

VAX 4000

Site Preparation

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S1569

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Preface

This manual is a guide to preparing a site for one of the VAX 4000 systems. It describes the physical, environmental, and power requirements of each VAX 4000 model and expander.

To ensure smooth installation and operation of a VAX 4000 system or expander, your site must meet the requirements found in this document *before* the arrival of your system shipment.

Intended Audience

This manual is intended for Digital service personnel and for Digital customers who wish to install their VAX 4000 systems, and intend to perform self-maintenance.

NOTE: *Digital Equipment Corporation recommends that a Digital service representative install your system.*

If you are a customer preparing your site for one of the VAX 4000 systems, please be aware that Digital provides a site preparation service. If you decide you would like a Digital professional to prepare your site, contact your Digital service or sales representative.

Systems, Enclosures, and Expanders

The systems, expanders and enclosures described in this document are listed in Table 1-1.

Go to Chapter 2 to find the specifications for the different systems and expanders.

Manual Structure

This manual contains two chapters and one appendix. It is organized as follows:

- Chapter 1 contains general information about the physical, environmental, and power requirements for VAX 4000 systems and expanders.
- Chapter 2 contains specific information about each VAX 4000 system configuration. The following information is provided:
 1. System dimensions (including the shipping carton)
 2. Acceptable temperature and humidity ranges (for both operating and nonoperating)
 3. Electrical requirements
 4. Noise levels
- The appendix lists the power cable order numbers for the different VAX 4000 systems and expanders.

Use this manual to prepare your site for the VAX 4000 system ordered. Refer to Chapter 1 for general environmental requirements. Then refer to Chapter 2 for the specific requirements for your VAX 4000 system.

Conventions

The following conventions are used in this manual:

Convention	Meaning
NOTE	Provides general information about the current topic.
CAUTION	Provides information to prevent damage to equipment or software.
WARNING	Provides information to prevent personal injury.

The following symbols appear on the system power supply. Please review their definitions below:



This warning symbol indicates risk of electric shock.



Warning. To reduce the risk of injury, do not remove modules, Integrated Storage Elements (ISEs), or the power supply. No user-serviceable parts are inside. Refer servicing questions to your Digital Customer Services representative or to your qualified self-maintenance personnel.

This equipment has not been designed for connection to a power system (a power system without a directly grounded neutral conductor).

This equipment should be plugged into a properly grounded receptacle only.

This system contains an automatic voltage select power supply. Voltage selection is not required prior to installation.

CHAPTER 1

Chapter 1

Physical Requirements

Table 1-1 lists the enclosures in which the systems and expanders covered in this document are shipped. For simplicity, enclosure designations will frequently be used throughout the document rather than the system or expander name.

Table 1-1: Enclosure Designations

System or Expander	Enclosure
VAX 4000 Model 200 System (BA430)	BA430
VAX 4000 Model 200 System (BA215)	BA215
VAX 4000 Model 300 System	BA440
B400X Expander	BA430
R400X Expander	R400X
B213F Expander	BA213
R215F Expander	BA215

The physical requirements for VAX 4000 systems are determined by system dimensions (both before and after the shipping carton has been removed), space for cabinet doors to swing open, and space for peripheral computer equipment such as printers and terminals, and allowances for adequate airflow around the system and the noise emission level of the system.

1.1 When Your Shipment Arrives

When the system arrives, you should inspect it with a Digital service representative to ensure that the system and all ordered options have arrived undamaged.

When you are ready to begin installation, find the Customer Hardware Information Kit and begin using the *Installation* manual to install your VAX 4000 system. Also see the *Installation Checklist*.

1.2 Space Requirements

When planning cable routing for multiple-terminal equipment, you should consider factors such as safety, convenience, future expansion, and cost. The system installer has other special factors to consider when cabling a multiple-terminal system on more than one floor in the same building, or in more than one building. Digital offers several cable types for these applications, and Digital service personnel are available to help you plan your installation. Your sales representative can provide more information.

Before unpacking any equipment, make sure you have enough space to remove the system from its shipping container. Also make sure you leave enough space around the system so it can be serviced. The dimensions of containers and enclosures are illustrated in Chapter 2.

You must leave at least 1 m (39 in) of clearance at the front of the system for opening and removing the door and to access system controls. You must also leave at least 5 cm (2 in) of clearance at the sides and rear for airflow. Since the base of the enclosure is 5 cm (2 in) wider than the cabinet in front and rear, you can place the rear of the system against a wall or table, and the system will have enough room for adequate airflow.

Space for Additional Equipment and Cabling

In addition to the space required for the VAX 4000 systems and/or expander(s), you should ensure that you have enough space for terminals, printers, mass storage media, printer paper, and other necessary supplies.

If you plan to connect your system to peripheral devices such as printers, terminals, or modems, you will need additional cabling. Cables that connect the system to peripheral devices must be ordered separately.

NOTE: *Cabling from peripheral devices should already be in place and labeled before the system is installed.*

1.3 Operating Environment

Computer systems are affected by (or vulnerable to) the discharge of static electricity, temperature changes, and humidity. These conditions can affect the operation and overall dependability of the computer system.

Your system should be installed in a well-ventilated area where the temperature and humidity ranges listed in Chapter 2 for your system are maintained throughout the year. Rapid temperature changes may affect system performance. Therefore, do not operate systems near heating or cooling devices, large windows, or doors that open to the outside. Air should contain a minimum of dust and other abrasive contaminants.

Mass storage media and other computer supplies, including paper, should be kept at the same temperature and humidity as that of the computer area.

1.3.1 Static Electricity

Static electricity is a common problem for computer systems. It can cause system failure and loss of data. The most common source of static buildup is contact between people and carpeting or clothing. Low humidity allows the greatest buildup of static charges.

To minimize static buildup, follow these guidelines:

- Maintain relative humidity of at least 40 percent.
- Locate your system away from busy office corridors.
- Avoid using carpeting in the computer area. If you install carpeting, use antistatic carpeting, if possible. If carpeting is already installed, place a grounded, antistatic mat under the system.
- Maintain the antistatic properties of antistatic floors, carpeting, or mats by following the manufacturer's recommendations for cleaning.

1.3.2 Temperature and Humidity Ranges

To function properly, each system and expander must operate in an environment with acceptable temperature and humidity ranges. To determine the appropriate temperature and humidity ranges for your system, refer to Chapter 2 and the specifications for your particular system.

When calculating the operating temperature in your computer environment, consider the heat that the system, peripherals, and other equipment generate. See Chapter 2 for the amount of heat dissipated by each system and expander.

1.3.3 Electrical Requirements

In determining the electrical requirements of a VAX 4000 system and expander, consider the following:

- What country the system is located in
- Voltage range
- Power-source phase
- Nominal frequency
- Frequency range

- Steady-state current
- Power consumption

When you are ready to use the above information, turn to Chapter 2 and find the electrical requirements for your system.

The power source should be able to handle the original system and allow for system expansion. Digital recommends a dedicated circuit from the power source for each VAX 4000 system enclosure and a separate dedicated power circuit for each expander. A dedicated, isolated ground circuit provides electrical isolation from possible power surges or electrical noise caused by other electrical equipment. You should not connect any other equipment such as air conditioners, office copiers, or coffee pots to the same circuit as your VAX 4000 system or expander.

If you cannot avoid power disturbances, your system will need additional power-conditioning equipment. For more information, contact your Digital sales representative. To operate a VAX 4000 system configuration at 240 Vac, obtain the power cable for use in your country. The appendix lists the power cables used to operate each system at 240 Vac. A power cable must also be ordered separately to enable the operation of your VAX 4000 system configuration. All orders must have selected the proper power cable to accompany your VAX 4000 system.

