DELQA-SF
Q-bus to Ethernet Adapter Option
Installation Guide

digital™

159 ×230

DELQA-SF
Q-bus to Ethernet Adapter Option
Installation Guide

Order No. EK-DELQA-IN-001

digital equipment corporation
maynard, massachusetts

First Edition, December 1987

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation.

Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The software, if any, described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license. No responsibility is assumed for the use or reliability of software or equipment that is not supplied by Digital Equipment Corporation or its affiliated companies.

Copyright ©1987 by Digital Equipment Corporation.

All Rights Reserved.
Printed in U.S.A.

The following are trademarks of Digital Equipment Corporation:

BASEWAY	FMS	RSTS
BI Bus	MASSBUS	RSX
DEC	Micro/RSTS	RT
DEC/MAP	MicroPDP-11	ThinWire
DECmate	Micro/RSX	UNIBUS
DECnet	MicroVAX II	VAX
DECUS	PDP	VAXcluster
DECwriter	P/OS	VAXstation II
DELNI	MicroVAX 3500	VAXstation II/GPX
DELQA	MicroVAX 3600	VMS
DEQNA	Professional	VT
DESTA	Q-bus	Work Processor
DIBOL	Q22-bus	
EDCS	Rainbow	

digital™

FCC NOTICE: The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense may be required to take measures to correct the interference.

Contents

About This Guide v

Chapter 1 Description

1.1 BA200 Series System Enclosure 1
1.2 DELQA-S Module 2

Chapter 2 Installation

2.1 Unpacking the Option Kit 4
2.2 Inspecting the EMI and EOS Clips 6
2.3 Software Backup 7
2.4 Checking the System Configuration 7
2.4.1 Guidelines for Module Placement 10
2.5 Configuring the DELQA Module 13
2.6 Finding CSR Addresses and Interrupt Vectors 15
2.7 Operating System Shutdown 17
2.8 Testing the Existing System 17
2.9 Relocating Modules 17
2.9.1 Modules with Blank Covers 17
2.9.2 Modules with Handles 19
2.10 Installing the DELQA Module 21
2.11 Verifying the Ground Connections 22

Chapter 3 Testing the New Configuration

3.1 Checking LED Test Patterns 25
3.2 Testing a MicroVAX System 27
3.3 Testing a MicroPDP-11 System 27
3.4 Reconnecting External Devices 28
3.5 Connecting the DELQA Module to the Network 28
3.6 Additional Tests 30
3.6.1 NIE Test Tool 30
3.6.2 Network Control Program (NCP) Test Tools 30

Figures

1–1 BA200 Series Enclosures 1
1–2 DELQA-S Module (M7516) with Bulkhead Handle 3
2–1 DELQA-SF Option Kit Contents 5
2–2 EMI and EOS Clips 6
2–3 BA200 Series Configuration Worksheets 8
2–4 Bus Grant Continuity Path 10
2–5 DELQA-SA Module Layout 13
2–6 Releasing the Captive Screws 18
2–7 Unlocking the Release Levers 20
2–8 Inserting the Module 21
2–9 Ground Connections 23
2–10 Attaching the Gap Filler Assembly 24
3–1 Connecting the External Cable 29

Tables

2–1 DELQA-SF Option Kit Checklist 5
2–2 Power and Bus Load Data 9
2–3 Recommended Module Order 12
2–4 DELQA Switches 13
2–5 DELQA Mode Differences 14
2–6 Devices Supported by SYSGEN 15
3–1 Power-Up LED Patterns 26
3–2 Remote Boot LED Patterns (Normal or DEQNA Mode) 26

About This Guide

This guide provides step-by-step instructions to install the DELQA-SF option kit in a BA200 series microsystem enclosure. The kit is designed for use in BA200 series enclosures only.

The DELQA module provides a high-speed asynchronous connection between a Q-bus system and a local area network (LAN) based on Ethernet.

Intended Audience

This document is intended only for Digital Field Service personnel or for qualified self-maintenance customers who have purchased a micro systems maintenance kit.

MicroVAX Systems Maintenance Kit	part number ZNABX-GZ, C5
MicroPDP-11 Systems Maintenance Kit	part number ZYABX-GZ, P5

For the Customer

If you are not qualified to perform the installation of the DELQA-SF option kit, call Digital Field Service to schedule an installation.

It is your responsibility to perform a software backup before Digital Field Service personnel arrive at the site. This step is important to ensure that data is not lost during installation.

CAUTION: *If you install the DELQA-SF option kit yourself, make sure you are wearing an antistatic wrist strap connected to a grounded antistatic work surface before you handle the modules. The system modules are susceptible to damage by static discharge.*

Also make sure the bus grant continuity path is intact after the installation. There cannot be any empty backplane slots between modules.

To install the DELQA-SF option kit, carefully follow the installation procedure in Chapter 2. If you have any difficulty performing the installation, call Digital Field Service for assistance.

For Field Service

Make sure you take precautions against static when unpacking and installing the module. Use the groundstrap and antistatic mat found in the Antistatic Kit, part number 29-26246-00. The Antistatic Kit is part of the Field Service tool kit, not the option kit.

To install the DELQA-SF option kit, carefully follow the installation procedure in Chapter 2.

Submit a LARS Form After the Installation: For information on completing this form, contact your unit manager.

Cautions and Notes

Cautions and notes appear throughout this guide. They have the following meanings.

Cautions	Provide information to prevent damage to equipment or software.
Notes	Provide general information about the current topic.

Related Documents

You can order the following documents from Digital. This guide refers to many of these documents.

Document	Order Number
DELQA User Guide	EK-DELQA-UG
MicroVAX Systems Maintenance Guide*	EK-O01AA-MG
MicroVAX 3500 and MicroVAX 3600 Systems Maintenance Update*	EK-159AA-UD
MicroPDP-11 Systems Maintenance Guide†	AZ-FI11A-MG
H4000 Ethernet Transceiver Field Maintenance Print Set	MP-01369
H4000 Ethernet Transceiver Technical Manual	EK-H4000-TM
The ETHERNET, a Local Area Network, Data Link Layer and Physical Layer Specifications	AA-K759B-TK
ETHERNET Installation Guide	EK-ETHER-IN

*These documents are included in the MicroVAX Systems Maintenance Kit (ZNABX-GZ, C5).

†This document is included in the MicroPDP-11 Systems Maintenance Kit (ZYABX-GZ, P5).

Document	Order Number
Introduction to Local Area Networks	EB-22714-18
MDM User's Guide	AA-FM7A-DN
Guide to Networking on VAX/VMS	AA-Y512B-TE
NIE User's Guide	AA-HIO6A-TE

Digital personnel may order these documents from:

Digital Equipment Corporation
444 Whitney Street
Northboro, MA 01532

Attn: Publishing and Circulation Services (NR03/W3) Order Processing Section

Customers may order documents from:

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

Chapter 1
Description

This chapter describes the BA200 series enclosure and the DELQA module.

1.1 BA200 Series System Enclosure

The BA200 series enclosure has a 6- or 12-slot Q-bus backplane. Figure 1–1 shows the 12-slot BA213 and the 6-slot BA214 enclosure chassis. The BA213 has one or two modular power supplies, and the BA214 has one power supply.

The backplane implements the Q22-bus on the AB rows of each slot. The CD interconnect is implemented on the CD rows of each slot. Fixed disk drives face the rear of the enclosure, providing easy access to the drive signal and power cables. A TK tape drive faces the front of the enclosure.

