digital

Systems and Options Catalog

November 1996

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Customers:
Individual country product offerings, part numbers, and system variants may differ. Consult your local Digital sales representative for further information.

Internet access to configuration information:
***Digital Systems and Options Catalog* files are updated online and available at:**
http://www.digital.com:80/info/soc/
***Digital Configuration Utility*, a windows-based PC application, that automatically configures AlphaStations and AlphaServers, is available at:**
http://www.digital.com/info/alphaserver/acu.html

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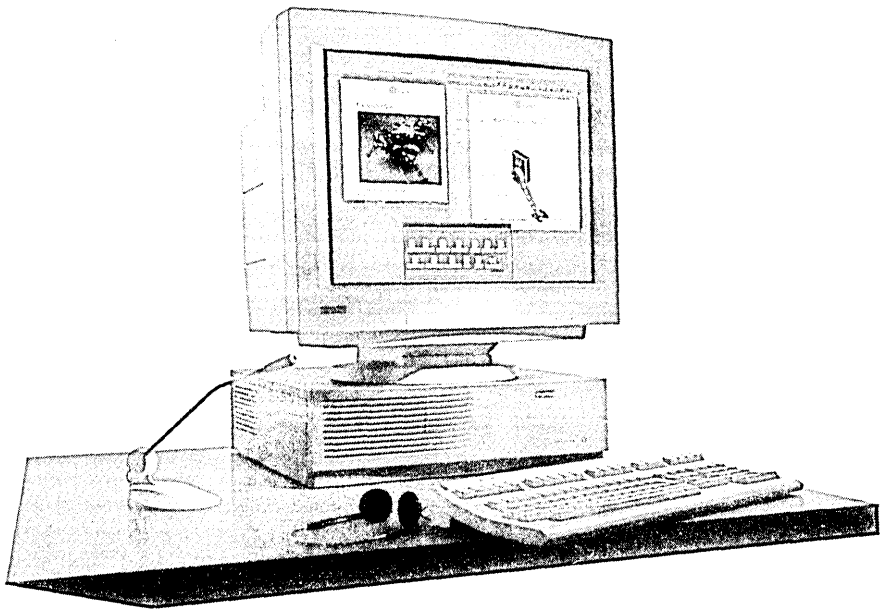


AlphaStation 255/233 and 255/300

Product Description

The AlphaStation 255/233 and 255/300 Desktop Workstations comprise a family of entry to mid-range PCI-based Alpha Universal Client systems. The AlphaStation 255 family delivers premium performance while providing access to thousands of applications running on the Digital UNIX, OpenVMS or Windows NT Workstation operating systems.

The **AlphaStation 255/233** system uses the Alpha 21064A microprocessor running at 233 MHz with performance measuring 3.80 SPECint95 and 5.09 SPECfp95. This entry level to low end system is ideal for running 2D CAD, CASE, Multimedia and Software Development applications.

The **AlphaStation 255/300** system also uses the Alpha 21064A microprocessor, but at a higher speed of 300 MHz and with performance measuring 4.51 SPECint95 and 5.71 SPECfp95. This mid-range system is optimal for working with 2D CAD and 3D CAD applications.

All AlphaStation 255 systems come packaged in a compact enclosure, with capacity for up to 512 Mbytes of parity memory, 128-bit wide memory bus, four storage slots, four option slots (2 PCI, 1 PCI/ISA combination, 1 ISA) and a 1 Mbyte secondary cache. The high performance PCI I/O bus, running at 132 Mbytes/second, provides expansion for options such as high-performance graphics, networking, and SCSI adapters without the need for additional tabletop options or expansion boxes. All systems support a wide variety of industry-standard peripherals and PCI/ISA options. Other standard features include integrated Twisted Pair Ethernet (ThinWire is optional), stereo-quality audio, external ports for serial/parallel communications, and external SCSI.

The AlphaStation 255 Family workstations come in a new design and color enclosure. Only peripherals in the new color scheme and design can be ordered with the new systems. Customer-installable chip upgrades provide investment protection to all AlphaStation 255 users and Digital's TradeIn '96 program offers a cost-effective upgrade path for users of older workstations. All AlphaStation 255 systems come with the best hardware warranty in the industry —a three year warranty.

Systems

- Select country specific power cord and keyboard for **all** systems. All systems come configured at 240V and can be switched by the user. A U.S country kit including a U.S. keyboard and power cord is available.
- Digital UNIX and OpenVMS systems include factory-installed software (FIS).
- Windows NT systems include Windows NT Workstation 3.51 media (CD-ROM), license, and documentation in shrink-wrapped package.
- All software updates are delivered on CD-ROM.
- Options ordered will be factory installed unless specified as **spares.**

AlphaStation 255 Desktop systems include

- Alpha dual issue microprocessor 21064A CPU with 1 Mbyte onboard secondary cache
- Deskside enclosure which includes:
  - Four expansion slots:
    Two PCI slots
    One PCI/ISA combination slot
    One ISA slot
  - Two memory banks (Eight SIMM memory slots)
  - Integrated PCI-based Fast Narrow Single Ended SCSI-2 controller with Direct Memory Access and external SCSI-2 connector
  - Four storage slots:
    One Floppy diskette drive slot
    One 5.25" removable media slot
    Two 3.5" hard disk drive slots
  - Integrated high-performance Twisted Pair Ethernet
  - 200-Watt power supply
  - Two serial ports, support full modem control
  - One bi-directional enhanced parallel port
  - Keyboard port and mouse port
- Memory*
- Hard Disk*
- Graphics*
- 600-Mbyte CD-ROM drive
- Monitor selection required for Advantage Packages
- Keyboard and power cord selection (OpenVMS keyboard available on OpenVMS systems)
- Integrated Audio
- Headphone and microphone
- 3-button mouse
- English Hardware Documentation
- Hardware Warranty: 1-year on-site, 2-year return to factory
- Software Warranty: 90-day SPD conformance with advisory telephone support
- Digital UNIX V 3.2D 2-user base license
  Digital Open3D license
  Multimedia Services license
  Digital NAS Client 150 license
  Communique! starter license, **or**
- OpenVMS V6.2-1H1 base license plus 1-user license
  Digital Open3D license
  Multimedia Services license
  Digital NAS Client 150 license, **or**
- Windows NT Workstation 3.51 media kit,
  Communique! starter license,
  Digital Light & Sound license

* Included in Advantage Packages, selection required in Base Configurations

Ordering menus that follow include

- AlphaStation 255/233 Advantage and Base Configurations
- AlphaStation 255/300 Advantage and Base Configurations

Menus are streamlined for ease of ordering. Select Advantage Configurations to meet application and performance needs.

- Multimedia
- CASE
- 2D CAD
- 3D CAD

To configure a customized system, use Base Configuration menus. Additional system options are in the AlphaStation Option section.

Warranty Statement

AlphaStations are sold with specific warranty response times, hours of coverage, warranty duration, and a specific manner by which the warranty service will be delivered. Digital also makes available extended coverage offerings to uplift or extend the service coverage and/or response time: See Supplemental Services in AlphaStation Options section.

AlphaStation 255/233 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 255/233	Resources Used		Digital UNIX	Digital UNIX/ OpenVMS	Digital UNIX	Digital UNIX
Application Profile			CASE	2D CAD	3D CAD	Multimedia
Operates at 120V / 240V			PB470-CA	PB470-AA/ PB471-AA	PB470-BA	PB470-DA
CPU Alpha dual issue microprocessor	21064A 233-MHz	Y	Y	Y	Y	Y
Floppy diskette drive 1.44 MB	Accessible bay					Y
CD-ROM 600 Mbyte	5.25" SCSI-2 bay	Y	Y	Y	Y	Y
Ethernet (10BaseT), audio, headphone, microphone, mouse		Y	Y	Y	Y	Y
Operating System		Y	Y	Y	Y	Y
Memory	1 bank	Y	32 Mbyte	32 Mbyte	64 Mbyte	32 Mbyte
Internal hard disk drive	3.5" x 1" SCSI-2 bay	Y	1 Gbyte	1 Gbyte	2 Gbyte	1 Gbyte
Graphics (a)	1 PCI slot	Y	PowerStorm 3D10	PowerStorm 3D30	ZLXp-L1	PowerStorm 3D30
MultiMedia kit (AVP20-AA)						Y
User Documentation–English		Y	Y	Y	Y	Y
Remaining available resources						
I/O slots PCI			1	1	1	1
PCI/ISA combo (b)			1	1 / 0	1	1
ISA (half size)			1	1	1	1
Memory banks			1	1	1	1
Internal hard drives (2 maximum)	1" or 1.6" SCSI-2 bay		1	1	1	1
SCSI-2 External storage (c,d)			5	5	5	5
1. Country Options	**Select**		1	1	1	1
Keyboards (e)		M	LK47W-xx or LK46W-xx	LK46W-xx or LK46W-xx	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx
Power Cord (f)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.						
2. Monitors	**Select**		1	1	1	
15" Color Monitor NH/NH/SH (g)		M	VRC15-WA/W3/W4	N/A	N/A	N/A
17" Color Monitor NH/NH/SH (g)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor NH/NH/SH (g)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1	0 or 1	0 or 1
32 Mbyte	1 bank	O	MSP01-BA	MSP01-BA	MSP01-BA	MSP01-BA
64 Mbyte	1 bank	O	MSP01-BB	MSP01-BB	MSP01-BB	MSP01-BB
128 Mbyte	1 bank	O	MSP01-BC	MSP01-BC	MSP01-BC	MSP01-BC
256 Mbyte	1 bank	O	MSP01-BD	MSP01-BD	MSP01-BD	MSP01-BD
4. Second hard disk drive (h)	**Select**		0 or 1	0 or 1	0 or 1	0 or 1
1.05 Gbyte drive 1.0" (i)	1" or 1.6" SCSI-2 bay	O	PBXRZ-ED	PBXRZ-ED	PBXRZ-ED	PBXRZ-ED
1.05 Gbyte drive 1.0"	1" or 1.6" SCSI-2 bay	O	PBXRZ-EB	PBXRZ-EB	PBXRZ-EB	PBXRZ-EB
2.1 Gbyte drive 1.0" 7200 RPM	1" or 1.6" SCSI-2 bay	O	PBXRZ-JB	PBXRZ-JB	PBXRZ-JB	PBXRZ-JB
2.1 Gbyte drive 1.0" 5400 RPM	1" or 1.6" SCSI-2 bay	O	PBXRZ-HB	PBXRZ-HB	PBXRZ-HB	PBXRZ-HB
4.3 Gbyte drive 1.6" (j)	1.6" SCSI-2 bay	O	PBXRZ-NA	PBXRZ-NA	PBXRZ-NA	PBXRZ-NA
5. Accessible bay 3.5 x 1"	**Select**		0 or 1	0 or 1	0 or 1	0
1.44 MB Floppy diskette drive	Accessible bay	O	PBXRX-AB	PBXRX-AB	PBXRX-AB	Included
6. Software Media and Documentation kits						
Digital UNIX		O	QA-MT4AA-H8	QA-MT4AA-H8	QA-MT4AA-H8	QA-MT4AA-H8
OpenVMS V6.2 (k)				QA-MT1AA-H8		
OpenVMS V6.2-1H1				QA-MT1AG-H8		
7. Additional Options: See AlphaStation Options for a comprehensive list of qualified options (m)						
ThinWire Ethernet MAU (10Base2)	Internal connection	O	PBXDC-DA	PBXDC-DA	PBXDC-DA	PBXDC-DA

AlphaStation 255/233 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 255/233	Resources Used		Digital UNIX	Open VMS	Windows NT
Operates at 120V/240V			PB47A-AA	PB47A-BA	PB47A-CA
CPU Alpha dual issue microprocessor	21064A 233 MHz	Y	Y	Y	Y
Floppy diskette drive 1.44 MB	Accessible bay				Y
CD-ROM 600 Mbyte	5.25" SCSI-2 bay	Y	Y	Y	Y
Ethernet (10BaseT), audio, headphone, microphone, mouse		Y	Y	Y	Y
Integration Service		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
User Documentation–English		Y	Y	Y	Y
Remaining available resources					
I/O slots PCI			2	2	2
PCI/ISA combo (b)			1	0	1
ISA (half size)			1	1	1
Memory banks			2	2	2
Internal disk drives (2 maximum)	1" or 1.6" SCSI-2 bays		2	2	2
SCSI-2 External (c,d)			6	6	6
1. Country Options	**Select**		1	1	1
Keyboards (e)		M	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx
Power Cord (f)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		**Minimum Required 32 Mbyte 1 or 2**	**Minimum Required 32 Mbyte 1 or 2**	**Minimum Required 32 Mbyte 1 or 2**
32 Mbyte	1 bank	M	MSP01-BA	MSP01-BA	MSP01-BA
64 Mbyte	1 bank	M	MSP01-BB	MSP01-BB	MSP01-BB
128 Mbyte	1 bank	M	MSP01-BC	MSP01-BC	MSP01-BC
256 Mbyte	1 bank	M	MSP01-BD	MSP01-BD	MSP01-BD
3. Disk drives 1 Required (h)	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte drive 1.0" (i)	1" or 1.6" SCSI-2 bay	M	PBXRZ-ED	PBXRZ-ED	PBXRZ-ED
1.05 Gbyte drive 1.0"	1" or 1.6" SCSI-2 bay	M	PBXRZ-EB	PBXRZ-EB	PBXRZ-EB
2.1 Gbyte drive 1.0" 7200 RPM	1" or 1.6" SCSI-2 bay	M	PBXRZ-JB	PBXRZ-JB	PBXRZ-JB
2.1 Gbyte drive 1.0" 5400 RPM	1" or 1.6" SCSI-2 bay	M	PBXRZ-HB	PBXRZ-HB	PBXRZ-HB
4.3 Gbyte drive 1.6" (j)	1.6" SCSI-2 bay	M	PBXRZ-NA	PBXRZ-NA	PBXRZ-NA
4. Accessible bay 3.5 x 1"	**Select**		0 or 1	0 or 1	0
1.44 MB Floppy diskette drive	Accessible bay	O	PBXRX-AB	PBXRX-AB	Included
5. Graphics 1 Required	**Select**		1	1	1
PowerStorm 3D10 Entry 2D (a)	1 PCI slot	M	PB2GA-JA	PB2GA-JA	PB2GA-JA
PowerStorm 3D30 8-plane (a)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 24-plane Z-buffer (a)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
ZLXp-L1 24-plane (a)	1 PCI slot		PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane (a)	2 PCI slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN
6. Monitors	**Select**		1	1	1
15" Color Monitor NH/NH/SH (g)		M	VRC15-WA/W3/W4	VRC15-WA/W3/W4	VRC15-WA/W3/W4
17" Color Monitor NH/NH/SH (g)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor NH/NH/SH (g)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
7. Software Media and Documentation kits					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2 (k)		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1		O		QA-MT1AG-H8	
Windows NT Workstation		O			QB-0QRAA-SA
8. Additional Options: See AlphaStation Options for a comprehensive list of qualified options (m)					
ThinWire Ethernet MAU (10Base2)	Internal connection	O	PBXDC-DA	PBXDC-DA	PBXDC-DA

AlphaStation 255/233 *(continued)*

AlphaStation 255/233 Notes

(a) Up to **3** PowerStorm graphics options and 3 monitors are supported on Digital UNIX and Windows NT systems.
Up to **2** PowerStorm graphics options and 2 monitors are supported on OpenVMS systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.
Graphics options are supported in the following combinations with a maximum of 3 on Digital UNIX and Windows NT systems and a maximum of 2 on OpenVMS systems:
One PowerStorm 3D10 option, or
Three PowerStorm 3D30 options (two for OpenVMS), or
Three PowerStorm 4D20 options (two for OpenVMS), or
Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
One ZLXp-L1 on Digital UNIX, OpenVMS and Windows NT, or
One ZLXp-L2 (uses two PCI slots) on Digital UNIX and OpenVMS systems **only**.

(b) PCI/ISA combination slot is not supported for PCI options on systems running OpenVMS.

(c) For more than 7 internal or external devices, a fast SCSI-2 controller, which supports 7 devices, is required.

(d) Each external device requires a 3-foot SCSI cable

(e) Select country-specific keyboard from AlphaStation Options section. LK47W-xx = 101/102 key PC style Frost White keyboard, LK46W-xx = 108 key LK201/LK401 style Frost White keyboard (preferred for OpenVMS users).

(f) Select country-specific power cord from AlphaStation Options section.

(g) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = Northern Hemisphere monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants from AlphaStation Options section.

(h) The system can support the following hard drive configurations:
The system disk will be installed below the floppy if the drive size is 2.1 GB or smaller.(The 1.0 GB & 2.1 GB drives are 1.0" high.)

(Maximum of two drives total including system disk)

HD bay beneath floppy	HD bay beneath CD-ROM
one 1.0" hard drive	one 1.0" hard drive or one 1.6" hard drive
nothing	one 1.6" hard drive

(i) Does not support Tag Command Queuing, Seek Reordering Spindle Sync, or Variable Sector Size.

(j) Maximum of one 1.6" SCSI-2 bay available.

(k) OpenVMS V6.2-1H1 kit is required for AlphaStation 255. It must be installed over OpenVMS V6.2 media when reloading operating system

(m) Check availability of slots (initially 2 PCI, 1 PCI/ISA combination, 1 ISA). PCI/ISA combination slot not supported for PCI options on OpenVMS systems. ISA slot is a 1/2 sized slot.

AlphaStation 255/300 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 255/300	Resources Used		Digital UNIX / OpenVMS	Digital UNIX
Application Profile			2D CAD	3D CAD
Operates at 120V / 240V			PB480-AA / PB481-AA	PB480-CA
CPU Alpha dual issue microprocessor	21064A 300 MHz	Y	Y	Y
CD-ROM 600 Mbyte	5.25" SCSI-2 bay	Y	Y	Y
Ethernet (10BaseT), audio, headphone, microphone, mouse		Y	Y	Y
Operating System		Y	Y	Y
Memory	1 bank	Y	64 Mbyte	64 Mbyte
Internal hard disk drive	1" SCSI-2 bay	Y	1 Gbyte	2 Gbyte
Graphics (a)	1 PCI slot 2 PCI slot	Y	PowerStorm 3D30	 4D40T
User Documentation–English		Y	Y	Y
Remaining available resources				
I/O slots PCI			1	0
PCI/ISA combo (b)			1 / 0	1
ISA (half size)			1	1
Memory banks			1	1
Internal disk drives (2 maximum)	1" or 1.6" SCSI-2 bays		1	1
SCSI-2 External storage (c,d)			5	5
1. Country Options	**Select**		1	1
Keyboards (e)		M	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx
Power Cord (f)		M	BNxxx-xx	BNxxx-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.				
2. Monitors	**Select**		1	1
17" Color Monitor NH/NH/SH (g)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor NH/NH/SH (g)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1
32 Mbyte	1 bank	O	MSP01-BA	MSP01-BA
64 Mbyte	1 bank	O	MSP01-BB	MSP01-BB
128 Mbyte	1 bank	O	MSP01-BC	MSP01-BC
256 Mbyte	1 bank	O	MSP01-BD	MSP01-BD
4. Second hard disk drive (h)	**Select**		0 or 1	0 or 1
1.05 Gbyte drive 1.0" (i)	1" or 1.6" SCSI-2 bay	O	PBXRZ-ED	PBXRZ-ED
1.05 Gbyte drive 1.0"	1" or 1.6" SCSI-2 bay	O	PBXRZ-EB	PBXRZ-EB
2.1 Gbyte drive 1.0" 7200 RPM	1" or 1.6" SCSI-2 bay	O	PBXRZ-JB	PBXRZ-JB
2.1 Gbyte drive 1.0" 5400 RPM	1" or 1.6" SCSI-2 bay	O	PBXRZ-HB	PBXRZ-HB
4.3 Gbyte drive 1.6" (j)	1.6" SCSI-2 bay	O	PBXRZ-NA	PBXRZ-NA
5. Accessible bay 3.5 x 1"	**Select**		1	1
1.44 MB Floppy diskette drive	Accessible bay	O	PBXRX-AB	PBXRX-AB
6. Software Media and Documentation kits				
Digital UNIX		O	QA-MT4AA-H8	QA-MT4AA-H8
OpenVMS V6.2 (k)		O	QA-MT1AA-H8	
OpenVMS V6.2-1H1		O	QA-MT1AG-H8	
7. Additional Options: See AlphaStation Options for a comprehensive list of qualified options (m)				
ThinWire Ethernet MAU (10Base2)	Internal connection	O	PBXDC-DA	PBXDC-DA

Note: See AlphaStation 255/300 notes on Page 9.

AlphaStation 255/300 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 255/300	Resources Used		Digital UNIX	Open VMS	Windows NT
Operates at 120V/240V			PB48A-AA	PB48A-BA	PB48A-CA
CPU Alpha dual issue microprocessor	21064A 300 MHz	Y	Y	Y	Y
Floppy diskette drive 1.44 MB	Accessible bay				Y
CD-ROM 600 Mbyte	5.25" SCSI-2 bay	Y	Y	Y	Y
Ethernet (10BaseT), audio, headphone, microphone, mouse		Y	Y	Y	Y
Integration Service		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
User Documentation–English		Y	Y	Y	Y
Remaining available resources					
I/O slots PCI PCI/ISA combo (b) ISA (half size)			2 1 1	2 0 1	2 1 1
Memory banks			2	2	2
Internal disk drives (2 maximum)	1" or 1.6" SCSI-2 bays		2	2	2
SCSI-2 External (c,d)			6	6	6
1. Country Options	**Select**		1	1	1
Keyboards (e)		M	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx	LK47W-xx or LK46W-xx
Power Cord (f)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		**Minimum Required 32 Mbyte 1 or 2**	**Minimum Required 32 Mbyte 1 or 2**	**Minimum Required 32 Mbyte 1 or 2**
32 Mbyte	1 bank	M	MSP01-BA	MSP01-BA	MSP01-BA
64 Mbyte	1 bank	M	MSP01-BB	MSP01-BB	MSP01-BB
128 Mbyte	1 bank	M	MSP01-BC	MSP01-BC	MSP01-BC
256 Mbyte	1 bank	M	MSP01-BD	MSP01-BD	MSP01-BD
3. Disk drives 1 Required (h)	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte drive 1.0" (i)	1" or 1.6" SCSI-2 bay	M	PBXRZ-ED	PBXRZ-ED	PBXRZ-ED
1.05 Gbyte drive 1.0"	1" or 1.6" SCSI-2 bay	M	PBXRZ-EB	PBXRZ-EB	PBXRZ-EB
2.1 Gbyte drive 1.0" 7200 RPM	1" or 1.6" SCSI-2 bay	M	PBXRZ-JB	PBXRZ-JB	PBXRZ-JB
2.1 Gbyte drive 1.0" 5400 RPM	1" or 1.6" SCSI-2 bay	M	PBXRZ-HB	PBXRZ-HB	PBXRZ-HB
4.3 Gbyte drive 1.6" (j)	1.6" SCSI-2 bay	M	PBXRZ-NA	PBXRZ-NA	PBXRZ-NA
4. Accessible bay 3.5 x 1"	**Select**		0 or 1	0 or 1	0
1.44 MB Floppy diskette drive	Accessible bay	O	PBXRX-AB	PBXRX-AB	Included
5. Graphics 1 Required	**Select**		1	1	1
PowerStorm 3D30 8-plane (a)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 24-plane Z-buffer (a)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
ZLXp-L1 24-plane (a)	1 PCI slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane (a)	2 PCI slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN
6 Monitors	**Select**		1	1	1
17" Color Monitor NH/NH/SH (g)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor NH/NH/SH (g)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
7 Software Media and Documentation kits					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2 (k)		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1		O		QA-MT1AG-H8	
Windows NT Workstation		O			QB-0QRAA-SA
8 Additional Options: See AlphaStation Options for a comprehensive list of qualified options (m)					
ThinWire Ethernet MAU (10Base2)	Internal connection	O	PBXDC-DA	PBXDC-DA	PBXDC-DA

AlphaStation 255/300 *(continued)*

AlphaStation 255/300 Notes

(a) Up to **3** PowerStorm graphics options and 3 monitors are supported on Digital UNIX and Windows NT systems.
Up to **2** PowerStorm graphics options and 2 monitors are supported on OpenVMS systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.
Graphics options are supported in the following combinations with a maximum of 3 on Digital UNIX and Windows NT systems and a maximum of 2 on OpenVMS systems:
Three PowerStorm 3D30 options (two for OpenVMS), or
Three PowerStorm 4D20 options (two for OpenVMS), or
Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
One ZLXp-L1 on Digital UNIX, OpenVMS and Windows NT, or
One ZLXp-L2 (uses two PCI slots) on Digital UNIX and OpenVMS systems **only**.

(b) PCI/ISA combination slot is not supported for PCI options on systems running OpenVMS.

(c) For more than 7 internal or external devices, a fast SCSI-2 controller, which supports 7 devices, is required.

(d) Each external device requires a 3-foot SCSI cable

(e) Select country-specific keyboard from AlphaStation Options section. LK47W-xx = 101/102 key PC style Frost White keyboard, LK46W-xx = 108 key LK201/LK401 style Frost White keyboard (preferred for OpenVMS users).

(f) Select country-specific power cord from AlphaStation Options section.

(g) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = Northern Hemisphere monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants from AlphaStation Options section.

(h) The system can support the following hard drive configurations:
The system disk will be installed below the floppy if the drive size is 2.1 GB or smaller.(The 1.0 GB & 2.1 GB drives are 1.0" high.)

(Maximum of two drives total including system disk)

HD bay beneath floppy	HD bay beneath CD-ROM
one 1.0" hard drive	one 1.0" hard drive or one 1.6" hard drive
nothing	one 1.6" hard drive

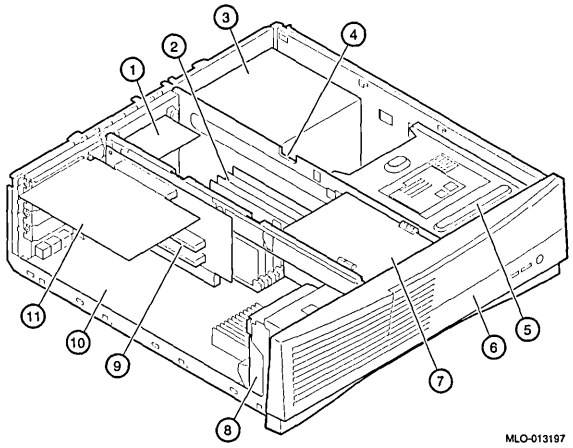
(i) Does not support Tag Command Queuing, Seek Reordering Spindle Sync, or Variable Sector Size.

(j) Maximum of one 1.6" SCSI-2 bay available.

(k) OpenVMS V6.2-1H1 kit is required for AlphaStation 255. It must be installed over OpenVMS V6.2 media when reloading operating system

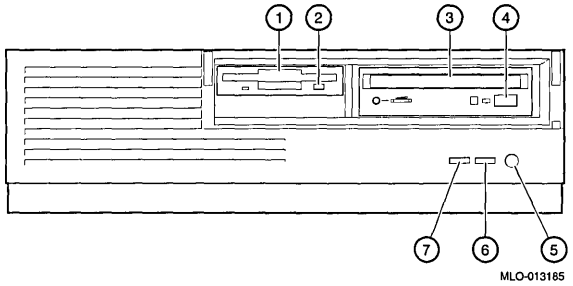
(m) Check availability of slots (initially 2 PCI, 1 PCI/ISA combination, 1 ISA). PCI/ISA combination slot not supported for PCI options on OpenVMS systems. ISA slot is a 1/2 sized slot.

Internal



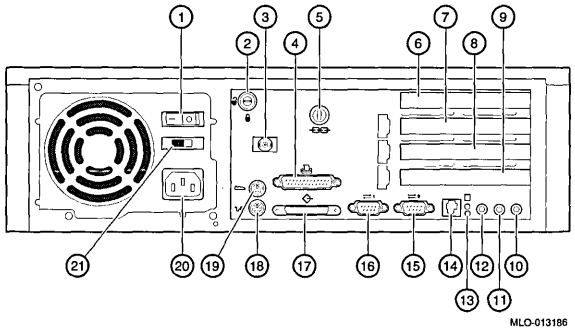
1. Media adapter unit (MAU) (optional). Provides ThinWire Ethernet connections.
2 Memory SIMMs (two banks of 4 SIMMs each).
3 Power supply with internal fan.
4 Cable routing areas.
5 CD-ROM drive. Located below the CD-ROM drive is storage for one 1.6-inch-high 3.5-inch hard drive or one 1-inch-high 3.5-inch drive or two 1-inch-high 3.5-inch hard drives.
6 Speaker.
7 3.5-inch, 1.44-MB floppy disk drive. Located below the floppy is storage for one 1.0-inch 3.5-inch hard drive. If this bay is used, only ONE hard drive can be located below the CD-ROM. See disk drive installation rules footnote (h) under Base Configurations on previous page.
8 Cooling fan.
9 Riser card for ISA and PCI option cards which provides 2 PCI slots, 1 PCI/ISA combo slot, and 1 ISA slot. OpenVMS users cannot use the combo slot for PCI options.
10 Motherboard.
11 Typical PCI option card (size varies with option).