Each VAX 4000 Model 200 and VAX 4000 Model 300 system shipped within North America includes a 120-Vac power cable.

If your system will be shipped outside North America, or if you require a 240-Vac cable, you must order power cable(s) separately. See Appendix A for a list of the countries and their associated power cables.

1.3.4 Acoustics

Computer systems generate noise. Higher than acceptable noise levels can adversely affect a work environment. Digital recommends placing the VAX 4000 systems and the B400X, R400X, B213F, and R215F expanders in an open office environment.

Chapter 2

Site Preparation Specifications

This chapter lists the acceptable temperature and humidity ranges, electrical requirements, and acoustic levels to consider in preparing the site for your VAX 4000 system.

2.1 Dimensions

VAX 4000 systems and B400X, R400X, B213F, and the R215F expanders are shown in this section with their shipping container dimensions and system dimensions.

CAUTION: *Use at least two people to handle the system and/or expander, plus terminal boxes.*

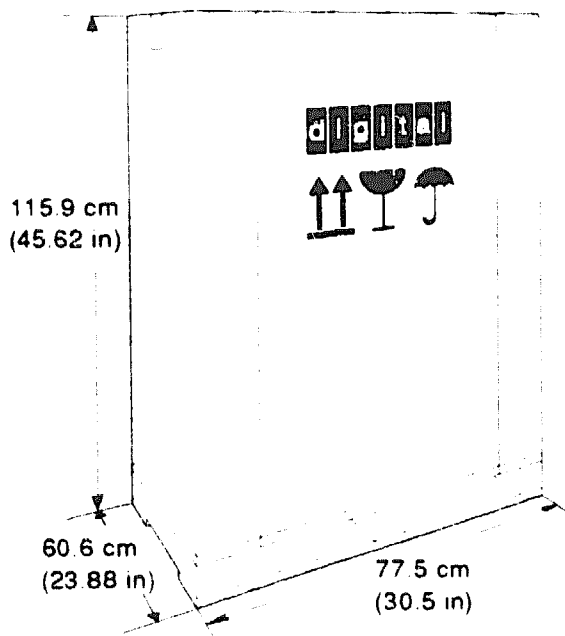
Figure 2-1 shows the dimensions of the container used to ship the VAX 4000 (BA430 or BA440) systems and the R400X, B400X expanders.

Figure 2-2 shows the system dimensions for the VAX 4000 systems and expanders that use the BA430/BA440 enclosure.

Figure 2-3 shows the dimensions of the container used to ship the VAX 4000 Model 200 (BA215) system and the R215F expander, as well as the dimensions of the VAX 4000 Model 200 (BA215) system and the R215F expander.

Figure 2-4 shows the dimensions of the B213F expander and shipping container.

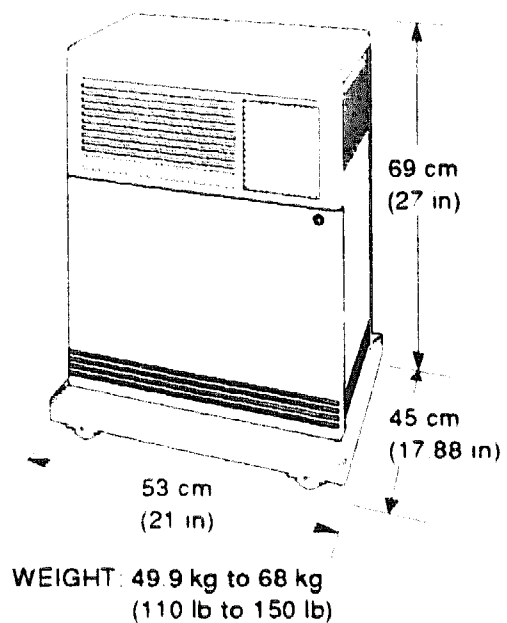
Figure 2-1: BA430/BA440 Enclosure and the B400X or R400X Expander Shipping Container Dimensions



WEIGHT: 63.5 kg to 85.3 kg
(140 lb to 188 lb)

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Figure 2-2: BA430/BA440 Enclosure and the B400X or R400X Expander Dimensions



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Figure 2-3: BA215 Enclosure and Shipping Container Dimensions