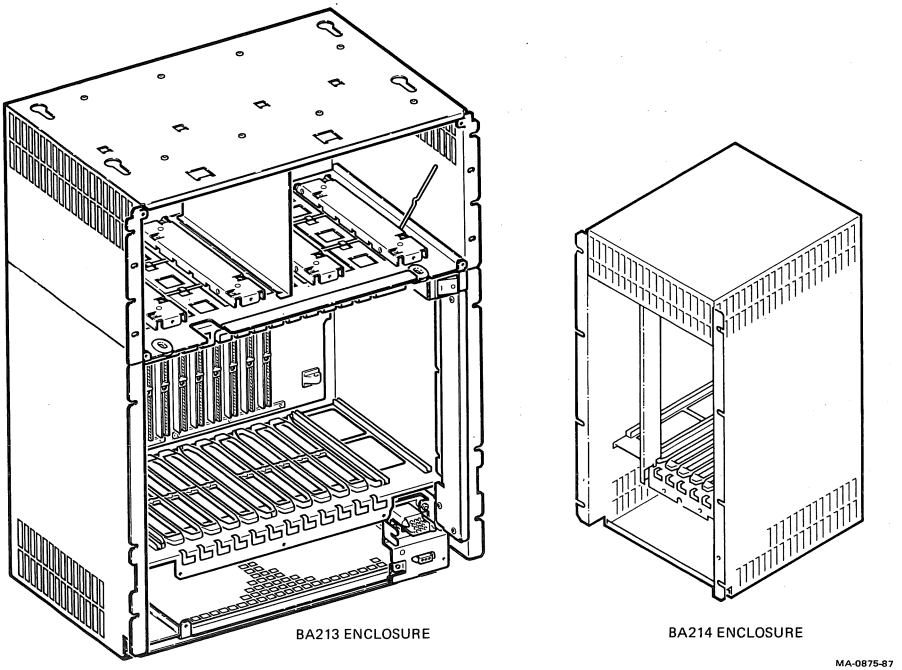


Figure 1–1 BA200 Series Enclosures

The major difference between the BA200 series enclosure and other microsystem enclosures is the way you connect external devices to the system. Modules in the BA200 series enclosure connect directly to external devices through I/O connectors on the module handles. Other enclosures require an insert panel and internal cabling between the option module and the device.

There are two main differences between the modules used in the BA200 series enclosure and the modules used in the other microsystem enclosures.

- Option modules with external I/O have attached bulkhead handles. These handles replace the insert panels and internal cabling found in the BA23 and BA123 enclosures.
- Non-I/O modules (such as memory modules) have blank bulkhead covers.

The module handles and blank covers form an electrical seal that complies with regulations for electromagnetic interference (EMI) for (1) keeping radio frequency interference generated by the system in the enclosure, and (2) keeping external radio frequencies from entering the enclosure. The module handles and blank covers also help guarantee proper airflow.

For more information: See the *MicroVAX Systems Maintenance Guide* to learn more about BA200 series enclosures.

1.2 DELQA-S Module

The DELQA module provides a high-speed asynchronous connection between a Q-bus system and a local area network (LAN) based on Ethernet. The quad-height DELQA-S module (Figure 1–2) is designed for the BA200 series enclosures.

Ethernet is a communication system that lets computers exchange data within a moderate distance (2.8 km/1.74 mi). The DELQA conforms to the Ethernet specification, Version 2.0, performing the data link layer functions and part of the physical layer functions.

The DELQA permits higher level software protocols, such as DECnet, to communicate over a 10 Mbit per second Ethernet. The DELQA connects through an Ethernet coaxial cable to:

- an H4000 transceiver,
- a DELNI local network interconnect, or
- a DESTA converter.

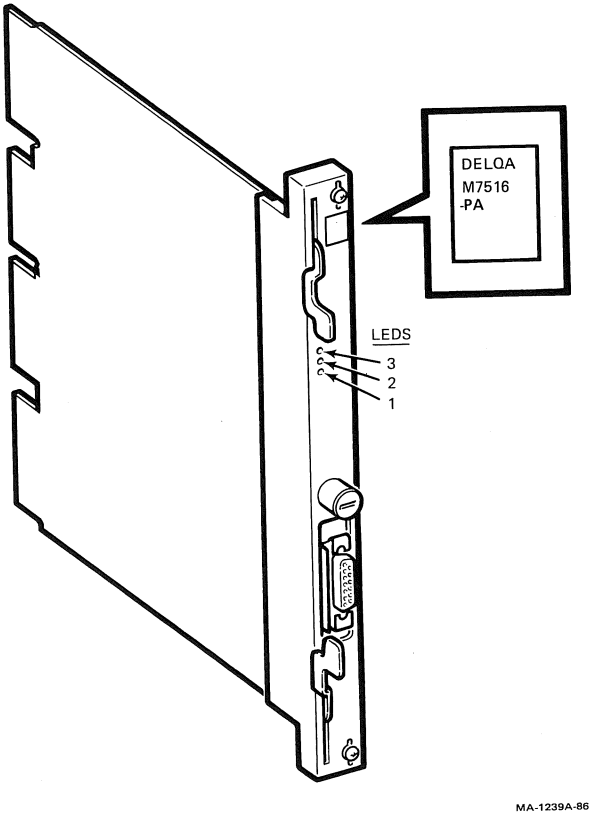


Figure 1–2 DELQA-S Module (M7516) with Bulkhead Handle

The DELQA is supported by MicroVMS Version 4.6 and offers two modes of operation.

DEQNA mode	Compatible with existing DEQNA software.
DELQA mode	Enhances the DEQNA mode with the addition of maintenance operation protocol (MOP) functions.

For more information: See the *DELQA User Guide* for DELQA specifications and operating information.

Chapter 2
Installation

This chapter provides step-by-step procedures for unpacking, inspecting, and installing the DELQA-SF option kit in a BA200 series enclosure. The chapter also discusses system and module configuration.

2.1 Unpacking the Option Kit

Unpack the shipment and check the contents as follows. If any item is missing or damaged:

- contact the customer's sales representative.
- contact the customer's delivery agent.

1. Look for external damage on the shipping container, such as dents, holes, or crushed corners.
2. Do not dispose of the packing material until you have installed the module and tested the system successfully.
3. Put on your antistatic wrist strap. Attach the alligator clip to the metal chassis of the BA200 series enclosure. Place the antistatic mat on your work surface.
4. Use Table 2–1 to identify the contents of the DELQA-SF option kit. The checklist numbers correspond to the numbered items in Figure 2–1.

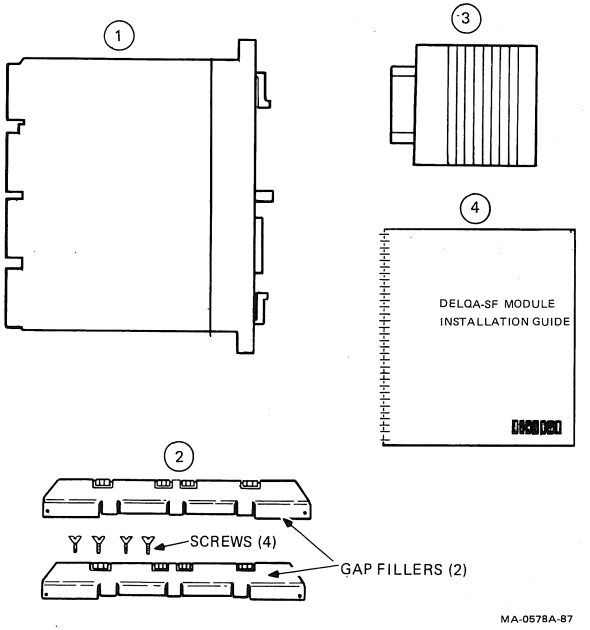


Figure 2–1 DELQA-SF Option Kit Contents

Table 2–1 DELQA-SF Option Kit Checklist

	Part Description	Part Number
1	DELQA-S Q-bus to Ethernet adapter module	M7516
2	Two gap filler assemblies, consisting of two gap fillers and four flathead screws	70-24505-01
3	Loopback connector	12-22196-02
4	Installation guide	EK-DELQA-IN

5. Remove the DELQA module from the antistatic bag.
6. Inspect the module for shipping damage. Carefully check for cracks, breaks, and loose components.