System Front



1 Floppy drive
2 Floppy eject button
3 CD-ROM drive
4 CD-ROM eject button
5 Reset button (button resets system and causes self-test to run)
6 Power indicator (lights when system is on)
7 Disk activity indicator (lights when hard disk drive on embedded SCSI controller bus is in use)

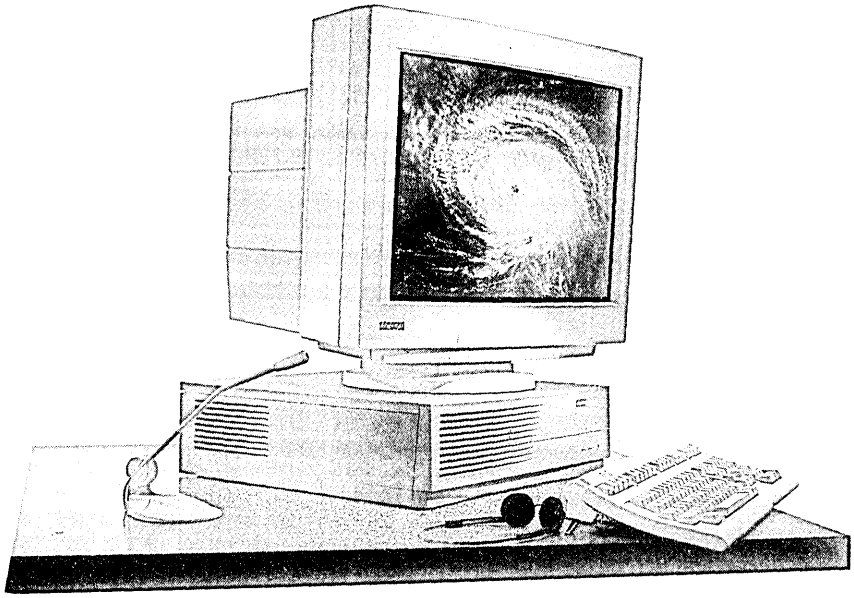
System Rear



1 Power on/off button
2 Key lock (locking mechanism for system)
3 MAU (Media adapter unit (optional ThinWire Ethernet connection))
4 Enhanced bi-directional parallel port (Connects an industry-standard parallel printer or other parallel device)
5 Kensington lock (optional), (Point for attaching system to another point for security)
6 Expansion slot (PCI slot)
7 Expansion slot (PCI slot)
8 Expansion slot (Combination slot: PCI or ISA. OpenVMS users cannot use this slot for PCI options)
9 Expansion slot (Used for ISA expansion options)
10 Headphone jack (Connector for headphones or customer-supplied external speakers)
11 Microphone jack (Connector for microphone)
12 Line-in connector (Brings audio signals into system)
13 Network LEDs (Green indicates system is linked to network. Yellow indicates network activity)
14 Twisted pair connector (Connector to embedded Ethernet controller)
15 COM port 2 (Connector for communications port 2)
16 COM port 1 (Connector for communications port 1)
17 SCSI port (Provides interface between system unit and external SCSI devices. Terminator required if no SCSI devices are present)
18 Mouse connector (Connects PS/2-compatible mouse)
19 Keyboard connector (Use to connect a 101-, 102-, or 108-key keyboard)
20 AC power connector (Connects system to AC power)
21 Voltage selector switch (Allows you to set your system to work with 115 or 230 Volts AC power)

Specifications

PCI	132-Mbyte/second
Fast SCSI-2 bus	10-Mbyte/s transfer rate
Ethernet	10-Mbit/s Twisted Pair standard
Power Requirements	
Line voltage	120/240 V
Voltage tolerance	90-128/190-256 V
Frequency single phase	50/60 Hz
Frequency tolerance	47-63 Hz
Maximum running current	7.0A/3.3A with monitor 5.0A/2.3A without monitor
Maximum power consumption	200 W
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity Maximum wet bulb	10% to 90% relative humidity 28° C (82° F)
Storage temperature	-40° C to 66° C (-40° F to 149° F)
Storage humidity Maximum wet bulb	10% to 90% relative humidity 46° C (114° F)
Maximum altitude Operating Nonoperating	 3,048 m (10,000 ft) maximum 12,190 m (40,000 ft) maximum
Nonoperating shock	30G, 25 ms halfsine
Physical Characteristics	
Height	13.0 cm (5.12 inches)
Width	44.6 cm (17.56 inches)
Depth	48.4 cm (19.06 inches)
Weight	16 kg (35 lb)



AlphaStation 500/266–500/333–500/400–500/500

Product Description

The AlphaStation 500 is a series of high performance desktop Workstations. These systems deliver premium performance and provide access to thousands of applications running on Digital UNIX, OpenVMS and Windows NT Workstation systems.

The AlphaStation 500/266 uses the Alpha microprocessor 21164 running at 266 MHz. The CPU performance measures 329 SPECint92, 7.93 SPECint95, 405 SPECfp92, and 11.1 SPECfp95 with 2-Mbytes third level cache.

The AlphaStation 500/333 uses the Alpha microprocessor 21164 running at 333 MHz. The CPU performance measures 389 SPECint92, 9.02 SPECint95, 480 SPECfp92, and 12.5 SPECfp95 with 2-Mbytes third level cache.

The AlphaStation 500/400 uses the Alpha microprocessor 21164 running at 400 MHz. The CPU performance measures 12.3 SPECint95 and 14.1 SPECfp95 with 2-Mbytes third level cache.

The AlphaStation 500/500 uses the Alpha microprocessor 21164 running at 500 MHz. The CPU performance measures 15 SPECint95 and 20.4 SPECfp95 with 8-Mbytes third level cache.

The system is housed in a new base colored desktop enclosure—Top Gun Blue, with capacity for up to 512 Mbyte of ECC memory on AlphaStation 500/266 and 500/333 systems, and 1 Gbyte on AlphaStation 500/400 and 500/500 systems, 256-bit wide memory bus, five storage slots, and four PCI expansion slots. Three of the PCI expansion slots are 32-bit, while the fourth is a 64-bit slot. The high performance 64-bit PCI I/O bus, running at 264-Mbytes/second peak, provides expansion for options such as high performance graphics, networking, and SCSI adapters. The system supports a wide variety of industry-standard peripherals and PC options. Other standard features include Twisted Pair and ThinWire Ethernet, stereo-quality audio, an array of external ports for serial/parallel communications, and external SCSI connectors. This combination of standard features allows multiple in-box configurations without the need for additional tabletop options or expansion boxes.

All AlphaStation 500 systems come with the best hardware warranty in the industry—a three-year warranty.

Systems

- Digital UNIX systems include factory-installed software (FIS).
- Options ordered will be factory installed unless specified as **spares.**

AlphaStation 500 systems include

- Alpha microprocessor 21164 266-MHz CPU with 2 MB of third level cache, **or**
- Alpha microprocessor 21164 333-MHz CPU with 2 MB of third level cache, **or**
- Alpha microprocessor 21164 400-MHz CPU with 2 MB of third level cache, **or**
- Alpha microprocessor 21164 500 MHz CPU with 8 MB of third level cache
- Desktop enclosure which includes:
  - Four expansion slots
    One 64-bit PCI[1]
    Three 32-bit PCI
  - Two memory banks for maximum:
    512 MB on AlphaStation 500/266 and 500/333 and,
    1.0 GB on AlphaStation 500/400 and 500/500
  - Five storage slots
    One dedicated diskette drive slot
    One dedicated CD ROM drive slot
    Three hard disk drives slots support
    Three 1" drives or
    One 1" drive and one 1.6" drive
  - Integral Fast Wide single ended SCSI-2 controller with one external SCSI-2 connector, and high performance 10 MB/second Twisted Pair[2] and ThinWire Ethernet
  - 320-Watt power supply
  - Two serial ports, support full modem control
  - One parallel port
  - Keyboard port and mouse port
- Memory (Advantage systems only)
- Hard Disk (Advantage systems only)
- Graphics (Advantage systems only)
- Audio, headset, and microphone
- 3-button mouse
- Hardware documentation
- Hardware Warranty: Industry leading one-year on-site and two-years return to Digital
- Software Warranty: 90-day SPD conformance with advisory telephone support
- Digital UNIX V3.2D, or later, 2-user base license
  Digital Open3D license
  Multimedia Services license
  Digital NAS Client 150 license
  Communique! starter license, **or**
- OpenVMS V6.2-1H1, or later, base plus 1-user license
  Multimedia Services license
  Digital NAS Client 150 license
  Communique! starter license, **or**
- Windows NT Workstation V3.51 media kit
  Communiuqe! starter license and CD-ROM,
  Digital Light & Sound license and CD-ROM

1. 32-bit PCI options can be installed in 64-bit PCI slot. Option will run at 32-bit speed of 132 Mbyte/seconds instead of 64-bit speed of 264 Mbytes/seconds.
2. Twisted Pair connection required Shielded Twisted Pair cable BN26M-xx. See AlphaStation Options for additional cabling information.

Ordering menu that follows includes

- AlphaStation 500/266, 500/333, 500/400, and 500/500 Advantage and Base Configurations

Menus are streamlined for ease of ordering. Select Advantage Configurations to meet application and performance needs in the following areas:

- 2D CAD
- 3D Solids CAD

To configure a customized system, use Base Configuration menus. Additional system options are in the AlphaStation Options section.

Warranty Statement

AlphaStations are sold with specific warranty response times, hours of coverage, warranty duration, and a specific manner by which the warranty service will be delivered. Digital also makes available extended coverage offerings to uplift or extend the service coverage and/or response time: See Supplemental Services in AlphaStation Options section.

AlphaStation 500/266 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/266	Resources Used		Digital UNIX / OpenVMS	Digital UNIX / Windows NT	Digital UNIX
Application Profile			2D CAD	3D CAD	3D CAD
Operates at 120V/240V			PB541-AA / PB541-BA	PB541-AB / PB541-CA	PB541-AC
CPU Alpha microprocessor	21164 266-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 Mbyte	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
Memory(a)	1 bank	Y	64 MB	128 MB	128 MB
Cache		Y	2 MB	2 MB	2 MB
Internal storage	1" SCSI bay	Y	2 GB	2 GB	2 GB
Graphics(b)	1 PCI slot 2 PCI slots	Y	PowerStorm 3D30	ZLXp-L2	PowerStorm 4D50T
User Documentation–English		Y	Y	Y	Y
Available resources after configuration					
I/O slots PCI-64 bit (c) PCI-32 bit			1 2	0 2	0 2
Memory banks			1	1	1
SCSI bays Two 3.5 x 1" **or** One 3.5 x 1.6" bay			2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"
1. Country Options	**Select**		1	1	
Keyboard (d)		M	LK47W-xx / LK46W-xx	LK47W-xx	LK47W-xx
Power Cord (e)		M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Color Monitors	**Select**		1		1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1	0 or 1
32-Mbyte	1 bank	O	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	O	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	O	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	O	MSP01-FD	MSP01-FD	MSP01-FD
4. Additional hard drives	**Select**		Two 1" or One 1.6"	Two 1" or One 1.6"	Two 1" or One 1.6"
1.05 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	O	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Software Media and Documentation					
Digital UNIX		O	QA-MT4AA-H8	QA-MT4AA-H8	QA-MT4AA-H8
OpenVMS V6.2		O	QA-MT1AA-H8		
OpenVMS V6.2-1H1 (h)		O	QA-MT1AG-H8		
Windows NT Documentation set		O		QA-0QRAA-GZ	
6. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
7. Additional Options: Refer to AlphaStation Options for a comprehensive list of qualified options (j)					

AlphaStation 500/266 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/266	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB54A-AA	PB54A-BA	PB54A-CA
CPU Alpha microprocessor	21164 266-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Cache		Y	2Mbyte	2Mbyte	2Mbyte
Integration Service		Y	Y	Y	Y
Operating System		Y	Y	Y	Y
User Documentation - English		Y	Y	Y	Y

Remaining available resources					
I/O slots PCI-64 bit (c) PCI-32 bit			1 3	1 3	1 3
Memory banks			2	2	2
SCSI bays Three 3.5 x 1" **or** One 3.5 x 1" and One 3.5 x 1.6" bays			3x1" or 1x1" and 1x1.6"	3x1" or 1x1" and 1x1.6"	3x1" or 1x1" and 1x1.6"
1. Country Options	**Select**		1	1	1
Keyboard (d)	Select 1	M	LK47W-xx	LK46W-xx	LK47W-xx
Power Cord (e)	Select 1	M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		**Minimum Required 32-Mbyte** **1**	**Minimum Required 32-Mbyte** **1**	**Minimum Required 32-Mbyte** **1**
32-Mbyte	1 bank	M	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	M	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	M	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	M	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte (k)	1 bank	M	MSP01-FE	MSP01-FE	MSP01-FE
3. Hard drive required 1	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	M	PBXRW-NA	PBXRW-NA	PBXRW-NA
4. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
5. Graphics required 1	**Select**		1	1	1
PowerStorm 3D30 (b)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 (b)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
PowerStorm 4D40T (b)	2 PCI slots	M	PBXGI-AA		PBXGI-AA
PowerStorm 4D50T (b)	2 PCI slots	M	PBXGI-AB		PBXGI-AB
PowerStorm 4D60T (b)	2 PCI slots	M	PBXGI-AC		PBXGI-AC
ZLXp-L1 24-plane Pixelvision(b)	1 PCI Slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane Pixelvision(b)	2 PCI Slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN

AlphaStation 500/266 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/266	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB54A-AA	PB54A-BA	PB54A-CA
5a. PowerStorm Texture Memory Upgrades—supported on PowerStorm 4D40T, 4D50T, and 4D60T graphics options only					
4-Mbyte Texture memory		O	PBXGI-GA		PBXGI-GA
16-Mbyte Texture memory		O	PBXGI-GB		PBXGI-GB
32-Mbyte Texture memory		O	PBXGI-GC		PBXGI-GC
6. Software Media/Documentation					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1 (h)		O		QA-MT1AG-H8	
Windows NT Documentation set		O			QA-0QRAA-GZ
7. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
8. 400 MHz CPU Board Upgrade for AlphaStation 500/266 MHz systems (i)					
AlphaStation 266 MHz to 400 MHz CPU Board Upgrade		O	PB56U-AA	PB56U-AA	PB56U-AA
On-site CPU board upgrade installation service		O	FM-WSDTP-IN	FM-WSDTP-IN	FM-WSDTP-IN
On-site CPU board upgrade travel		O	FM-TRAVL-IN	FM-TRAVL-IN	FM-TRAVL-IN
Note: Installation and Travel are not included with CPU Board Upgrade. Order FM-WSDTP-IN and FM-TRAVL-IN separately.					
9. Additional Options Refer to AlphaStation Options for a comprehensive list of qualified options. **(j)**					

(a) Eight DIMM slots support two memory options (4 DIMMs per option). Memory options can be mixed, see Note (k).

(b) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(c) Bottom two PCI slots support 1/2 length PCI options only

(d) Select country-specific keyboard from AlphaStation Options section. LK46W-xx = OpenVMS style; LK47W-xx = Digital UNIX, Windows NT style.

(e) Select country-specific power cord from AlphaStation Options section.

(f) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = NH monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

(g) Maximum of one 1.6" disk drive supported.

(h) OpenVMS V6.2-1H1 kit is required for AlphaStation 500. It must be installed over OpenVMS V6.2 media when reloading operating system

(i) Upgrading CPU from 266 MHz to 400 MHz in the field causes FCC classification of the AlphaStation 500 to be downgraded from FCC Class B to FCC Class A. This does not affect complete AlphaStation 500/400 systems shipped from Digital. Installed Operating System software must be upgraded (i.e. from Digital UNIX V3.2D to Digital UNIX V3.2F).

(j) Check availability of PCI slots before adding additional options (initially 4 PCI).

(k) **Note:** Maximum of one 512 MB memory option supported in AlphaStation 500/266. System supports two memory options in any combination of, 32 MB, 64 MB, 128 MB, 256 MB for a system maximum of 512 MBytes.

AlphaStation 500/333 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/333	Resources Used		Digital UNIX / OpenVMS	Digital UNIX / Windows NT	Digital UNIX
Application Profile			2D CAD	3D CAD	3D CAD
Operates at 120V/240V			PB551-AA / PB551-BA	PB551-AB / PB551-CA	PB551-AC
CPU Alpha microprocessor	21164 333-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 Mbyte	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
Memory (a)	1 bank	Y	64 MB	128 MB	128 MB
Cache		Y	2 MB	2 MB	2 MB
Internal storage	1" bay 1 SCSI	Y	2 GB	2 GB	2 GB
Graphics (b)	1 PCI slot 2 PCI slots	Y	PowerStorm 3D30	ZLXp-L2 / 4D50T	PowerStorm 4D50T
User Documentation–English		Y	Y	Y	Y
Available resources after configuration					
I/O slots PCI-64 bit (c) PCI-32 bit			1 2	0 2	0 2
Memory banks			1	1	1
SCSI bays Two 3.5 x 1" **or** One 3.5 x 1.6" bay			2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"
1. Country Options	**Select**		1	1	1
Keyboard (d)		M	LK47W-xx / LK46W-xx	LK47W-xx	LK47W-xx
Power Cord (e)		M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1	0 or 1
32-Mbyte	1 bank	O	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	O	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	O	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	O	MSP01-FD	MSP01-FD	MSP01-FD
4. Additional hard drives	**Select**		Two 1" or One 1.6"	Two 1" or One 1.6"	Two 1" or One 1.6"
1.05 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	O	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Software Media and Documentation					
Digital UNIX		O	QA-MT4AA-H8	QA-MT4AA-H8	QA-MT4AA-H8
OpenVMS V6.2		O	QA-MT1AA-H8		
OpenVMS V6.2-1H1 (h)		O	QA-MT1AG-H8		
Windows NT Documentation set		O		QA-0QRAA-GZ	
6. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
7. Additional Options: Refer to AlphaStation Options for a comprehensive list of qualified options (j)					

AlphaStation 500/333 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/333	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB55A-AA	PB55A-BA	PB55A-CA
CPU Alpha microprocessor	21164 333-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Cache		Y	2 Mbyte	2 Mbyte	2 Mbyte
Integration Service		Y	Y	Y	Y
Operating System		Y	Y	Y	Y
User Documentation - English		Y	Y	Y	Y

Remaining available resources					
I/O slots PCI-64 bit (c) PCI-32 bit			1 3	1 3	1 3
Memory banks			2	2	2
SCSI bays Three 3.5 x 1" **or** One 3.5 x 1" and One 3.5 x 1.6" bays			3 x 1" or 1 x 1" and 1 x 1.6'	3 x 1" or 1 x 1" and 1 x 1.6'	3 x 1" or 1 x 1" and 1 x 1.6'
1. Country Options	**Select**		1	1	1
Keyboard (d)	Select 1	M	LK47W-xx	LK46W-xx	LK47W-xx
Power Cord (e)	Select 1	M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		**Minimum Required 32-Mbyte** 1	**Minimum Required 32-Mbyte** 1	**Minimum Required 32-Mbyte** 1
32-Mbyte	1 bank	M	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	M	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	M	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	M	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte (j)	1 bank	M	MSP01-FE	MSP01-FE	MSP01-FE
3. Hard drive required 1	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	M	PBXRW-NA	PBXRW-NA	PBXRW-NA
4. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
5. Graphics required 1	**Select**		1	1	1
PowerStorm 3D30 (b)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 (b)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
PowerStorm 4D40T (b)	2 PCI slots	M	PBXGI-AA		PBXGI-AA
PowerStorm 4D50T (b)	2 PCI slots	M	PBXGI-AB		PBXGI-AB
PowerStorm 4D60T (b)	2 PCI slots	M	PBXGI-AC		PBXGI-AC
ZLXp-L1 24-plane Pixelvision(b)	1 PCI Slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane Pixelvision(b)	2 PCI Slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN

AlphaStation 500/333 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/333	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB55A-AA	PB55A-BA	PB55A-CA
5a. PowerStorm Texture Memory Upgrades—supported on PowerStorm 4D40T, 4D50T, and 4D60T graphics options only					
4-Mbyte Texture memory		O	PBXGI-GA		PBXGI-GA
16-Mbyte Texture memory		O	PBXGI-GB		PBXGI-GB
32-Mbyte Texture memory		O	PBXGI-GC		PBXGI-GC
6. Software Media/Documentation					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1 (h)		O		QA-MT1AG-H8	
Windows NT Documentation set		O			QA-0QRAA-GZ
7. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
8. 400 MHz CPU Board Upgrade for AlphaStation 500/333 MHz systems (i)					
AlphaStation 333 MHz to 400 MHz CPU Board Upgrade		O	PB56U-AB	PB56U-AB	PB56U-AB
Installation Service for on-site CPU board upgrade		O	FM-WSDTP-IN	FM-WSDTP-IN	FM-WSDTP-IN
Travel for on-site CPU board upgrade		O	FM-TRAVL-IN	FM-TRAVL-IN	FM-TRAVL-IN
Note: Installation and Travel are not included with CPU Board Upgrade. Order FM-WSDTP-IN and FM-TRAVL-IN separately.					
9. Additional Options Refer to AlphaStation Options for a comprehensive list of qualified options. (j)					

(a) Eight DIMM slots support two memory options (4 DIMMs per option). Memory options can be mixed, see Note (k).

(b) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(c) Bottom two PCI slots support 1/2 length PCI options only

(d) Select country-specific keyboard from AlphaStation Options section. LK46W-xx = OpenVMS style; LK47W-xx = Digital UNIX, Windows NT style.

(e) Select country-specific power cord from AlphaStation Options section.

(f) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = NH monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

(g) Maximum of one 1.6" disk drive supported.

(h) OpenVMS V6.2-1H1 kit is required for AlphaStation 500. It must be installed over OpenVMS V6.2 media when reloading operating system

(i) Upgrading CPU from 266 MHz to 400 MHz in the field causes FCC classification of the AlphaStation 500 to be downgraded from FCC Class B to FCC Class A. This does not affect complete AlphaStation 500/400 systems shipped from Digital. Installed Operating System software must be upgraded (i.e. from Digital UNIX V3.2D to Digital UNIX V3.2F).

(j) Check availability of PCI slots before adding additional options (initially 4 PCI).

(k) **Note:** Maximum of one 512 MB memory option supported in AlphaStation 500/333. System supports two memory options in any combination of, 32 MB, 64 MB, 128 MB, 256 MB for a system maximum of 512 MBytes.

AlphaStation 500/400 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/400	Resources Used		Digital UNIX / OpenVMS	Digital UNIX / Windows NT	Digital UNIX
Application Profile			2D CAD	3D CAD	3D CAD
Operates at 120V/240V			PB561-AA / PB561-BA	PB561-AB / PB561-CA	PB561-AC
CPU Alpha microprocessor	21164 400-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 Mbyte	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
Memory (a)	1 bank	Y	64 MB	128 MB	128 MB
Cache		Y	2 MB	2 MB	2 MB
Internal storage	1" bay 1 SCSI	Y	2 GB	2 GB	2 GB
Graphics (b)	1 PCI slot 2 PCI slots	Y	PowerStorm 3D30	PowerStorm 4D50T	PowerStorm 4D60T
User Documentation–English		Y	Y	Y	Y
Available resources after configuration					
I/O slots PCI-64 bit (c) PCI-32 bit			1 2	0 2	0 2
Memory banks			1	1	1
SCSI bays Two 3.5 x 1" **or** One 3.5 x 1.6" bay			2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"
1. Country Options	**Select**		1	1	1
Keyboard (d)		M	LK47W-xx / LK46W-xx	LK47W-xx	LK47W-xx
Power Cord (e)		M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1	0 or 1
32-Mbyte	1 bank	O	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	O	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	O	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	O	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte	1 bank	O	MSP01-FE	MSP01-FE	MSP01-FE
4. Additional hard drives	**Select**		Two 1" or One 1.6"	Two 1" or One 1.6"	Two 1" or One 1.6"
1.05 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	O	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Software Media and Documentation					
Digital UNIX		O	QA-MT4AA-H8	QA-MT4AA-H8	QA-MT4AA-H8
OpenVMS V6.2		O	QA-MT1AA-H8		
OpenVMS V6.2-1H1 (h)		O	QA-MT1AG-H8		
Windows NT Documentation set		O		QA-0QRAA-GZ	
6. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
7. Additional Options: Refer to AlphaStation Options for a comprehensive list of qualified options (j)					

AlphaStation 500/400 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/400	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB56A-AA	PB56A-BA	PB56A-CA
CPU Alpha microprocessor	21164 400-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Cache		Y	2Mbyte	2Mbyte	2Mbyte
Integration Service		Y	Y	Y	Y
Operating System		Y	Y	Y	Y
User Documentation - English		Y	Y	Y	Y

Remaining available resources					
I/O slots PCI-64 bit (c) PCI-32 bit			1 3	1 3	1 3
Memory banks			2	2	2
SCSI bays Three 3.5 x 1" **or** One 3.5 x 1" and One 3.5 x 1.6" bays			3x1" or 1x1" and 1x1.6"	3x1" or 1x1" and 1x1.6"	3x1" or 1x1" and 1x1.6"
1. Country Options	**Select**		1	1	1
Keyboard (d)	Select 1	M	LK47W-xx	LK46W-xx	LK47W-xx
Power Cord (e)	Select 1	M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		**Minimum Required 32-Mbyte** **1**	**Minimum Required 32-Mbyte** **1**	**Minimum Required 32-Mbyte** **1**
32-Mbyte	1 bank	M	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	M	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	M	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	M	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte	1 bank	M	MSP01-FE	MSP01-FE	MSP01-FE
3. Hard drive required 1	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	M	PBXRW-NA	PBXRW-NA	PBXRW-NA
4. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
5. Graphics required 1	**Select**		1	1	1
PowerStorm 3D30 (b)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 (b)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
PowerStorm 4D40T (b)	2 PCI slots	M	PBXGI-AA		PBXGI-AA
PowerStorm 4D50T (b)	2 PCI slots	M	PBXGI-AB		PBXGI-AB
PowerStorm 4D60T (b)	2 PCI slots	M	PBXGI-AC		PBXGI-AC
ZLXp-L1 24-plane Pixelvision(b)	1 PCI Slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane Pixelvision(b)	2 PCI Slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN

AlphaStation 500/400 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/400	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB56A-AA	PB56A-BA	PB56A-CA
5a. PowerStorm Texture Memory Upgrades—supported on PowerStorm 4D40T, 4D50T, and 4D60T graphics options only					
4-Mbyte Texture memory		O	PBXGI-GA		PBXGI-GA
16-Mbyte Texture memory		O	PBXGI-GB		PBXGI-GB
32-Mbyte Texture memory		O	PBXGI-GC		PBXGI-GC
6. Software Media/Documentation					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1 **(h)**		O		QA-MT1AG-H8	
Windows NT Documentation set		O			QA-0QRAA-GZ
7. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
8. Additional Options Refer to AlphaStation Options for a comprehensive list of qualified options. **(j)**					

(a) Eight DIMM slots support two memory options (4 DIMMs per option). Memory options can be mixed.

(b) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(c) Bottom PCI slot supports 1/2 length PCI options only

(d) Select country-specific keyboard from AlphaStation Options section. LK46W-xx = OpenVMS style; LK47W-xx = Digital UNIX, Windows NT style.

(e) Select country-specific power cord from AlphaStation Options section.

(f) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = NH monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

(g) Maximum of one 1.6" disk drive supported.

(h) OpenVMS V6.2-1H1 kit is required for AlphaStation 500. It must be installed over OpenVMS V6.2 media when reloading operating system

(j) Check availability of PCI slots before adding additional options (initially 4 PCI).