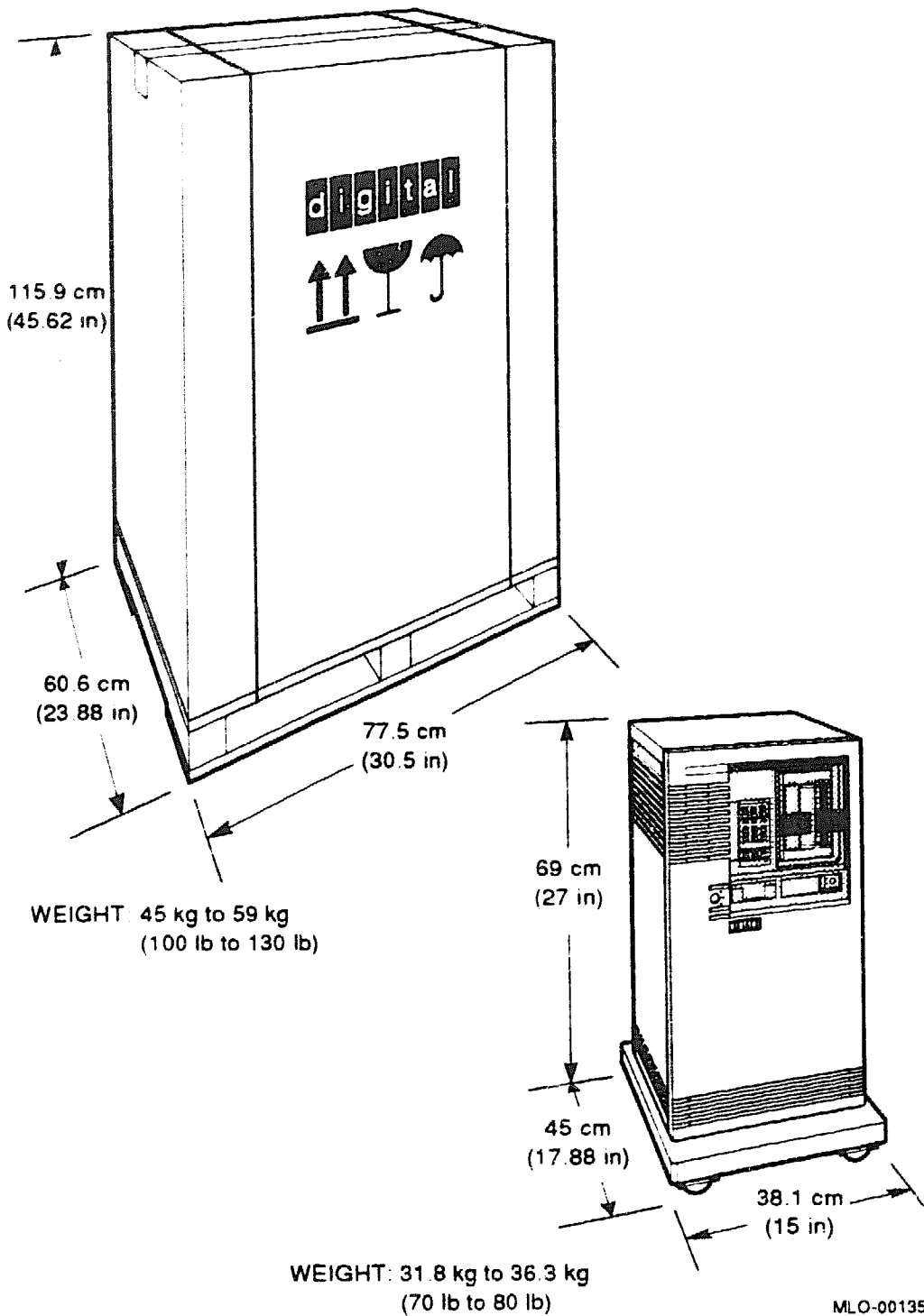
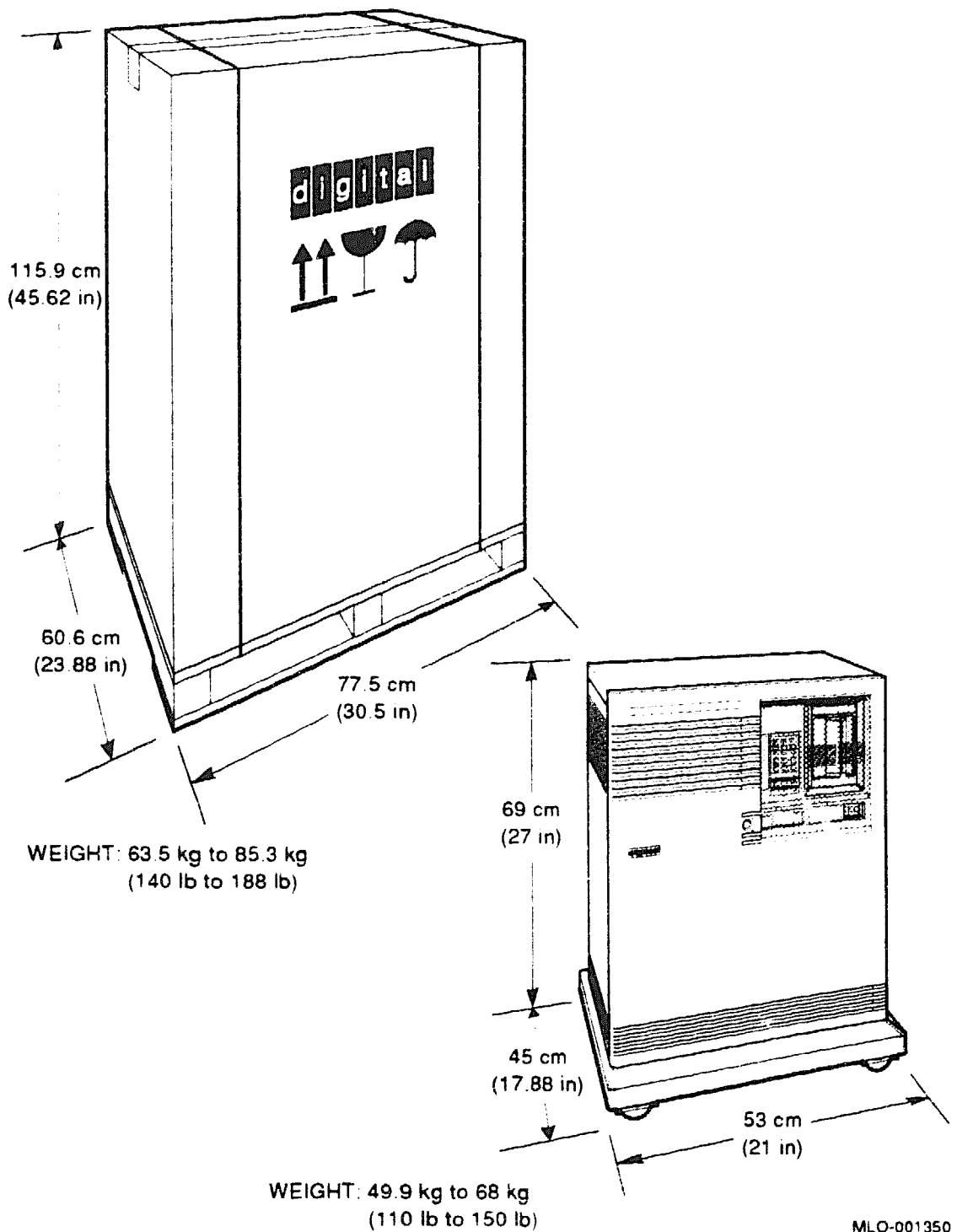


Figure 2-4: B213F Expander and Shipping Container Dimensions



2.2 Heat, Humidity, Electrical Requirements, and Acoustics

VAX 4000 systems and expanders operate within or at the values for temperature and humidity, power requirements, and noise levels listed in Table 2-1 through Table 2-3.

Table 2-1: BA430/BA440 Enclosure and R400X Expander Specifications

Heat Dissipation, Temperature, and Humidity Ranges

Condition		Measure
Heat dissipation		2978 BTU/h
Temperature	Operating:	10°C to 40°C 50°F to 104°F
	Nonoperating:	-40°C to 66°C -40°F to 151°F
Temperature rate of change	Operating:	11°C per hour maximum 20°F per hour maximum
Relative humidity	Operating:	20% to 80% noncondensing
	Nonoperating:	10% to 90%
Maximum altitude	Operating:	2434 m (8000 ft)
	Nonoperating:	4900 m (16,000 ft)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 m (or 1°F per 1000 ft).

Table 2-1 (Cont.): BA430/BA440 Enclosure and R400X Expander Specifications

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
5.8	43
Recommended placement	Office environment
LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt	
LPA = Sound pressure measured in decibels at 1.0 m from the front edge of the unit and 1.5 m above the floor.	
Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.	
All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).	

Electrical Requirements

Nominal AC Voltage ⇒	100 to 120 Vac	220 to 240 Vac
Voltage range	90 to 128 Vac	176 to 264 Vac
Power-source phase	Single	Single
Nominal frequency	50 to 60 Hz	50 to 60 Hz
Frequency range	47 to 63 Hz	47 to 63 Hz
Maximum steady-state current at nominal voltage	8.6 A	4.91 A
Maximum steady-state current at minimum voltage	11.91 A	6.82 A
Maximum inrush current	100 A	83 A
Maximum power consumption with 0.65 power factor	1030 W	1030 W

Table 2-2: BA215 Enclosure Specifications**Heat Dissipation, Temperature, and Humidity Ranges**

Condition		Measure
Heat dissipation		1178 BTU/h
Temperature	Operating:	10°C to 40°C 50°F to 104°F
	Nonoperating:	-40°C to 66°C -40°F to 151°F
Temperature rate of change	Operating:	11°C per hour maximum 19.8°F per hour maximum
Relative humidity	Operating:	20% to 80% (noncondensing)
	Nonoperating:	10% to 90%
Maximum altitude	Operating:	2438 m (8000 ft)
	Nonoperating:	4900 m (16,000 ft)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 m (or 1°F per 1000 ft).

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
-----------------	-----------------

6.1

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Recommended placement

Office environment

LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt

LPA = Sound pressure measured in decibels at 1.0 m from the front edge of the unit and 1.5 m above the floor.

Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.

All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).