2.2 Inspecting the EMI and EOS Clips

To comply with regulations on electromagnetic interference (EMI), the bulkhead handles, blank covers, and gap fillers have transient protection EMI and electrical overstress (EOS) clips. These clips are grounded through the module handle.

1. Check the EMI and EOS clips on the DELQA handle for residue or corrosion on (Figure 2–2). Also check the EMI clips on the two gap fillers. Remove any residue or corrosion with alcohol.

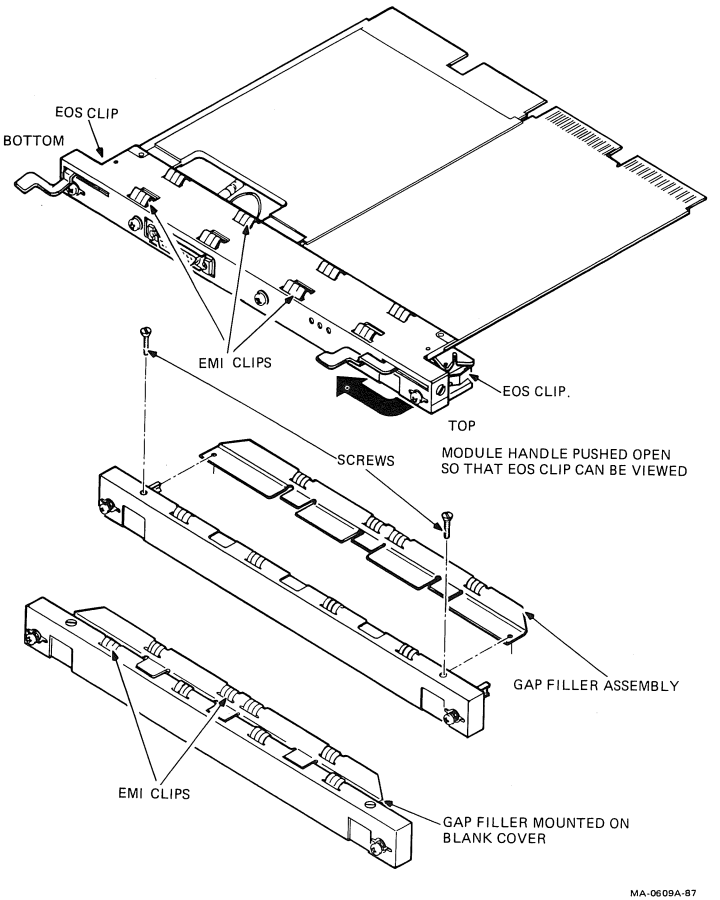


Figure 2–2 EMI and EOS Clips

2. Make sure the EMI and EOS clips are arched. When you press them slightly, they should return to their original shape.
3. If any clip is missing or broken, replace it.

EMI clip	part number 12-26340-01
EOS clip	part number 12-26922-01

4. Place the DELQA module on the antistatic mat.

2.3 Software Backup

It is the customer's responsibility to perform a software backup.

Make sure the customer has performed a software backup before you continue.

2.4 Checking the System Configuration

Before you install the DELQA option, you must complete a configuration worksheet for your BA200 series enclosure (Figure 2–3). This step ensures that you will not exceed the system's limits for power and bus loads.

You need to gain access to the modules installed in the system backplane before you configure the system. Refer to the system documentation for procedures to help you remove any covers and gain access to the modules. To check the system configuration, perform the following steps.

1. On the worksheet, list all the devices already installed in the system. Each module has an identifying label on the cover or handle.
2. List all the devices you plan to install in the system.
3. Fill in the information for each device, using the data listed in Table 2–2.
4. Add up the columns. Make sure the totals are within the limits for the enclosure.

12-SLOT ENCLOSURE

RIGHT–HALF POWER SUPPLY						
SLOT (ABCD)	MODULE	CURRENT 5 V	AMPS 12 V	POWER (WATTS)	BUS LOADS AC	BUS LOADS DC
1						
2						
3						
4						
5						
6						
MASS STORAGE >>> TAPE 1					0.0	0.0
>>> DISK 1					0.0	0.0
TOTAL: RIGHT–HALF POWER SUPPLY					—	—
MUST NOT EXCEED		33.0	7.0	230.0	—	—
LEFT–HALF POWER SUPPLY					—	—
SLOT (ABCD)	MODULE	CURRENT 5 V	AMPS 12 V	POWER (WATTS)	—	—
7						
8						
9						
10						
11						
12						
MASS STORAGE DISK					0.0	0.0
DISK					0.0	0.0
DISK					0.0	0.0
TOTAL LEFT-HALF POWER SUPPLY						
MUST NOT EXCEED		33.0	7.0	230.0 *		
TOTAL BUS LOADS						
MUST NOT EXCEED					35.0	20.0

6-SLOT ENCLOSURE

POWER SUPPLY						
SLOT (ABCD)	MODULE	CURRENT 5 V	AMPS 12 V	POWER (WATTS)	BUS LOADS AC	BUS LOADS DC
1						
2						
3						
4						
5						
6						
TOTAL: POWER SUPPLY					—	—
MUST NOT EXCEED		33.0	7.0	230.0 *	—	—
TOTAL: BUS LOADS						
MUST NOT EXCEED					35.0	20.0

* NOTE: POWER SUPPLIES MAY DIFFER. CHECK YOUR POWER SUPPLY SPECIFICATIONS TO CONFIRM THE MAXIMUM WATTAGE.

MA-0876-87

Figure 2–3 BA200 Series Configuration Worksheets

Table 2–2 Power and Bus Load Data

Option	Module	Current (Amps) (Max) +5 V	Current (Amps) (Max) +12 V	Power (Max) Watts	Bus Loads AC	Bus Loads DC
AAV11-SA	A1009-PA	1.8	0.0	9.0	2.1	0.5
ADV11-SA	A1008-PA	3.2	0.0	16.0	2.3	0.5
AXV11-SA	A026-PA	2.0	0.0	10.0	1.2	0.3
CXA16-M	M3118-YA	1.6	200 mA	10.4	3.0	0.5
CXB16-M	M3118-YB	2.0	0.0	10.0	3.0	0.5
CXY08-M	M3119-YA	1.8	300 mA	12.6	3.2	0.5
DELQA-SA	M7516-PA	2.7	0.5	19.5	2.2	0.5
DEQNA-SA	M7504	3.5	0.50	23.5	2.2	0.5
DFA01	M3121-PA	1.97	0.40	14.7	3.0	1.0
DPV11-SA	M8020-PA	1.2	0.30	9.6	1.0	1.0
DRQ3B-SA	M7658-PA	4.5	0.0	22.5	2.0	1.0
DRV1J-SA	M8049-PA	1.8	0.0	9.0	2.0	1.0
DRV1W-SA	M7651-PA	1.8	0.0	9.0	2.0	1.0
DZQ11-SA	M3106-PA	1.0	0.36	9.3	1.4	0.5
IBQ01-SA	M3125-PA	5.0	0.0	25.0	4.6	1.0
IEQ11-SA	M8634-PA	3.5	0.0	17.5	2.0	1.0
KA620-AA	M7478	6.2	0.14	32.7	2.7	1.0
KA630-AA	M7606	6.2	0.14	32.7	2.7	1.0
KA650-AA	M7620-A	6.4	0.14	33.6	2.7	1.0
KDA50-Q	M7164	6.93	0.0	34.65	3.0	0.5
KDA50-Q	M7165	6.57	0.03	33.21	–	–
KDJ11-BF	M8190	5.5	0.2	29.9	2.6	1.0
KLESI-SA	M7740-PA	3.0	0.0	15.0	2.3	1.0
KMV1A-SA	M7500-PA	2.6	0.2	15.4	3.0	1.0
KWV11-SA	M4002-PA	2.2	13 mA	11.156	1.0	0.3
LPV11-SA	M8086-PA	1.6	0.0	8.0	1.8	0.5
MRV11-D	M7942	1.6*	0.0	8.0*	3.0	0.5
M9060-YA		5.3	0.0	26.5	0.0	0.0
MS630-AA	M7607	1.0	0.0	5.0	–	–
MS630-BA	M7608	1.8	0.0	9.0	0.0	0.0
MS630-CA	M7609	3.1	0.0	15.5	0.0	0.0
MS650-AA	M7621-A	2.7	0.0	13.5	–	–
MSV11-JD	M8637-D	3.74	0.0	18.7	2.7	0.5

*Value is for the unpopulated module only.