AlphaStation 500/500 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/500	Resources Used		Digital UNIX/ OpenVMS	Digital UNIX / Windows NT	Digital UNIX	Windows NT
Application Profile			2D CAD	3D CAD	3D CAD	3D
Operates at 120V/240V			PB571-AA/ PB571-BA	PB571-AB/ PB571-CA	PB571-AD	PB571-CC
CPU Alpha microprocessor	21164 500-MHz	Y	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y	Y
CD-ROM 600 Mbyte	5.25" SCSI bay	Y	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y	Y
Operating system		Y	Y	Y	Y	Y
Memory (a)	1 bank	Y	64 MB	128 MB	128 MB	128 MB
Cache		Y	8 MB	8 MB	8 MB	8 MB
Internal storage	1" SCSI bay	Y	2 GB	2 GB	2 GB	2 GB
Graphics (b)	1 PCI slot 2 PCI slots	Y	PowerStorm 3D30	PowerStorm 4D50T	PowerStorm 4D60T	PowerStorm 4D60T
4 MB Texture Memory					PBXGI-GA	PBXGI-GA
User Documentation–English		Y	Y	Y	Y	Y
Available resources after configuration						
I/O slots PCI-64 bit (c) PCI-32 bit			1 2	0 2	0 2	0 2
Memory banks			1	1	1	1
SCSI bays Two 3.5 x 1" **or** One 3.5 x 1.6" bay			2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"	2 x 1" or 1 x 1.6"
1. Country Options	**Select**		1	1	1	1
Keyboard (d)		M	LK47W-xx	LK47W-xx	LK47W-xx	LK47W-xx
Power Cord (e)		M	BN19P-xx	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA English keyboard, includes U.S. power cord; power cord does not need to be ordered separately.						
2. Color Monitor	**Select**		1	1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
3. Additional Memory	**Select**		0 or 1	0 or 1	0 or 1	0 or 1
32-Mbyte	1 bank	O	MSP01-FA	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	O	MSP01-FB	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	O	MSP01-FC	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	O	MSP01-FD	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte	1 bank		MSP01-FE	MSP01-FE	MSP01-FE	MSP01-FE
4. Additional hard drive	**Select**		Two 1" or One 1.6"	Two 1" or One 1.6"	Two 1" or One 1.6"	Two 1" or One 1.6"
1.05 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-EB	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1" or 1.6" SCSI bay	O	PBXRW-JB	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	O	PBXRW-NA	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Software Media and Documentation						
Digital UNIX		O	QA-MT4AA-H8		QA-MT4AA-H8	
OpenVMS V6.2		O	QA-MT1AA-H8			
OpenVMS V6.2-1H1 (h)		O	QA-MT1AG-H8			
Windows NT Documentation		O		QA-0QRAA-GZ		QA-0QRAA-GZ
6. Hardware System Lock						
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG	PCP3H-AG
7. Additional Options: Refer to AlphaStation Options for a comprehensive list of qualified options (j)						

AlphaStation 500/500 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/500	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB57A-AA	PB57A-BA	PB57A-CA
CPU Alpha microprocessor	21164 500-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Ethernet, Sound, Headset, Microphone, Mouse		Y	Y	Y	Y
Cache		Y	8 Mbyte	8 Mbyte	8 Mbyte
Integration Service		Y	Y	Y	Y
Operating System		Y	Y	Y	Y
User Documentation - English		Y	Y	Y	Y
Remaining available resources					
I/O slots PCI-64 bit (c) PCI-32 bit			1 3	1 3	1 3
Memory banks			2	2	2
SCSI bays Three 3.5 x 1" **or** One 3.5 x 1" and One 3.5 x 1.6" bays			3 x 1" or 1 x 1" and 1 x 1.6"	3 x 1" or 1 x 1" and 1 x 1.6"	3 x 1" or 1 x 1" and 1 x 1.6"
1. Country Options	**Select**		1	1	1
Keyboard (d)	Select 1	M	LK47W-xx	LK46W-xx	LK47W-xx
Power Cord (e)	Select 1	M	BN19P-xx	BN19P-xx	BN19P-xx
Note: LK47W-AA and LK46W-AA, English keyboards, include U.S. power cord; power cord does not need to be ordered separately.					
2. Memory **Memory Required 1** **Optional Available 1**	**Select**		Minimum Required 32-Mbyte 1	Minimum Required 32-Mbyte 1	Minimum Required 32-Mbyte 1
32-Mbyte	1 bank	M	MSP01-FA	MSP01-FA	MSP01-FA
64-Mbyte	1 bank	M	MSP01-FB	MSP01-FB	MSP01-FB
128-Mbyte	1 bank	M	MSP01-FC	MSP01-FC	MSP01-FC
256-Mbyte	1 bank	M	MSP01-FD	MSP01-FD	MSP01-FD
512 Mbyte	1 bank	M	MSP01-FE	MSP01-FE	MSP01-FE
3. Hard drive required 1	**Select**		1 or 2	1 or 2	1 or 2
1.05 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 Gbyte	1.0" or 1.6" SCSI bay	M	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 Gbyte (g)	1.6" SCSI bay	M	PBXRW-NA	PBXRW-NA	PBXRW-NA
4. Color Monitors	**Select**		1	1	1
17" Color Monitor (f)		M	VRT17-WA/W3/W4	VRT17-WA/W3/W4	VRT17-WA/W3/W4
21" Color Monitor (f)		M	VRC21-WA/W3/W4	VRC21-WA/W3/W4	VRC21-WA/W3/W4
5. Graphics required 1	**Select**		1	1	1
PowerStorm 3D30 (b)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 (b)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
PowerStorm 4D40T (b)	2 PCI slots	M	PBXGI-AA		PBXGI-AA
PowerStorm 4D50T (b)	2 PCI slots	M	PBXGI-AB		PBXGI-AB
PowerStorm 4D60T (b)	2 PCI slots	M	PBXGI-AC		PBXGI-AC
ZLXp-L1 24-plane Pixelvision(b)	1 PCI Slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane Pixelvision(b)	2 PCI Slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN

AlphaStation 500/500 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 500/500	Resources Used		Digital UNIX	OpenVMS	Windows NT
Operates at 120V/240V			PB57A-AA	PB57A-BA	PB57A-CA
5a. PowerStorm Texture Memory Upgrades—supported on PowerStorm 4D40T, 4D50T, and 4D60T graphics options only					
4-Mbyte Texture memory		O	PBXGI-GA		PBXGI-GA
16-Mbyte Texture memory		O	PBXGI-GB		PBXGI-GB
32-Mbyte Texture memory		O	PBXGI-GC		PBXGI-GC
6. Software Media/Documentation					
Digital UNIX		O	QA-MT4AA-H8		
OpenVMS V6.2		O		QA-MT1AA-H8	
OpenVMS V6.2-1H1 **(h)**		O		QA-MT1AG-H8	
Windows NT Documentation set		O			QA-0QRAA-GZ
7. Hardware System Lock					
Kensington Lock		O	PCP3H-AG	PCP3H-AG	PCP3H-AG
8. Additional Options Refer to AlphaStation Options for a comprehensive list of qualified options. **(j)**					

(a) Eight DIMM slots support two memory options (4 DIMMs per option). Memory options can be mixed.

(b) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(c) Bottom PCI slot supports 1/2 length PCI options only.

(d) Select country-specific keyboard from AlphaStation Options section. LK46W-xx = OpenVMS style; LK47W-xx = Digital UNIX, Windows NT style.

(e) Select country-specific power cord from AlphaStation Options section.

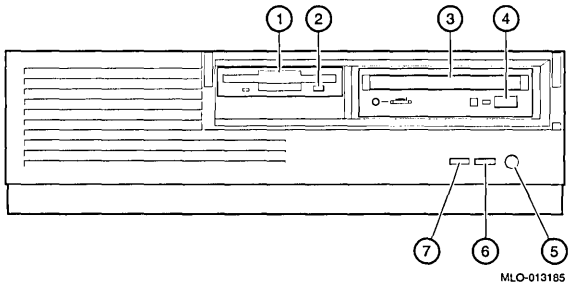
(f) -WA = NH (Northern Hemisphere) monitor with 120V power cord, -W3 = NH monitor without power cord, -W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

(g) Maximum of one 1.6" disk drive supported.

(h) OpenVMS V6.2-1H1 kit is required for AlphaStation 500. It must be installed over OpenVMS V6.2 media when reloading operating system

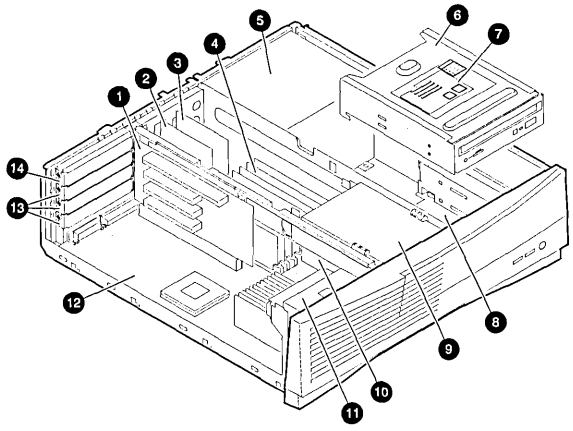
(j) Check availability of PCI slots before adding additional options (initially 4 PCI).

Front Controls, Indicators, and Drive Bay Locations



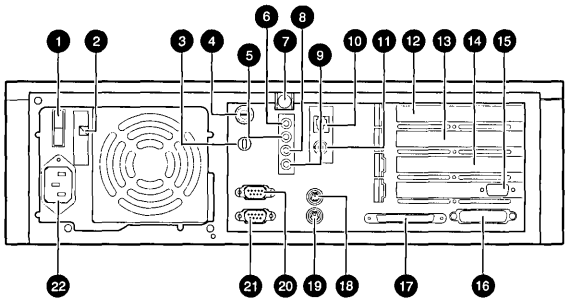
1	Floppy drive bay	Location of external bay for 3.5-inch Floppy diskette device.
2	Diskette eject button	Releases a 3.5-inch diskette from the diskette drive.
3	CD drive bay	Location of 5.25-inch CD-ROM device.
4	CD-ROM eject button	Opens the CD loading drawer
5	Halt/Reset button	Jumper Selectable. When halt is pressed, system halts immediately. When reset is pressed, resets system and causes self-test to run.
6	LED Indicator	DC On, lights when system is on.
7	LED Indicator	Lights to indicate SCSI activity.
8	Louvered air intake	Passageway for cooling air to enter system. Do not block air intake.

AlphaStation 500 system unit components



1. Riser Card for PCI (peripheral component interconnect option cards)
2. Media adapter unit (MAU). Provides twisted pair and ThinWire Ethernet connections.
3. Audio Card
4. Memory modules (two banks with four DIMMs in each bank)
5. Power supply and fan
6. Right upper external drive bay for 5.25-inch x 1.6 inch device (CD-ROM)
7. Customer Configuration Label
8. Right lower internal drive bay for:
   one 3.5-inch x 1.6 inch device (optional) **or**
   one 3.5-inch x 1 inch device (optional) **or**
   two 3.5-inch x 1 inch devices (optional)
9. Left upper external drive bay for 3.5-inch x 1 inch device (Floppy)
10. Left lower internal drive bay for 3.5-inch x 1 inch device (optional)
11. System cooling fan
12. System board
13. PCI expansion slots, three 32-bit slots; one full length and two half length
14. PCI expansion slot, one 64-bit slot, one full length slot

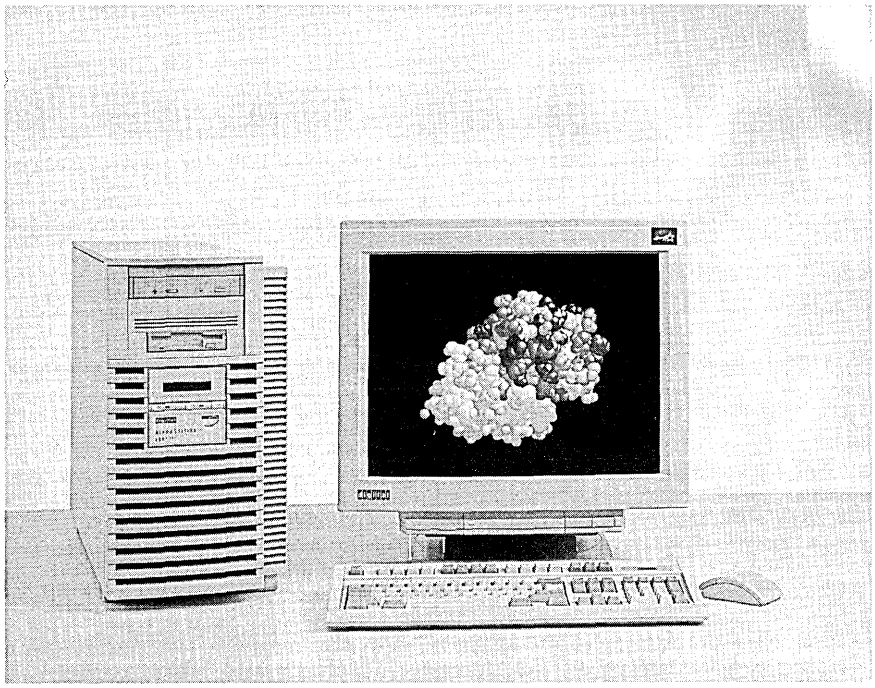
Rear Connectors



1. On/Off Switch	Power
2. Voltage selection switch	Allows user to set voltage from factory set 230V to 115 VAC power
3. Lock Slot	Use with optional Kensington type security lock
4. System (chassis) lock	Provides security for internal components
5. Sound card stereo LINE OUT connector	Routes audio signals to an external amplifier
6. Sound card stereo headphone jack	Connects headphones, or amplified speakers
7. Top Cover Screw	Secures top cover
8. Sound card microphone jack	Connects microphone. (2.2Ohm to 2.5V)
9. Sound card stereo LINE IN connector	Brings audio signals into card (for example, from a stereo amplifier)
10. Twisted Pair connector	Connection to the embedded Ethernet controller
11. ThinWire connector	Connection to the embedded Ethernet controller
12. 64-bit PCI expansion slot	Used for PCI expansion options
13. 14, 15 32-bit PCI expansion slots interface	Example shows PCI graphics adapter in bottom slot. Provides connection between video/graphics expansion module (option) and supported monitor.
16. Enhanced bi-directional parallel port	Connects industry-standard parallel printer or other parallel device. 25 pin sub-miniature D parallel port female connector
17. Wide SCSI connector - 68-pin	Provides interface between system unit and external SCSI devices. 68 pin high-density port (single-ended P cable)
18. Keyboard connector	Connects a VMS or PS/2 style keyboard
19. Mouse connector	Connects a PS/2-compatible mouse. Miniature six position, circular DIN receptacle.
20. COM1 - Serial port connector	Connects serial devices. Nine position sub-miniature D series male connectors.
21. COM2 - Serial port connector	Connects serial devices. Nine position sub-miniature D series male connectors.
22. AC power connector	Connects the system to AC power.

Specifications

PCI	264-Mbyte/second (64-bit PCI)
Fast SCSI-2 bus	20-Mbyte/s transfer rate
Power Requirements	
Line voltage	120/240 V
Voltage tolerance	90-128/190-25f6 V
Frequency single phase	50/60 Hz
Frequency tolerance	47-63 Hz
Maximum running current	7.0A/3.3A with monitor 5.0A/2.3A without monitor
Maximum power consumption	320 W
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Temperature change rate	11° C/hour (20° F/hour)
Operating humidity Maximum wet bulb Minimum dew point	10% to 90% relative humidity 28° C (82° F) 2° C (36° F)
Storage temperature	-40° C to 66° C (-40° F to 149° F)
Storage humidity Maximum wet bulb	10% to 90% relative humidity 46° C (114° F)
Maximum altitude	2438 m (8,000 ft)
Physical shock	10 G, 10 ms (+/- 3 ms) duration
Vibration	5-10 Hz @ 0.02"DA, 10-500 Hz @ 0.01G peak
Physical Characteristics	
Height	13.0 cm (5.12 inches)
Width	44.6 cm (17.56 inches)
Depth	48.4 cm (19.06 inches)
Weight	32 lb
Regulatory Approvals	
Safety	TUV-GS, EN60950, IEC-950, CSA 22.2 #950, UL 1950, EMC: FCC part 15 class "A", CISPR-22, VCCI, CE



AlphaStation 600 5/266 and 5/333

Product Description

The AlphaStation 600 high performance deskside Workstation series delivers premium performance and excellent expandability, providing access to tens of thousands of applications running on Digital UNIX, OpenVMS, and Windows NT Workstation systems.

The AlphaStation 600 uses the Alpha microprocessor 21164:

- **AlphaStation 600 5/266 MHz** CPU performance measures 7.9 SPECint95, and 11.4 SPECfp95 with 2 Mbytes third level cache.
- **AlphaStation 600 5/333 MHz** CPU performance measures 9.8 SPECint95, and 13.3 SPECfp95 with 4 Mbyte third level cache.

The system is housed in a deskside enclosure with capacity for up to 1 Gbyte of ECC memory, 256-bit wide memory bus, six storage slots, and eight option slots. The high performance 64-bit PCI I/O bus, running at 267 Mbytes/second peak, provides expansion for options such as high performance graphics, networking, and SCSI adapters. Lower performance options are supported on the EISA bus. The system supports a wide variety of industry-standard peripherals and PCI and EISA options. Other standard features include Thick wire, Twisted Pair, ThinWire Ethernet, stereo-quality audio, an array of external ports for serial/parallel communications, and external SCSI connectors. This combination of standard features allows multiple in-box configurations without the need for additional tabletop options or expansion boxes.

All AlphaStation 600 systems come with the best hardware warranty in the industry—a three-year warranty. Digital's Trade-In '96 program provides a cost-effective upgrade path for users of older workstations.

Systems

- Digital UNIX and OpenVMS systems include factory-installed software (FIS).
- Options ordered will be factory installed unless specified as **spares**.

AlphaStation 600 5/266 and 5/333 systems include

- Alpha microprocessor 21164 with 266-MHz CPU, **or**
- Alpha microprocessor 21164 with 333-MHz CPU
- Deskside enclosure which includes:
  - Eight expansion slots
    Three 64-bit PCI*
    One 32-bit PCI
    One 32-bit PCI/EISA combination
    Three EISA
  - Four memory options (thirty-two SIMM memory slots)
  - Six storage slots:
    One dedicated diskette drive slot
    Two removable media slots (CD-ROM included in one slot)
    Three 3.5-inch hard disk drive slots for 1- and 1.6-inch (16-bit) wide ready drives
  - 400-Watt power supply
  - Two serial ports, support full modem control
  - One parallel port
  - Keyboard port and mouse port
- PCI-based option card with Fast Wide single ended SCSI-2 controller with two external SCSI-2 connectors, and high performance Thick wire, Twisted Pair†, ThinWire Ethernet—uses one 32-bit PCI slot
- Memory (Advantage Configurations only)
- Cache (Advantage Configurations only)
- Hard Disk (Advantage Configurations only)
- Graphics (Advantage Configurations only)
- 1.44 Mbyte diskette drive
- 600 Mbyte CD-ROM drive
- Audio, headset, and microphone
- 3-button mouse
- Hardware documentation
- Hardware Warranty: Three-year on-site
- Software Warranty: 90-day SPD conformance with advisory telephone support*
- Digital UNIX V 3.2C 2-user base license
  Digital Open3D license
  Multimedia Services license
  Digital NAS Client 150 license
  Communique! starter license, and CD-ROM **or**
- OpenVMS V6.2 base license plus concurrent use license
  Digital Open3D license
  Multimedia Services license
  Digital NAS Client 150 license **or**
- Windows NT Workstation 3.51 media kit, Communique! starter license and CD-ROM,
  Digital Light & Sound license and CD-ROM

* 32-bit PCI option can be installed in 64-bit PCI slot. Option will run at 32-bit speed of 133 Mbyte/seconds instead of 64-bit speed of 267 Mbytes/seconds.

† 10BaseT connection requires shielded twisted pair cable BN26M-xx, see AlphaStation Options for additional cabling information.

Ordering menus that follows include

- AlphaStation 600 5/266 and 5/333 Advantage Configurations and Base Configurations.

Menus are streamlined for ease of ordering. Select Advantage Configurations to meet application and performance needs. To configure a customized system, use Base Configuration menus.

- 2D CAD
- 3D Solids CAD

System options are in a separate section.

Warranty Statement

AlphaStations are sold with specific warranty response times, hours of coverage, warranty duration, and a specific manner by which the warranty service will be delivered. Digital also makes available extended coverage offerings to uplift or extend the service coverage and/or response time: See Supplemental Services in AlphaStation Options section.

AlphaStation 600 5/266 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 600 5/266	Resources Used		Digital UNIX 2D	OpenVMS 2D	Digital UNIX 3D Solids	Windows NT 3D Solids
Application Profile			EDA	EDA	CAD	CAD
120V / 240V			PB621-AC	PB621-BC	PB621-AD	PB621-CD
CPU Alpha microprocessor	21164 266-MHz	Y	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y	Y
Headset, microphone, mouse	1 EISA slot	Y	Y	Y	Y	Y
Ethernet	1 32-bit PCI slot	Y	Y	Y	Y	Y
Operating System		Y	Y	Y	Y	Y
Memory (a)	1 option	Y	128 MB	128 MB	128 MB	128 MB
Cache		Y	2 MB	2 MB	4 MB	2 MB
Internal storage	1" SCSI bay	Y	2 GB	2 GB	2 GB	2 GB
Graphics (b)	1 PCI slot 2 PCI slots	Y	ZLXp-E1	ZLXp-E1	ZLXp-L2	ZLXp-L2
User documentation–English		Y	Y	Y	Y	Y
Remaining available resources						
I/O slots PCI 64-bit wide PCI 32-bit wide EISA PCI / EISA Combo			2 0 2 1	2 0 2 1	1 0 2 1	1 0 2 1
Memory options			3	3	3	3
Cache	Occupied		0	0	0	0
SCSI bays Internal 5.25"			1	1	1	1
Internal 3.5"			2	2	2	2
SCSI External (c)						
Note: 3.5-inch hard disk drive supported in 5.25-inch CD-ROM bay, brackets are included. Brackets support 3.5 x 1-inch disk drive **only**						
1. Country Options	**Select**		1	1	1	1
PS/2 style keyboard (d) VMS / VT style keyboard		M	LK471-xx LK461-xx	LK461-xx LK461-xx	LK471-xx LK461-xx	LK471-xx LK461-xx
Power Cord (e)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK471-AA and LK461-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.						
2. Monitors	**Select**		1	1	1	
21" Color Monitor NH/SH (f)		M	VRC21-PA/P4	VRC21-PA/P4	VRC21-PA/P4	VRC21-PA/P4
17" Color Monitor NH/SH (f)		M	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4
3. Additional Memory	**Select**		0, 1, 2, or 3	0, 1, 2, or 3	0, 1, 2, or 3	0, 1, 2, or 3
32 MB	1 option	O	MSP01-CA	MSP01-CA	MSP01-CA	MSP01-CA
64 MB	1 option	O	MSP01-CB	MSP01-CB	MSP01-CB	MSP01-CB
128 MB	1 option	O	MSP01-CC	MSP01-CC	MSP01-CC	MSP01-CC
256 MB	1 option	O	MSP01-CD	MSP01-CD	MSP01-CD	MSP01-CD
4. Wide hard drive	**Select**		0, 1 or 2	0, 1 or 2	0, 1 or 2	0, 1 or 2
1.05 GB drive 5400 RPM (g)	1" bay 1 SCSI	O	PBXRW-EB	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 GB drive 7200 RPM (g)	1" bay 1 SCSI	O	PBXRW-JB	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 GB drive 7200 RPM (g)	1.6" bay 1 SCSI	O	PBXRW-NA	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Removable media	**Select**		0 or 1	0 or 1	0 or 1	0 or 1
8 GB 4 mm DAT TLZ09	5.25" bay 1 SCSI	O	PBXTL-DA	PBXTL-DA	PBXTL-DA	PBXTL-DA
2.0 GB QIC TZK11	5.25" bay 1 SCSI	O	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA
6. Software Media and Documentation kits						
Digital UNIX		O	QA-MT4AA-H8		QA-MT4AA-H8	
OpenVMS		O		QA-MT1AA-H8		
Windows NT		O				QA-0QRAA-GZ
7. Additional Options: See AlphaStation Options for a comprehensive list of qualified options (h)						

AlphaStation 600 5/333 ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 600 5/333	Resources Used		Digital UNIX 2D	OpenVMS 2D	Digital UNIX 3D Solids	Digital UNIX 3D Solids	Windows NT 3D Solids
Application Profile 120 V / 240 V			EDA PB641-AC	EDA PB641-BC	CAD PB641-AE	MCAD PB641-AF	MCAD PB641-CF
CPU Alpha microprocessor	21164 333-MHz	Y	Y	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y	Y	Y
Headset, microphone, mouse	1 EISA slot	Y	Y	Y	Y	Y	Y
Ethernet	1 32-bit PCI slot	Y	Y	Y	Y	Y	Y
Operating System		Y	Y	Y	Y	Y	Y
Memory (a)	1 option	Y	128 MB	128 MB	128 MB	128 MB	128 MB
Fast Cache		Y	4 MB	4 MB	4 MB	4 MB	4 MB
Internal storage	1" SCSI bay	Y	2 GB	2 GB	2 GB	2 GB	2 GB
Graphics (b)	1 PCI slot 2 PCI slots	Y	3D30	3D30	4D60T	4D50T	4D50T
User documentation–English		Y	Y	Y	Y	Y	Y
Remaining available resources							
I/O slots PCI 64-bit wide PCI 32-bit wide EISA PCI/EISA Combo			2 0 2 1	2 0 2 1	1 0 2 1	1 0 2 1	1 0 2 1
Memory options			3	3	3	3	3
Cache	Occupied		0	0	0	0	0
SCSI bays Internal 5.25"			1	1	1	1	1
Internal 3.5"			2	2	2	2	2
SCSI External (c)							
Note: 3.5-inch hard disk drive supported in 5.25-inch CD-ROM bay, brackets are included. Brackets support 3.5 x 1-inch disk drive **only**							
1. Country Options	**Select**		1	1	1	1	1
PS/2 style keyboard (d) VMS / VT style keyboard		M	LK471-xx LK461-xx	LK471-xx LK461-xx	LK471-xx LK461-xx	LK471-xx LK461-xx	LK471-xx LK461-xx
Power Cord (e)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK471-AA and LK461-AA, English keyboards, include U.S. power cord, power cord does not need to be ordered separately.							
2. Monitors	**Select**		1	1	1	1	
21" Color monitor NH/SH (f)		M	VRC21-PA/P4	VRC21-PA/P4	VRC21-PA/P4	VRC21-PA/P4	VRC21-PA/P4
17" Color monitor NH/SH (f)		M	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4
3. Additional Memory	**Select**		0, 1, 2, or 3	0, 1, 2, or 3	0, 1, 2, or 3	0, 1, 2, or 3	0, 1, 2, or 3
32 MB	1 option	O	MSP01-CA	MSP01-CA	MSP01-CA	MSP01-CA	MSP01-CA
64 MB	1 option	O	MSP01-CB	MSP01-CB	MSP01-CB	MSP01-CB	MSP01-CB
128 MB	1 option	O	MSP01-CC	MSP01-CC	MSP01-CC	MSP01-CC	MSP01-CC
256 MB	1 option	O	MSP01-CD	MSP01-CD	MSP01-CD	MSP01-CD	MSP01-CD
4. Wide hard drives	**Select**		0, 1 or 2	0, 1 or 2	0, 1 or 2	0, 1 or 2	0, 1 or 2
1.05 GB drive 5400 RPM(g)	1" bay 1 SCSI	O	PBXRW-EB	PBXRW-EB	PBXRW-EB	PBXRW-EB	PBXRW-EB
2.1 GB drive 7200 RPM (g)	1" bay 1 SCSI	O	PBXRW-JB	PBXRW-JB	PBXRW-JB	PBXRW-JB	PBXRW-JB
4.3 GB drive 7200 RPM (g)	1.6" bay 1 SCSI	O	PBXRW-NA	PBXRW-NA	PBXRW-NA	PBXRW-NA	PBXRW-NA
5. Removable media	**Select**		0 or 1	0 or 1	0 or 1	0 or 1	0 or 1
8 GB 4 mm DAT TLZ09	5.25" bay 1 SCSI	O	PBXTL-DA	PBXTL-DA	PBXTL-DA	PBXTL-DA	PBXTL-DA
2.0 GB QIC TZK11	5.25" bay 1 SCSI	O	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA
6. Software Media and Documentation kits							
Digital UNIX		O	QA-MT4AA-H8		QA-MT4AA-H8	QA-MT4AA-H8	
OpenVMS		O		QA-MT1AA-H8			
Windows NT		O					QA-0QRAA-GZ
7. Additional Options: See AlphaStation Options for a comprehensive list of qualified options (h)							

AlphaStation 600 ADVANTAGE CONFIGURATIONS *(continued)*

Footnotes for AlphaStation 600 5/266 and 5/333 ADVANTAGE Configurations

(a) Thirty-two SIMM slots support four memory options (8 SIMMs per option). Memory options can be mixed.

(b) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(c) See External Expansion for additional external storage options.

(d) Select country-specific keyboard from AlphaStation Options section.

(e) Select country-specific power cord from AlphaStation Options section.

(f) Monitors include video cable and 120V power cord, order country specific power cord for 240 V use from AlphaStation Options section.

(g) Internal SCSI uses a wide 68-pin connector. To add a narrow drive, order PBXKP-BA (wide to narrow adapter). Order one adapter for each additional drive.

(h) Check availability of slots (initially 4 PCI, 1 PCI/EISA combination, 3 EISA).