Table 2-2 (Cont.): BA215 Enclosure Specifications**Electrical Requirements**

Nominal AC Voltage →	101 Vac	120 Vac	220-240 Vac
Voltage range	88 to 110 Vac	93 to 132 Vac	176 to 264 Vac
Power-source phase	Single	Single	Single
Nominal frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Frequency range	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Maximum steady-state current at nominal voltage	5.2 A	4.4 A	2.4 A
Maximum steady-state current at minimum voltage	8.3A	7.2 A	3.9 A
Maximum inrush current	50 A	50 A	50 A
Startup current (30 seconds) at nominal voltage	7.1 A	5.9 A	3.1 A
Maximum power consumption with 0.65 power factor	340 W	340 W	340 W

Table 2-3: BA213 Enclosure Specifications**Heat Dissipation, Temperature, and Humidity Ranges**

Condition		Measure
Heat dissipation		2304 BTU/h
Temperature	Operating:	10°C to 40°C 50°F to 104°F
	Nonoperating:	-40°C to 66°C -40°F to 151°F
Temperature rate of change	Operating:	11°C per hour maximum 20°F per hour maximum
Relative humidity	Operating:	20% to 80% (noncondensing)
	Nonoperating:	10% to 90%
Maximum altitude	Operating:	2438 m (8000 ft)
	Nonoperating:	4900 m (16,000 ft)

NOTE: For operation above sea level, decrease the operating temperature range values by 1.8°C per 1000 m (or 1°F per 1000 ft).

Operating Acoustic Emission Levels

LNPE (B)	LPA (dB)
----------	----------

5.8

43

LNPE = Noise power emission level (A-weighted sound power level) measured in bels reference 1 pico-watt

LPA = Sound pressure measured in decibels at 1.0 m from the front edge of the unit and 1.5 m above the floor.

Levels may be lower than those shown, depending on the kind and number of mass storage devices in the system.

All data measured in accordance with ANSI S12.10-1985 (American National Standards Institute) and ISO/DIS 7779 (International Standards Organization).

Table 2–3 (Cont.): BA213 Enclosure Specifications**Electrical Requirements**

Nominal AC Voltage	101 Vac	120 Vac	220–240 Vac
Voltage range	90 to 110 Vac	104 to 128 Vac	190 to 256 Vac
Power-source phase	Single	Single	Single
Nominal frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Frequency range	49 to 61 Hz	49 to 61 Hz	49 to 61 Hz
Maximum steady-state current at nominal voltage	10.2 A	8.6 A	4.7 A
Maximum steady-state current at minimum voltage	11.4 A	9.9 A	5.4 A
Maximum inrush current	100 A	100 A	100 A
Maximum power consumption with 0.65 power factor	1030 W	1030 W	1030 W

2.3 Additional Expander Requirements

The installation of an expander on a VAX 4000 system has the following special requirements.

- All B400X, R400X, B213F, and R215F expanders require dedicated wall outlets for each expander.
- The B400X, R400X, B213F, and R215F expanders must be installed by Digital Customer Services when the system or expander is not part of a factory-configured system.
- When installing a B213F or an R215F expander on a VAX 4000 system, an H4010-AA expander cable kit is required.
- See Appendix A for the required power cables.

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Appendix A

Power Cable Order Numbers

Refer to the tables in this appendix and locate the service that is appropriate for your system and your country. Order the power cable listed for your country. For more information on 240-Vac operation, check with your Digital sales representative.

Table A-1: Power Cables for BA430 and BA440 Enclosure Systems and the B400X and R400X Expanders

Part Number	Country
BN20A-2E	United States, Japan, Canada (120 Vac)
BN20B-2E	United States, Japan, Canada (240 Vac)
BN22C-2E	Australia, New Zealand (240 Vac)
BN22D-2E	Central Europe (240 Vac)
BN22E-2E	United Kingdom, Ireland (240 Vac)
BN22F-2E	Switzerland (220 Vac)
BN22H-2E	Denmark (220 Vac)
BN22J-2E	Italy (240 Vac)
BN22K-2E	India (240 Vac)
BN22L-2E	Israel (240 Vac)

NOTE: A 120-Vac power cable (BN20A-2E) is shipped with each 120-Vac system enclosure.

Table A-2: Power Cables for BA215 Enclosure Systems and the R215F Expander

Part Number	Country
BN20M-2E	United States (120 Vac)
BN20N-2E	United States, Japan, Canada (240 Vac)
BN19J-2E	Australia, New Zealand (230/240 Vac)
BN03B-2E	Central Europe (240 Vac)
BN19B-2E	United Kingdom, Ireland (240 Vac)
BN19F-2E	Switzerland (220 Vac)
BN19L-2E	Denmark (220 Vac)
BN19T-2E	India (240 Vac)
BN19Y-2E	Israel (240 Vac)
BN19N-2E	Italy (240 Vac)

NOTE: *A 120-Vac power cable (BN20M-2E) is shipped with each 120-Vac system enclosure.*

Table A-3: Power Cables for the B213F Expander

Part Number	Country
BN20A-2E	United States, (included with each 120-Vac system enclosure.)
BN20B-2E	United States, Japan, Canada (240 Vac)
BN20C-2E	Australia, New Zealand (240 Vac)
BN20D-2E	Central Europe (240 Vac)
BN20E-2E	United Kingdom, Ireland (240 Vac)
BN20F-2E	Switzerland (240 Vac)
BN20H-2E	Denmark (240 Vac)
BN20J-2E	Italy (240 Vac)
BN20K-2E	India (240 Vac)
BN20L-2E	Israel (240 Vac)

NOTE: *A 120-Vac power cable (BN20A-2E) is shipped with each (120-Vac) system enclosure.*

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VAX 4000 Dual-Host Systems

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Preface

This manual describes the VAX 4000 series dual-host configurations supported by VAX/VMS version 5.3-2 or later.

For information on how to install or operate your dual-host system, see your system *Operation* or *Installation* manuals.

Intended Audience

This guide is intended for use by Digital customers who are familiar with the individual VAX 4000 systems that form dual-host configurations. The content of this manual is primarily reference information needed to plan configurations of dual-host systems.

Organization

This guide has two chapters, as follows:

Chapter 1 presents an overview of dual hosts and the basic requirements for dual-host configurations.

Chapter 2 gives examples of supported configurations, with diagrams.

Conventions

The following conventions are used in this manual:

Convention	Meaning
NOTE	Provides general information about the current topic.
CAUTION	Provides information to prevent damage to equipment or software.
WARNING	Provides information to prevent personal injury.

Dual-Host Systems and DSSI

1.1 Introduction to Dual-Host Systems

A dual-host configuration is made up of two Q-bus VAX 4000 systems connected by a Digital Storage Systems Interconnect (DSSI) bus. The two systems share one another's Integrated Storage Elements (ISEs) across this bus. The ISEs can be located within each host, within an expander, or both.

In a dual-host configuration, both systems remain functionally independent. However, the common DSSI storage bus, together with VAXcluster software, creates a unique subsystem that makes all media devices available to both host systems. This provides two data paths for access to all ISEs by either host.

A dual-host system always includes RF-series ISEs, Ethernet, a DSSI storage bus, the VMS operating system, and DECnet and VAXcluster software. A VAX 4000 system can also function as dual host with a Q-bus MicroVAX system.

1.1.1 Higher Disk Availability

Dual-host systems provide higher disk availability for critical applications. A dual-host system can provide automatic failover when used as a server for satellites in a VAXcluster system. In this instance, the application runs on the satellite. As such, the dual-host system increases your ability to access data by providing alternate an access path to the running application if one of the host systems fails. The user sees a pause in the application. Then, following the cluster state transition, the application resumes on the other host with no user intervention.

When an application is running on one of the dual hosts, and that host system fails, the user has to restart the application on the second host system.

1.1.2 Minimized Downtime

In a timesharing environment, a dual-host system minimizes downtime. If one host fails, a user on that host simply logs in to the second host and restarts the job, or does an edit/recover routine. The second host in the configuration assumes responsibility for the application and lets the user access data on the storage devices connected to the DSSI storage bus. (The same recovery/restart routine is used in CI VAXclusters.)