Table 2–2 (Cont.) Power and Bus Load Data

		Current (Amps) (Max)		Power (Max)	Bus Loads	
Option	Module	+5 V	+12 V	Watts	AC	DC
MSV11-JE	M8637-E	4.1	0.0	20.5	2.7	0.5
MSV11-QA	M7551-AA	2.4	0.0	12.0	2.0	1.0
RA70		3.8	4.2	69.4	-	-
RD53A-EA		0.9	2.5	34.5	0.0	0.0
RD54A-EA		1.3	1.34	22.6	0.0	0.0
RQDX3-M	M7555	2.48	0.06	13.1	1.9	0.5
TK50E-EA		1.35	2.4	35.6	0.0	0.0
TK70E-EA		1.3	2.4	35.3	-	-
TQK50	M7546	2.9	0.0	14.5	2.8	0.5
TQK70-SA	M7559	3.5	0.0	17.5	4.3	.5
TSV05-SA	M7196	6.5	0.0	32.5	3.0	1.0

2.4.1 Guidelines for Module Placement

Bus Continuity

Bus grant signals pass through each installed module, using the A connectors of each slot. Figure 2–4 shows the path of the bus grant signals. To ensure the continuity of this path, use bus grant continuity cards (M9047) in empty backplane slots.

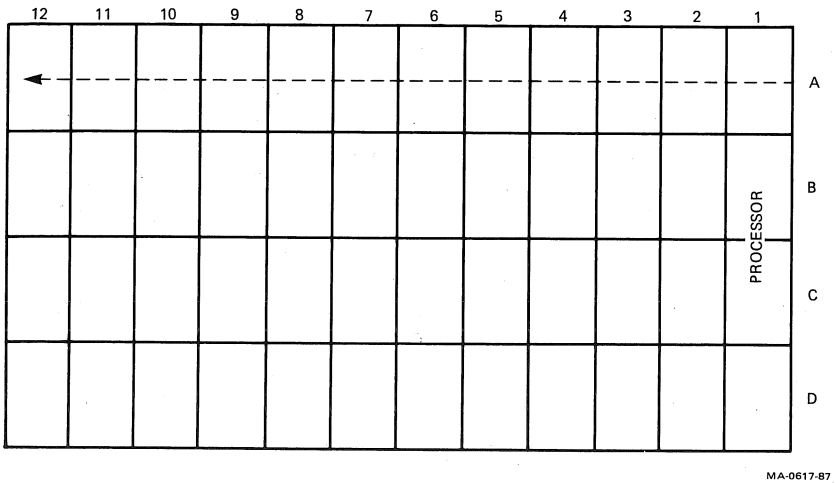


Figure 2–4 Bus Grant Continuity Path

Power Supplies

The BA200 series enclosure contains one or two 230 watt power supplies.

- A 12-slot enclosure has one or two power supplies.
  - If there is one power supply, it is to the right of the backplane.
  - If there are two power supplies, the one to the right of the backplane powers slots 1 through 6, and the one to the left of the backplane powers slots 7 through 12.
- A 6-slot enclosure has one power supply, to the left of the backplane.

Each power supply in the enclosure must have a minimum 5 amp load on the 5 volt output, to maintain regulation. If a power supply does not meet the minimum load requirement, you *must* install an M9060-YA load module in one of the open backplane slots powered by that power supply. Otherwise, the power supply enters an error mode and shuts down the system.

If a power supply meets the minimum load requirement, you should remove an existing load module.

See Section 2.9 for procedures on installing or removing load modules.

Module Order

The order of modules in the backplane depends on four factors.

- The relative use of devices in the system
- The expected performance of each device relative to other devices
- The ability of a device to tolerate delays between bus requests and bus grants (delay tolerance)
- The tendency of a device to prevent devices farther from the CPU from accessing the bus

The maximum number of DELQAs allowed is two for each system. The DELQA(s) should be the highest priority device(s) on the Q22-bus (the DMA devices nearest to the CPU).

Table 2–3 lists the recommended order of modules in a BA200 series enclosure. Use the table as a guideline when installing modules.

Table 2–3 Recommended Module Order

MicroVAX	MicroPDP-11/53	MicroPDP-11/83
KA620/KA630/KA650	KDJ11-SA/-SB	MSV11-JD/-JE
MS630-B/-C/MS650-A	MSV11-QA	KDJ11-BF
TSV05	TSV05	TSV05
MRV11	MRV11	MRV11
AAV11	AAV11	AAV11
ADV11	ADV11	ADV11
KWV11	KWV11	KWV11
AXV11	AXV11	AXV11
DEQNA/DELQA	DEQNA/DELQA	DEQNA/DELQA
DPV11	DPV11	DPV11
DFA01	DFA01	DFA01
DZQ11	DZQ11	DZQ11
CXA16	CXA16	CXA16
CXB16	CXB16	CXB16
CXY08	CXY08	CXY08
LPV11	LPV11	LPV11
KDA50	KDA50	KDA50
KLESI	KLESI	KLESI
IEQ11	IEQ11	IEQ11
DRV1J	DRV1J	DRV1J
DRQ3B	DRQ3B	DRQ3B
DRV1W	DRV1W	DRV1W
IBQ01	TQK50/TQK70	TQK50/TQK70
TQK50/TQK70	RQDX3	RQDX3
RQDX3		

2.5 Configuring the DELQA Module

You configure the DELQA by using a switchpack (Figure 2–5). The switchpack has five switches, S1 through S5. Table 2–4 lists their functions. The DELQA is shipped from the factory with all five switches closed.

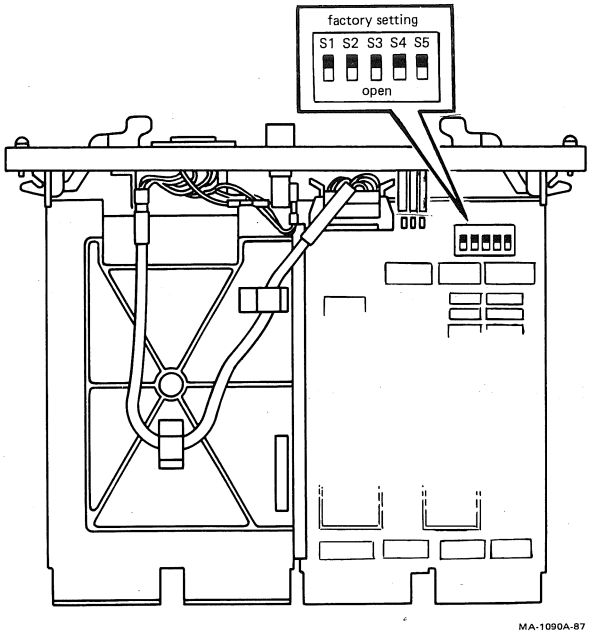


Figure 2–5 DELQA-SA Module Layout

Table 2–4 DELQA Switches

Switch	Setting	Function
S1	closed open	Selects CSR address 17774440. (factory) Selects CSR address 17774460 (for second DELQA).
S2	–	Reserved.
S3	closed open	Selects normal mode. (factory) Selects DEQNA lock mode.
S4	closed, and S3 closed open, and S3 closed open, and S3 open closed, and S3 open	Remote Boot off. (factory) Remote Boot on. Sanity timer on. Sanity timer off.
S5	–	Reserved.

