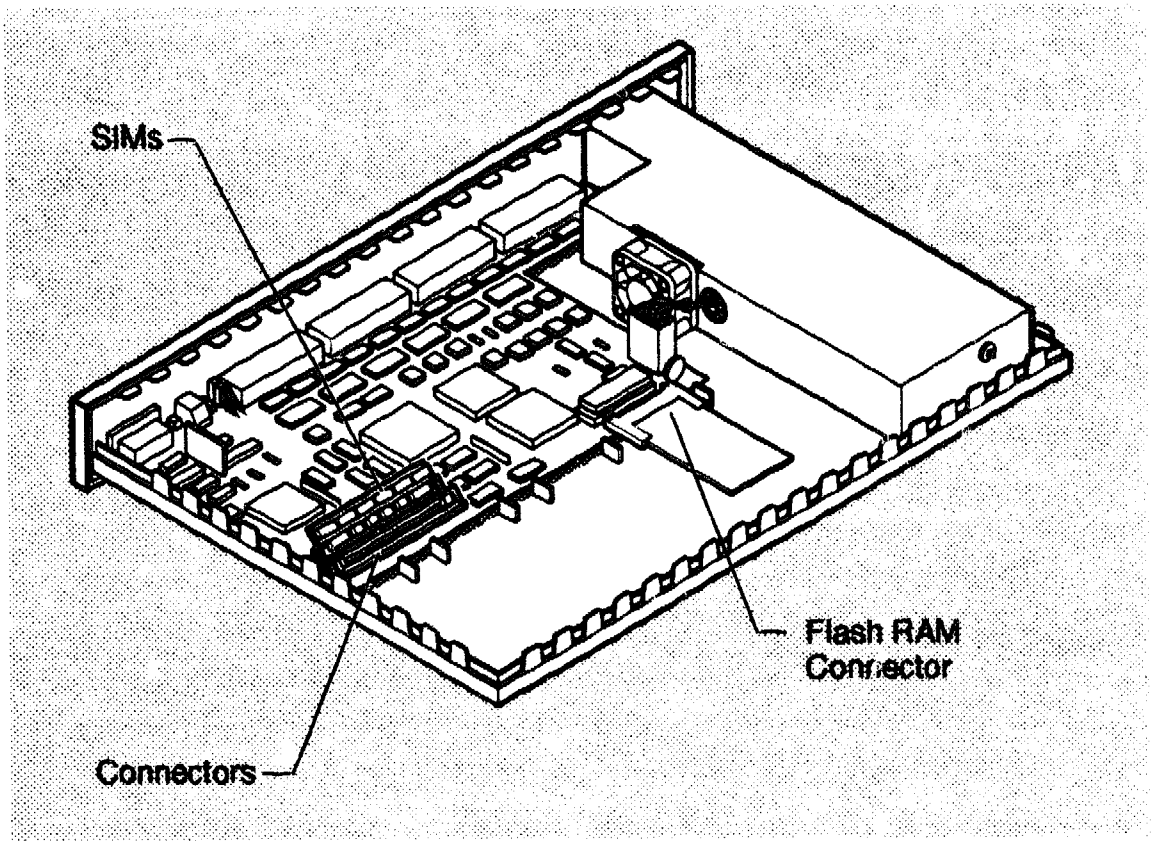

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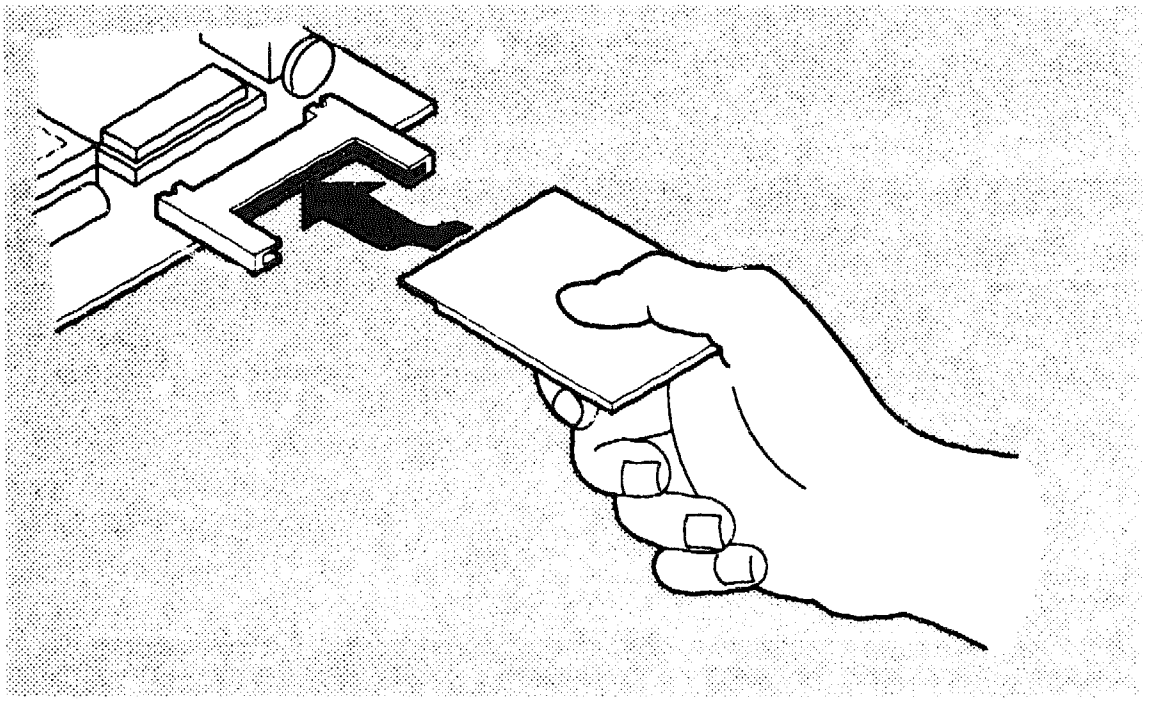
Figure 6–2: Inserting the Flash RAM Card