Using a dual-host system for a boot server can help eliminate the risk of cluster downtime if a single host cannot be booted. Dual hosts create two paths to disk storage, ensuring that the VAXcluster users have automatic failover to another system if one of the boot servers fails. A dual-host configuration provides high system and data availability, and maintains the VAXcluster.

Other advantages of a dual-host configuration include the following:

- Automatic failover when an application is running on the satellite node
- Higher availability to data for satellites and timesharing users
- Read/write file sharing down to the record level
- Resource sharing through distributed batch and print queues
- Data and resource sharing through a distributed file system
- Centralized system management and security
- Ability to run any VMS application
- Growth path from a single VAX 4000 or MicroVAX system
- Greater performance and more I/O than with a single-host system

1.2 Dual-Host Components

Basic dual-host components are the RF-series ISEs, the storage expander, and the DSSI cable.

1.2.1 RF-Series Integrated Storage Elements

RF-series ISEs are:

RF30 (150 Mbytes)

RF31 (380 Mbytes)

RF71 (400 Mbytes)

The ISE has a disk controller on board the physical drive. The ISE receives a complete packet of information requesting a task to be done. The intelligent on-board controller interprets the packet and performs the task without any further communication from other DSSI nodes. At this point, the ISE begins doing the intelligent tasks of reading, writing, collecting status, and so forth.

The intelligence of the ISE extends beyond reading and writing. The intelligent on-board controller can provide detailed status of the ISE, or start and monitor an internal diagnostic of the ISE.

1.2.2 R400X Expander

The R400X expander provides a VAX 4000 system with additional ISEs. This DSSI expander has the following specifications for use in a dual-host configuration:

- One expander per DSSI bus
- Can be used with systems not based on DSSI by adding KFQSA
- Holds up to seven ISEs

1.2.3 External DSSI Cables

One external DSSI cable is required for each connection between systems; two cables are required to connect two systems and an expander.

External cables connect DSSI storage devices and adapters. The DSSI external cable, part number BC21M-09, is included with a factory-configured dual-host configuration, as well as with expansion boxes. If your system was not factory-configured, you must order additional cables separately.

1.3 DSSI Storage Bus and Adapters

Each DSSI storage bus consists of a maximum of eight nodes, two of which may be adapters and six of which may be ISEs.

Embedded DSSI adapters (EDAs) are the interface between a CPU host and the DSSI storage bus, connecting the CPU and the intelligent controllers within each ISE. Once the initialization and device configurations are complete, the DSSI adapter becomes a passive protocol interpreter, leaving the communications control to the host CPU and the intelligent controller on each ISE.

Two basic DSSI adapter designs are in use for dual-host configurations: the EDA and the KFQSA.

1.3.1 Embedded DSSI Adapter

The primary adapter design involves DSSI interface logic embedded on the CPU module. This design is called the Embedded DSSI Adapter (EDA).

A KFQSA module may be installed in a system that contains an EDA.

1.3.2 KFQSA

The KFQSA is a standard Q-bus option module that may be added to a VAX 4000 system to increase the number of DSSI storage busses connected to that system. See Table 1-1 for an explanation of KFQSA suffixes. Each KFQSA module adds one additional DSSI storage bus to the system.

When linked to a MicroVAX in a dual-host configuration, the VAX 4000 may have as its co-host a system that uses a KFQSA module.

Table 1-1: KFQSA Suffixes

Suffix	Description	Where Needed
-SA	KFQSA Q-bus to DSSI adapter, factory installed in BA213 enclosure	For MicroVAX 3800 only; cannot be ordered separately
-SE	Additional KFQSA Q-bus to DSSI adapter, factory installed	When new MicroVAX 3300, 3400, or 3800 needs second DSSI adapter, or when VAX 4000 needs additional DSSI adapter
-SG	KFQSA adapter, field installed	For existing MicroVAX 3600 or 3900 that requires its first DSSI adapter, or for existing MicroVAX 3300, 3400, or 3800 that requires second DSSI adapter, or VAX 4000 needing additional DSSI adapter
-AA	KFQSA Q-bus to DSSI adapter, field installed in BA23 or H9642 enclosure	For existing MicroVAX II in BA23 or H9642 cabinet that requires DSSI adapter
-BA	KFQSA Q-bus to DSSI adapter, field installed in BA123 enclosure	For existing MicroVAX II in BA123 enclosure that requires DSSI adapter

1.4 Configuration Rules for Dual-Host Systems

The following rules are required for a dual-host configuration:

1. Two VAX 4000 systems, or one Q-bus MicroVAX and one VAX 4000.
2. Software licenses shown in Table 1-2.
3. DSSI adapters (KFQSA module and/or embedded adapters). See Table 1-3 and Table 1-4.

4. Ethernet hardware.
5. Maximum of six ISEs on each DSSI bus.
6. Maximum of two system enclosures and one expander per DSSI storage bus.

Table 1-2: System Software Licenses

First System	Second System
VMS	VMS
VAXcluster	VAXcluster
DECnet full-function	DECnet end-node

All systems used in dual-host configurations must have DSSI storage adapters, whether they are embedded on the system module or connected to the Q-bus by means of a KFQSA module. Table 1-3 and Table 1-4 show what type of adapter each system uses.

Table 1-3: VAX 4000 and MicroVAX Systems With Internal DSSI

System	Adapter
VAX 4000 Model 300	EDA (2)
VAX 4000 Model 200	EDA (1)
MicroVAX 3300	EDA
MicroVAX 3400	EDA
MicroVAX 3800	KFQSA

Table 1-4: MicroVAX Systems Without Internal DSSI

System	Adapter Requirements
MicroVAX II	KFQSA-AA or KFQSA-BA
MicroVAX 3500	KFQSA-SG
MicroVAX 3600	KFQSA-SG
MicroVAX 3900	KFQSA-SG

1.5 Sample Configurations

Chapter 2 shows different ways to use VAX 4000 systems in dual-host configurations. As shown in Figure 2-9 and other diagrams, previously purchased MicroVAX systems can be upgraded to dual-host configurations with VAX 4000 systems.

1.6 Software Levels and Dual-Host Configurations

As shown in Table 1-5, you must have VMS version 5.3-2 or greater to use VAX 4000 systems in dual-host configurations.

Software requirements also include DECnet and VAXcluster software.

Table 1-5: VMS Versions, Adapters, and Restrictions

VMS Version	EDA in Systems or KFQSA	Adapter Restrictions
5.3-2 or later	VAX 4000 to VAX 4000 VAX 4000 to MicroVAX 3300 /3400 VAX 4000 to KFQSA	Mixed adapters allowed Dual DSSI/dual host allowed

1.7 Module Order

The order of modules for individual systems in a dual-host configuration is the same as for single-host configurations.

1.8 System Disk

A dual-host configuration may be run using one system disk. Since expanders fail less often than systems, Digital recommends that, when possible, you locate the system disk in an expander.

Chapter 2

Supported VAX 4000 Dual-Host Configurations

This chapter contains diagrams illustrating eleven supported VAX 4000 dual-host configurations. The configurations are captioned to indicate the enclosures shown: BA440, BA430, or BA215.