The DELQA can operate in DEQNA mode or normal (DELQA) mode, which you select using S3. Note that S4 is an option switch, whose function depends on the position of S3.

The sanity timer enabled by S4 monitors the host for hardware or software malfunctions. You should enable the sanity timer *only* for specific applications.

CAUTION: *If you enable the sanity timer in DEQNA mode and download software or diagnostics, the sanity timer may time out before the load is complete, causing the system to reboot.*

The DELQA interrupt vector of 120 is written into a read/write register by software. If you install a second DELQA, its interrupt vector floats, with a rank of 47.

Table 2–5 lists the differences between DEQNA lock mode and normal mode.

Table 2–5 DELQA Mode Differences

Support	DEQNA Lock Mode	Normal Mode
All DEQNA functions	yes	yes
Maintenance operation protocol (MOP) functions	no	yes
Self test support	yes	yes
Boot/diagnostic code support	yes	yes
Sanity timer	yes	no

2.6 Finding CSR Addresses and Interrupt Vectors

When you add a DELQA module to the backplane, you may need to reconfigure the modules already installed. Use the following procedures to find new CSR addresses and interrupt vectors for the modules, if necessary.

MicroPDP-11 Systems

To find CSR addresses and interrupt vectors for modules in a MicroPDP-11 system, see the *MicroPDP-11 Systems Maintenance Guide.*

MicroVAX System

For modules in a MicroVAX system, you can (1) manually calculate CSR addresses and interrupt vectors, or (2) use the CONFIG program. To manually calculate values, see Chapter 5 of the *MicroVAX Systems Maintenance Guide.*

The CONFIG program is in the MicroVMS or VMS SYSGEN utility. When you type in a list of the devices in the system, CONFIG automatically provides CSR address and interrupt vector information. Table 2–6 lists the devices supported by this utility.

Table 2–6 Devices Supported by SYSGEN

Device	Enter at DEVICE> Prompt
CXA16	DHV11
CXY08	DHV11
DELQA	QNA
DEQNA	QNA
DPV11	DPV11
DRV1W	DR11W
DZQ11	DZ11
IEQ11	IEQ11
RQDX3	UDA
TQK50/TQK70	TU81
TSV05	TS11

To use the SYSGEN utility, follow these steps.

1. Plug the ac power cord into the wall outlet and turn the I/O power switch on (1).
2. Type the following command at the system command prompt.

   MCR SYSGEN

3. Press Return. The utility responds with the prompt

   SYSGEN>

4. At the prompt, type

   CONFIGURE

5. Press Return. The utility responds with the prompt

   DEVICE>

6. Enter the abbreviation for each system device Table 2–6. Include those devices already installed and those you intend to install.

   Enter one abbreviation per line, then press Return. The DEVICE> prompt prompts you for another entry. If you are installing more than one unit of a particular device, enter a comma and the number of devices after the abbreviation. For example, DHV11,2 indicates two DHV11 modules.

7. After you have entered all devices, type Ctrl Z. The program displays the following information for each device you entered.

   CSR address and vector
   the name assigned to the device by the operating system
   the operating system support status (yes or no)

   The program uses an asterisk (*) to indicate a floating address or vector. If there is more than one unit of a particular device, the first address refers to the first device to be installed.

8. To exit from the SYSGEN utility, type **EXIT** at the SYSGEN prompt and press Return.

2.7 Operating System Shutdown

It is the customer's responsibility to shut down the operating system software.

Make sure the customer shuts down the operating system software before you continue. Have the customer leave the system power on.

2.8 Testing the Existing System

Test the existing system as follows.

1. Insert the diagnostic tape cartridge into the tape drive. Use the MicroVAX diagnosic monitor (MDM) for a MicroVAX system, or XXDP+ for MicroPDP-11 systems.
2. Test the existing system to make sure it is running properly. See Chapter 3 for more information on testing and troubleshooting.
3. After the successful completion of the test, remove the tape cartridge and turn the I/O power switch off (0). Unplug the ac power cord from the wall outlet.

   CAUTION: *Always remove the tape cartridge before turning power off.*

2.9 Relocating Modules

CAUTION: *Only qualified service personnel should remove or install modules.*

Check the recommended module order listed in Section 2.4.1 to determine which slot you should install the DELQA module in. If you need to relocate modules in the backplane, use the following procedures and keep the modules in their original order.

2.9.1 Modules with Blank Covers

Use the following procedure to remove and install modules with blank covers.

CAUTION: *Make sure you are wearing a grounded antistatic wrist strap when you remove or install modules.*