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7

What to Do If You Have Problems

This chapter helps you identify and correct problems you may encounter during and after the installation of the DECserver 700 hardware. The troubleshooting procedures are for diagnosing and correcting hardware-related problems only.

Notify the network manager if the troubleshooting procedures indicate the problem is software related or if the procedures do not correct the problem. Additional software troubleshooting information is provided in the *Network Access Server Problem Solving* manual.

Use the following to diagnose and troubleshoot the DECserver 700 problems:

- Seven-segment display
- System OK LED
- Console port messages

A full list of seven-segment display codes are shown at the end of this chapter. Refer to the *Network Access Server Management* manual for the procedure to configure a terminal to receive console port messages.

7.1 Diagnosing DECserver 700 Problems

Compare the state of the seven-segment display and the System OK LED with those shown in Table 7-1 and go to the section indicated for information on corrective action.

NOTE

On power up, the seven-segment display will show an "8". Allow about 3 minutes to elapse before determining the state of the display.

Table 7–1: Display/Indications

Device	Definition	State	Indication	Corrective Action
System OK LED	Diagnostic	On	Self-test passed	
		Off	[1]Fatal error	Section 7.4
		Flashing	[1]Nonfatal error	Section 7.5
Seven-segment display	Status/ diagnostic	Off	No power or display broken	Section 7.2
		"C", "d", "n"	SIM failure	Section 7.3
		Flashing	Fatal error	Section 6.4
		"3"	Load request backoff	Section 7.6
		Rotating segment pattern	DECserver 700 software executing	

[1]A fatal error means that the network access server cannot function. A nonfatal error means that the network access server can function with reduced capability (for example, one serial port not working).

7.2 Seven-Segment Display Off and System OK LED Off

Problem

Power is not reaching the DECserver 700 hardware.

Correction: Secure the power cable at the DECserver 700 and at the wall outlet and check the fuse in the power cable plug (if applicable).

Correction: Check the wall outlet using another appliance or light, or plug the DECserver 700 power cord into another outlet. If power is not available at the wall outlet, check the wall outlet's circuit breaker.

Correction: Check the power cord by substituting another one. If the first power cord is defective, replace it.

Problem

The DECserver 700 hardware is defective.

Correction: Notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation.

7.3 System OK LED Off/Seven-Segment Display Flashing "C", "d", or "n"

Problem

The DECserver 700 single-in-line memory (SIM) is faulty.

Correction: If the seven-segment display is flashing "C", replace the SIM in connector 1. If the seven-segment display is flashing "d", replace the SIM in connector 2. If no SIM or the wrong type of SIM is installed, the seven-segment display flashes "n". Refer to Section 5.1 for the procedure to replace a faulty SIM.

NOTE

If the SIM is found to be faulty, return the SIM to Digital Equipment Corporation.

7.4 System OK LED Off/Seven-Segment Display Flashing

Problem

A hardware error occurred that makes the DECserver 700 nonoperational.

Correction: There is no corrective procedure for this problem except for SIM failure (refer to note). Notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation.

7.5 System OK LED Flashing

If the System OK LED is flashing after power up, it indicates that the DECserver 700 has a nonfatal problem detected during self-test. The error message on the console terminal shows the primary problem.

To isolate and diagnose the problem, do the following:

1. Connect a console terminal to the console port (default port is port 1) of the DECserver 700, then power up the terminal. Refer to the *Network Access Server Management* manual for procedure to set up the console port.
2. Configure the terminal to operate with a speed of 9600 bits per second and a character size of 8 bits (no parity). (Refer to the specific terminal user's guide if you need help setting up the terminal parameters.)
3. Unplug the DECserver 700 power cord at the wall outlet, then reinsert it.
4. Read the error message that appears on the terminal display.

The following sections list the error messages that occur in conjunction with System OK LED flashing. Locate the section that describes the displayed error message and follow the recommended corrective action.

7.5.1 Error Message 952

Local -952- Enter ^P to repeat self-test

Problem

An error was detected on the Ethernet port.