Table 2-1: VAX 4000 Enclosures and Their DSSI Capabilities

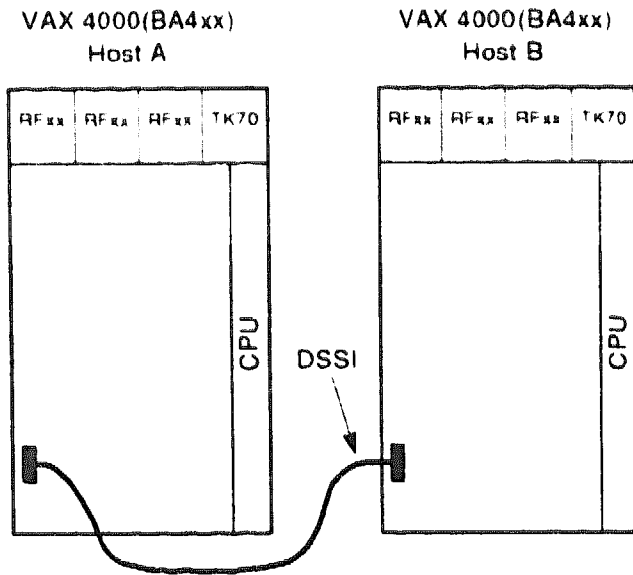
Enclosure	VAX 4000 Model	Embedded DSSI Busses	KFQSA Slots
BA440	300	2	2
BA430	200	1	2
BA215	200	1	2

The diagrams in this chapter are as follows:

- Figure 2-1: Dual VAX 4000 Model 200 (BA430) hosts
- Figure 2-2: Dual VAX 4000 Model 300 (BA440) as dual DSSI/dual hosts
- Figure 2-3: Dual VAX 4000 Model 200 (BA215) hosts
- Figure 2-4: Dual VAX 4000 Model 200 (BA215) hosts and either Model 200 (BA430) or Model 300 (BA440))
- Figure 2-5: Dual VAX 4000 Model 200 (BA430) hosts sharing an expander
- Figure 2-6: Dual VAX 4000 Model 200 (BA215) hosts sharing an expander
- Figure 2-7: Dual VAX 4000 Model 300 (BA440) as dual DSSI/dual hosts sharing an expander
- Figure 2-8: Dual VAX 4000 Model 300 (BA440) as dual DSSI/dual hosts sharing two expanders

- **Figure 2-9: VAX 4000 Model 300 (BA440) and MicroVAX 3800 sharing an expander**
- **Figure 2-10: VAX 4000 Model 200 (BA215) and MicroVAX 3800 dual hosts**
- **Figure 2-11: VAX 4000 Model 200 (BA215) and MicroVAX 3300/3400 dual hosts**

Figure 2-1: Dual VAX 4000 Model 200 (BA430) Hosts

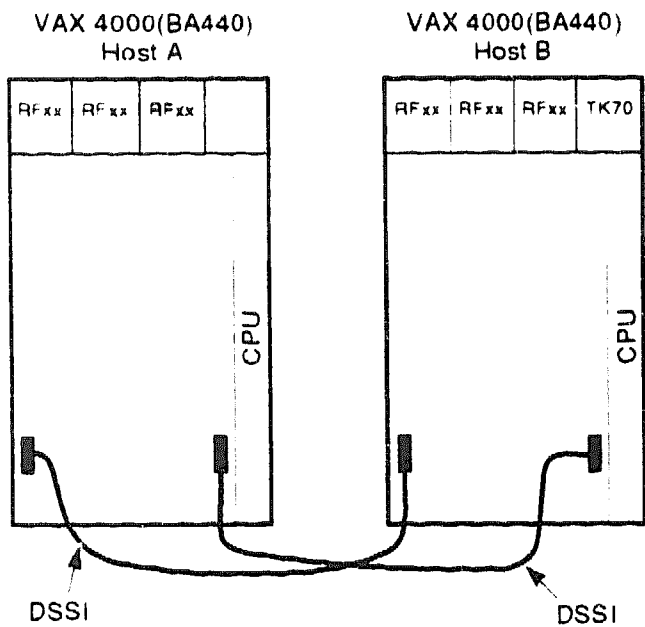


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In Figure 2-1, ISEs are located in the system enclosures.

The embedded DSSI bus is used by each host to share the six internal ISEs.

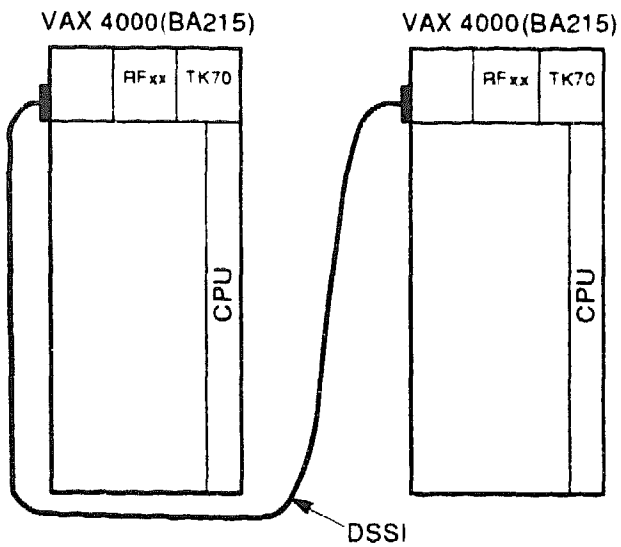
Figure 2-2: Dual VAX 4000 Model 300 (BA440) as Dual DSSI/Dual Hosts



MLO-005671

In Figure 2-2, one DSSI bus (cable running from far left of Host A to far left of Host B) shares the ISEs installed on the two systems. The other DSSI bus can be used for communications.

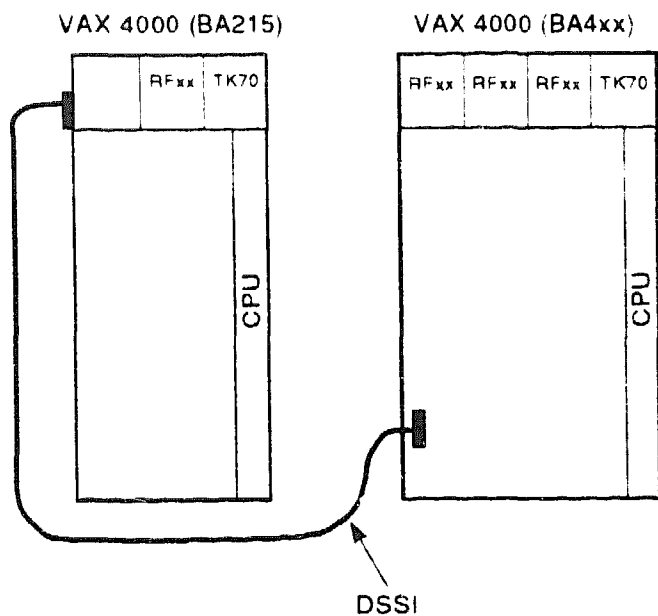
Figure 2-3: Dual VAX 4000 Model 200 (BA215) Hosts



MLO-005672

In Figure 2-3, two VAX 4000 Model 200 (BA215) hosts share their two ISEs.