1. Release the two 1/4-turn captive screws that hold the blank cover to the card cage (Figure 2–6).

2. Pull the blank cover away from the card cage.

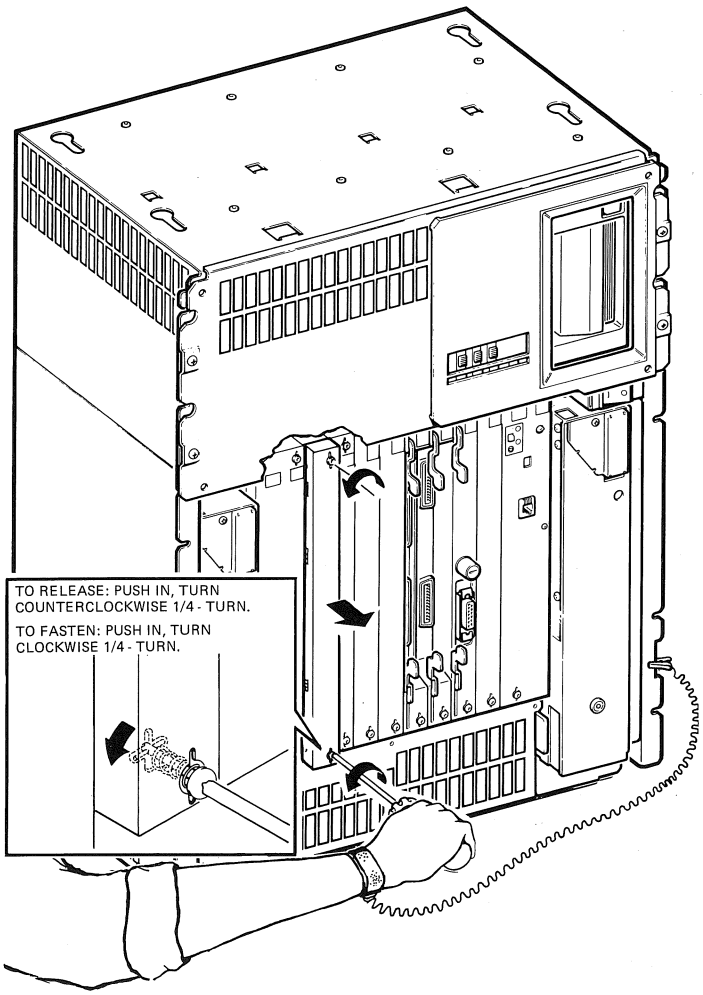


Figure 2–6 Releasing the Captive Screws

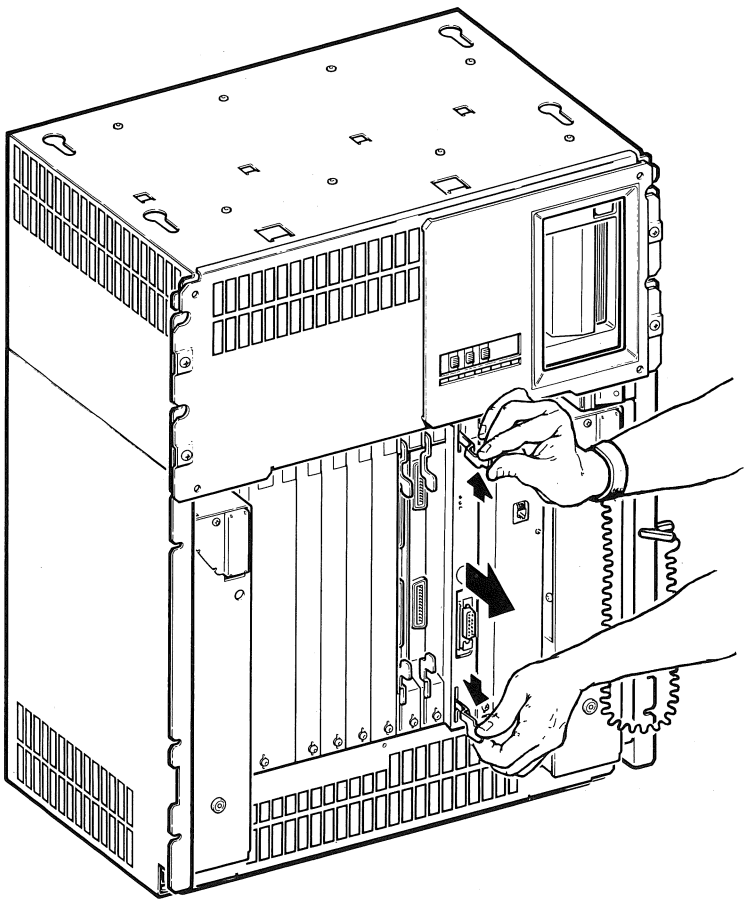
3. Note the orientation of any internal cables connected to the module. Some connectors are not keyed. Carefully label and disconnect the internal cables.
4. Unlock the module's release levers by simultaneously pulling up on the top lever and pulling down on the bottom lever. For a module with a plastic handle, pull out on the plastic handle.
5. Carefully pull the module out of the card cage.
6. Confirm the module's CSR address and interrupt vector (Section 2.6) and change jumpers or switch settings if necessary. If no change is necessary, be careful not to disturb any switch packs on the module.
7. Install the module in its new location by reversing the steps in this procedure. Do not fasten the 1/4-turn screws yet.

2.9.2 Modules with Handles

Use the following procedure to remove and install modules with handles.

CAUTION: *Make sure you are wearing a grounded antistatic wrist strap when you remove or install modules.*

1. Note the orientation of external cables connected to the module. *Carefully* label and then disconnect the cables.
2. Release the two 1/4-turn captive screws that hold the module's handle to the card cage (Figure 2–6).
3. Unlock the release levers by simultaneously pulling up on the top lever and pulling down on the bottom lever (Figure 2–7).
4. Pull out on the module's handle and remove the module from the card cage.
5. Confirm the module's CSR address and interrupt vector (Section 2.6). Change jumpers or switch settings if necessary. If no change is necessary, be careful not to disturb any switchpacks on the module.
6. Install the module in its new location by reversing the steps in this procedure. Do not fasten the 1/4-turn screws yet.



NOTE:
THIS ILLUSTRATION SHOWS HOW TO
UNLOCK RELEASE LEVERS ON ALL
MODULES WITH ATTACHED HANDLES.

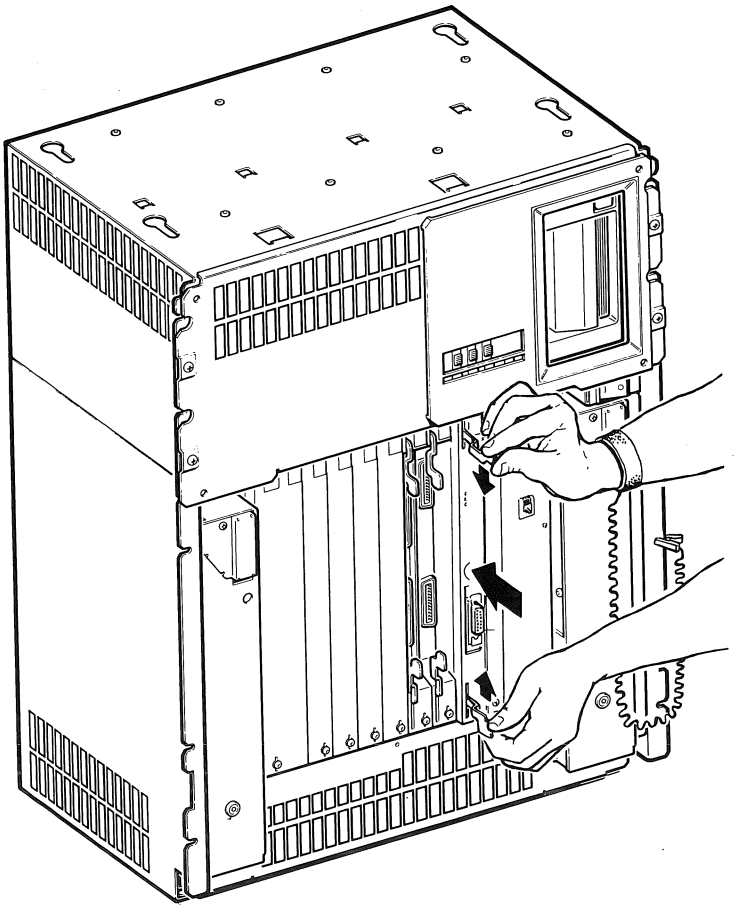
MA-0588-87

Figure 2–7 Unlocking the Release Levers

2.10 Installing the DELQA Module

CAUTION: *Be careful not to snag the module's components on the card guides or adjacent modules.*

1. Insert the DELQA module into the appropriate card slot, using the recommended module order listed in Section 2.4.1.
2. Grasp the module's top and bottom release levers. Lock the module in place by simultaneously pushing the top lever down and pulling the bottom lever up (Figure 2–8).
3. Do not fasten the 1/4-turn captive screws.



NOTE:
THIS ILLUSTRATION SHOWS HOW TO LOCK RELEASE LEVERS AND INSERT ALL MODULES WITH ATTACHED HANDLES.

MA-0590-87

Figure 2–8 Inserting the Module

2.11 Verifying the Ground Connections

If you install a module with a blank cover or flush handle next to a recessed-handle module, you *must* install a gap filler assembly between the modules to meet EMI regulations. Without the gap filler, circuitry on the recessed handle module is exposed.

Two gap filler assemblies (part number 70-24505-01) are provided with the option kit. Each gap filler assembly includes one gap filler and two screws. Use as many of the assemblies as you need for your configuration.

Check that the ground connections are correctly in place as follows.

1. Check the backplane to see if any recessed-handle module is next to a module with a blank cover or a flush handle.
2. If so, make sure a gap filler assembly is installed on the side of the blank cover or flush handle that is next to the recessed-handle module (Figure 2–9).

   NOTE: *There should not be any open spaces between the modules in the backplane.*
3. If there are no open spaces, you do not need to install any gap filler assemblies. Fasten the 1/4-turn captive screws on all handles and covers in the backplane.