AlphaStation 600 5/266 and 5/333 BASE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

AlphaStation 600 5/266	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V			PB62A-AA	PB62A-BA	PB62A-CA
CPU Alpha microprocessor	21164 266-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Headset, microphone, mouse	1 EISA slot	Y	Y	Y	Y
Ethernet	1 32-bit PCI slot	Y	Y	Y	Y
Integration Service		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
User Documentation–English		Y	Y	Y	Y

AlphaStation 600 5/333	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V			PB64A-AA	PB64A-BA	PB64A-CA
CPU Alpha microprocessor	21164 333-MHz	Y	Y	Y	Y
Floppy Disk Drive 1.44 MB	Dedicated bay	Y	Y	Y	Y
CD-ROM 600 MB	5.25" SCSI bay	Y	Y	Y	Y
Headset, microphone, mouse	1 EISA slot	Y	Y	Y	Y
Ethernet	1 32-bit PCI slot	Y	Y	Y	Y
Integration Service		Y	Y	Y	Y
Operating system		Y	Y	Y	Y
User Documentation–English		Y	Y	Y	Y

Remaining available resources						
I/O slots	PCI-64-bit wide			3	3	3
	PCI 32-bit wide			0	0	0
	EISA			2	2	2
	PCI / EISA Combo.			1	1	1
Memory options	(a)			4	4	4
Cache				1	1	1
SCSI bays	Internal 5.25"			1	1	1
	Internal 3.50"			3	3	3
Note: 3.5-inch hard disk drive supported in 5.25-inch CD-ROM bay, brackets are included. Brackets support 3.5 x 1-inch disk drive **only**						
1. Country Options		**Select**		1	1	1
PS/2 style keyboard VMS / VT style keyboard	(b)		M	LK471-xx LK461-xx	LK471-xx LK461-xx	LK471-xx LK461-xx
Power Cord	(c)		M	BNxxx-xx	BNxxx-xx	BNxxx-xx
Note: LK471-AA and LK461-AA, include English keyboards and U.S. power cord. Power cord does not need to be ordered separately						
2. Memory **Memory Required 1** **Optional Available 2, 3, or 4**		**Select**		**Minimum Required 64 MB 1, 2, 3 or 4**	**Minimum Required 64 MB 1, 2, 3, or 4**	**Minimum Required 32 MB 1, 2,3 or 4**
32 MB		1 option	M	MSP01-CA	MSP01-CA	MSP01-CA
64 MB		1 option	M	MSP01-CB	MSP01-CB	MSP01-CB
128 MB		1 option	M	MSP01-CC	MSP01-CC	MSP01-CC
256 MB		1 option	M	MSP01-CD	MSP01-CD	MSP01-CD
Note: To reach 1 GB maximum memory order MSP01-CD options						
3. Cache		**Select**		1	1	1
2 MB cache for 5/266 only			M	MSP01-EA	MSP01-EA	MSP01-EA
4 MB cache for 5/266 only			M	MSP01-EB	MSP01-EB	MSP01-EB
4 MB fast cache for 5/333 only			M	MSP01-EC	MSP01-EC	MSP01-EC

AlphaStation 600 5/266 and 5/333 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 600 5/266	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V	21164 266-MHz		PB62A-AA	PB62A-BA	PB62A-CA

AlphaStation 600 5/333	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V	21164 333-MHz		PB64A-AA	PB64A-BA	PB64A-CA

5. Graphics	Select		1	1	1
PowerStorm 3D30 8-plane (e)	1 PCI slot	M	PBXGB-AA	PBXGB-AA	PBXGB-AA
PowerStorm 4D20 24-plane (e)	1 PCI slot	M	PBXGB-CA	PBXGB-CA	PBXGB-CA
PowerStorm 4D40T (e)	2 PCI slots	M	PBXGI-AA		PBXGI-AA
PowerStorm 4D50T (e)	2 PCI slots	M	PBXGI-AB		PBXGI-AB
PowerStorm 4D60T (e)	2 PCI slots	M	PBXGI-AC		PBXGI-AC
ZLXp-E1 8-plane (e)	1 PCI slot	M	PBXGA-AA	PBXGA-AA	PBXGA-AN
ZLXp-E2 24-plane (e)	1 PCI slot	M	PBXGA-BA	PBXGA-BA	PBXGA-BN
ZLXp-E3 24-plane Z-buffer (e)	1 PCI slot	M	PBXGA-CA	PBXGA-CA	PBXGA-CN
ZLXp-L1 24-plane Pixelvision (e)	1 PCI slot	M	PBXGC-AA	PBXGC-AA	PBXGC-AN
ZLXp-L2 24-plane Pixelvision (e)	2 PCI slots	M	PBXGC-BA	PBXGC-BA	PBXGC-BN
E&S Freedom Series 3150 (f) 3 Performance Modules 1 MB texture memory	1 PCI slot	M	PBXGE-BB		
E&S Freedom Series 3250 (f) 5 Performance Modules 1 MB texture memory	1 PCI slot	M	PBXGE-BD		
E&S Freedom Series 3400 (f) 8 Performance Modules 4 MB texture memory	1 PCI slot	M	PBXGE-BG		
5a. PowerStorm Texture Memory Upgrades—supported on PowerStorm 4D40T, 4D50T, and 4D60T graphics options only					
4 MB Texture memory module		O	PBXGI-GA		PBXGI-GA
16 MB Texture memory module		O	PBXGI-GB		PBXGI-GB
32 MB Texture memory module		O	PBXGI-GC		PBXGI-GC
5b. E&S Graphics Memory Upgrade					
4 MB Texture memory module		O	PBXGE-CB		
16 MB Texture memory module		O	PBXGE-CC		
6. Monitors	**Select**		**1**	**1**	**1**
21" Color Monitor NH/SH (g)		O	VRC21-LA/P4	VRC21-LA/P4	VRC21-LA/P4
17" Color Monitor NH/SH (g)		O	VRT17-PA/P4	VRT17-PA/P4	VRT17-PA/P4
7. Removable media	**Select**		**0 or 1**	**0 or 1**	**0 or 1**
8 GB 4 mm DAT TLZ09	5.25" SCSI bay	O	PBXTL-DA	PBXTL-DA	PBXTL-DA
2.0 GB QIC TZK11	5.25" SCSI bay	O	PBXTZ-AA	PBXTZ-AA	PBXTZ-AA
8. Communication Options					
EISA Ethernet	1 EISA slot	O	DE425-AA	DE425-AA	DE425-AA
PCI High-performance Ethernet	1 PCI slot	O	DE435-AA	DE435-AA	DE435-AA
PCI FDDI controller (fiber)	1 PCI slot	O	DEFPA-AA	DEFPA-AA	DEFPA-AA
PCI Fast SCSI-2 controller*	1 PCI slot	O	KZPAA-AA	KZPAA-AA	KZPAA-AA
* Maximum two Fast SCSI-2 controllers per system					

AlphaStation 600 5/266 and 5/333 BASE CONFIGURATIONS *(continued)*

Y=in base configuration; M=mandatory option; O=option

AlphaStation 600 5/266	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V	21164 266-MHz		PB62A-AA	PB62A-BA	PB62A-CA

AlphaStation 600 5/333	Resources Used		Digital UNIX	Open VMS	Windows NT
120V/240V	21164 333-MHz		PB64A-AA	PB64A-BA	PB64A-CA

9. Software Media and Documentation kits				
Digital UNIX	O	QA-MT4AA-H8		
OpenVMS	O		QA-MT1AA-H8	
Windows NT	O			QA-0QRAA-GZ
AlphaStation 600 User Documentation	O	EK-AS800-UI*	EK-AS800-UI*	EK-AS800-UI*
AlphaStation 600 Installation Guide	O	EK-AS800-IN*	EK-AS800-IN*	EK-AS800-IN*
* English User Documentation and Installation Guide are included with Advantage and Base Configurations.				
10. 333 MHz CPU Upgrade with 4 MB Cache				
AlphaStation 5/266 to 5/333 MHz CPU upgrade	O	PB62U-BA	PB62U-BA	PB62U-BA
Note: Installation is not included with CPU upgrade, order FM-WSDSD-IN separately -				
11. Additional Options: See AlphaStation Options for a comprehensive list of qualified options **(h)**				

Footnotes for AlphaStation 600 5/266 and 5/333 BASE Configurations

(a) Thirty-two SIMM slots support four memory options (8 SIMMs per option). Memory options can be mixed.

(b) Select country-specific keyboard from AlphaStation Options section.

(c) Select country-specific power cord from AlphaStation Options section.

(d) Internal SCSI uses a wide 68-pin connector. To add a narrow drive, order PBXKP-BA (wide to narrow adapter). Order one adapter for each additional drive.

(e) Up to **3** PowerStorm 3D30 and/or 4D20 graphics options and 3 monitors are supported on Digital UNIX, OpenVMS and Windows NT systems. Graphics options require Digital Open3D media, included in factory installed software (FIS). Windows NT graphics options include Graphics Support Services Software license, media and documentation. Windows NT graphics options must be homogeneous, (three PowerStorm 3D30 options or three PowerStorm 4D20 options). 3D multi screen not hardware accelerated for Windows NT.

Graphics options are supported in the following combinations on Digital UNIX, OpenVMS and Windows NT systems:

- Three PowerStorm 3D30 options, **or**
- Three PowerStorm 4D20 options, **or**
  - Any combination of PowerStorm 3D30 and PowerStorm 4D20 options are supported on Digital UNIX and OpenVMS systems. Support for Windows NT must be homogeneous.
- One PowerStorm 4D40T, 4D50T, or 4D60T, **or**
  - PowerStorm 4D40T, 4D50T, and 4D60T require minimum of Digital UNIX V4.0 or Windows NT 3.51, and Digital Open3D V4.0A)
  - PowerStorm 4D40T, 4D50T, and 4D60T options **cannot** be mixed with any other graphics option and are supported on Digital UNIX and Windows NT systems only.
  - **Note: PowerStorm 4Dx0T graphics options change system to FCC Class A**
- One ZLXp-L1, **or**
- One ZLXp-L2 (uses two PCI slots)

(f) E&S Freedom Series graphics are packaged in a deskside pedestal and connect to PCI interface card in AlphaStation system box by a10 foot interface cable. Graphics options include graphics subsystem, PCI interface card, interface cable, and video cable for a VRC21-PA/P4 monitor. Country specific power cord is required for each Freedom Series graphics option. Texture memory module upgrades are available for E&S Freedom Series graphics. **Note:** E&S graphics cards are supported in both 64-bit and 32-bit PCI slots; 64-bit slots are recommended for best performance.

(g) Monitors include video cable and 120V power cord, order country specific power cord for 240V use from AlphaStation Options section.

(h) For PCI or EISA cards, check the availability of slots (initially 4 PCI, 1 PCI/EISA combination, 3 EISA).

AlphaStation 600 5/266 and 5/333 External Storage Options

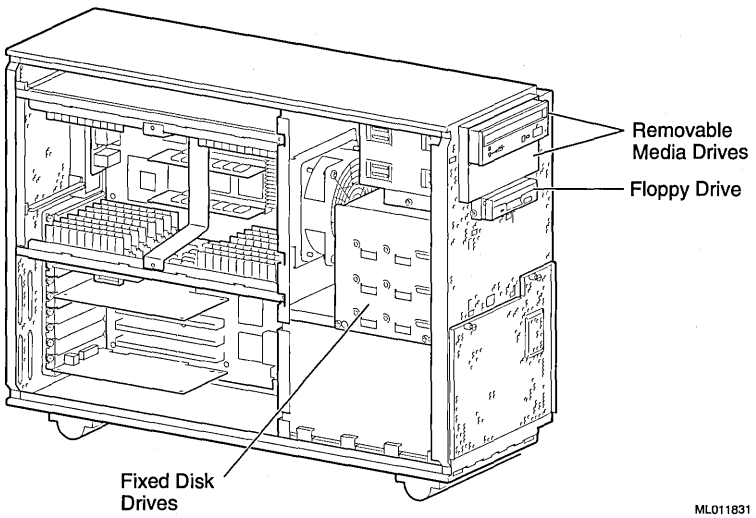
External Expansion	Resources Used			
BA353 Narrow expansion box (3)	Ext.SCSI Bus 1 (1)	**BA353-AA**	**BA353-AA**	**BA353-AA**
BA356 Wide expansion box	Ext.SCSI Bus 2 (2)	**BA356-KC**	**BA356-KC**	**BA356-KC**
Fast Narrow Single Ended SCSI-2 Controller (4)	32- or 64-bit PCI slot	**KZPAA-AA**	**KZPAA-AA**	**KZPAA-AA**
* Maximum two Fast SCSI-2 controllers per system				

AlphaStation 600 systems include 2 external SCSI buses

(1) First FWSE SCSI-2 controller supports five internal **wide** or **narrow** devices and two external **narrow** SCSI devices. Total external bus length for first FWSE SCSI-2 controller is 1.2 meters, bus connector on rear bulkhead is a high density 50 pin narrow connector.
(2) Second FWSE SCSI-2 controller supports seven external **wide** or **narrow** SCSI devices. Total external bus length for second external FWSE SCSI-2 controller is 2.2 meters, requires BN21K-01 for right angle connection to BA356-KC.
(3) To run narrow devices/enclosures off the Wide external SCSI bus, order a BN36A-0B, a 68-pin HD to 50-pin HD hi-byte terminator adapter, and 50-pin HD to 50-pin HD BN21H-01 SCSI cable.
(4) If additional external narrow storage is required, select KZPAA-AA Fast SCSI-2 controller (maximum two supported per system).

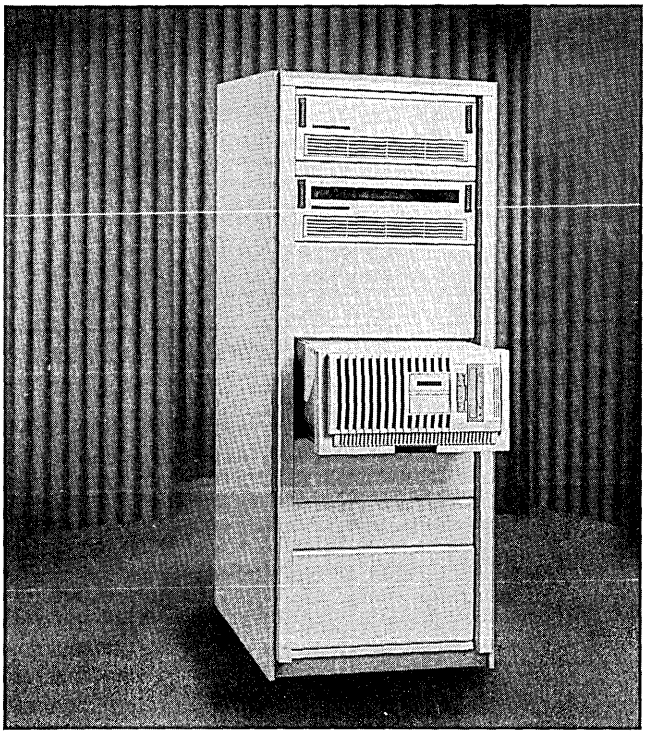
See AlphaStation Options for a comprehensive list of additional qualified options.

System Diagram



Specifications

PCI -64 bit	264 MB/second
PCI -32 bit	132 MB/second
Fast Wide SCSI-2 bus	20 MB/s transfer rate
Ethernet	10 MBit/s Twisted Pair/Thin Wire standard
Power Requirements	
Line voltage	120 V/240 V
Voltage tolerance	90-128 V/190-256 V
Frequency single phase	50 Hz/ 60 Hz
Frequency tolerance	47-63 Hz
Maximum running current	8.0A/4.0A A.C. without monitor
Maximum power consumption	400 W D.C.
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity Maximum wet bulb	20% to 80% relative humidity 40° C (104° F)
Storage temperature	-20° C to 65° C (-4° F to 149° F)
Storage humidity Maximum wet bulb	10% to 90% relative humidity 65° C (149° F)
Maximum altitude Operating Nonoperating	 2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Nonoperating shock	30G, 25 ms halfsine
Physical Characteristics	
Height	469.9 mm (18.5 inches)
Width	241.3 mm (9.5 inches)
Depth	660.4 mm (26.0 inches)
Weight	31.8 kg (70 lb)
Regulatory	
Agency Approval	AlphaStation 600 5/266 is FCC Class B AlphaStation 600 5/333 is FCC Class A (system and upgrade)



AlphaStation 600 Rackmount

Product Description

The AlphaStation 600 Rackmount Workstation is housed in a rackmountable tower enclosure ready for integration into a 19" ANSI/EIA standard cabinet enclosure. It offers the same functionality and footprint as the deskside system. Configuration flexibility and storage expansion is easily obtainable through many rackmounted options.

The AlphaStation 600 uses the DECchip 21164 processor.

- **AlphaStation 600 5/266 MHz** CPU performance measures 288 SPECint92 and 428 SPECfp92 with 2 MB third level cache.
- **AlphaStation 600 5/333 MHz** CPU performance measures 412 SPECint92 and 535 SPECfp92 with 4 MB third level cache.

The AlphaStation 600 workstation has capacity for up to 1 GB of ECC memory, six internal storage cavities and eight total option slots. High performance options are supported on the 64-bit PCI I/O bus. Lower performance options are supported on the EISA bus.

The AlphaStation 600 workstation is sold with specific warranty response times, hours of coverage, warranty duration, and a specific manner by which the warranty service will be delivered. digital also makes available extended coverage offerings to uplift or extend the service coverage and/or response time. See Supplemental Services in AlphaStation Option Section.

Step 1—System Building Blocks

- AlphaStation 600 rackmount systems are available as System Building Blocks.
- Options ordered will be factory installed unless specified as spares.
- Digital UNIX and OpenVMS system include factory-installed software (FIS).
- **For full functionality systems require:**
  - Minimum of one 64 MB memory option for Digital UNIX and OpenVMS systems
  - Minimum of one 32 MB memory option for Windows NT systems
  - 2 or 4 MB cache
  - One hard disk drive
  - Graphics option
  - Keyboard and 120V or 240V power cord, see AlphaStation Options Section for country specific options

Note: For a comprehensive list of qualified options, see AlphaStation Options Section

Note: Minimum required options **must** be on purchase order at initial order acceptence.

Rackmount AlphaStation 600 5/266 and 5/333 systems include

- Rackmountable AlphaStation 600 enclosure with rackmount shelf and slide assembly which includes
  - Alpha microprocessor 21164 with 266-MHz CPU **or**
  - Alpha microprocessor 21164 with 333-MHz CPU
  - Eight option slots
    Three 64-bit PCI*
    One 32-bit PCI
    One 32-bit PCI/EISA combination
    Three EISA slots
  - Four memory options (32 SIMM memory slots)
  - Six internal storage slots
    One dedicated diskette drive slot
    Two removable media slots
    Three 3.5-inch hard disk drive slots for 1" and 1.6" 16-bit wide drives
  - 400 Watt power supply
  - Two serial ports, supports full modem control
  - One parallel port
  - Keyboard port and mouse port
- PCI based Fast Wide Single Ended SCSI-2 controller with two external SCSI-2 connectors, and high performance Thickwire, Twisted Pair†, ThinWire Ethernet (uses one 32-bit PCI slot)
- 1.44 MB diskette drive (in dedicated slot)
- 600 MB CD-ROM (uses one 5.25" removable media slot)
- Audio, headset, and microphone (uses one EISA slot)
- 3-button mouse
- Video/Keyboard/Mouse extension cables
- Rackmount Installation Guide
- Hardware documentation
- Hardware Warranty: Three year
- Software Warranty: 90 day SPD conformance with advisory telephone support
- Digital UNIX V3.2C two-user base license, Digital Open3D license, Multimedia Services license, Digital NAS Client 150 license, Communique! starter license and CD-ROM **or**
- OpenVMS V6.2 base license plus 1-user license, Digital Open3D license, Multimedia Services license, Digital NAS Client 150 license, **or**
- Windows NT Workstation 3.51 media kit, Communique! starter license and CD-ROM, Digital Light and Sound license and CD-ROM

* 32-bit PCI option can be installed in 64-bit PCI slot. Option will run at 32-bit speed of 133 MB/seconds instead of 64-bit speed of 267 MBs/seconds.

† 10BaseT connection requires shielded twisted pair cable BN26M-xx, see Step 7 for additional cabling information.

Note: Available remaining resources: Three 64-bit PCI slots, One PCI/EISA slot, 2 EISA slots

AlphaStation 600 5/266 Rackmount Workstations						
Order Number	**Operating System**	**Memory**	**Cache**	**Hard Drive**	**Monitor**	**Graphics**
CT-PB62A-AA	Digital UNIX	Recommended	Recommended	Recommended	Optional	Optional
CT-PB62A-BA	OpenVMS	Recommended	Recommended	Recommended	Optional	Optional
CT-PB62A-CA	Windows NT	Recommended	Recommended	Recommended	Optional	Optional
AlphaStation 600 5/333 Rackmount Workstations						
PB64S-AA	Digital UNIX	Recommended	Recommended	Recommended	Optional	Optional
PB64S-BA	OpenVMS	Recommended	Recommended	Recommended	Optional	Optional
PB64S-CA	Windows NT	Recommended	Recommended	Recommended	Optional	Optional

Step 2—Memory

- Minimum of one 64 MB (MSP01-CB) memory for Digital UNIX and OpenVMS systems
- Minimum of one 32 MB (MSP01-CA) memory for Windows NT systems
- System supports four memory options (8 SIMMS per option). Memory options can be mixed.
- System maximum of 1 GB can only be obtained by selecting four (MSP01-CD) 264 MB memory options.

MSP01-CA	32-MB (8 x 4 MB 70 ns SIMMs) ECC
MSP01-CB	64-MB (8 x 8 MB 70 ns SIMMs) ECC
MSP01-CC	128-MB (8 x 16 MB 60 ns SIMMs) ECC
MSP01-CD	264-MB (8 x 32 MB 60 ns SIMMs) ECC

Step 3—Cache Memory

- One cache option **must** be on initial order.
- One cache memory option supported per system.

MSP01-EA	2-MB cache for AlphaStation 5/266 systems **only**
MSP01-EB	4-MB cache for AlphaStation 5/266 systems **only**
MSP01-EC	4-MB fast cache for AlphaStation 5/333 systems **only**

Step 4—Storage

- One hard disk drive **must** be on initial order.
- First Fast Wide Single Ended (FWSE) SCSI-2 controller supports five internal **wide** or **narrow** devices. If external storage is required, select KZPAA-AA Fast SCSI-2 controller.
- Internal SCSI cable is 68-pin Wide SCSI connector. To add 8-bit **narrow** SCSI drives, order PBXKP-BA (Wide to Narrow SCSI adapter). One adapter required for each narrow drive installed in system chassis.
- Three 3.5" x 1" or 1.6" 16-bit Wide SCSI hard disk drives are supported in system chassis. One 5.25" removable media slot supports one 3.5" x 1" hard disk drive, brackets are included. **Note:** Brackets support 3.5 x 1" disk drive **only**

16-bit Wide SCSI Drives

PBXRW-EB	1.05 GB 3.5" x 1" 5400 RPM Wide SCSI disk drive
PRXRW-JB	2.1 GB 3.5" x 1" 7200 RPM Wide SCSI disk drive
PBXRW-NA	4.3 GB 3.5" x 1.6" 7200 RPM Wide SCSI disk drive

External Storage

- 1st FWSE SCSI-2 controller supports five internal **wide** or **narrow** devices. Total external bus length is limited to 1.2 meters and is not recommended for external storage.
- 2nd FWSE SCSI-2 controller supports seven external **wide** or **narrow** devices. Total external bus length is limited to 2.2 meters. 2nd FWSE SCSI-2 controller should be limited to external **narrow** SCSI-2 devices.
- If additional external storage is required, select KZPAA-AA 8-bit Fast Narrow Single Ended (FNSE) SCSI-2 controller. Maximum two per system.

Rackmountable StorageWorks Shelves

- Each rackmounted StorageWorks shelf requires seven inches of vertical rackmount space. Two shelves can occupy the same space by using front and rear mounted shelves.

BA35R-SF	Rackmountable BA350 front mounted StorageWorks shelf for **narrow** 8-bit disks
BA35R-SR	Rackmountable BA350 rear mounted StorageWorks shelf for **narrow** 8-bit disks
BA35R-AF	Rackmountable BA356 front mounted StorageWorks shelf for **wide** 16-bit disks
BA35R-AR	Rackmountable BA356 rear mounted StorageWorks shelf for **wide** 16-bit disks

Step 4—Storage

SCSI cables

BN21M-02/03	68-pin high density to 50-pin low density (wide to narrow) for tape applications.
BN21N-02	68-pin high density to 50-pin high density for BA35R connection with tape and CD-ROM. Shelf must be located directly above or below rackmount system chassis.
BN21K-02	68-pin high density to BA36R wide StorageWorks shelf. Shelf must be located directly above or below rackmount system chassis.

Step 5—Monitors

- Monitors include 3.0 meter HD15 male to BNC video cable. If purchased in North America, -PA and -LA variants include 120V power cord, otherwise power cords are not included, order separately from AlphaStation Options Section.
- Rackmount system include video, keyboard, and mouse extension cables.

Note: If additional monitor cable lentth is required, order 2T-45KM-AA (video, keyboard, mouse extention cable kit).

VRT17-PA/P4	17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately from AlphaStation Options Section.
VRC21-LA/L4	21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately from AlphaStation Options Section.

Step 6—Graphics Adapters

- Up to three ZLXp-Ex graphics options and three monitors are supported on Digital UNIX, Open VMS and Windows NT systems.
  - **Digital UNIX and OpenVMS** support any combination of ZLXp -E1, -E2 and -E3 graphics. Options require Digital Open3D media included in factory installed software (FIS) on Digital UNIX and OpenVMS systems.
  - **Windows NT** graphics must be homogeneous (three ZLXp-E1, or three -E2, or three -E3 graphics) Options include Graphics Support Services Software license, media and documentation. 3D multi screen not hardware accelerated for Windows NT.
- Up to three PowerStorm graphics options are supported on Digital UNIX, OpenVMS and Windows NT systems.
  - **Digital UNIX and OpenVMS** support any combination of PowerStorm 3D30 and 4D20 graphics. Options require Digital Open3D media included in factory installed software (FIS) on Digital UNIX and OpenVMS systems.
  - **Windows NT** graphics must be homogeneous (three PowerStorm 3D30 or three PowerStorm 4D20 graphics). Options include Graphics Support Services Software license, media and documentation. 3D multi screen not hardware accelerated for Windows NT.
- ZLXp-Ex and PowerStorm 3D30 and 4D20 graphics options **cannot** be mixed in same system.
- One ZLXp-Lx graphics option supported per system; -Lx graphics **cannot** be mixed with any other graphics option.
- E&S Freedom Series graphics are packaged in a deskside pedestal and connect to PCI interface card in AlphaStation system box by a 10-foot interface cable. Graphics options include graphics subsystem, PCI interface card, interface cable, and video cable for a VRC21-PA/P4 monitor. Country specific power cord is required. Texture memory module upgrades are available for E&S Freedom Series graphics.
- To upgrade E&S Freedom Series graphics memory, select one texture memory module for each performance module.

PBXGA-AA	ZLXp-E1 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Digital UNIX and OpenVMS, uses 1 PCI slot

Step 6—Graphics Adapters *(continued)*

PBXGA-BA	ZLXp-E2 2D/3D 24-plane PCI graphics accelerator, 8 MB memory, 1280x1024, 72 Hz, 16.7M colors for Digital UNIX and OpenVMS, uses 1 PCI slot
PBXGA-CA	ZLXp-E3 3D 24-plane PCI graphics accelerator, plus 24 bit Z-buffer, 16-MB memory, 1280x1024, 72 Hz, 16.7M colors for Digital UNIX and OpenVMS, uses 1 PCI slot
PBXGC-AA	ZLXp-L1 24-plane supported on Digital UNIX and OpenVMS, uses 1 PCI slot
PBXGC-BA	ZLXp-L2 24-plane supported on Digital UNIX and OpenVMS, uses 2 PCI slot
PBXGA-AN	ZLXp-E1 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Windows NT
PBXGA-BN	ZLXp-E2 2D/3D 24-plane PCI graphics accelerator, 8 MB memory, 1280x1024, 72 Hz, 16.7M colors for Windows NT
PBXGA-CN	ZLXp-E3 3D 24-plane PCI graphics accelerator, plus 24 bit Z-buffer, 16-MB memory, 1280x1024, 72 Hz, 16.7M colors for Windows NT
PBXGC-AN	ZLXp-L1 24-plane supported on Windows NT, uses 1 PCI slot
PBXGB-AA	PowerStorm 3D30 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Digital UNIX, OpenVMS, and Windows NT, uses 1 PCI slot
PBXGB-CA	PowerStorm 4D20 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB memory, 1280x1024, 75 Hz (1600x1200 75 Hz 12 planes double buffered plus 24-bit Z-buffer) for Digital UNIX, OpenVMS, and Windows NT, uses 1 PCI slot
PBXGE-BB	E&S Freedom Series 3150, 3 Performance Modules, 1 MB texture memory
PBXGE-BD	E&S Freedom Series 3250, 5 Performance Modules, 1 MB texture memory
PBXGE-BG	E&S Freedom Series 3400, 8 Performance Modules, 4 MB texture memory
PBXGE-CB	4 MB Texture memory module upgrade for E&S Freedom Series graphics
PBXGE-CC	16 MB Texture memory module upgrade for E&S Freedom Series graphics

Step 7—Networks and Communications

Rackmount systems include PCI-based Ethernet controller(DE435-AA), uses one PCI slot.