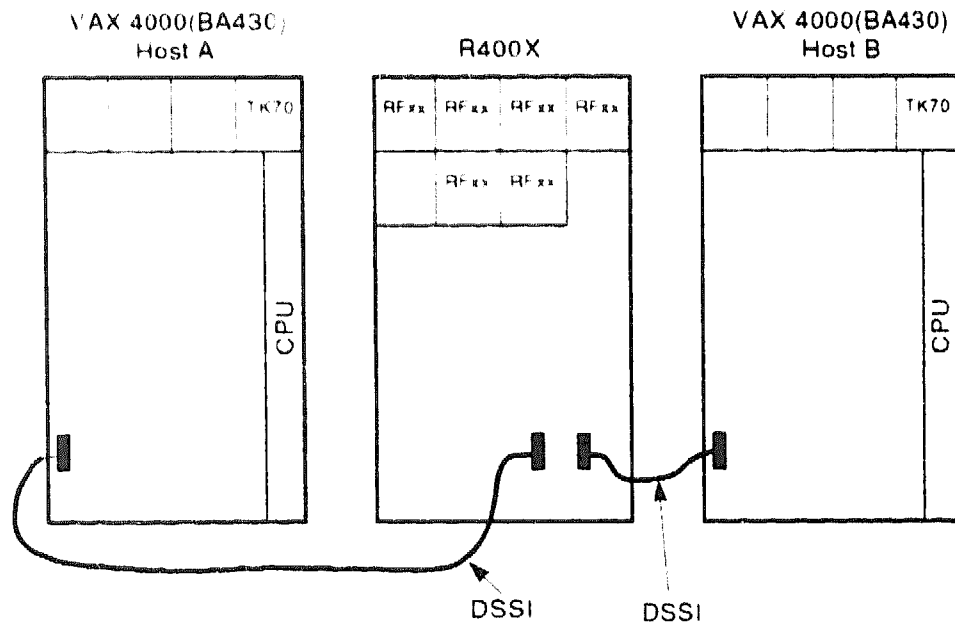
Figure 2-4: Dual VAX 4000 Hosts Model 200 (BA215) and Either Model 200 (BA430) or Model 300 (BA440)



MLO-005673

In Figure 2-4, a BA215 and a BA4xx share four ISEs.

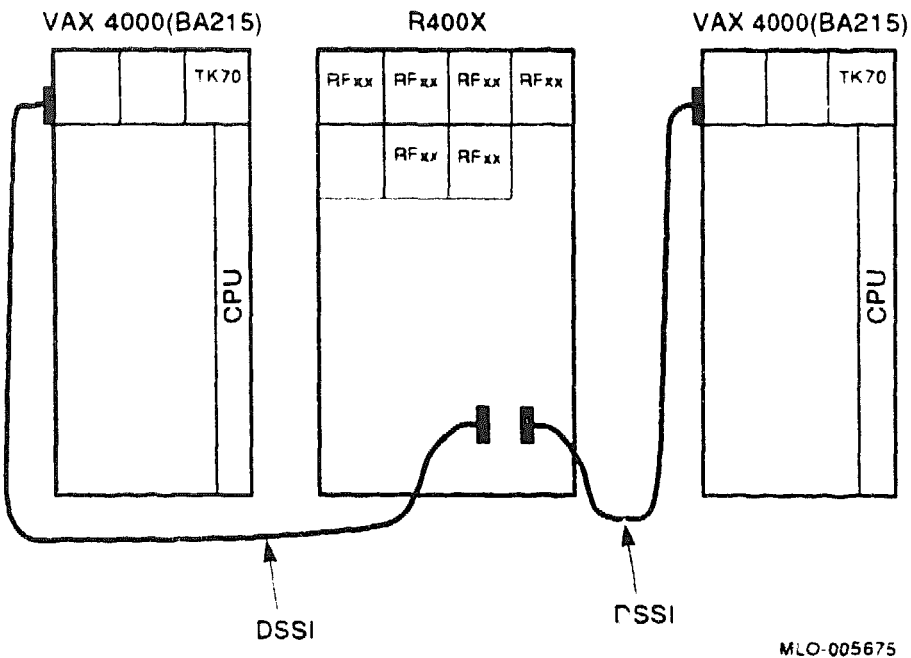
Figure 2-5: Dual VAX 4000 Model 200 (BA430) Hosts Sharing an Expander



MLO-004186

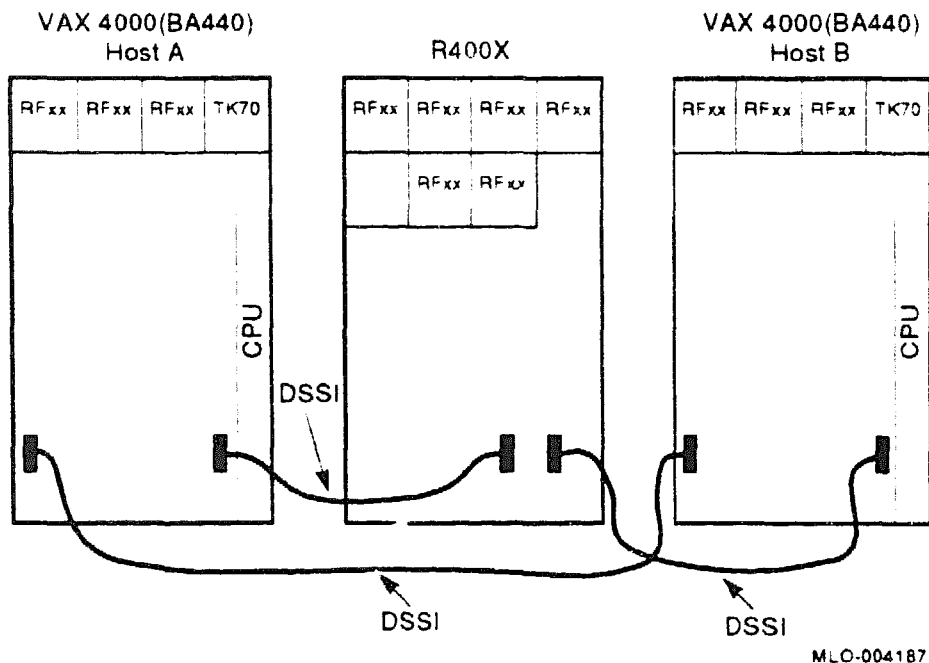
In Figure 2-5, two BA430s share the six ISEs in the expander.

Figure 2-6: Dual VAX 4000 Model 200 (BA215) Hosts Sharing an Expander



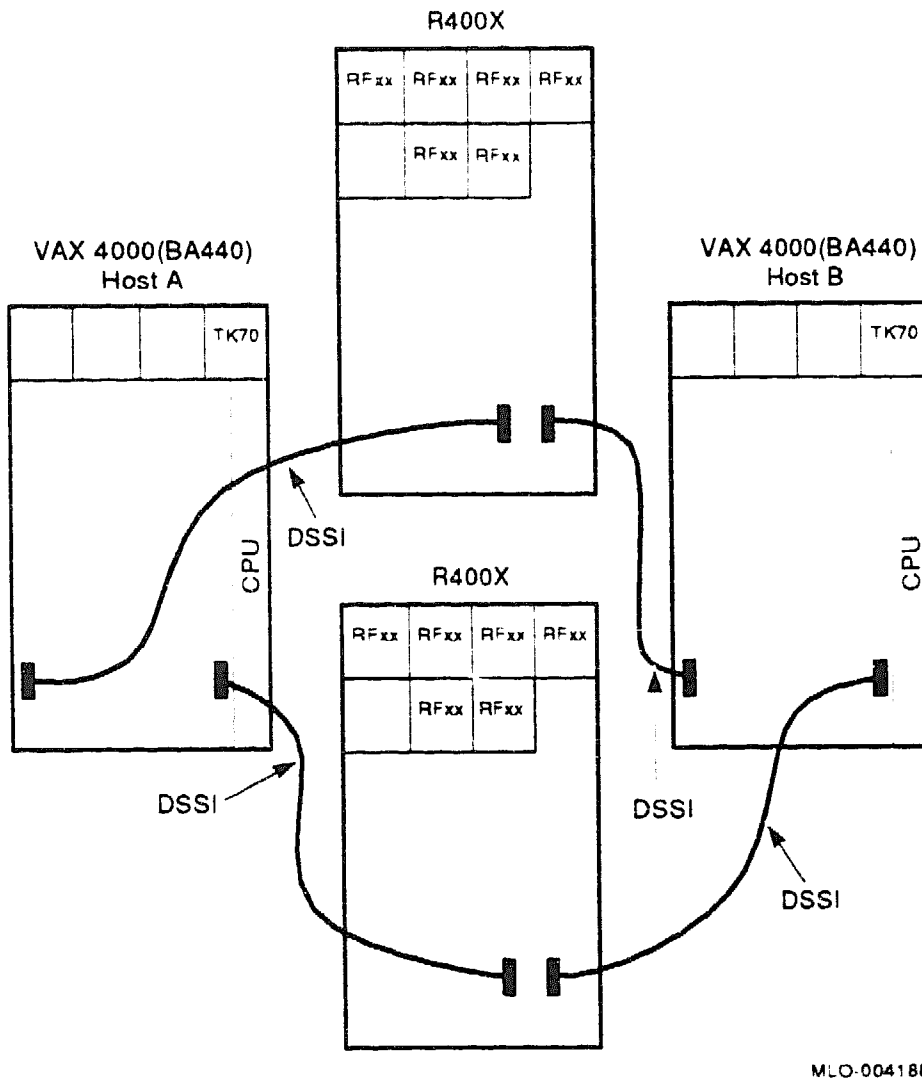
In Figure 2-6, two VAX 4000 Model 200 (BA215) hosts share an expander that contains all the ISEs.