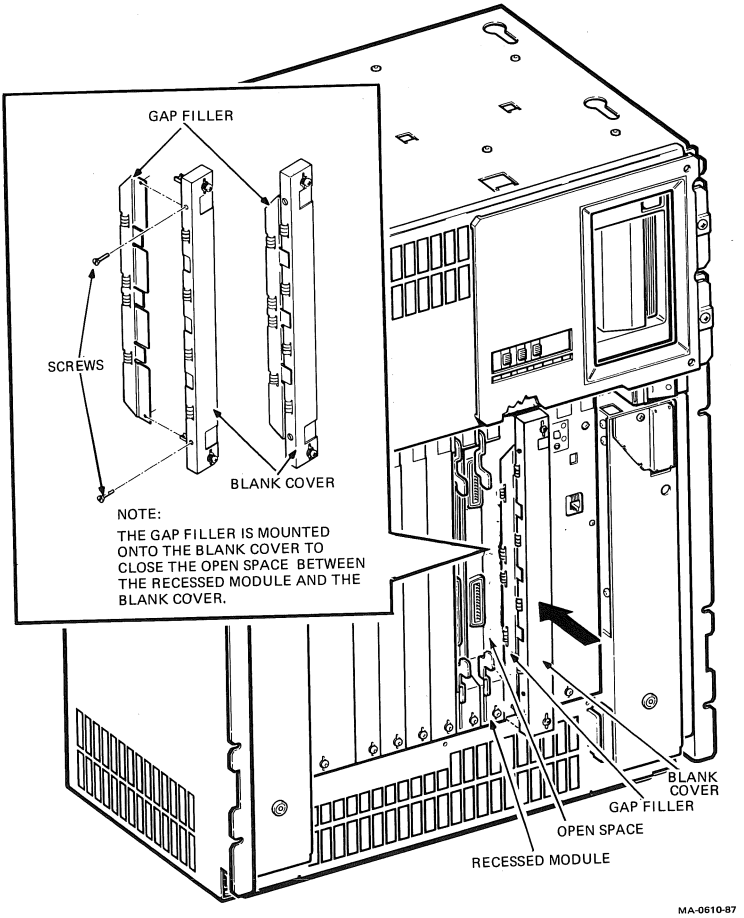


Figure 2–9 Ground Connections

4. If needed, install a gap filler assembly as follows.

   a. Fit the gap filler (part number 70-24505-01) onto the side of the blank cover or flush-handle module that is next to the recessed-handle module. Make sure the gap filler's tabs fit into the tab indentations on the blank cover or flush handle (Figure 2–10). Use the two screws that come with the assembly to attach the gap filler at the top and bottom.

   b. If you have a blank cover, place the blank cover with the gap filler over the card cage slot.

      If you have a flush-handle module, insert the module into the card slot.

   c. Make sure there is correct ground (no open spaces) between the two modules.

   d. Fasten the 1/4-turn captive screws on all handles and covers in the backplane.

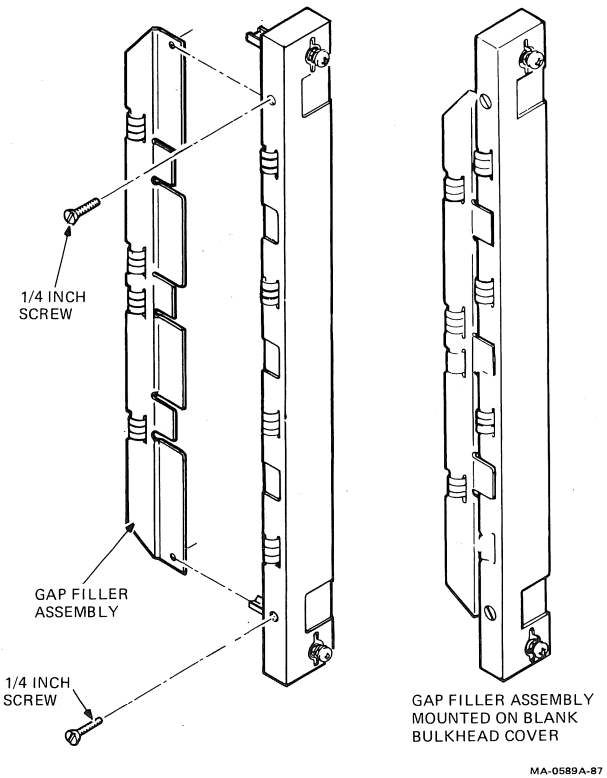


Figure 2–10 Attaching the Gap Filler Assembly

Chapter 3
Testing the New Configuration

This chapter describes the tests and procedures you should use to complete the DELQA installation.

3.1 Checking LED Test Patterns

The DELQA module has a power-up self-test that performs an external loopback test through the Ethernet transceiver or a loopback connector. The self-test is only available when the DELQA is in normal mode. The host operating system software can request the self-test through the DELQA Q-bus register.

Use the following procedure to check that the DELQA module is operating correctly.

1. Attach the loopback connector (part number 12-22196-02) to the 12-pin D-subminiature connector on the DELQA handle.
2. Plug the ac power cord into the wall outlet and turn the I/O power switch on (1).
3. Type in the following console command at the >>> prompt.

```
B XQA0
```

4. Use Table 3–1 to check the patterns displayed by the three nonflashing LEDs on the module. The LED display is only accurate the first time you run the tests. To reset the LEDs, you must power down and then power up the system.

Table 3–1 Power-Up LED Patterns

LED			
1	2	3	Definition
Normal Mode			
•	•	•	Running the internal logic self-test.
•	•	o	The self-test is running an external loopback test.
•	•	•	Ready to run citizenship tests and/or normal functions, or run the module self-test.
DEQNA Mode			
•	•	•	LEDs turn on and stay on.

• = on. o = off.

Whether the DELQA is in normal mode or DEQNA mode, make sure all three LEDs are on, indicating a successful power-up.

Remote Boots: Check the LED patterns in Table 3–2 (1) if you initiate an Ethernet boot in normal mode or DEQNA mode, or (2) if software initiates a citizenship test.

Table 3–2 Remote Boot LED Patterns (Normal or DEQNA Mode)

LED			
1	2	3	Definition
o	•	•	Running citizenship tests.
o	o	•	Internal loopback citizenship tests completed successfully.
o	o	o	External loopback citizenship tests completed successfully.

• = on. o = off.

Confirm that all three LEDs are off, indicating that all citizenship tests completed successfully.

3.2 Testing a MicroVAX System

Use the MicroVAX diagnostic monitor (MDM) to test a MicroVAX system. This software provides the following five groups of menu-driven tests.

NOTE: *For BA214 enclosures, use the Ethernet Server Kit (ZNA07-CM, -CP, or -C5) to test the system.*

Verify mode functional tests	user or field service
Verify mode exerciser tests	user or field service
Service mode functional tests	field service
Service mode exerciser tests	field service
Utility tests	field service

1. Boot the MDM media.
2. Type **2** at the main menu, so the diagnostics can identify the new module and add it to the configuration file.

   Look at the list of devices displayed to make sure the new module is included. If it is not included, repeat the installation sequence and make sure the you have set the module switches correctly.
3. Run the verify mode functional tests and exerciser tests.
4. Run the service mode exerciser tests. These tests require a loopback connector, provided with the maintenance kit. See the *MDM User's Guide* for information on how to run the tests.

These tests should complete without error. If an error occurs, see Chapter 6 of the *MicroVAX Systems Maintenance Guide* for troubleshooting procedures.

3.3 Testing a MicroPDP-11 System

Use XXDP+ to test a MicroPDP-11 system.

NOTE: *XXDP+ diagnostic support is not available for the MicroPDP-11 system in the 6-slot BA214 enclosure.*

1. Boot the MicroPDP-11 customer diagnostic media.
2. Type **2** at the main menu, so the diagnostics can identify the new module and add it to the configuration file.

Look at the list of devices displayed to make sure the new module is included. If it is not included, repeat the installation sequence and make sure you have set the module switches correctly.

The MicroPDP-11 Maintenance Kit (ZYABX-GZ, C5) lets you:

- run individual diagnostic programs under the XXDP+ diagnostic monitor.
- configure and run DEC/X11 system test programs.

DEC/X11 checks to see if the system is operating correctly. The exerciser is made up of different modules, one for each option present. If you remove or install options, you must reconfigure the exerciser. Do not run DEC/X11 until all individual device diagnostics have run without error.

The tests should complete without error. If an error occurs, see Chapter 4 of *MicroPDP-11 Systems Maintenance Guide* for troubleshooting procedures and more instructions on how to run XXDP+.

3.4 Reconnecting External Devices

After you complete the tests successfully, reconnect external devices to the system as follows.