- Select networking cable for DE435-AA:
  - BNE4G-02 for AUI
  - BN26M-xx for 10BaseT (twisted pair)
  - BC16M-xx for ThinWire

DE425-AA	EISA Ethernet, uses 1 EISA slot
DE435-AA	High-performance Ethernet. Supported by Digital UNIX, OpenVMS and Windows NT, uses one PCI slot
DEFPA-AA	PCI-based Digital FDDI-SAS/PCI (MMF) controller, Single attachment, uses one PCI slot

Step 9—Cabinet Enclosure

H9A10-CE/CF	Digital Rackmount Cabinet Enclosure Dimensions: 66.93-inches high, 23.62-inches wide, 33.84-inches deep Usable rackmount dimensions: 56-inches high, 19-inches wide 30.8-inches deep 120 V contains (2) H7600-AA power controllers @ 24 amps each 240 V contains (2) H7600-AB power controllers @ 16 amps each. Maximum load 1,000 lbs
H9A11-BA/BB	Digital Rackmount Cabinet Enclosure Dimension: 43.31-inches high x 23.62-inches wide x 33.86-inches deep Useable rackmount dimensions: 35-inches high, x 19-inches wide x 30.8-inches deep 120 V contains (1) H7600-AA power controller @ 24 amps each 240 V contains (1) H7600-AB power controller @ 16 amps each. Maximum load 750 lbs
H9A15-BA/BB	Digital Rackmount Cabinet Enclosure Dimensions: 78.74-inches high, 23.62-inches wide, 33.42-inches deep Usable rackmount dimensions: 68.25-inches high, 19-inches wide 29.75-inches deep 120 V contains (2) H7600-AA power controllers @ 24 amps each 240 V contains (2) H7600-AB power controllers @ 16 amps each. Maximum load 1,000 lbs

Note: For cabinet enclosures without power controllers use H9A10-AB, H9A11-BE or H9A15-BE

Step 8—Power Cords and Keyboards

Power Cords

Select either 120V or 240V power cord for connection within the rackmount cabinet enclosure from system to power distribution panel or outlet.

BN20Z-4E	120 V 60 HZ power cord, 15 foot terminal 3-18 SJT 125 V, 1781N NEMA connects system to 5-15R outlet 60 HZ rackmounted power distribution unit
BN20Q-4E	240 V 50 HZ power cord, 15 foot terminal 3-14 SJT 250 V, 1781N NEMA connects system to 6-15R outlet 50 HZ rackmounted power distribution unit

Keyboards

LK471-A2 and LK461-A2 are English keyboards. Select country specific keyboard from AlphaStation Options section.

Note: If additional monitor cable lentth is required, order 2T-45KM-AA (video, keyboard, mouse extention cable kit).

PS/2 style keyboard	OpenVMS / VT style keyboard
LK471-xx	**LK461-xx**

Specifications

Physical Characteristics	
Height	26.7 cm (10.5 in.)
Width	48.2 cm (19.0 in.)
Depth	73.7 cm (29.0 in.) system chassis and shelf assembly 63.5 cm (25.0 in.) system chassis only
Weight	31.5 kg (70 lb) approximately
Clearances	
Front	124.04 cm (50 in.)
Rear	61 cm (24 in.)
Power Requirements	
Line voltage	120 V/240 V
Voltage tolerance	90-128 V/190-256 V
Frequency single phase	50 Hz/ 60 Hz
Frequency tolerance	47-63 Hz
Maximum running current	8.0A/4.0A AC without monitor
Maximum power consumption	400 Watt DC
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity Maximum wet bulb	20% to 80% relative humidity 40° C (104° F)
Storage temperature	-20° C to 65° C (-4° F to 149° F)
Storage humidity Maximum wet bulb	10% to 90% relative humidity 65° C (149° F)
Maximum altitude Operating Nonoperating	 2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Nonoperating shock	30G, 25 ms halfsine

Recommended UPS for AlphaStation 600

4N-AEABF-CA	1.5kVA Rackmount UPS for 120V
4N-AEABF-BG	1.5kVA Rackmount UPS for 240V
4N-AEAEO-RA	Rackmount kit for 240 V systems 22 through 27-inches deep
4N-AEAEO-RB	Rackmount kit for 240 V systems 28 through 34-inches deep

Country Specific Keyboards and Power Cords

Monitors

Graphics

2D and 3D Input Devices

System Memory

Cache Memory

Internal SCSI Storage

SCSI Controllers and Adapters

External SCSI Storage

Communications

Multimedia

UPS

Software

User Documentation

Hardware Supplemental Services

Software Supplemental Services

Warranty Attributes

AlphaStation Country Specific Keyboards and Power Cords

- LK47W and LK46W are Frost White keyboards for AlphaStation 255 and 500 Systems **only.**
- LK471 and LK461 are Light Gray keyboards for all other AlphaStations.

Required option		101/102 Key—PC style keyboard		108 Key—VT style keyboard	
Keyboard Country Table	Select	1		1	
North America/English		LK471-AA *	LK47W-AA *	LK461-AA *	LK46W-AA *
Arabic		LK471-BR	LK47W-BR		
Belgian		LK471-AB	LK47W-AB	LK461-AB	LK46W-AB
Canadian/French		LK471-AC	LK47W-AC	LK461-AC	LK46W-AC
Cyrillic		LK471-BT	LK47W-BT	LK461-BT	LK46W-BT
Czech		LK471-BV	LK47W-BV	LK461-BV	LK46W-BV
Danish		LK471-AD	LK47W-AD	LK461-AD	LK46W-AD
Finnish				LK461-AF	LK46W-AF
French		LK471-AP	LK47W-AP	LK461-AP	LK46W-AP
German		LK471-AG	LK47W-AG	LK461-AG	LK46W-AG
Dutch		LK471-AH	LK47W-AH	LK461-AH	LK46W-AH
Greek		LK471-BH	LK47W-BH	LK461-BH	LK46W-BH
Hebrew		LK471-AT	LK47W-AT	LK461-AT	LK46W-AT
Hungarian		LK471-BQ	LK47W-BQ	LK461-BQ	LK46W-BQ
Icelandic		LK471-CQ	LK47W-CQ		
Italian		LK471-AI	LK47W-AI	LK461-AI	LK46W-AI
Latin American		LK471-AR	LK47W-AR		
Norwegian		LK471-AN	LK47W-AN	LK461-AN	LK46W-AN
Polish		LK471-PB	LK47W-PB	LK461-BP	LK46W-BP
Portuguese		LK471-AV	LK47W-AV	LK461-AV	LK46W-AV
Romanian				LK461-BL	LK46W-BL
Slovak		LK471-CZ	LK47W-CZ	LK461-CZ	LK46W-CZ
Spanish		LK471-AS	LK47W-AS	LK461-AS	LK46W-AS
Swiss/Generic		LK471-AK	LK47W-AK		
Swiss/French				LK461-AK	LK46W-AK
Swiss/German				LK461-AL	LK46W-AL
Swedish				LK461-AM	LK46W-AM
Swedish/Finnish		LK471-AF	LK47W-AF		
Taiwanese		LK471-BI	LK47W-BI		
Thai		LK471-CB	LK47W-CB		
Turkish		LK471-BU	LK47W-BU	LK461-BU	LK46W-BU
Turkish F.		LK471-BW	LK47W-BW	LK461-BW	LK46W-BW
United Kingdom/English		LK471-AE	LK47W-AE	LK461-A2	LK46W-A2
Yugoslavia		LK471-BY	LK47W-BY	LK461-BY	LK46W-BY

* LK471-AA, LK461-AA, LK471W, and LK461W English keyboards, include U.S. power cord; power cord does not need to be ordered separately.

Power Cord	Select 1	System	Monitor
Africa/India		BN19S-2E	BN19S-2E
Australia, NZ		BN19H-2E	BN19H-2E
Denmark		BN19K-2E	BN19K-2E
Italy		BN19M-2E	BN19M-2E
Israel		BN18L-2E	BN18L-2E
North America		BN19P-1K	BN19P-1K
Central Europe		BN03A-2E	BN03A-2E
Switzerland		BN19E-2E	BN19E-2E
UK, Ireland		BN26D-2E	BN26D-2E

AlphaStation Options and Technical Specifications

Refer to System Sections for allowable option configurations.All options will be factory installed unless specified as Spares on original order.

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Monitors							
VRC15-KA/K4	Y	N	N	N	N	N	N
VRC15-WA/W3/W4	N	N	N	Y	N	N	N
VRT17-PA/P4	Y	Y	Y	N	Y	N	Y
VRT17-WA/W3/W4	N	N	N	Y	N	Y	N
VRC21-LA/L4	Y	Y	Y	N	Y	N	Y
VRC21-WA/W3/W4	N	N	N	Y	N	Y	N
Graphics							
PB2GA-JA (a)	Y	Y / N	N	Y / N	Y	N	N
PBXGA-AA (b)	Y	Y	Y	N	Y	N	Y
PBXGA-BA (b)	Y	Y	Y	N	Y	N	Y
PBXGA-CA (b)	Y	Y	Y	N	Y	N	Y

(a) Embedded in AlphaStation 255/233 Case Advantage Configuration, and orderable for 255/233 Base systems. **Not** orderable for AlphaStation 255/300 systems.

(b) Up to **3** ZLXp-Ex, or any combination of up to three ZLXp -E1, -E2 and -E3 graphics options and three monitors are supported on Digital UNIX and Open VMS systems. Options require Digital Open3D media which is included in factory installed software (FIS) on Digital UNIX and OpenVMS systems.

AlphaStation Options and Technical Specifications

Refer to System Sections for allowable option configurations. All options will be factory installed unless specified as Spares on original order.

Monitors	
15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4-meter HD15 male-to-male video cable. - Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. - If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 not included, order separately.	**VRC15-KA/K4**
15" (13.9" viewable image size) high resolution color monitor with Frost White enclosure. Flat-square CRT with 0.28mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024x768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4-meter HD15 male-to-male video cable. The -WA and -W3 are for Northern Hemisphere operation. The -W4 is for Southern Hemisphere operation. The -WA includes 120V power cord. Power cords for -W3 and -W4 not included, order separately.	**VRC15-WA/W3/W4**
17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0-meter HD15 male-to-BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North America, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.	**VRT17-PA/P4**
17" (16.0" viewable image size) high resolution color monitor with Frost White enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. On Screen Display (OSD). Auto-scanning from VGA to 1280x1024 at 75Hz NI refresh rates. Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.8-meter HD15 male-to-male video cable. The -WA and -W3 are for Northern Hemisphere operation. The -W4 is for Southern Hemisphere operation. The -WA includes 120V power cord. Power cords for -W3 and -W4 not included, order separately.	**VRT17-WA/W3/W4**
21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0-meter HD15 male-to-BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.	**VRC21-LA/L4**
21 inch (19.6" viewable image size) ultra high resolution color monitor with Frost White enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600x1200 at 75Hz NI refresh rates. On screen Display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0-meter HD15 male-to-male video cable. The -WA and -W3 are for Northern Hemisphere operation. The -W4 is for Southern Hemisphere operation. The -WA includes 120V power cord. Power cords for -W3 and -W4 not included, order separately.	**VRC21-WA/W3/W4**

Graphics			
1 PCI slot	**	PowerStorm 3D10 8-plane, PCI graphics accelerator, 1280x1024, 72Hz, 256 colors for Digital UNIX, OpenVMS and Windows NT	**PB2GA-JA**
1 PCI slot	**	ZLXp-E1 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Digital UNIX and OpenVMS	**PBXGA-AA**
1 PCI slot	**	ZLXp-E2 2D/3D 24-plane PCI graphics accelerator, 8 MB memory, 1280x1024, 72 Hz, 16.7M colors for Digital UNIX and OpenVMS	**PBXGA-BA**
1 PCI slot	**	ZLXp-E3 3D 24-plane PCI graphics accelerator, plus 24 bit Z-buffer, 16 MB memory, 1280x1024, 72 Hz, 16.7M colors for Digital UNIX and OpenVMS	**PBXGA-CA**

** ZLXp-Ex graphics options and PowerStorm 3D30 and 4D20 graphics options **cannot** be mixed in same system.

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Graphics							
PBXGA-AN (c)	Y	Y	Y	N	Y	N	Y
PBXGA-BN (c)	Y	Y	Y	N	Y	N	Y
PBXGA-CN (c)	Y	Y	Y	N	Y	N	Y
PBXGI-AA	N	N	N	N	N	Y	Y
PBXGI-AB	N	N	N	N	N	Y	Y
PBXGI-AC	N	N	N	N	N	Y **(d)**	Y
PBXGI-GA	N	N	N	N	N	Y **(d)**	Y
PBXGI-GB	N	N	N	N	N	Y **(d)**	Y
PBXGI-GC	N	N	N	N	N	Y	Y
PBXGB-AA (e)	N	N	N	Y	N	Y	Y
PBXGB-CA (e)	N	N	N	Y	N	Y	Y
PBXGC-AA (f)	N	Y	Y	Y	Y	Y (g)	Y
PBXGC-AN (f)	N	Y	Y	Y	Y	Y	Y
PBXGC-BA (f)	N	Y	Y	Y	Y	Y (g)	Y
PBXGC-BN (f)	N	Y	Y	N	Y	Y	Y
PBXGE-BB (h)	N	N	Y	N	N	Y (i)	Y
PBXGE-BD (h)	N	N	Y	N	N	Y (i)	Y
PBXGE-BG (h)	N	N	Y	N	N	Y (i)	Y
PBXGE-CB (j)	N	N	Y	N	N	Y (i)	Y
PBXGE-CC (j)	N	N	Y	N	N	Y (i)	Y
MSP01-DA (j)	Y	Y	Y	N	Y	N	N

(c) Multi screen support for Windows NT must be homogeneous (Three ZLXp -E1, three -E2 or three -E3). Graphics options include Graphics Support Services Software license, media and documentation. 3D multi screen not hardware accelerated for Windows NT.

(d) Supported on Digital UNIX and Windows NT systems only.

(e) Up to **3** PowerStorm 3D30 or **3** PowerStorm 4D20, or any combination of up to 3 PowerStorm 3D30/4D20 graphics options and 3 monitors are supported on Digital UNIX and OpenVMS systems. **Note:** AlphaStation 255 support **2** PowerStorm graphics options and 2 monitors on OpenVMS systems. Graphics options require Digital Open3D media, included in factory installed software (FIS) on Digital UNIX and OpenVMS systems. Multi screen support for Windows NT must be homogeneous (3 PowerStorm 3D30 options or 3 PowerStorm 4D20). Windows NT graphics options include Graphics Support Services Software license, media and documentation. 3D multi screen not hardware accelerated for Windows NT. PowerStorm 3D30 and 4D20 graphics options and ZLXp-Ex graphics options **cannot** be mixed in same system.

(f) One ZLXp-Lx graphics option supported per system; -Lx graphics cannot be mixed with any other graphics option.

(g) Currently supported on AlphaStation 500/500 Digital UNIX and OpenVMS only.

(h) E&S Freedom Series graphics are packaged in a deskside pedestal and connect to PCI interface card in AlphaStation system box by a 10-foot interface cable. Graphics options include graphics subsystem, PCI interface card, interface cable, and video cable for a VRC21-LA/L4 monitor. Country specific power cord required. Texture memory module upgrades are available for E&S Freedom Series graphics. **Note:** E&S 64-bit graphics supported in both 64-bit and 32-bit PCI slots; 64-bit slots recommended for best performance.

(i) Currently supported on AlphaStation 500/266 and 500/300 systems only.

(j) To upgrade E&S Freedom Series graphics memory, select one texture memory module for each performance module.

AlphaStation Options and Technical Specifications

Bus / Slots Required	Description	
Graphics		
1 PCI slot **	ZLXp-E1 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Windows NT	**PBXGA-AN**
1 PCI slot **	ZLXp-E2 2D/3D 24-plane PCI graphics accelerator, 8 MB memory, 1280x1024, 72 Hz, 16.7M colors for Windows NT	**PBXGA-BN**
1 PCI slot **	ZLXp-E3 3D 24-plane PCI graphics accelerator, plus 24 bit Z-buffer, 16 MB memory, 1280x1024, 72 Hz, 16.7M colors for Windows NT	**PBXGA-CN**
1 PCI slot **	PowerStorm 3D30 2D 8-plane PCI graphics accelerator, 2 MB memory, 1280x1024, 72 Hz, 256 colors for Digital UNIX, OpenVMS and Windows NT	**PBXGI-AA**
1 PCI slot **	PowerStorm 4D20 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB memory, 1280x1024 75Hz (1600x1200 75Hz 12 planes double buffered plus 24-bit Z-buffer) for Digital UNIX, OpenVMS and Windows NT	**PBXGI-AB**
2 PCI slots (†) **	PowerStorm 4D40T Advanced 3D graphics accelerator with 16 MB video memory, 1280 x 1024 resolution, 24 bit true color, double buffered, 24 bit Z-buffer, hardware accelerated 3D shading and texture mapping.	**PBXGI-AC**
2 PCI slots (†) **	PowerStorm 4D50T Advanced 3D graphics accelerator with enhanced performance, 16 MB video memory, 1280 x 1024 resolution, 24 bit true color, double buffered, 24 bit Z-buffer, hardware accelerated 3D shading and texture mapping.	**PBXGI-GA**
2 PCI slots (†) **	PowerStorm 4D60T Advanced 3D Graphics accelerator with enhanced performance, 32 MB video memory, 1600 x 1280 resolution, 24 bit true color, double buffered 32 bit Z buffer, hardware accelerated 3D shading and texture mapping.	**PBXGI-GB**
	4 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T graphics accelerators.	**PBXGI-GC**
	16 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T graphics accelerators.	**PBXGB-AA**
	32 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T Graphics Accelerators.	**PBXGB-CA**
1 PCI slot	ZLXp-L1 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB memory, 1280x1024 72 Hz, 1 rendering engine, for Digital UNIX and OpenVMS	**PBXGC-AA**
1 PCI slot	ZLXp-L1 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB memory, 1280x1024 72 Hz, 1 rendering engine, for Windows NT	**PBXGC-AN**
2 PCI slots	ZLXp-L2 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 32 MB memory, 1280x1024 72 Hz, 2 rendering engines, for Digital UNIX and OpenVMS	**PBXGC-BA**
2 PCI slots	ZLXp-L2 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 32 MB memory, 1280x1024 72 Hz, 2 rendering engines, for Windows NT	**PBXGC-BN**
1 PCI slot	E&S Freedom Series 3150, 3 Performance Modules, 1 MB texture memory	**PBXGE-BB**
1 PCI slot	E&S Freedom Series 3250, 5 Performance Modules, 1 MB texture memory	**PBXGE-BD**
1 PCI slot	E&S Freedom Series 3400, 8 Performance Modules, 4 MB texture memory	**PBXGE-BG**
	4 MB Texture memory module upgrade for E&S Freedom Series graphics	**PBXGE-CB**
	16 MB Texture memory module upgrade for E&S Freedom Series graphics	**PBXGE-CC**
	2 MB DRAM upgrade for PBXGA-JA	**MSP01-DA**

** ZLXp-Ex graphics options and PowerStorm 3D30 and 4D20 graphics options **cannot** be mixed in same system.

† Support on Digital UNIX and Windows NT systems. Minimum operating software required is: Digital UNIX V4.0, and Windows NT 3.51. Hardware-accelerated texturing requires Texture Memory Module.

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
2D and 3D Input Devices							
PBXWA-AA	Y	Y	Y	Y	Y	Y	Y
PBXWB-AA	Y	Y	Y	Y	Y	Y	Y
PBXWT-AA	Y	Y	Y	Y	Y	Y	Y
PBXWT-AB	Y	Y	Y	Y	Y	Y	Y
PBXWT-AC	Y	Y	Y	Y	Y	Y	Y
PBXWT-AD	Y	Y	Y	Y	Y	Y	Y
PBXWT-BA	Y	Y	Y	Y	Y	Y	Y
PBXWS-AA	Y	Y	Y	N	Y	N	Y
PBXWS-WA	N	N	N	Y	N	Y	N
System Memory							
MSP01-AA	Y	Y	N	N	Y	N	N
MSP01-AB	Y	Y	N	N	Y	N	N
MSP01-AC	Y	Y	N	N	Y	N	N
MSP01-AD	Y	Y	N	N	Y	N	N
MSP01-AE	Y	Y	N	N	Y	N	N
MSP01-BA	N	N	Y	Y	N	N	N
MSP01-BB	N	N	Y	Y	N	N	N
MSP01-BC	N	N	Y	Y	N	N	N
MSP01-BD	N	N	Y	Y	N	N	N
MSP01-FA	N	N	N	N	N	Y	N
MSP01-FB	N	N	N	N	N	Y	N
MSP01-FC	N	N	N	N	N	Y	N
MSP01-FD	N	N	N	N	N	Y	N
MSP01-FE	N	N	N	N	N	Y	N
MSP01-CA	N	N	N	N	N	N	Y
MSP01-CB	N	N	N	N	N	N	Y
MSP01-CC	N	N	N	N	N	N	Y
MSP01-CD	N	N	N	N	N	N	Y
Cache Memory							
MSP01-EA	N	N	N	N	N	N	Y
MSP01-EB	N	N	N	N	N	N	Y

AlphaStation Options and Technical Specifications

Description	
2D and 3D Input Devices	
Spaceball Model 3003 3D Motion Control Device. Full simultaneous six-degree-of-freedom control with dynamic pan, zoom, and rotation of models (X,Y,Z translations and rotations) instantly. Serial port interface. Includes Spaceware device driver on CD-ROM. Supported on Digital UNIX, OpenVMS and Windows NT. Check with ISV for application support status.	**PBXWA-AA**
3-button Trackball. Replaces standard AlphaStation mouse as an alternative pointing device. Plugs into AlphaStation mouse port. No special device drivers required. Supported on Digital UNIX, OpenVMS and Windows NT.	**PBXWB-AA**
12" x 12" Digitizing Tablet with Opaque surface, user selectable resolution up to 2,540 lpi, 16 button cordless cursor, serial interface cable, 9 to 25 pin adapter cable, Digital UNIX driver, Windows NT (WinTab compliant) driver, OpenVMS driver, 120V North American wall mounted power supply.	**PBXWT-AA**
12" x 12" Digitizing Tablet with Opaque surface, user selectable resolution up to 2,540 lpi, 16 button cordless cursor, serial interface cable, 9 to 25 pin adapter cable, Digital UNIX driver, Windows NT (WinTab compliant) driver, OpenVMS driver, 220V European wall mounted power supply.	**PBXWT-AB**
12" x 12" Digitizing Tablet with Opaque surface, user selectable resolution up to 2,540 lpi, 16 button cordless cursor, serial interface cable, 9 to 25 pin adapter cable, Digital UNIX driver, Windows NT (WinTab compliant) driver, OpenVMS driver, 240V U.K. wall mounted power supply.	**PBXWT-AC**
12" x 12" Digitizing Tablet with Opaque surface, user selectable resolution up to 2,540 lpi, 16 button cordless cursor, serial interface cable, 9 to 25 pin adapter cable, Digital UNIX driver, Windows NT (WinTab compliant) driver, OpenVMS driver, 100V Japan wall mounted power supply.	**PBXWT-AD**
Two button click tip pen for PBXWT-Ax Digitizing Tablet	**PBXWT-BA**
Spare 3-button mouse, Light Gray enclosure	**PBXWS-AA**
Spare 3-button mouse, Frost White enclosure	**PBXWS-WA**

System Memory		
1 bank	8 MB (2 x 4 MB SIMMs) 1Mx33	**MSP01-AA**
1 bank	16 MB (2 x 8 MB SIMMs) 2Mx33	**MSP01-AB**
1 bank	32 MB (2 x 16 MB SIMMs) 4Mx33	**MSP01-AC**
1 bank	64 MB (2 x 32 MB SIMMs) 8Mx33	**MSP01-AD**
1 bank	128 MB (2 x 64 MB SIMMs) 16Mx33	**MSP01-AE**
1 bank	32 MB (4 x 8 MB SIMMs) 2Mx33	**MSP01-BA**
1 bank	64 MB (4 x 16 MB SIMMs) 4Mx33	**MSP01-BB**
1 bank	128 MB (4 x 32 MB SIMMs) 8Mx33	**MSP01-BC**
1 bank	256 MB (4 x 64 MB SIMMs) 16Mx33	**MSP01-BD**
1 bank	32 MB (4 x 8 MB DIMMs) 1Mx72	**MSP01-FA**
1 bank	64 MB (4 x 16 MB DIMMs) 2Mx72	**MSP01-FB**
1 bank	128 MB (4 x 32 MB DIMMs) 4Mx72	**MSP01-FC**
1 bank	256 MB (4 x 64 MB DIMMs) 8Mx72	**MSP01-FD**
1 bank	512 MB (4 x 128 MB DIMMs) 16Mx72	**MSP01-FE**
1 bank	32 MB (8 x 4 MB SIMMs) 1Mx36	**MSP01-CA**
1 bank	64 MB (8 x 8 MB SIMMs) 2Mx36	**MSP01-CB**
1 bank	128 MB (8 x 16 MB SIMMs) 4Mx36	**MSP01-CC**
1 bank	256 MB (8 x 32 MB SIMMs) 8Mx36	**MSP01-CD**

Cache Memory		
	2 MB 3 x .667 MB SIMMs	**MSP01-EA**
	4 MB 3 x 1.33 MB SIMMs	**MSP01-EB**

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Internal SCSI Storage							
PBXRX-AA	Y	Y	Y	N	Y	N	Y
PBXRX-AB	N	N	N	Y	N	Y	N
PBXRD-CA	Y	Y	Y	N	Y	N	Y
PBXRD-CB	N	N	N	Y	N	Y	N
PBXRZ-BB (a)	Y	Y	N	N	N	N	N
PBXRZ-EB	Y	Y	Y	Y	Y	Y (b)	Y (b)
PBXRZ-ED (a)	Y	Y	N	Y	N	N	N
PBXRZ-HB	Y	Y	Y	Y	Y	Y (b)	Y (b)
PBXRZ-JB	Y	Y	Y	Y	Y	Y (b)	Y (b)
PBXRZ-NA	Y	Y	Y	Y	Y	Y (b)	Y (b)
PBXRW-EB	N	N	N	N	N	Y	Y
PBXRW-HB	N	N	N	N	N	Y	Y
PBXRW-JB	N	N	N	N	N	Y	Y
PBXRW-NA	N	N	N	N	N	Y	Y
PBXTL-DA	Y (c, d)	Y (c, d)	Y (c, d)	N	Y (d)	N	Y (d)
PBXTZ-AA	Y (c)	Y (c)	Y (c)	N	Y	N	Y
PBXTZ-CA	Y (c, e)	Y (c, e)	Y (c, e)	N	Y (e)	N	Y (e)
SCSI Controllers and Adapter							
KZPAA-AA	Y	Y	Y	Y	Y	Y	Y
KZPSA-BB	Y (f, g)	Y (f, g)	Y (g)	N	Y	N	Y (g)
KZPDA-AA	N	N	N	N	Y	Y (h)	N
DWZZB	Y	Y	Y	N	Y	N	Y
KZPSC-AA	N	N	Y (i)	Y (f, i)	Y (i)	Y (i, j)	Y (i, j)
KZPSC-BA	N	N	Y (i)	Y (f, i)	Y (i)	Y (i, j)	Y (i, j)
PBXKP-BA (k)	N	N	N	N	N	Y	Y

(a) Does not support Tag Command Queuing, Seek Reordering, Spindle Sync, Variable Sector Size, or OpenVMS SCSI clusters.
(b) To add a narrow SCSI drive to AlphaStation 500 and 600 systems, order wide to narrow adapter (PBXKP-BA) for each drive.
(c) Supported as embedded only in place of CD-ROM drive
(d) Supported on Digital UNIX, OpenVMS, and Windows NT 4.0. For use with Windows NT 3.51, obtain upgrade kit part number QC-00LAC-UC, which includes driver and installation instructions. Driver and instructions are also available at Web Site http://www.storage.digital.com under, the "Technomania" section.
(e) Supported on Digital UNIX and OpenVMS only. Windows NT requires 4.0 minimum.
(f) Digital UNIX V3.2D and OpenVMS V6.2-1H1 both require SRM console V6.1-2 minimum, which support bootable versions of ARC/Alphabios, and V3.6 or V3.7 firmware CD-ROM which contains ARC/Alphabios images required to build a bootable floppy (V3.6) or boot directly from the CD-ROM (V3.7). This allows user to configure referenced adapters without re-flashing the SRM console. Refer to Web Site: http://ftp.digital.com/pub/Digital/Alpha/firmware/utilities/
(g) Not supported on OpenVMS SCSI clusters.
(h) Supported on Digital UNIX and Windows NT only.
(i) Boot support of RAID set under OpenVMS requires minimum of OpenVMS V6.2-1H3, previous versions support data device RAID set only. Digital UNIX support requires minimum of V3.2D, and requires patch OSF350-135.
(j) KZPSC hardware Rev C or greater requires console firmware upgrade to V6.0-21 or later. Access Website: http://ftp.digital.com:80/pub/Digital/Alpha/firmware/interim/
(k) To add a narrow SCSI drive to AlphaStation 500 and 600 systems, order a wide to narrow adapter (PBXKP-BA) for each drive.