Figure 2-7: Dual VAX 4000 Model 300 (BA440) as Dual DSSI/Dual Hosts Sharing an Expander



In Figure 2-7, the two BA440s share their combined system ISEs on one of the embedded DSSI busses; they share the ISEs in the expander on the other embedded DSSI bus.

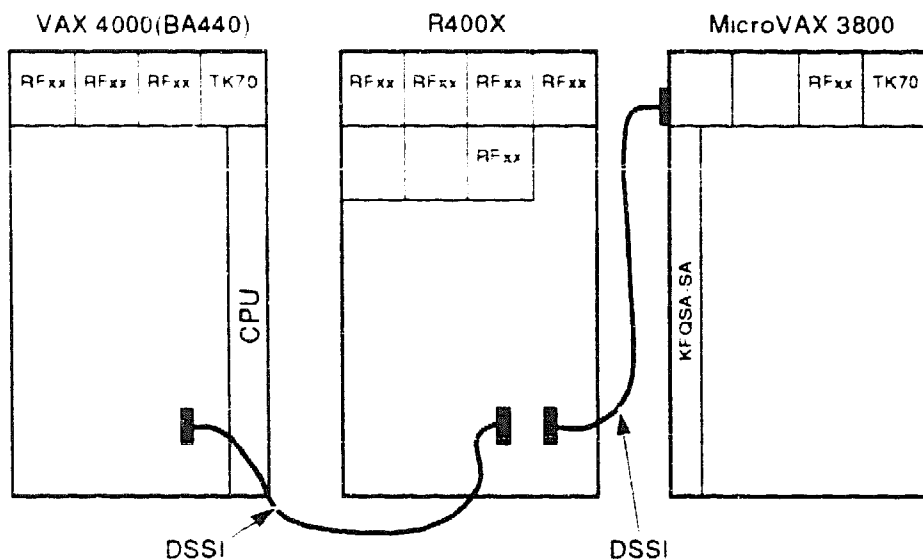
Figure 2-8: Dual VAX 4000 Model 300 (BA440) as Dual DSSI/Dual Hosts Sharing Two Expanders



MLO-004188

In Figure 2-8, the two BA440s are connected by means of each of the two embedded DSSI busses to a separate, shared expander.

Figure 2-9: VAX 4000 Model 300 (BA440) and MicroVAX 3800 Hosts Sharing an Expander



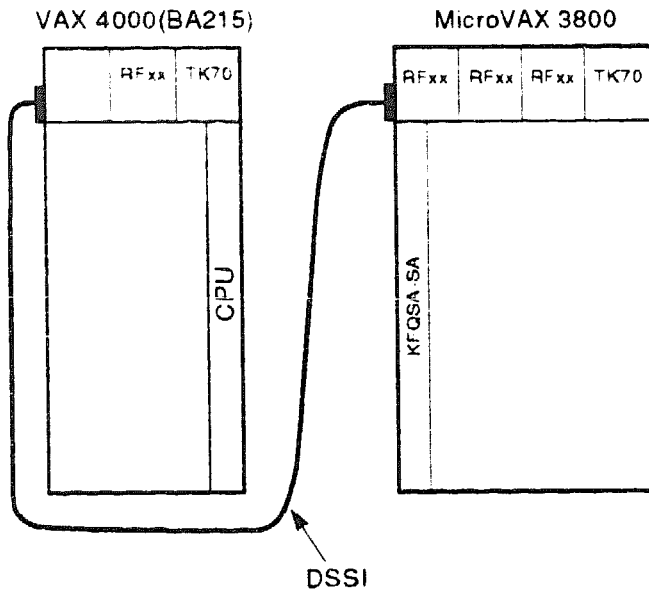
MLO-004184

Figure 2-9 illustrates the VAX 4000 Model 300 (BA440) as a dual host with a MicroVAX 3800. The KFQSA module in the MicroVAX 3800 interfaces to the DSSI storage bus, allowing it to share the ISEs in the expander. The VAX 4000 interfaces to the DSSI storage bus by means of an embedded DSSI adapter.

The three RF-series ISEs in the BA440 enclosure are not dual-hosted but they are available by means of the cluster server.

The MicroVAX host in this configuration is factory configured and contains one ISE.

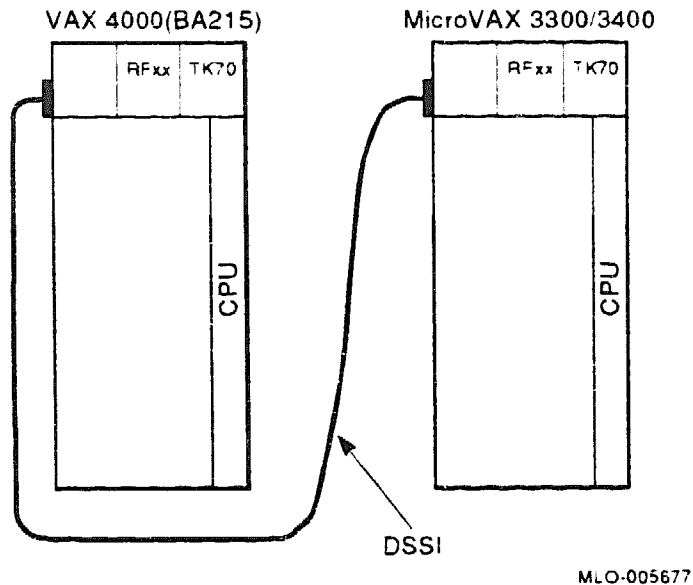
Figure 2-10: VAX 4000 Model 200 (BA215) and MicroVAX 3800 Dual Hosts



MLO-005676

Figure 2-10 illustrates a dual-host configuration that includes a VAX 4000 Model 200 (BA215) and a MicroVAX 3800 with a total of four ISEs, all internal to the hosts.

Figure 2-11: VAX 4000 Model 200 (BA215) and MicroVAX 3300/3400 Dual Hosts



In Figure 2-11, a VAX 4000 Model 200 (BA215) combines with a MicroVAX 3300/3400 to share the two ISEs within the two systems.

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Appendix A

Related Documentation

The following documents contain information related to the concepts and hardware maintenance of dual-host system configurations.

Document Title	Order Number
KFQSA Installation and User Guide	EK-KFQSA-IN
RF71 User Guide	EK-RF71E-UG

[illegible]

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