Correction: The DECserver 700 displays this error message with error message 941. Refer to Section 7.5.3 for the correct action.

7.5.2 Error Message 922

Local -922- Port hardware error on port *n*

Problem

The specified port has failed self-test.

Correction: There is no corrective procedure for this condition. Notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or for replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation.

7.5.3 Error Message 941

Local -941- Transceiver loopback error

Problem

The Ethernet port has failed self-test.

Correction: Standard Ethernet/ ThinWire Ethernet - Disconnect the cables or MAU from the standard Ethernet connector and insert a loopback connector part number 12-22196-02. Test the hardware again by pulling out the power cord and reinserting it. If this corrects the problem, the fault is external to the DECserver 700. If this fails to correct the problem, notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or for replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation. If the DECserver 700 passes self-test, then the problem lies in the cables or equipment connected to the DECserver 700.

Correction: 10BaseT Ethernet – 10BaseT Ethernet cannot be checked by using a loopback connector on the DECserver 700. Replace the cables and device that is connected to the DECserver 700. If this corrects the problem, the fault is external to the DECserver 700. If this fails to correct the problem, notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or for replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation. If the DECserver 700 passes self-test, then the problem lies in the cables or equipment connected to the DECserver 700.

7.5.4 Error Message 967

Local –967– Parameter checksum error detected in NVRAM

Problem

Self-test has detected a checksum error in nonvolatile random-access memory (NVRAM) parameters.

Correction: Reset the DECserver 700 to the factory settings by pulling out the power cord and reinserting it while pressing the system reset switch until E shows on the seven-segment display. If this fails to correct the problem, notify the network manager that the DECserver 700 must be returned to Digital Equipment Corporation for repair or for replacement. Refer to the *Network Access Server Problem Solving* manual for information about returning the unit to Digital Equipment Corporation.

7.6 Seven-Segment Display Has a "3"

If the seven-segment display has a "3" after power up, the DECserver 700 has a downline loading problem. To isolate and diagnose the problem, do the following:

1. Connect a terminal to the console port of the DECserver 700, then power up the terminal.
2. Configure the terminal to operate with a speed of 9600 bits per second and a character size of 8 bits (no parity). (Refer to the specific terminal user's guide if you need help setting up the terminal parameters.)
3. Initialize the DECserver 700 by pressing Ctrl/P on your console terminal.
4. Read the message that appears on the terminal display.

Section 7.6.1 and Section 7.6.2 describe the messages that might appear on the terminal.

7.6.1 Downline Load Starts, Then Fails

The following sequence of messages appears on the console terminal at various time intervals:

Local -953- [IP] Attempting to locate load host, [ETHERNET]
Local -953- [MOP] Attempting to locate load host, [ISO8802]
Local -953- [MOP] Attempting to locate load host, [ETHERNET]
Local -955- [MOP] host xx-xx-xx-xx-xx-xx LOCATED [ETHERNET]
Local -956- [MOP] Requesting load from host xx-xx-xx-xx-xx-xx
Local -912- [MOP] Load failure, timeout

Problem

The host system failed to complete the downline load to the DECserver 700.

Correction: Copy the error message exactly as it appears on the console terminal display and notify the network manager. For more information, refer to the *Network Access Server Problem Solving* manual.

7.6.2 Downline Load Does Not Start

The following sequence of messages appears on the console terminal at various time intervals:

Local -953- [IP] Attempting to locate load host, [ETHERNET]
Local -953- [MOP] Attempting to locate load host, [ISO8802]
Local -953- [MOP] Attempting to locate load host, [ETHERNET]
Local -951- network access server will retry operation in n seconds

Problem

Load hosts not responding to the DECserver 700 downline load request within the allotted timeout period.

Correction: Copy the error message exactly as it appears on the console terminal display and notify the network manager. For more information, refer to the *Network Access Server Problem Solving* manual.

7.7 Seven-Segment Display Codes

The following page lists and describes the codes that will be displayed during the server internal self-test when the DECserver 700 goes through a power up and initialization.

Off	No power or display broken
8	Initial power on
F	Initialization
E	DECserver 700 internal test
d	SIM 1 test
C	SIM 2 test
b	DECserver 700 internal test
A	DECserver 700 internal test
9	DECserver 700 internal test
7	DECserver 700 internal test
5	NI external test
≡	Firmware loading from Flash RAM
4	Requesting load
3	Load request backoff
2	Loading
1	Requesting dump
0	Dumping
H	Hardware revision number incompatible with firmware revision number
n	No SIMs or wrong type SIMs installed
ROTATING	DECserver 700 is operating correctly

7.8 Network Activity LED

Table 7–2: Network Activity LED

Ethernet Selected	Connection Status	LED Display
10BaseT	Open/incorrectly terminated Correctly terminated / no network activity Correctly terminated / network activity	OFF ON FLASHING (rate independent of network activity)
Standard Ethernet	Open Correctly connected / no network activity Correctly connected / network activity	OFF OFF Flashing or ON, depending on network activity