AlphaStation Options and Technical Specifications

Bus / Slots Required	Description	
Internal SCSI Storage		
3.5" x 1" bay	1.44 MB 3.5" diskette drive, included in most systems (FDI), Light Gray	**PBXRX-AA**
3.5" x 1" bay	1.44 MB 3.5" x 1 diskette drive, Frost White	**PBXRX-AB**
5.25" bay	600 MB 5.25" half-height quad-speed CD-ROM drive, included in most systems, Light Gray	**PBXRD-CA**
5.25" bay	600 MB 5.25" half-height quad-speed CD-ROM drive, included in most systems Frost White	**PBXRD-CB**
3.5 x 1" or 1.6" bay	535 MB 3.5" x 1" **narrow** hard disk drive 5400 RPM	**PBXRZ-BB**
3.5 x 1" or 1.6" bay	1.05 GB 3.5" x 1" **narrow** hard disk drive 5400 RPM	**PBXRZ-EB**
3.5 x 1" or 1.6" bay	1.05 GB 3.5" x 1", **narrow** hard disk drive 5400 RPM	**PBXRZ-ED**
3.5 x 1.6" bay	2.1 GB 3.5" x 1.6" **narrow** hard disk drive 5400 RPM	**PBXRZ-HB**
3.5 x 1" or 1.6" bay	2.1 GB 3.5" x 1.6", **narrow** hard disk drive 7200 RPM	**PBXRZ-JB**
3.5 x 1.6" bay	4.3 GB 3.5" x 1.6", **narrow** hard disk drive 7200 RPM	**PBXRZ-NA**
3.5 x 1" or 1.6" bay	1.05 GB 3.5" x 1", **wide** hard disk drive 5400 RPM	**PBXRW-EB**
3.5 x 1" or 1.6" bay	2.1 GB 3.5" x 1" **wide** hard disk drive 5400 RPM	**PBXRW-HB**
3.5 x 1" or 1.6" bay	2.1 GB 3.5" x 1", **wide** hard disk drive 7200 RPM	**PBXRW-JB**
3.5 x 1.6" bay	4.3 GB 3.5" x 1.6", **wide** hard disk drive 7200 RPM	**PBXRW-NA**
5.25" bay	4.0/8.0 GB 5.25" x 1.6" 4-mm DAT drive	**PBXTL-DA**
5.25" bay	2.0 GB 5.25" half-height QIC tape drive	**PBXTZ-AA**
5.25" bay	2.3 GB 5.25" half-height mini-cartridge QIC tape drive	**PBXTZ-CA**

SCSI Controllers and Adapter		
1 PCI slot	PCI-based Fast Narrow Single Ended (FNSE) SCSI-2 controller, maximum 2 per system, requires BN21H-02 SCSI cable.	**KZPAA-AA**
1 PCI slot	PCI-based Fast Wide Differential (FWD) SCSI-2 controller, requires DWZZB-AA adapter	**KZPSA-BB**
1 PCI slot	PCI-based one port Fast Wide Single Ended (FWSE) SCSI-2 controller, requires BN21K-02 SCSI cable.	**KZPDA-AA**
External	SCSI bus extender and converter, Fast Wide Differential on one end to Fast Wide Single Ended on other, requires BN21K-xx SCSI cable.	**DWZZB**
1 PCI slot	PCI-based one port RAID controller, requires BN31S-1E SCSI cable	**KZPSC-AA**
1/2 PCI slot	PCI-based three port RAID controller, requires three BN31S-1E and one BN31K-0E bulkhead kit adapter for third port connection (third port requires one additional PCI bulkhead slot)	**KZPSC-BA**
internal adapter	Wide to Narrow SCSI adapter	**PBXKP-BA**

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
External SCSI Storage (a, b)							
BA353-AA (d)	Y	Y	Y	Y	Y	Y (c)	(c, e)
BA356-KC	Y (f)	Y (f)	Y (f)	Y (f)	Y (f)	Y (f)	Y (f)
BA362-AA/AB	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)
BA364-AA/AB	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)	Y (g)
TLZ09-DB	Y (h)	Y (h)	Y (h)	Y (h)	Y (h)	N	Y (h)
TLZ09-DC	N	N	N	N	N	Y (h)	N
TZ87-TA	Y	Y	Y	Y	Y	Y (c, i)	Y (c)
TZ88N-TA	Y	Y	Y	Y	Y	Y (c, i)	Y (c)
TZ875-TA	N	N	Y	N	Y	N	N
TZ885-NT	Y	Y	Y	N	Y	Y (c, i)	Y (c)
TZ887-NT	Y	Y	Y	N	Y	Y (c, i)	Y (c)
TZK20-DB	Y (j)	Y (j)	Y (j)	Y (j)	Y (j)	N	Y (j)
TZK20-DC	N	N	N	N	N	Y (j)	N
TZK11-DA	Y	Y	Y	Y	Y	Y (c)	Y (c)
RRD45-DA	Y	Y	Y	Y	Y	Y (c)	Y (c)

(a) For more than 7 internal or external devices, a fast SCSI-2 controller, which supports 7 devices, is required.
(b) Each external device requires a 3-foot SCSI cable.
(c) To run narrow devices/enclosures off the Wide external SCSI bus, order BN36A-0B, 68-pin HD to 50-pin HD hi-byte terminator adapter, and either 50-pin HD to 50-pin LD BN23G-01 one-meter cable for tabletop devices, or 50-pin HD to 50-pin HD BN21H-01 one-meter cable for BA350/BA353.
(d) Supports 5400 RPM drives only.
(e) See AlphaStation 600 external expansion in order menu.
(f) For narrow connection to BA356-KC with AlphaStation 200, 250, 255, and 400, order a KZPAA-AA controller and BN21N-02 SCSI cable. For wide connection off the external wide bus on AlphaStations 500 and 600, order a BN21K-01.
(g) For narrow device support from external 8-bit narrow SCSI port on AlphaStations 200, 250, 255 and 400, order a one-meter 68-pin HD to 50-pin HD external SCSI cable BN31V-01. For wide device support from external 16-bit wide SCSI port on AlphaStations 500 and 600, order a 1-meter 68-pin HD to 68-pin HD external SCSI cable BN31G-01.
(h) Supported on Digital UNIX, OpenVMS, and Windows NT 4.0. For use with Windows NT 3.51, obtain upgrade kit part number QC-00LAC-UC, which includes driver and installation instructions. Driver and instructions are also available at Web Site http://www.storage.digital.com under, the "Technomania" section.
(i) Supported on Digital UNIX and OpenVMS only.
(j) Supported on Digital UNIX and OpenVMS only. Windows NT requires 4.0 minimum.

AlphaStation Options and Technical Specifications

Bus / Slots Required	Description	
External SCSI Storage		
(e)	StorageWorks desktop expansion box (up to three devices). Requires BN21H-01 off external SCSI bus, or BN21H-02 off KZPAA-AA SCSI controller	**BA353-AA**
(e)	Deskside unit with BA356 shelf and power supply BA35X-HF, pedestal kit BA35X-VA, dual-speed blowers, 16-bit I/O module BA35X-MH, and North American power cord. Supports up to seven Narrow and Wide device	**BA356-KC**
external	StorageWorks desktop expansion for Narrow and Wide devices, supports up to two devices	**BA362-AA/AB**
external	StorageWorks desktop expansion for Narrow and Wide devices, supports up to four devices	**BA364-AA/AB**
external	8.0 GB 4-mm DAT tape drive, Tabletop, Frost White (Digital UNIX and OpenVMS, see note (h) for Windows NT); includes SCSI cable	**TLZ09-DB**
external	8.0 GB 4-mm DAT tape drive, Tabletop with wide to narrow SCSI adapter and cable, Frost White (Digital UNIX, OpenVMS support, see note (h) for Windows NT)	**TLZ09-DC**
external	20/10 GB DLT cartridge tape drive, single slot, Tabletop, requires BN23G-01 SCSI cable (Digital UNIX and OpenVMS only)	**TZ87-TA**
external	40/20 GB DLT cartridge tape drive, single slot, Tabletop, requires BN23G-01 SCSI cable (Digital UNIX and OpenVMS only)	**TZ88N-TA**
external	100/50 GB TZ87 (5 cartridge loader) Tabletop, requires BN23G-01 SCSI cable (Digital UNIX and Open VMS only)	**TZ875-TA**
external	200/100 GB DLT (5 cartridge loader) Tabletop, requires BN23G-01 SCSI cable (Digital UNIX and OpenVMS only)	**TZ885-NT**
external	280/140 GB DLT (7 cartridge loader) Tabletop, requires BN23G-01 SCSI cable (Digital UNIX and OpenVMS only)	**TZ887-NT**
external	2.3 GB QIC tape drive, Tabletop, includes SCSI cable, Frost White	**TZK20-DB**
external	2.3 GB QIC tape drive, Tabletop with wide to narrow SCSI adapter and cable, Frost White	**TZK20-DC**
external	2.0 GB QIC tape, Tabletop, requires BN23G-01 SCSI cable	**TZK11-DA**
external	600 MB 5.25" half-height quad-speed CD-ROM drive, Tabletop, requires BN23G-01 SCSI cable	**RRD45-DA**

(e) See AlphaStation 600 external expansion in order menu.

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Communication Options—Check availability of PCI, EISA, and ISA slots							
DE425-AA	N	N	N	N	N	N	Y
DE450-CA	Y	Y	Y	Y	Y	Y	Y
DE450-TA	Y	Y	Y	Y	Y	Y	Y
DE500-XA	Y	Y	Y	Y	Y	Y	Y
DE205-AC	Y	Y	Y	Y	Y	N	N
DGLPB-AB (a)	Y	Y	Y	Y	Y	Y	Y
DIIAA-AA (b)	Y	Y	Y	Y	Y	N	Y
DIIAA-AB (b)	Y	Y	Y	Y	Y	N	Y
PBXDC-DA	N	N	N	Y	N	N	N
PBXDF-AA	Y	Y	Y	Y	Y	N	N
PBXDF-BA	Y	Y	Y	Y	Y	N	Y
PBXDI-AA	Y (c)	Y (c)	Y (c)	Y / N (d)	Y (c)	N	N
PBXDI-AB	Y (c)	Y (c)	Y (c)	Y / N (d)	Y (c)	N	N
PBXDI-AC	Y (c)	Y (c)	Y (c)	Y / N (d)	Y (c)	N	N
PBXDP-AA	N	N	N	N / Y (e, f)	N	Y	N (e)
PBXNP-AA (e)	Y	Y	Y	Y	Y	Y	Y
DEFPA-AA	Y	Y	Y	Y	Y	Y	Y
DEFPA-DA	Y	Y	Y	Y	Y	Y	Y
DEFPA-UA	Y	Y	Y	Y	Y	Y	Y
DEFPA-MA	Y	Y	Y	Y	Y	Y	Y
DETTR-BA/BB	Y	Y	Y	Y	Y	N	N
DNSES-AA (e)	N	N	N	N	N	N	Y (e)
CXI01-AA	Y	Y	Y	N	Y	N	N
CXI01-AD	Y	Y	Y	N	Y	N	N
DJ-ML200-AA				N		Y	
PCP3H-AG				Y		Y	
Multimedia and Audio							
AVH01-AA	Y	Y	Y	Y	Y	Y	Y
AVP20-AA	Y	Y	Y	Y	Y	Y	Y
AVP00-AN	Y	Y	Y	Y	Y	Y	Y
AVP23-CA	Y	Y	Y	Y	Y	Y	Y
AVP03-CA	Y	Y	Y	Y	Y	Y	Y
AV301-AA	Y	Y	Y	Y	Y	Y	Y
AV321-AA	Y	Y	Y	Y	Y	Y	Y
AV201-AA	Y	Y	Y	N	Y	Y	Y
AVC00-AA	Y	Y	Y	Y	Y	Y	Y
AVC00-AE	Y	Y	Y	Y	Y	Y	Y
AVC00-AJ	Y	Y	Y	Y	Y	Y	Y
AVC00-CA	Y	Y	Y	Y	Y	Y	Y

(a) Supported on Digital UNIX and Windows NT systems only.
(b) Supported on Windows NT systems only.
(c) Supported in ISA/combination slot only.
(d) Supported on AlphaStation 255/233 systems only.
(e) Supported on Digital UNIX and OpenVMS systems only.
(f) Supported on AlphaStation 255/300 systems only.

AlphaStation Options and Technical Specifications

Bus / Slots Required	Description	
Communication Options		
1 EISA	EISA Ethernet	**DE425-AA**
1 PCI	PCI Ethernet, Twisted Pair, ThinWire, Thick wire	**DE450-CA**
1 PCI	PCI Ethernet, Twisted Pair	**DE450-TA**
1 PCI	PCI Fast Ethernet, 100 MB	**DE500-XA**
1 ISA	ISA Ethernet for Digital UNIX and Windows NT	**DE205-AC**
1 PCI	PCI to ATM adapter features multi-mode fiber cable interface and SONET/SDH framing, for Digital UNIX and Windows NT	**DGLPB-AB**
1 ISA	ISA ISDN adapter/network interface card for Windows NT. U interface for U.S. and Canada	**DIIAA-AA**
1 ISA	ISA ISDN adapter/network interface card for Windows NT. S/T interface for Europe, APA	**DIIAA-AB**
	Ethernet Halo AUI Card, ThinWire	**PBXDC-DA**
1 ISA	ISA modem 14.4K (U.S. only)	**PBXDF-AA**
1 ISA	ISA modem 28.8K (U.S. only)	**PBXDF-BA**
1 ISA/ Combo slot	2-port ISA Synchronous communication controller, X.25/SNA V.24/V.28 equivalent to EIA 232, supported in ISA/Combo slot only	**PBXDI-AA**
1 ISA/ Combo slot	2-port ISA Synchronous communication controller, X.25/SNA V 35, supported in ISA/Combo slot only	**PBXDI-AB**
1 ISA/ Combo slot	2-port ISA Synchronous communication controller, X25/SNA V 21/EIA-530, supported in ISA/Combo slot only	**PBXDI-AC**
1 PCI	2 port PCI synchronous communications controller, EIA-232, -422, -423, -449, -485, -530,V.35, and or X.21	**PBXDP-AA**
1 PCI	PCI Token Ring Network Adapter for all operating systems	**PBXNP-AA**
1 PCI	PCI-based Digital FDDI-SAS/PCI (MMF) controller, Single attachment	**DEFPA-AA**
1 PCI	PCI-based Digital FDDI-DAS/PCI (MMF) controller, Dual attachment	**DEFPA-DA**
1 PCI	PCI-based Digital FDDI-SAS/PCI (UTP) controller	**DEFPA-UA**
1 PCI	PCI-based Digital FDDI-DAS/PCI (UTP) controller, Dual attachment	**DEFPA-MA**
	10BaseT to AUI (UTP to thick wire) single port adapter/repeater, 120/240V, 120V variant includes North American power cord; order country specific power cord for 240V variant. Supported on all systems.	**DETTR-BA/BB**
1 EISA	2 port EISA Synchronous communication controller, X.25/SNA V.24/V.28 Equivalent to EIA-232	**DNSES-AA**
1 ISA	16-64 Port Asynchronous Multiplexer for Digital UNIX and Windows NT	**CXI01-AA**
1 ISA	16-224 Port Asynchronous Multiplexer for Digital UNIX and Windows NT	**CXI01-AD**
1 PCI	PCI Prestoserve 2 MB Digital UNIX	**DJ-ML200-AA**
external	Kensington lock for added security	**PCP3H-AG**

MultiMedia and Audio		
	Replacement headphones and microphone	**AVH01-AA**
	Video conferencing upgrade kit with camera for Digital UNIX	**AVP20-AA**
	Video conferencing upgrade kit with camera for Windows NT	**AVP00-AN**
	Video conferencing upgrade kit without camera for Digital UNIX	**AVP23-CA**
	Video conferencing upgrade kit without camera for Windows NT	**AVP03-CA**
1 PCI slot	FullVideo Supreme for all systems	**AV301-AA**
1 PCI slot	FullVideo Supreme JPEG for all systems	**AV321-AA**
1 PCI slot	FullVideo Basic for Digital UNIX and Windows NT	**AV201-AA**
	Toshiba camera, North America	**AVC00-AA**
	Toshiba camera, UK	**AVC00-AE**
	Toshiba camera, Japan	**AVC00-AJ**
	Toshiba camera, Europe	**AVC00-CA**

AlphaStation Options and Technical Specifications

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Recommended UPS							
4N-AEABC-AF 120V	Y	Y	Y	N	N	N	N
4N-AEABC-BF 240V	Y	Y	Y	N	N	N	N
4N-AEABD-AF 120V	N	N	N	N	Y	N	N
4N-AEABD-BF 240V	N	N	N	N	Y	N	N
4N-AEABF-AA 120V	N	N	N	N	N	Y	Y
4N-AEABF-BF 240V	N	N	N	N	N	Y	Y
Data Line Surge protectors (For complete protection select surge protectors for UPS products)							
4N-GA249-AB	Y	Y	Y		Y	Y	Y
4N-GA249-CA	Y	Y	Y		Y	Y	Y
4N-GA249-BF	Y	Y	Y		Y	Y	Y

AlphaStation Options and Technical Specifications

Description	
Recommended UPS	
Prestige Model 650 for 120V systems	**4N-AEABC-AF**
Prestige Model 650 for 240V systems	**4N-AEABC-BF**
Prestige Model 800 for 120V systems	**4N-AEABD-AF**
Prestige Model 800 for 240V systems	**4N-AEABD-BF**
Prestige Model 1250 EXT for 120V systems. Unit includes plug-in battery extension provisions to over 2 hours at full load	**4N-AEABF-AA**
Prestige Model 1250 EXT for 240V systems. Unit includes plug-in battery extension provisions to over 2 hours at full load	**4N-AEABF-BF**

Data Line Surge protectors—Surge protectors for UPS products	
Data line surge protector for two wire modem	**4N-GA249-AB**
Data line surge protector for 10BaseT	**4N-GA249-CA**
Data line surge protector for ThinWire	**4N-GA249-BF**

Operating System and Layered Software

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
Processor Code	**E**	**E**	**E**	**E**	**E**	**E**	**G**
Digital UNIX Media and Documentation							
QA-MT4AA-H8	Y	Y	Y	Y	Y	Y	Y
QA-MT4AA-GZ	Y	Y	Y	Y	Y	Y	Y
QA-MT4AB-GZ	Y	Y	Y	Y	Y	Y	Y
QA-MT5AA-GZ	Y	Y	Y	Y	Y	Y	Y
QA-MT6AA-GZ	Y	Y	Y	Y	Y	Y	Y
Digital UNIX Layered Products CD-ROM							
QA-054AA-H8	Y	Y	Y	Y	Y	Y	Y
Digital Open3D for Digital UNIX							
QA-0AFAA-H8	Y	Y	Y	Y	Y	Y	Y
Digital NAS Client 150 for Digital UNIX							
Included with operating system	Y	Y	Y	Y	Y	Y	Y
OpenVMS Media and Documentation							
QA-MT1AA-H8 (a)	Y	Y	Y	Y	Y	Y	Y
QA-MT1AG-H8				Y		Y	
QA-MT1AH-GZ				Y		Y	
QA-001AA-GZ	Y	Y	Y	Y	Y	Y	Y
OpenVMS Layered Products CD-ROM							
QA-03XAA-H8	Y	Y	Y	Y	Y	Y	Y
Digital Open 3D for OpenVMS							
QA-0ADAA-H8	Y	Y	Y	Y	Y	Y	Y
Digital NAS Client 150 for OpenVMS							
Included with operating system	Y	Y	Y	Y	Y	Y	Y
Media for Microsoft Windows NT							
QB-0QRAA-SA	Y	Y	Y	Y	Y	Y	N
QB-4LTAA-SA	Y	Y	Y	Y	Y	Y	Y
Support Services Software for Microsoft Windows NT							
QM-356AA-AA	Y	Y	Y	Y	Y	Y	Y
QB-356AA-SA	Y	Y	Y	Y	Y	Y	Y
QA-356AA-GZ	Y	Y	Y	Y	Y	Y	Y
Layered Software							
QA-4DEAA-GZ	Y	Y	Y	Y	Y	Y	Y
QM-4DFAA-BA	Y	Y	Y	Y	Y	Y	Y
QB-4DFAA-WA	Y	Y	Y	Y	Y	Y	Y

(a) OpenVMS V6.2-1H1 kit is required for AlphaStation 255 and AlphaStation 500. It must be installed over OpenVMS V6.2 media when reloading operating system

Operating System and Layered Software

Digital UNIX Media and Documentation	
Digital UNIX media and documentation on CD-ROM	**QA-MT4AA-H8**
Digital UNIX base hardcopy documentation	**QA-MT4AA-GZ**
Digital UNIX End User Documentation	**QA-MT4AB-GZ**
Digital UNIX Developer's Documentation	**QA-MT5AA-GZ**
Digital UNIX Server Extension documentation	**QA-MT6AA-GZ**
Digital UNIX Layered Products CD-ROM	
Layered products media and documentation for on CD-ROM	**QA-054AA-H8**
Digital Open3D for Digital UNIX	
Digital Open3D for Digital UNIX media and documentation	**QA-0AFAA-H8**
Digital NAS Client 150 for Digital UNIX	
Digital NAS Client 150 license is included with Digital UNIX systems. Media available on layered products CD-ROM.	Included with operating system
OpenVMS Media and Documentation	
OpenVMS V6.2 media and documentation on CD-ROM	**QA-MT1AA-H8**
OpenVMS V62-1H1 media and documentation on CD-ROM	**QA-MT1AG-H8**
OpenVMS Base hardcopy documentation	**QA-MT1AH-GZ**
OpenVMS Full hardcopy documentation	**QA-001AA-GZ**
OpenVMS Layered Products CD-ROM	
Layered products media and documentation for OpenVMS on CD-ROM	**QA-03XAA-H8**
Digital Open 3D for OpenVMS	
Digital Open3D for OpenVMS media and documentation on CD	**QA-0ADAA-H8**
Digital NAS Client 150 for OpenVMS	
Digital NAS Client 150 license is included with OpenVMS systems. Media available on layered products CD-ROM.	Included with operating system
Media for Microsoft Windows NT	
Windows NT Media Kit (CD-ROM)	**QB-0QRAA-SA**
Digital Light & Sound Pack (License and CD-ROM)	**QB-4LTAA-SA**
Support Services Software for Microsoft Windows NT	
License for Graphics Support Services Software for Microsoft Windows NT	**QM-356AA-AA**
Graphics Services Software for Microsoft Windows NT, license, media (diskette), and documentation	**QB-356AA-SA**
Graphics Services Software for Microsoft Windows NT (documentation only)	**QA-356AA-GZ**
Layered Software	
Communique! Administrators Guide and documentation kit for Digital UNIX	**QA-4DEAA-GZ**
Communique! Starter license for Digital UNIX	**QM-4DFAA-BA**
Communique! Starter kit for Digital UNIX and Windows NT (License and CD-ROM)	**QB-4DFAA-WA**

AlphaStation Concurrent Use Licenses

Used On Processor Code	200 4/100 E	200 4/166, 4/233 E	250 4/266 E	255/233 255/300 E	400 4/233 E	500/266, 500/333 500/400, 500/500 E	600 5/266 600 5/333 G
Digital UNIX Concurrent Use Licenses							
Note: Digital UNIX Concurrent Use Licenses are not specific to a single system and can be moved from one system to another at user discretion.							
QL-MT7AM-3B	Y	Y	Y	Y	Y	Y	Y
QL-MT7AM-3C	Y	Y	Y	Y	Y	Y	Y
QL-MT7AM-3D	Y	Y	Y	Y	Y	Y	Y
QL-MT7AM-3E	Y	Y	Y	Y	Y	Y	Y
QL-MT7AM-3F	Y	Y	Y	Y	Y	Y	Y
QL-MT7A*-AA	* = E	* = E	* = E	* = E	* = E	* = E	* = G
QL-MT6AE-AA	Y	Y	Y	Y	Y	Y	Y
QL-MT5AE-AA	Y	Y	Y	Y	Y	Y	Y
OpenVMS Concurrent Use Licenses							
Note: OpenVMS Concurrent Use Licenses are not specific to a single system and can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster..							
QL-MT3AA-3B	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3C	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3D	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3E	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3F	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3G	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3H	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3J	Y	Y	Y	Y	Y	Y	Y
QL-MT3AA-3K	Y	Y	Y	Y	Y	Y	Y
QL-MT2A*-AA	* = E	* = E	* = E	* = E	* = E	* = E	* = G

AlphaStation Concurrent Use Licenses

Digital UNIX Concurrent Use Licenses	
Note: Digital UNIX Concurrent Use Licenses are not specific to a single system and can be moved from one system to another at user discretion.	
Digital UNIX Concurrent Use 1-user license	**QL-MT7AM-3B**
Digital UNIX Concurrent Use 2-user license	**QL-MT7AM-3C**
Digital UNIX Concurrent Use 4-user license	**QL-MT7AM-3D**
Digital UNIX Concurrent Use 8-user license	**QL-MT7AM-3E**
Digital UNIX Concurrent Use 16-user license	**QL-MT7AM-3F**
Digital UNIX Traditional unlimited user license	**QL-MT7A*-AA**
Digital UNIX server extension license	**QL-MT6AE-AA**
Digital UNIX developer's extension license	**QL-MT5AE-AA**

OpenVMS Concurrent Use Licenses	
Note: OpenVMS Concurrent Use Licenses are not specific to a single system and can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.	
OpenVMS Concurrent Use 1-user license	**QL-MT3AA-3B**
OpenVMS Concurrent Use 2-user license	**QL-MT3AA-3C**
OpenVMS Concurrent Use 4-user license	**QL-MT3AA-3D**
OpenVMS Concurrent Use 8-user license	**QL-MT3AA-3E**
OpenVMS Concurrent Use 16-user license	**QL-MT3AA-3F**
OpenVMS Concurrent Use 32-user license	**QL-MT3AA-3G**
OpenVMS Concurrent Use 64-user license	**QL-MT3AA-3H**
OpenVMS Concurrent Use 128-user license	**QL-MT3AA-3J**
OpenVMS Concurrent Use 256-user license	**QL-MT3AA-3K**
OpenVMS Traditional unlimited user license	**QL-MT2A*-AA**

User Documentation

Used On	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 4/233	500/266, 500/333 500/400, 500/500	600 5/266 600 5/333
User Documentation							
EK-PCDTA-UI	Y	Y	N	N	N	N	N
EK-PCDTA-UP	Y	Y	N	N	N	N	N
EK-PCDTA-UG	Y	Y	N	N	N	N	N
EK-PCDTA-UU	Y	Y	N	N	N	N	N
EK-PCDTA-US	Y	Y	N	N	N	N	N
EK-PCDTA-UH	Y	Y	N	N	N	N	N
EK-PCCTA-UI	N	N	N	N	Y	N	N
EK-PCDSA-TI	N	N	N	N	N	N	N
EK-PCDSA-UI	N	N	N	N	N	N	N
EK-PCDSA-CI	N	N	N	N	N	N	N
EK-PCDSP-UI	N	N	N	N	N	N	N
EK-PCDSP-CI	N	N	N	N	N	N	N
EK-PCDSG-UI	N	N	N	N	N	N	N
EK-PCDSG-CI	N	N	N	N	N	N	N
EK-PCDSI-UI	N	N	N	N	N	N	N
EK-PCDSI-CI	N	N	N	N	N	N	N
EK-PCDSS-UI	N	N	N	N	N	N	N
EK-PCDSS-CI	N	N	N	N	N	N	N
EK-PCDSH-UI	N	N	N	N	N	N	N
EK-PCDSH-CI	N	N	N	N	N	N	N
EK-PCDSY-UI	N	N	N	N	N	N	N
EK-PCDSY-CI	N	N	N	N	N	N	N
EK-AS800-UI	N	N	N	N	N	N	Y
EK-AS800-IN	N	N	N	N	N	N	Y
EK-VLLXA-UI	N	N	N	Y	N	N	N
EK-VLLXS-UI	N	N	N	Y	N	N	N
EK-VLLXF-UI	N	N	N	Y	N	N	N
EK-VLLXG-UI	N	N	N	Y	N	N	N
EK-VLLXI-UI	N	N	N	Y	N	N	N
EK-VLLXD-UI	N	N	N	Y	N	N	N
EK-VLLXJ-UI	N	N	N	Y	N	N	N
EK-VLLXA-TI	N	N	N	Y	N	N	N
EK-VLLXA-II	N	N	N	Y	N	N	N
AK-QUBKA-CA	N	N	N	Y	N	N	N
EK-A0864-UG	N	N	N	N	N	Y	N
EK-A0865-UG	N	N	N	N	N	Y	N
EK-A0866-UG	N	N	N	N	N	Y	N
EK-A0867-UG	N	N	N	N	N	Y	N
EK-A0868-UG	N	N	N	N	N	Y	N
EK-A0869-UG	N	N	N	N	N	Y	N
EK-ALPH5-UI	N	N	N	N	N	Y	N