1. Remove the tape cartridge from the BA200 series enclosure and turn the I/O power switch off (0). Unplug the ac power cord from the wall outlet.
2. **Carefully** reconnect any external devices you may have disconnected from modules. Make sure you reconnect the external cables to their correct modules.

3.5 Connecting the DELQA Module to the Network

Make the network connection to the DELQA module as follows.

1. Use an Ethernet transceiver cable (part number BNE3B or BNE3D). The cable has a male connector at one end and a female connector at the other end.
2. Plug the male connector into the female connector on the DELQA handle. Slide up the locking device on the bottom of the female connector to secure the connection (Figure 3–1).

3. Connect the other end of the cable to one of the following devices.
   - An H4000 transceiver, located on a traditional baseband Ethernet cable
   - A DELNI unit, which can be connected to a baseband Ethernet cable or can connect up to eight systems in a local area network
   - A DESTA converter, which connects to a ThinWire network
4. Install any covers you removed to gain access to the modules.
5. Have the customer bring up the operating system software. The installation procedure is now complete.

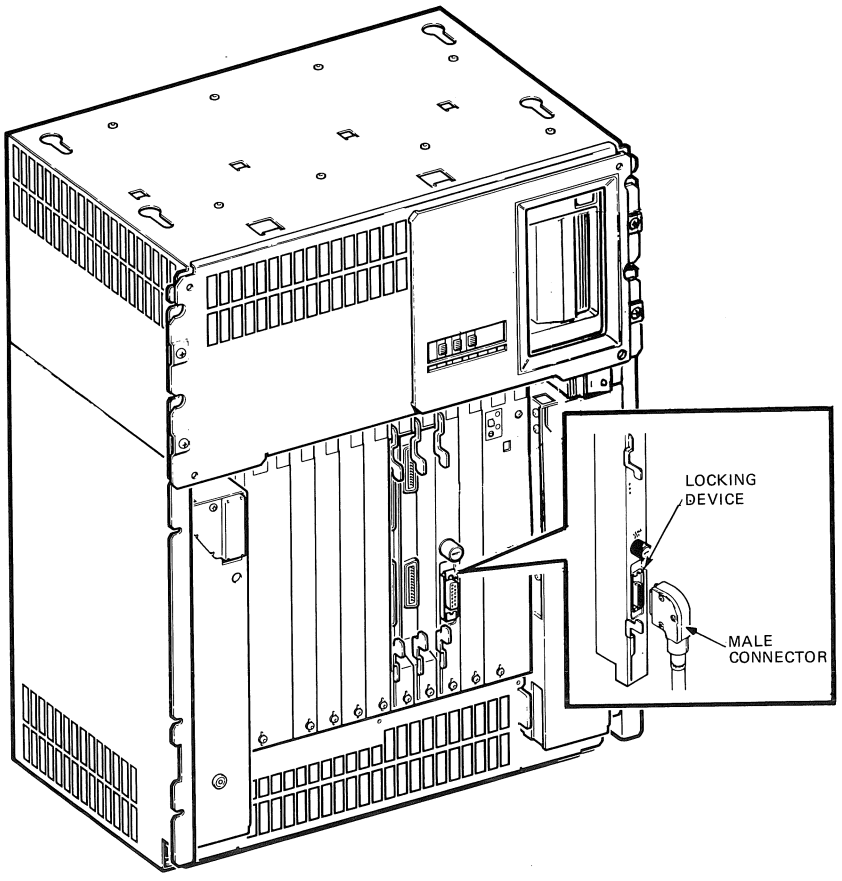


Figure 3–1 Connecting the External Cable

3.6 Additional Tests

The following sections describe additional tests you may need to perform for the customer.

3.6.1 NIE Test Tool

The MicroVAX diagnostic monitor (MDM) has a test that lets you run the network interconnect exerciser (NIE). NIE lets you test whether nodes on an Ethernet can communicate with each other. You can determine the volume and type of messages moving throughout the network. This can help you isolate communication problems.

NIE operates at the data link level of Ethernet architecture and uses the loopback features of the maintenance operation protocol (MOP). NIE also operates on comparable levels of non-Digital nodes that may be in the network. Because NIE operates at the lower layers of the network architecture, you can only use NIE at the early stages of network installation.

You can have NIE loop a predefined message to specified network nodes. You can include a specific node, pair of nodes, group of nodes, or all nodes in the loop path. NIE displays or prints out statistics recorded by the test.

You can run NIE on one node without affecting other data in the network.

For more information: See the *NIE User's Guide.*

3.6.2 Network Control Program (NCP) Test Tools

The VAX/VMS network control program (NCP) provides several tests to help you determine if the network is operating correctly. These tests let you exercise network software and hardware by sending data through various network components and returning that data to its source. You must start the DECnet and VMS software before running NCP tests.

There are two types of DECnet and VMS tests.

- Node-level loopback tests
- Circuit-level loopback tests

Use node-level tests to evaluate the operation of logical links, routing, and other network-related software. Use circuit-level tests to evaluate the operation of circuits. Use node-level tests first, then circuit-level tests.

For more information: See the *MicroVAX Systems Maintenance Guide.*

DELQA-SF Q-bus to Ethernet Adapter
Option Installation Guide
EK-DELQA-IN-001

READER'S COMMENTS

Your comments and suggestions will help us in our efforts to improve the quality of our publications.

1. **How did you use this manual? (Circle your response.)**

   (a) Installation (c) Maintenance (e) Training
   (b) Operation/use (d) Programming (f) Other (Please specify.) _____

2. **Did the manual meet your needs? Yes ☐ No ☐ Why?** _____

3. **Please rate the manual on the following categories. (Circle your response.)**

	Excellent	Good	Fair	Poor	Unacceptable
Accuracy	5	4	3	2	1
Clarity	5	4	3	2	1
Completeness	5	4	3	2	1
Table of Contents, Index	5	4	3	2	1
Illustrations, examples	5	4	3	2	1
Overall ease of use	5	4	3	2	1

4. **What things did you like *most* about this manual?** _____

5. **What things did you like *least* about this manual?** _____

6. **Please list and describe any errors you found in the manual.**

Page	Description/Location of Error
_____	_____
_____	_____
_____	_____
_____	_____

Name _____ Job Title _____
Street _____ Company _____
City _____ Department _____
State/Country _____ Telephone Number _____
Postal (ZIP) Code _____ Date _____

THANK YOU FOR YOUR COMMENTS AND SUGGESTIONS.

Please do not use this form to order manuals. Contact your representative at Digital Equipment Corporation or (in the USA) call our DECdirect™ department at this toll-free number: 800-258-1710.

© 1987 by Digital Equipment Corporation.

MYO

FOLD HERE AND TAPE. DO NOT STAPLE.

digital™

No Postage Necessary if Mailed in the United States

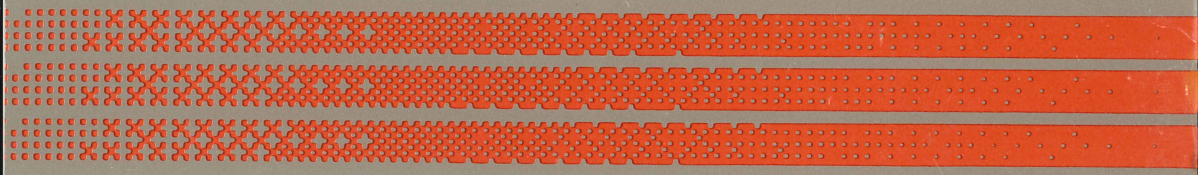
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 33 MAYNARD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

DIGITAL EQUIPMENT CORPORATION
Educational Services/Quality Assurance
12 Crosby Drive BUO/E08
Bedford, MA 01730-1493
USA

FOLD HERE AND TAPE. DO NOT STAPLE.



Printed in U.S.A.
EK-DELQA-IN-001