User Documentation

User Documentation	
User Documentation - English	**EK-PCDTA-UI**
User Documentation - French	**EK-PCDTA-UP**
User Documentation - German	**EK-PCDTA-UG**
User Documentation - Italian	**EK-PCDTA-UU**
User Documentation - Spanish	**EK-PCDTA-US**
User Documentation - Dutch	**EK-PCDTA-UH**
User Documentation - English - Alpha Station 250 4/266	**EK-PCCTA-UI**
Technical Documentation	**EK-PCDSA-TI**
User Documentation - English	**EK-PCDSA-UI**
CPU Documentation - English	**EK-PCDSA-CI**
User Documentation - French	**EK-PCDSP-UI**
CPU Documentation - French	**EK-PCDSP-CI**
User Documentation - German	**EK-PCDSG-UI**
CPU Documentation - German	**EK-PCDSG-CI**
User Documentation - Italian	**EK-PCDSI-UI**
CPU Documentation - Italian	**EK-PCDSI-CI**
User Documentation - Spanish	**EK-PCDSS-UI**
CPU Documentation - Spanish	**EK-PCDSS-CI**
User Documentation - Dutch	**EK-PCDSH-UI**
CPU Documentation - Dutch	**EK-PCDSH-CI**
User Documentation - Japanese	**EK-PCDSY-UI**
CPU Documentation - Japanese	**EK-PCDSY-CI**
User Documentation - English	**EK-AS800-UI**
Installation Guide - English	**EK-AS800-IN**
AlphaStation 255 User Information - English	**EK-VLLXA-UI**
AlphaStation 255 User Information - Spanish	**EK-VLLXS-UI**
AlphaStation 255 User Information - French	**EK-VLLXF-UI**
AlphaStation 255 User Information - German	**EK-VLLXG-UI**
AlphaStation 255 User Information - Italian	**EK-VLLXI-UI**
AlphaStation 255 User Information - Dutch	**EK-VLLXD-UI**
AlphaStation 255 User Information - Japanese	**EK-VLLXJ-UI**
AlphaStation 255 Technical Information	**EK-VLLXA-TI**
AlphaStation 255 Installation Information	**EK-VLLXA-II**
AlphaStation 255 Service Guide Floppy	**AK-QUBKA-CA**
AlphaStation 500 Series User Information - German	**EK-A0864-UG**
AlphaStation 500 Series User Information - French	**EK-A0865-UG**
AlphaStation 500 Series User Information - Spanish	**EK-A0866-UG**
AlphaStation 500 Series User Information - Italian	**EK-A0867-UG**
AlphaStation 500 Series User Information - Dutch	**EK-A0868-UG**
AlphaStation 500 Series User Information - Japanese	**EK-A0869-UG**
AlphaStation 500 Series User Information - English	**EK-ALPH5-UI**

AlphaStation Service Options

Hardware Supplemental Services	200 4/100	200 4/166, 4/233	250 4/266	255/233 255/300	400 2/233
Year 2&3, 5x9, next day	FM-AFXHW-36	FM-AFXHW-36	FM-AFXHW-36	FM-AFXHW-36	FM-ACXHW-36
Year 1-3, 5x9, 4 hour	FM-AF4HR-36	FM-AF4HR-36	FM-AF4HR-36	FM-AF4HR-36	FM-AC4HR-36
Year 1-3, 5x12, 4 hour	FM-AF512-36	FM-AF512-36	FM-AF512-36	FM-AF512-36	FM-AC512-36
Year 1-3, 6x16, 4 hour	FM-AF616-36	FM-AF616-36	FM-AF616-36	FM-AF616-36	FM-AC616-36
Year 1-3, 7x24, 4 hour	FM-AF724-36	FM-AF724-36	FM-AF724-36	FM-AF724-36	FM-AC724-36
Year 2-4, 5x9, next day	FM-AFXHW-48	FM-AFXHW-48	FM-AFXHW-48	FM-AFXHW-48	FM-ACXH2-48
Year 1-4, 5x9, 4 hour	FM-AF4HR-48	FM-AF4HR-48	FM-AF4HR-48	FM-AF4HR-48	FM-AC4HR-48
Year 1-4, 5x12, 4 hour	FM-AF512-48	FM-AF512-48	FM-AF512-48	FM-AF512-48	FM-AC512-48
Year 1-4, 6x16, 4 hour	FM-AF616-48	FM-AF616-48	FM-AF616-48	FM-AF616-48	FM-AC616-48
Year 1-4, 7x24, 4 hour	FM-AF724-48	FM-AF724-48	FM-AF724-48	FM-AF724-48	FM-AC724-48
Year 2-5, 5x9, next day on site	FM-AFXHW-60	FM-AFXHW-60	FM-AFXHW-60	FM-AFXHW-60	FM-ACHXW-60
Year 1-5, 5x9, 4 hour	FM-AF4HR-60	FM-AF4HR-60	FM-AF4HR-60	FM-AF4HR-60	FM-AC4HR-60
Year 1-5, 5x12, 4 hour	FM-AF512-60	FM-AF512-60	FM-AF512-60	FM-AF512-60	FM-AC512-60
Year 1-5, 6x16, 4 hour	FM-AF616-60	FM-AF616-60	FM-AF616-60	FM-AF616-60	FM-AC616-60
Year 1-5, 7x24, 4 hour	FM-AF724-60	FM-AF724-60	FM-AF724-60	FM-AF724-60	FM-AC724-60
Software Supplemental Services					
12-month - Digital UNIX	FM-A4OSF-12	FM-A2OSF-12	FM-M3OSF-12	FM-M3OSF-12	FM-A4OSF-12
OpenVMS	FM-A4VMS-12	FM-A2VMS-12	FM-M3VMS-12	FM-M3VMS-12	FM-A4VMS-12
Windows NT	FM-A4NTS-12	FM-A2NTS-12	FM-M3NTS-12	FM-M3NTS-12	FM-A4NTS-12
36-month - Digital UNIX	FM-A4OSF-36	FM-A2OSF-36	FM-M3OSF-36	FM-M3OSF-36	FM-A4OSF-36
OpenVMS	FM-A4VMS-36	FM-A2VMS-36	FM-M3VMS-36	FM-M3VMS-36	FM-A4VMS-36
Windows NT	FM-A4NTS-36	FM-A2NTS-36	FM-M3NTS-36	FM-M3NTS-36	FM-A4NTS-12
60-month - Digital UNIX	FM-A4OSF-60	FM-A2OSF-60	FM-M3OSF-60	FM-M3OSF-60	FM-A4OSF-60
OpenVMS	FM-A4VMS-60	FM-A2VMS-60	FM-M3VMS-60	FM-M3VMS-60	FM-A4VMS-60
Windows NT	FM-A4NTS-60	FM-A2NTS-60	FM-M3NTS-60	FM-M3NTS-60	FM-A4NTS-60
Monitor Supplemental Services					
Year 2&3, 5x9, next day	FM-MNXHW-36	FM-MNXHW-36	FM-MNXHW-36	FM-MNXHW-36	FM-MNXHW-36
Year 1-3, 5x9, 4 hour	FM-MN4HR-36	FM-MN4HR-36	FM-MN4HR-36	FM-MN4HR-36	FM-MN4HR-36
Year 1-3, 5x12, 4 hour	FM-MN512-36	FM-MN512-36	FM-MN512-36	FM-MN512-36	FM-MN512-36
Year 1-3, 6x16, 4 hour	FM-MN616-36	FM-MN616-36	FM-MN616-36	FM-MN616-36	FM-MN616-36
Year 1-3, 7x24, 4 hour	FM-MN724-36	FM-MN724-36	FM-MN724-36	FM-MN724-36	FM-MN724-36

Warranty Attributes

The above extended coverage offerings can be purchased at any time during the warranty duration. Supplemental Service commencement date is the same as warranty commencement date.

Digital honors the warranty worldwide where Digital maintains a direct service presence. For orders placed with ultimate destination in a country where Digital has an indirect presence, warranty is not available except with the express written consent of the country distributor, and when Digital provides parts, parts replacement and training. Contact Digital Services for additional Warranty information.

AlphaStations are covered by a three (3) year warranty

- One (1) year hardware service 8am - 5pm, Monday through Friday, next business day response.
- Years two (2) and three (3) Return-To-Digital support for hardware.
- Ninety (90) days software advisory level telephone support, 8am-5pm, Monday through Friday, for Digital UNIX, OpenVMS, Multimedia Services (MMS), Open 3D, and NAS purchased and shipped with the hardware.
- In the case of distributor shipments to end users, Digital AlphaStation options integrated with the base hardware system, including graphics, storage disks, keyboards and mouse will be covered by the three (3) year warranty.
- Monitor are covered by a 3-year Customer Returnable Unit (CRU) warranty.

AlphaStation Service Options

500/266, 500/333 500/400, 500/500	600 5/266 600 5/333	Hardware Supplemental Services
FM-AF4HR-36	FM-PBXHW-36	Years 2 and 3, 5 x 9, next day response time
FM-AFXHW-36	FM-PB4HR-36	Years 1 to 3, 5 x 9, 4 hour response time
FM-AF512-36	FM-PB512-36	Years 1 to 3, 5 x 12, 4 hour response time
FM-AF616-36	FM-PB616-36	Years 1 to 3, 6 x 16, 4 hour response time
FM-AF724-36	FM-PB724-36	Years 1 to 3, 7 x 24, 4 hour response time
FM-AFXHW-48	FM-PBXHW-48	Years 2 to 4, 5 x 9, next day response time
FM-AF4HR-48	FM-PB4HR-48	Years 1 to 4, 5 x 9, 4 hour response time
FM-AF512-48	FM-PB512-48	Years 1 to 4, 5 x 12, 4 hour response time
FM-AF616-48	FM-PB616-48	Years 1 to 4, 6 x 16, 4 hour response time
FM-AF724-48	FM-PB724-48	Years 1 to 4, 7 x 24, 4 hour response time
FM-AFXHW-60	FM-PBXHW-60	Year 2-5, 5x9, next day on site
FM-AF4HR-60	FM-PB4HR-60	Years 1 to 5, 5 x 9, 4 hour response time
FM-AF512-60	FM-PB512-60	Years 1 to 5, 5 x 12, 4 hour response time
FM-AF616-60	FM-PB616-60	Years 1 to 5, 6 x 16, 4 hour response time
FM-AF724-60	FM-PB724-60	Years 1 to 5, 7 x 24, 4 hour response time

500/266, 500/333 500/400	600 5/266 600 5/333	Software Supplemental Services	
FM-M3OSF-12 FM-M3VMS-12 FM-M3NTS-12	FM-PB6UX-12 FM-PB6VM-12 FM-PB6NT-12	12 Month	Digital UNIX OpenVMS Windows NT
FM-M3OSF-36 FM-M3VMS-36 FM-M3NTS-36	FM-PB6UX-36 FM-PB6VM-36 FM-PB6NT-36	36 Month	Digital UNIX OpenVMS Windows NT
FM-M3OSF-60 FM-M3VMS-60 FM-M3NTS-36	FM-PB6UX-60 FM-PB6VM-60 FM-PB6NT-60	60 Month	Digital UNIX OpenVMS Windows NT

500/266, 500/333 500/400	600 5/266	Monitor Supplemental Services
FM-MNXHW-36	FM-MNXHW-36	Years 2 and 3, 5 x 9, next day response time
FM-MN4HR-36	FM-MN4HR-36	Years 1 to 3, 5 x 9, 4 hour response time
FM-MN512-36	FM-MN512-36	Years 1 to 3, 5 x 12, 4 hour response time
FM-MN616-36	FM-MN616-36	Years 1 to 3, 6 x 16, 4 hour response time
FM-MN724-36	FM-MN724-36	Years 1 to 3, 7 x 24, 4 hour response time

Alpha XL Personal Workstation for Windows NT

Product Description

Alpha XL Personal Workstation for Windows NT family is targeted at the rapidly expanding market of Windows NT based workstations. The 64-bit Alpha microprocessors accommodate demanding technical applications such as 2D CAD and 3D CAD. New 3D graphics options significantly improve productivity for demanding, floating point intensive, graphics applications, such as MCAD, ECAD, GIS and animation.

Alpha XL Personal Workstation for Windows NT is available in three models:

- Alpha XL 300—Alpha microprocessor 21164 300 MHz CPU
- Alpha XL 366—Alpha microprocessor 21164 366 MHz CPU
- Alpha XL 433 Upgrade—Alpha microprocessor 21164 433 MHz CPU

All variants support Windows NT V3.51, or later. The operating system is factory installed on Alpha XL Advantage Configurations.

The system enclosure supports integral Fast narrow SCSI-2 controller with one external port, two PCI slots, one PCI/ISA combination slot, and two ISA slots for industry standard options. Storage bays support one 5.25" half height CD-ROM, one 3.5" floppy diskette, one internal 3.5" bay for hard disk drive, and two front accessible bays for 5.25-inch or 3.5-inch devices. Other standard features include integrated network adapter, two serial and one bi-directional, enhanced parallel ports for serial/parallel communications, and external SCSI connectors.

Alpha XL models come standard with a three-year limited warranty. Year one features on-site service; years two and three are return to Digital service. This warranty represents one of the most comprehensive in the industry and includes product lifetime toll-free technical assistance.

Alpha XL ADVANTAGE CONFIGURATIONS

Y=in base configuration; M=mandatory option; O=option

Alpha XL Workstation	Resources Used		Alpha XL 300		Alpha XL 366
120 V U.S. North America (a)			SN-A22AA-NM		SN-A23AA-NM
240 V Worldwide (b)			SN-A22WW-CM		SN-A23WW-CM
CPU Alpha microprocessor	21164 300 MHz	Y	Y		
	21164 366 MHz			Y	Y
Memory	1 bank	Y	32 MB	Y	32 MB
1.44 MB Floppy disk drive	3.5" x 1" bay	Y	Y	Y	Y
600 MB 4 x SCSI CD-ROM	5.25" x 1.6" SCSI bay	Y	Y	Y	Y
Internal storage	3.5" x 1.6" SCSI bay	Y	1.05 GB	Y	1.05 GB
Matrox Millennium 2D/3D graphics	1 PCI slot	Y	Y	Y	Y
Ethernet	Integrated on-board	Y	Y	Y	Y
Windows NT Operating System (c)	Included in country kit	Y	Y	Y	Y
Remaining available resources					
I/O Slots: PCI/ISA/Combination			1 / 2/ 1		1 / 2/ 1
Memory banks			1		1
5.25" x 1.6" bays			2		2
3.5" x 1.6" bays			0		0
SCSI Devices			5		5
1. Color Monitors (d)	**Select**		1		1
15" (13.9" viewable) Color monitor		O	SN-PCXBV-YA/YC/ID	O	SN-PCXBV-YA/YC/ID
17" (16.0" viewable) Color monitor		O	SN-PCXAV-YB/YC	O	SN-PCXAV-YB/YC
21" (19.6" viewable) Color monitor		O	SN-PCXAV-ZB/ZC	O	SN-PCXAV-ZB/ZC
2. Additional Memory	**Select**		1		1
32 MB	1 bank	O	SN-PC77M-AK	O	SN-PC77M-AK
64 MB	1 bank	O	SN-PC77M-AL	O	SN-PC77M-AL
128 MB	1 bank	O	SN-PC77M-AM	O	SN-PC77M-AM
3. Additional Hard Drives (e)	**Select**		1 or 2		1 or 2
1.0 GB SCSI	1.6" bay	O	SN-PCXRE-AB	O	SN-PCXRE-AB
2.1 GB SCSI	1.6" bay	O	SN-PCXAR-AY	O	SN-PCXAR-AY
4.3 GB SCSI	1.6" bay	O	SN-PCXAR-AZ	O	SN-PCXAR-AZ
4. Network Connection	**Select**		1		1
PCI EtherWORKS adapter	1 PCI slot		Integrated		Integrated
PCI 10/100 mb FastEthernet	1 PCI slot	O	DE500-XA	O	DE500-XA
5. Country Kits include keyboard, 3-button mouse, power cord, Windows NT media and license, Alpha XL User Guide					
120V system (a)		Y	Y	Y	Y
240V system (b)	See Options list	M	SN-PCA1N-xx	M	SN-PCA1N-xx
6. Additional Options: See Alpha XL Options for a comprehensive list of qualified options					

(a) 120 V U.S. North America systems include country kit (SN-PCA1N-AA) with keyboard, 3-button mouse, power cord, Windows NT media and license, and Alpha XL User Guide.

(b) Country kit ordered for 240 V Worldwide systems determines language variant of Windows NT and user documentation. See Options list.

(c) Windows NT is factory-installed on all Advantage Systems.

(d) Monitors include video cable and 120 V power cord, order country-specific power cord for 240 V use. See Option List.

(e) Integrated Fast SCSI-2 controller supports up to seven internal and external SCSI devices. For more than seven, a second PCI Fast SCSI-2 controller is required. See Options List.

(f) Network options (DE450, DE500) ordered for Europe, Australia, and New Zealand are **not** factory integrated, options ship as **spares.**

Alpha XL 300 BASE SYSTEMS

Y=in base configuration; M=mandatory option; O=option

Alpha XL Workstation	Resources Used		Alpha XL 300		Alpha XL 300		Alpha XL 300
120 V U.S. North America (a)			SN-A22AA-AG		SN-A22AA-AH		SN-A22AA-AJ
240 V Worldwide (b)			SN-A22WW-AG		SN-A22WW-AH		SN-A22WW-AJ
CPU Alpha microprocessor	21164 300 MHz	Y	Y	Y	Y	Y	Y
Memory	1 bank	Y	32 MB	Y	64 MB	Y	128 MB
1.44 MB Floppy disk drive	3.5" x 1" disk bay	Y	Y	Y	Y	Y	Y
600 MB 4 x SCSI CD-ROM	5.25" x 1.6" SCSI bay	Y	Y	Y	Y	Y	Y
Ethernet	Integrated on-board	Y	Y	Y	Y	Y	Y
Windows NT Operating System	Included in country kit	Y	Y	Y	Y	Y	Y
Remaining available resources							
I/O Slots: PCI/ISA/Combination			2 / 2 / 1		2 / 2 / 1		2 / 2 / 1
Memory banks			1		1		1
5.25" x 1.6" bays			2		2		2
3.5" x 1.6" bays			1		1		1
SCSI Devices			6		6		6
1. Color Monitors (c)	**Select**		1		1		1
15" (13.9" viewable) Color monitor		O	SN-PCXBV-YA/YC/ID	O	SN-PCXBV-YA/YC/ID	O	SN-PCXBV-YA/YC/ID
17" (16.0" viewable) Color monitor		O	SN-PCXAV-YB/YC	O	SN-PCXAV-YB/YC	O	SN-PCXAV-YB/YC
21" (19.6" viewable) Color monitor		O	SN-PCXAV-ZB/ZC	O	SN-PCXAV-ZB/ZC	O	SN-PCXAV-ZB/ZC
2. Additional Memory Options	**Select**		1		1		1
32 MB	1 bank	O	SN-PC77M-AK	O	SN-PC77M-AK	O	SN-PC77M-AK
64 MB	1 bank	O	SN-PC77M-AL	O	SN-PC77M-AL	O	SN-PC77M-AL
128 MB	1 bank	O	SN-PC77M-AM	O	SN-PC77M-AM	O	SN-PC77M-AM
3. Additional Hard Drives (d)	**Select**		1, 2 or 3		1, 2 or 3		1, 2 or 3
1.0 GB SCSI	1.6" bay	O	SN-PCXRE-AB	O	SN-PCXRE-AB	O	SN-PCXRE-AB
2.1 GB SCSI	1.6" bay	O	SN-PCXAR-AY	O	SN-PCXAR-AY	O	SN-PCXAR-AY
4.3 GB SCSI	1.6" bay	O	SN-PCXAR-AZ	O	SN-PCXAR-AZ	O	SN-PCXAR-AZ
4. Country Kits includes keyboard, 3-button mouse, power cord, Windows NT media and license, and Alpha XL User Guide							
120V system (a)		Y	Y	Y	Y	Y	Y
240V system (b)	See Options List	M	SN-PCA1N-xx	M	SN-PCA1N-xx	M	SN-PCA1N-xx
5. Graphics Accelerator	**Select**		1		1		1
Matrox Millennium 2D/3D Graphics	1 PCI slot	O	SN-PCXAG-AQ	O	SN-PCXAG-AQ	O	SN-PCXAG-AQ
PowerStorm 4D20 3D, 16MB	1 PCI slot	O	SN-PBXGB-CN	O	SN-PBXGB-CN	O	SN-PBXGB-CN
PowerStorm 4D40T 3D, 16 MB	1 PCI slot	O	SN-PBXGI-AA	O	SN-PBXGI-AA	O	SN-PBXGI-AA
PowerStorm 4D50T 3D, 16 MB	1 PCI slot	O	SN-PBXGI-AB	O	SN-PBXGI-AB	O	SN-PBXGI-AB
PowerStorm 4D60T 3D, 32 MB	1 PCI slot	O	SN-PBXGI-AC	O	SN-PBXGI-AC	O	SN-PBXGI-AC
Digital ZLXp-L1 3D, 16MB	1 PCI slot	O	SN-PBXGC-AN	O	SN-PBXGC-AN	O	SN-PBXGC-AN
Digital ZLXp-L2 3D, 32MB	1 PCI slot	O	SN-PBXGC-BN	O	SN-PBXGC-BN	O	SN-PBXGC-BN
AccelGraphics AG300 3D	1 PCI slot & 1 ISA slot	O	SN-PCXAG-AU	O	SN-PCXAG-AU	O	SN-PCXAG-AU
6. Additional Options: See Alpha XL Options for a comprehensive list of qualified options							

(a) 120 V U.S. North America systems include country kit (SN-PCA1N-AA) with keyboard, 3-button mouse, power cord, Windows NT media and license, and Alpha XL User Guide.

(b) Country Kit ordered for 240 V Worldwide systems determines language variant of Windows NT and user documentation. See Options List.

(c) Monitors include video cable and 120 V power cord, order country-specific power cord for 240 V use. See Options List.

(d) Integrated Fast SCSI-2 controller supports up to seven internal and external SCSI devices. For more than seven, a second PCI Fast SCSI-2 controller is required. See Options List.

Alpha XL 366 BASE SYSTEMS

Y=in base configuration; M=mandatory option; O=option

Alpha XL Workstation	Resources Used		Alpha XL 366		Alpha XL 366		Alpha XL 366
120 V U.S. North America (a)			SN-A23AA-AG		SN-A23AA-AH		SN-A23AA-AJ
240 V Worldwide (b)			SN-A23WW-AG		SN-A23WW-AH		SN-A23WW-AJ
CPU Alpha microprocessor	21164 366 MHz	Y	Y	Y	Y	Y	Y
Memory	1 bank	Y	32 MB	Y	64 MB	Y	128 MB
1.44 MB Floppy disk drive	3.5" x 1" disk bay	Y	Y	Y	Y	Y	Y
600 MB 4 x SCSI CD-ROM	5.25" x 1.6" SCSI bay	Y	Y	Y	Y	Y	Y
Ethernet	Integrated on-board	Y	Y	Y	Y	Y	Y
Windows NT Operating System	Included in country kit	Y	Y	Y	Y	Y	Y
Remaining available resources							
I/O Slots: PCI/ISA/Combination			2 / 2 / 1		2 / 2 / 1		2 / 2 / 1
Memory banks			1		1		1
5.25" x 1.6" bays			2		2		2
3.5" x 1.6" bays			1		1		1
SCSI Devices			6		6		6
1. Color Monitors (c)	**Select**		1		1		1
15" (13.9" viewable) Color monitor		O	SN-PCXBV-YA/YC/ID	O	SN-PCXBV-YA/YC/ID	O	SN-PCXBV-YA/YC/ID
17" (16.0" viewable) Color monitor		O	SN-PCXAV-YB/YC	O	SN-PCXAV-YB/YC	O	SN-PCXAV-YB/YC
21" (19.6" viewable) Color monitor		O	SN-PCXAV-ZB/ZC	O	SN-PCXAV-ZB/ZC	O	SN-PCXAV-ZB/ZC
2. Additional Memory Options	**Select**		1		1		1
32 MB	1 bank	O	SN-PC77M-AK	O	SN-PC77M-AK	O	SN-PC77M-AK
64 MB	1 bank	O	SN-PC77M-AL	O	SN-PC77M-AL	O	SN-PC77M-AL
128 MB	1 bank	O	SN-PC77M-AM	O	SN-PC77M-AM	O	SN-PC77M-AM
3. Additional Hard Drives (d)	**Select**		1, 2 or 3		1, 2 or 3		1, 2 or 3
1.0 GB SCSI	1.6" bay	O	SN-PCXRE-AB	O	SN-PCXRE-AB	O	SN-PCXRE-AB
2.1 GB SCSI	1.6" bay	O	SN-PCXAR-AY	O	SN-PCXAR-AY	O	SN-PCXAR-AY
4.3 GB SCSI	1.6" bay	O	SN-PCXAR-AZ	O	SN-PCXAR-AZ	O	SN-PCXAR-AZ
5. Country Kit includes keyboard, 3-button mouse, power cord, Windows NT media and license, and Alpha XL User Guide							
120V system (a)		Y	Y	Y	Y	Y	Y
240V system (b)	See Options List	M	SN-PCA1N-xx	M	SN-PCA1N-xx	M	SN-PCA1N-xx
5. Graphics Accelerator	**Select**		1		1		1
Matrox Millennium 2D/3D Graphics	1 PCI slot	O	SN-PCXAG-AQ	O	SN-PCXAG-AQ	O	SN-PCXAG-AQ
PowerStorm 4D20 3D, 16MB	1 PCI slot	O	SN-PBXGB-CN	O	SN-PBXGB-CN	O	SN-PBXGB-CN
PowerStorm 4D40T 3D, 16 MB	1 PCI slot	O	SN-PBXGI-AA	O	SN-PBXGI-AA	O	SN-PBXGI-AA
PowerStorm 4D50T 3D, 16 MB	1 PCI slot	O	SN-PBXGI-AB	O	SN-PBXGI-AB	O	SN-PBXGI-AB
PowerStorm 4D60T 3D, 32 MB	1 PCI slot	O	SN-PBXGI-AC	O	SN-PBXGI-AC	O	SN-PBXGI-AC
Digital ZLXp-L1 3D, 16MB	1 PCI slot	O	SN-PBXGC-AN	O	SN-PBXGC-AN	O	SN-PBXGC-AN
Digital ZLXp-L2 3D, 32MB	1 PCI slot	O	SN-PBXGC-BN	O	SN-PBXGC-BN	O	SN-PBXGC-BN
AccelGraphics AG300 3D	1 PCI slot & 1 ISA slot	O	SN-PCXAG-AU	O	SN-PCXAG-AU	O	SN-PCXAG-AU
6. Additional Options: See Alpha XL Options for a comprehensive list of qualified options							

(a) 120 V U.S. North America systems include country kit (SN-PCA1N-AA) with keyboard, 3-button mouse, power cord, Windows NT media and license, and Alpha XL User Guide.

(b) Country Kit ordered for 240 V Worldwide systems determines language variant of Windows NT and user documentation. See Options List.

(c) Monitors include video cable and 120 V power cord, order country-specific power cord for 240 V use. See Options List.

(d) Integrated Fast SCSI-2 controller supports up to seven internal and external SCSI devices. For more than seven, a second PCI Fast SCSI-2 controller is required. See Options List.

Alpha XL Personal Workstations for Windows NT

Specifications

Height	43 cm (17 inches)
Width	18 mm (7 inches)
Depth	43 mm (17 inches)

Alpha XL Workstation Options

Color Monitors	Description
SN-PCXBV-YA/YC/TD	15" (13.9" viewable) high-resolution auto-scanning color monitor, flat-square invar CRT, 0.28 dot pitch, refresh rates up to 75Hz non-interlaced from VGA through 1024x768 resolution modes, MPRII, Energy Star compliant, 120/240V universal power supply, includes video cable. Select -YA for Northern Hemisphere operation, variant includes 120V North American power cord. Select -TD for Northern Hemisphere/Europe, and -YC for Southern Hemisphere operation. -TD and -YC variants require country specific power cords for 240V use.
SN-PCXAV-YB/YC	17" (16.0" viewable) high-resolution auto-scanning color monitor, cylindrical aperature grill CRT, 0.26 dot pitch, refresh rates up to 75Hz non-interlaced from VGA through 1280x1024 resolution modes, MPRII, Energy Star compliant, 120/240V universal power supply, includes video cable. Select -YB for Northern Hemisphere, or -YC for Southern Hemisphere operation. Order country-specific power cords for 240V use.
SN-PCXAV-ZB/ZC	21" (19.6" viewable) high-resolution auto-scanning color monitor, cylindrical aperature grill CRT, 0.31 dot pitch, refresh rates up to 75Hz non-interlaced from VGA through 1280x1024 resolution modes, MPRII, Energy Star compliant, 120/240V universal power supply, includes video cable. Select -ZB for Northern Hemisphere, or -ZC for Southern Hemisphere operation. Order country specific power cords for 240V use.

Monitor Power Cords	
BN22X-2E	Africa, India
BN19H-2E	Australia, New Zealand
BN19K-2E	Denmark
BN18L-2E	Israel
BN24X-2E	Italy
BN19P-1K	North America
BN03A-2E	Other Europe
BN19E-2E	Switzerland
BN26D-2E	UK, Ireland

Graphics Options	Slots Required	Description
SN-PCXAG-AQ	1 PCI slot	Matrox Millennium PCI 2D/3D adapter, 2 MB WRAM
SN-PBXGB-CN	1 PCI slot	PowerStorm 4D20 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB VRAM
SN-PBXGI-AA	1 PCI slot	PowerStorm 4D40T Advanced 3D graphics accelerator with 16 MB video memory, 1280 x 1024 resolution, 24 bit true color, double buffered, 24 bit Z-buffer, hardware accelerated 3D shading and texture mapping.
SN-PBXGI-AB	1 PCI slot	PowerStorm 4D50T Advanced 3D graphics accelerator with enhanced performance, 16 MB video memory, 1280 x 1024 resolution, 24 bit true color, double buffered, 24 bit Z-buffer, hardware accelerated 3D shading and texture mapping.
SN-PBXGI-AC	1 PCI slot	PowerStorm 4D60T Advanced 3D Graphics accelerator with enhanced performance, 32 MB video memory, 1600 x 1280 resolution, 24 bit true color, double buffered 32 bit Z buffer, hardware accelerated 3D shading and texture mapping.
SN-PBXGI-GA		4 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T graphics accelerators.
SN-PBXGI-GB		16 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T graphics accelerators.
SN-PBXGI-GC		32 MB Texture Memory Module. Supports hardware accelerated texture mapping on PowerStorm 4D40T, 4D50T, and 4D60T Graphics Accelerators.

Alpha XL Workstation Options *(continued)*

Graphics Options	Slots Required	Description
SN-PCXAG-AU	1 PCI and 1 ISA	AccelGraphics AG300 PCI 3D adapter, 7.5 MB RAM
SN-PBXGC-AN	1 PCI slot	ZLXp-L1 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 16 MB VRAM
SN-PBXGC-BN	1 PCI slot	ZLXp-L2 3D 24-plane double buffered PCI graphics accelerator, 24-bit Z-buffer, 32 MB VRAM
SN-PCCAM-CA		2 MB WRAM upgrade for Matrox Millennium adapter
SN-PCCAM-CB		6 MB WRAM upgrade for Matrox Millennium adapter

Memory	Slots Required	Description
SN-PC77M-AK	1 slot	32 MB (4 x 8 MB 70 ns SIMMs, 36-bit)
SN-PC77M-AL	1 slot	64 MB (4 x 16 MB 70 ns SIMMs, 36-bit)
SN-PC77M-AM	1 slot	128 MB (4 x 32 MB 70 ns SIMMs, 36-bit)

Storage Controller	Slots Required	Description
KZPAA-AA	1 PCI slot	PCI-based Fast Narrow Single Ended (FNSE) SCSI-2 controller

Storage	Slots Required	Description
SN-PCXRE-AB	1.6" bay	1.05 Gbyte 3.5" x 1" hard disk drive 5400 RPM
SN-PCXAR-AY	1.6" bay	2.0 Gbyte 3.5" x 1.6", hard disk drive 7200 RPM
SN-PCXAR-AZ	1.6" bay	4.0 Gbyte 3.5" x 1.6", hard disk drive 7200 RPM
SN-PCXAT-AF	5.25 x 1.6" bay	4.0/8.0 Gbyte 5.25" half-height 4mm SCSI DAT drive

Networks and Communications		
DE450-CA	1 PCI slot	High-performance Ethernet. Select BNE4G-02 for AUI BN26K-xx for 10BaseT (twisted pair) BC16M-xx for ThinWire
DE500-XA	1 PCI slot	10/100mbs Fast Ethernet
SN-PCXHF-AA	1 ISA slot	ISA Fax/Data Modem 28.8 baud

User Documentation	
EK-ALXLA-UG	Alpha XL User's Guide (English)
EK-ALXLF-UG	Alpha XL User's Guide (French)
EK-ALXLG-UG	Alpha XL User's Guide (German)
EK-ALXLJ-UG	Alpha XL User's Guide (Japanese)
EK-ALXLS-UG	Alpha XL User's Guide (Spanish)
EK-ALXLA-CG	Alpha XL CPU Guide
EK-ALXLA-WI	Alpha XL Warranty and Service Information

Hardware Supplemental Services	
FM-PCXHW-36	Years 2 and 3, 5 x 9, Next day response time
FM-PC4HR-12	Year 1, 5 x 9, 4 Hour Response time
FM-PC4HR-36	Years 1 to 3, 5 x 9, 4 Hour Response time
FM-PC724-12	Year 1, 7 x 24, 4 Hour Response time
FM-PC724-36	Years 1 to 3, 7 x 24, 4 Hour Response time

Software Supplemental Services	
FM-PCXSW-12	12 Month Software Supplemental Support Services
FM-PCXSW-24	36 Month Software Supplemental Support Services
FM-PCXSW-36	60 Month Software Supplemental Support Services

Alpha XL Workstation Options *(continued)*

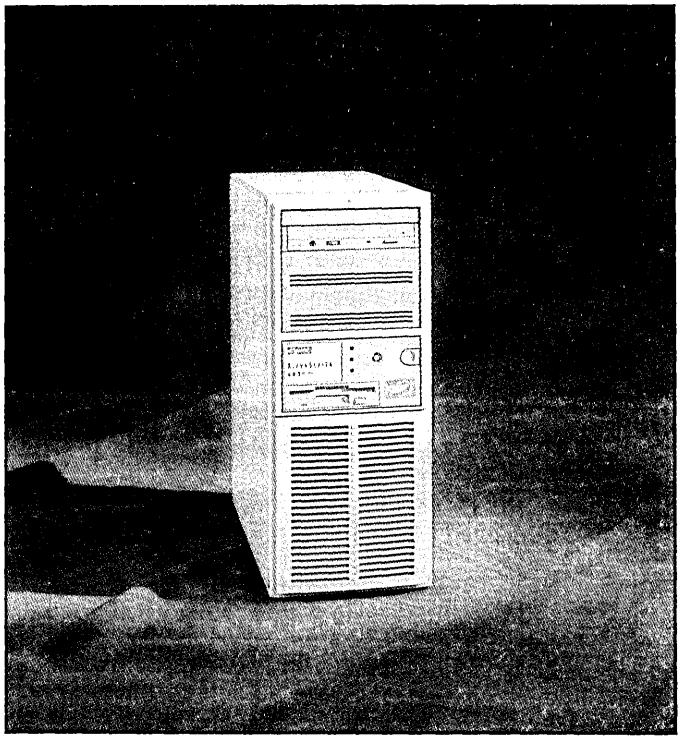
CPU Upgrades			
Order Number	**From**	**To**	**Includes**
SN-A230U-AA	Alpha XL 233 Alpha XL 266 Celebris XL 5100, 5120, 5133, 6150, 6180, 6200	Alpha XL 366	366 MHz CPU and motherboard upgrade kit
SN-A230U-AB	Alpha XL 300	Alpha XL 366	366 MHz CPU upgrade kit
SN-A250U-AA	Alpha XL 233, 266, 300 Celebris XL 5100, 5120, 5133, 6150, 6180, 6200	Alpha XL 433	433 MHz CPU and motherboard upgrade kit
SN-A250U-AB	Alpha XL 366 Celebris XL 5100, 5120, 5133, 6150, 6180, 6200	Alpha XL 433	433 MHz CPU upgrade kit

Alpha XL Workstation Options

Alpha XL Country Kits

Note: Country Kit must be order for system to be operational. Windows NT Country Kit includes: country keyboard and power cord, 3-button mouse, user documentation, and Windows NT operating system license and media. Availability of local language Windows NT is dependent upon Microsoft's release schedule.

Order Number	Area	Power Cord	Keyboard	Country	Keyboard Language	Windows NT Language	User Documentation
SN-PCA1N-AA	America	PC7XC-AA	PCXLA-GA	U.S.	English	English	English
SN-PCA1N-AB	Europe	BN19C-2E	PCXLA-GB	Belgium	Flemish	French	French
SN-PCA1N-AC	America	PC7XC-AA	PCXLA-GC	Canada	French	French	French
SN-PCA1N-AD	Europe	BN19K-2E	PCXLA-GD	Denmark	Danish	Danish	English
SN-PCA1N-AE	Europe	BN19A-2E	PCXLA-GE	U.K./Ireland	English	English	English
SN-PCA1N-AF	Europe	BN19C-2E	PCXLA-GF	Finland	Swami	Finish	English
SN-PCA1N-AG	Europe	BN19C-2E	PCXLA-GG	Germany/Austria	German	German	German
SN-PCA1N-AH	Europe	BN19C-2E	PCXLA-GH	Holland	Dutch	Dutch	English
SN-PCA1N-AI	Europe	BN19C-2E	PCXLA-GI	Italy	Italian	Italian	Italian
SN-PCAIN-AJ	APA	PC7XC-AA	PCXJA-NA	Japan	Japanese	Japanese	Japanese
SN-PCA1N-AK	Europe	BN24T-2E	PCXLA-GK	Switzerland	French	French	French
SN-PCA1N-AL	Europe	BN24T-2E	PCXLA-GL	Switzerland	German	German	German
SN-PCA1N-AM	Europe	BN19C-2E	PCXLA-GF	Sweden	Swedish	English	English
SN-PCA1N-AN	Europe	BN19C-2E	PCXLA-GN	Norway	Norwegian	English	English
SN-PCA1N-AP	Europe	BN19C-2E	PCXLA-GP	France/Belgium	French	French	French
SN-PCA1N-AQ	America	PC7XC-AA	PCXAL-TB	Canada	French	French	French
SN-PCA1N-AS	Europe	BN19C-2E	PCXLA-GS	Spain	Spanish	English	English
SN-PCA1N-AT	Europe	BN18L-2E	PCXLA-GT	Israel	Hebrew	English	English
SN-PCA1N-AV	Europe	BN19C-2E	PCXLA-GV	Portugal	Portuguese	Portuguese	English
SN-PCAIN-AZ	APA	BN19H-2E	PCXLA-GA	Australia/NewZealand	English	English	English
SN-PCA1N-BH	Europe	BN19C-2E	PCXLA-HH	Greece	Greek	English	English
SN-PCA1N-BI	APA	PC7XC-AA	PCXLA-HI	Taiwan	Tiawanese	English	English
SN-PCA1N-BK	APA	BN19C-2E	PCXLA-HK	Korea	Korean	English	English
SN-PCA1N-BL	Europe	BN19C-2E	PCXLA-HL	Romania	Romanian	English	English
SN-PCA1N-BP	Europe	BN19C-2E	PCXLA-GA	Poland	Polish	English	English
SN-PCA1N-BQ	Europe	BN19C-2E	PCXLA-HQ	Hungary	Hugararian	English	English
SN-PCA1N-BR	Europe	BN19C-2E	PCXLA-HR	Arabic	English	English	English
SN-PCA1N-BT	Europe	BN19C-2E	PCXLA-HT	Russia	Russian	English	English
SN-PCA1N-BU	Europe	BN19C-2E	PCXLA-HU	Turkey	Turkish	English	English
SN-PCA1N-BY	Europe	BN19C-2E	PCXLA-HY	Serbia	Serbian	English	English
SN-PCA1N-CA	APA	PC7XC-AE	PCXLA-GA	Far East	English	English	English
SN-PCA1N-CE	APA	PC7XC-AA	PCXLA-GA	Phillipines	Filipino	English	English
SN-PCA1N-CG	APA	BN19C-2E	PCXLA-GA	Vietnam	Vietnamese	English	English
SN-PCA1N-CP	APA	BN19C-2E	PCXLA-GA	Thailand	Thai	English	English
SN-PCA1N-CQ	Europe	BN19C-2E	PCXLA-JQ	Iceland	Icelandic	English	English
SN-PCA1N-CS	America	PC7XC-AA	PCXLA-GR	Latin America	Spanish	Spanish	Spanish
SN-PCAIN-CV	APA	BN19A-2E	PCXLA-GA	China	English	English	English
SN-PCA1N-CZ	Europe	BN19C-2E	PCXLA-JZ	Czechoslavakia	Slovak	English	English
SN-PCA1N-EC	Europe	BN19C-2E	PCXLA-GA	Europe	English	English	English



AlphaServer 400

Product Description

The AlphaServer 400 Mini Tower System is an Alpha microprocessor 233 MHz CPU system. This highly reliable product offers many server specific features, including management and security, with remote management possible via a simple serial link. For investment protection, customers get a choice of three popular operating systems: Digital UNIX (V3.2C), OpenVMS (V6.2) and Microsoft Windows NT Server (V3.51). The product also has been designed to allow for future, seamless upgrades to faster Alpha processors.

The server supports up to 384 MB of industry-standard SIMM memory and has an integrated Fast Narrow SCSI-2 controller. The system enclosure supports five storage devices including a floppy diskette drive, CD-ROM, and hard drives. Six industry standard I/O expansion slots (two PCI, three ISA, and one PCI/ISA slot provide for options such as high-performance graphics, networking and SCSI adapters.

Advanced server management features are provided with all AlphaServer 1000A shipments via the bundled ServerWORKS Manager kit. The kit includes Simple Network Management Protocol (SNMP) agents for Windows NT 3.51 and Digital UNIX V3.2D. The SNMP agents for OpenVMS will be available with the next release of TCP/IP Services for OpenVMS. The management console software runs on a Windows PC and the SNMP agents are installed on the AlphaServer. The SNMP agents collect critical server information including system status, I/O information, storage and disk information and network status information. Thresholds can be set to monitor key server events and alarms are forwarded to the ServerWORKS console. Additionally, remote management can be handled via a simple serial link.

All AlphaServer 400 systems come with a three year on-site warranty. Digital's ADVANTAGE-UPGRADE Program provides a cost-effective upgrade path for investment protection.

Step 1—Systems

- Digital UNIX and OpenVMS Packaged and Base systems ordered with one 1.05 GB disk include factory-installed software (FIS).
- Windows NT Packaged and Base systems include Windows NT Server 3.51 plus 5-client media (CD-ROM) and license in shrink-wrapped package.
- Options that are factory installable, will be installed unless specified as **spares**.

AlphaServer 400 Systems include

- Alpha microprocessor 21064A 233-MHz CPU
- 512-Kbyte onboard secondary cache
- Mini tower enclosure which includes:
  - Six expansion slots: 2 PCI, 3 ISA, and 1 PCI/ISA combination slot
  - Integrated PCI-based Fast Narrow SCSI-2 controller with DMA and external SCSI-2 connector
  - Six SIMM memory slots
  - Five storage slots, including:
    One dedicated diskette drive slot,
    Three 5.25-inch slots for removable media or hard disk drives, and
    One internal 3.5-inch hard disk drive slot
  - 300-Watt power supply
  - Two serial ports, support full duplex asynchronous modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 32 MB of memory (Packaged systems only)
- 1.44 MB diskette drive in dedicated slot
- High-performance Ethernet adapter—uses one PCI slot (included in Packaged systems only)
- 3-button mouse
- Hardware documentation (Americas and AP orders only)
- Hardware Warranty: Three-year on-site*
- Software Warranty: 90-day SPD conformance with advisory telephone support*
- Windows NT Server plus 5-client access, V3.51 media kit **or**
- Digital UNIX 2-user base license and Digital NAS Base Server 200 license, and Server Extension License **or**
- OpenVMS base license with System Manager license and Digital NAS Base Server 200 license

* Service upgrades are available; see Step 11, Hardware and Software Supplemental Services.

Packaged Systems

- Packaged systems ordered in the Americas and Asia Pacific (AP) include 120 V power cord packaged with keyboard, and English hardware documentation.
- Select country-specific power cord, keyboard and hardware documentation for all Packaged systems ordered in Europe.
- All Packaged systems include high-performance PCI-based Ethernet adapter—uses one PCI slot
- Windows NT Packaged systems include entry level graphics (PB2GA) 1280 x 1024 x 256 colors, 72 Hz—uses one PCI slot

Order Number	Operating System	Memory	Graphics	Monitor	1.05 GB Hard Drive	600 MB CD-ROM	Ethernet
PB523-AA/AB	Digital UNIX	32 MB	Recommended	Recommended	Included	Included	Included
PB524-AA/AB	OpenVMS	32 MB	Recommended	Recommended	Included	Included	Included
PB525-AA/AB	Windows NT Server	32 MB	Included	Required	Included	Included	Included

Note: xA = 120V and xB = 240V

Step 1—Systems (continued)

Base Systems

- **Digital UNIX and OpenVMS Base systems require:**
  - Minimum of 32 MB memory
  - One hard disk drive
  - Country-specific power cord
- **Windows NT base systems require:**
  - Minimum of 32 MB memory
  - One hard disk drive, one CD-ROM Drive
  - Graphics Option
  - Monitor and keyboard
  - Country-specific power cord
- Graphics option, monitor, and keyboard for Digital UNIX and OpenVMS base systems are available as options if required

Note: Mandatory items **must** be on purchase order at initial order acceptance.

Order Number	Operating System	Memory	Graphics	Monitor	1.05 GB Hard Drive	600 MB CD-ROM	Ethernet
PB51C-AA	Digital UNIX	Mandatory	Recommended	Recommended	Mandatory	Recommended	Recommended
PB51C-BA	OpenVMS	Mandatory	Recommended	Recommended	Mandatory	Recommended	Optional
PB51C-CA	Windows NT Server	Mandatory	Required	Required	Mandatory	Mandatory	Optional

Step 2—Memory

- Six SIMM slots support 3 memory options (3 SIMM pairs) for maximum of 384 MB. Memory pairs can be mixed.
- Packaged systems include 32 MB memory, one MSP01-AC. Base systems require minimum of 32 MB
- System maximum of 384 MB can only be obtained by starting with Base system and three MSP01-AE 128 MB memory options.

MSP01-AA	8 MB (2 x 4 MB 70ns SIMMs)
MSP01-AB	16 MB (2 x 8 MB 70ns SIMMs)
MSP01-AC	32 MB (2 x 16 MB 70ns SIMMs)
MSP01-AD	64 MB (2 x 32 MB 70ns SIMMs)
MSP01-AE	128 MB (2 x 64 MB 70ns SIMMs)
DJ-ML200-AA	PCI-based 2-MB PrestoServe I/O Performance Enhancement Option; 1 per system **only**.

Step 3—Monitors

- Windows NT Packaged systems include video adapter that support 1024 x 768 and 1280 x 1024 resolution, 72 Hz monitors. Systems require a graphics monitor to run all functions.

VRC15-KA/K4 15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 must be ordered separately.

VRT17-PA/P4 17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 must be ordered separately.

VRC21-LA/L4 21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 must be ordered separately.

Step 4—Storage

- Select storage devices if required.
- Integrated Fast Narrow SCSI-2 controller supports maximum of seven narrow devices, four of which may be internal.
- Maximum Integrated SCSI bus length cannot exceed 3.0 meters.

Step 4a—Internal Storage

- System enclosure supports five narrow SCSI storage devices: One dedicated diskette drive slot, three front accessible 5.25-inch slots for removable media (tapes or CD-ROM) or hard drives, and one internal 3.5-inch hard drive slot. See system diagram.
- Packaged systems include: one 1.44 MB diskette drive, one 1.05 GB narrow SCSI hard drive, and one CD-ROM.
- Base systems include one 1.44 MB diskette drive.
- Base systems require a minimum of one hard disk drive.
- Windows NT Base systems require one CD-ROM drive.
- Software distribution is only available on CD-ROM.

Removable Media Devices

PBXRD-CA	600 MB 5.25-inch half-height dual-speed CD-ROM drive (RRD45)
PBXTZ-AA	2.0 MB 5.25-inch half-height QIC tape drive (TZK11)
PBXTL-DA	8.0 MB 5.25-inch half-height 4-mm DAT drive (TLZ09)

Internally Supported Hard Drives

PBXRZ-BB	540 MB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive (RZ25F-E)
PBXRZ-EB	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive (RZ26N-E)
PBXRZ-HB	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive (RZ28M-E)
PBXRZ-JB	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI disk drive (RZ28D-E)
PBXRZ-NA	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" SCSI hard disk drive (RZ29B-E)

Note: Wide drives installed in system enclosure require a wide SCSI controller and BC25V-1A cable.

PBXRW-EA	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" half-height disk drive (RZ26L-W)
PBXRW-EB	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" half-height disk drive (RZ26N-W)
PBXRW-HB	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI disk drive (RZ28M-W)
PBXRW-JB	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI disk drive (RZ28D-W)
PBXRW-NA	4.3 GB 16-bit wide 7200 RPM 3.5 X 1.6" SCSI disk drive (RZ29B-W

Step 4b—External Expansion

- Systems support three external devices on integrated PCI-based Fast Narrow SCSI-2 controller when four devices are installed in system enclosure.
- Seven external narrow SCSI devices are supported on integrated Fast Narrow SCSI-2 controller if storage devices are not installed in system enclosure.
- Select additional PCI-based wide or narrow SCSI-2 controllers if additional external storage is required.
- System supports a maximum of three PCI-based SCSI-2 controllers (**Note:** Packaged systems have only two PCI slots available, due to embedded PCI-based Ethernet controller.)
- PCI-based SCSI-2 controllers supports 7 additional external devices.

Controllers

KZPAA-AA	PCI-based one-port high-performance Fast Narrow Single Ended (FNSE) SCSI-2 controller
BN21H-xx	Connects from KZPAA-AA to BA353 narrow storage enclosure
KZPSA-BB	PCI-based one-port high-performance Fast Wide Differential (FWD) SCSI controller. Supports external disks only.
BN21K-01	Connects from KZPSA to DWZZA-VA in narrow BA353, or DWZZB-VW in wide BA356/BA346 storage enclosure

Step 4b—External Expansion *(continued)*

Controllers

KZPSC-AA*	One-port PCI backplane RAID Fast Wide Single Ended (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Supports external disks only.
BN31S-1E	Connects from KZPSC-AA to BA346/BA356 wide storage enclosure
BN31L-1E	Connects from KZPSC-AA to BA353 narrow storage enclosure
KZPSC-BA*	Three-port PCI backplane RAID (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Supports external disks only.
BN31K-0E	SCSI cable/bulkhead assembly kit for KZPSC-BA; required for connection to third port; uses one PCI bulkhead slot
BN31S-1E	Connects from KZPSC-BA to BA346/BA356 wide storage enclosures
BN31L-1E	Connects from KZPSC-BA to BA353 narrow storage enclosure
KZPSM-AA	PCI-based SCSI Ethernet combination controller. (FWSE) SCSI controller, 10 Mbit Ethernet
BC25V-1A	SCSI cable/bulkhead assembly kit for KZPSM-AA; connects from KZPSM-AA to bulkhead for external storage; requires BN21K-xx
BN21K-xx	Connects from KZPSM-AA to bulkhead assembly kit to BA346/BA356 wide storage enclosure
KFPSA-AA	PCI-based single-DSSI controller (OpenVMS systems only). See Step 4d DSSI cables.

* See Storage Devices for additional information on StorageWorks RAID Array 230 systems.

External Tabletop Tape Expansion

- Tabletop expansion units include North American power cord; order country-specific power cord for 240 V use.
- Each tabletop expansion unit requires 3-foot SCSI cable (BC09D-03)

TLZ09-DA	8.0 GB 5.25-inch half-height 4 mm DAT tape drive
RRD45-FA	600 MB 5.25-inch half-height quad-speed CD-ROM

External Disk Expansion

- BA353 expansion units are supported on wide and narrow SCSI controllers. Devices operate in narrow mode when BA353 is connected to a Fast Wide SCSI controller.
- BA356 and BA346 expansion units are supported on Fast Wide SCSI controllers.

StorageWorks Modular Storage Options

BA353-AA	StorageWorks 8-bit **Narrow** Desktop expansion unit includes enclosure and 120 V power cord. Supports up to three 3.5" narrow hard disk drives. Not supported with RAID controllers.
BA356-KC	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
BA346-KB	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to nine devices, two 5.25" narrow and seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
DWZZA-VA	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 bit Fast Narrow Single-Ended SCSI-2 on other end.
DWZZB-VW	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 or 16 bit Fast Wide or Fast Narrow Single-Ended SCSI-2 on other end.

Externally supported SCSI devices

SCSI devices may be purchased separately and are customer installable.

RZ26N-VA	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VA	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI disk drive
RZ29B-VA	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" SCSI hard disk drive

Step 4b—External Expansion *(continued)*

Externally supported SCSI devices

RZ26N-VW	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" half-height disk drive
RZ28M-VW	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI disk drive
RZ28D-VW	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI disk drive
RZ29B-VW	4.3 GB 16-bit wide 7200 RPM 3.5 X 1.6" SCSI disk drive
RRD45-VA	600 MB 5.25-inch half-height compact disk drive
RRD45-VU*	600 MB 5.25-inch half-height compact disk drive

* 600 MB CD-ROM drive can be added to RRD45-VA or TZK11-VA for a total of two 5.25-inch drives in one carrier.

Step 5—Graphics Adapters and Multimedia Options

Windows NT systems include entry-level (PB2GA-JB) graphics adapter.

Order Number	Description	Supported Operating System	Bus Slots Required/ Recommended Slot
PBXGA-AA[1]	ZLXp-E1 8-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Digital UNIX OpenVMS	One PCI/1, 2, 3a
PBXGA-BA[1]	ZLXp-E2 24-plane, PCI graphics accelerator. 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Digital UNIX OpenVMS	One PCI/1, 2, 3a
PBXGA-CA[1]	ZLXp-E3 24-plane, PCI graphics accelerator, 24-bit Z-buffer, 4 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Digital UNIX OpenVMS	One PCI/1, 2, 3a
PBXGA-AN[2]	ZLXp-E1 8-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/1, 2, 3a
PBXGA-BN[2]	ZLXp-E2 24-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/1, 2, 3a
PBXGA-CN[2]	ZLXp-E3 24-plane, PCI graphics accelerator, 24-bit Z-buffer, 4 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/1, 2, 3a
PB2GA-JB	TRIO64 S3 PCI graphics accelerator, 1 MB DRAM 1280 x 1024 x 256, 72 Hz	Digital UNIX OpenVMS Windows NT[3]	One PCI/1, 2, 3a

1 Multi-screen graphics options for Digital UNIX and OpenVMS systems. Options require Digital Open3D media which is included in factory installed software (FIS)
2 Graphics options include Graphics Support Services Software for Windows NT license, media, and documentation.
3 PB2GA-JB graphics accelerator is included in Windows NT Packaged systems

Multimedia Options

AVA01-AA	Window sound system; compatible sound card, headset and microphone	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
AVH01-AA	Headset and microphone for AVA01 sound card	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
AV301-AA	FullVideo Supreme for all systems	Digital UNIX OpenVMS Windows NT	
AV321-AA	FullVideo Supreme JPEG for all systems	Digital UNIX OpenVMS Windows NT	
AVC00-AA	Toshiba camera, North America	Digital UNIX OpenVMS Windows NT	

Step 7—Communications and Miscellaneous Adapters

- Packaged systems include high-performance Ethernet—Thick wire, Twisted Pair, ThinWire)

Order Number	Description	Supported Operating Systems	Bus Slots Required / Recommended Slot
DE205-AC	ISA-based EtherWORKS 3 Network Interface Card	Digital UNIX OpenVMS Windows NT	One ISA/3a, 4, 5, 6
DE435-AA	PCI based High-performance Ethernet. Select AUI (Thick wire), 10BaseT (Twisted Pair) or ThinWire networking cableBNE4G-02 for AUI BN26K-xx for 10BaseT (twisted pair) BC16M-xx for ThinWire	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
DE500-XA	PCI-based Fast Ethernet network interface card	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
DEFPA-AA[1]	PCI-based DEC FDDI controller, Single Attachment	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
DEFPA-DA[1]	PCI-based DEC FDDI controller, Dual Attachment	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
DEFPA-UA[1]	PCI-based DEC FDDI (UTP) controller	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
DGLPB-AB	PCI-based ATMworks 350 adapter	Digital UNIX V3.2d-1 Windows NT 3.51	One PCI/1, 2, 3a
PBXNP-AA[1]	PCI-based Token Ring adapter, no boot support.	Digital UNIX OpenVMS Windows NT	One PCI/1, 2, 3a
CXI01-AA	ISA Asynchronous MUX Adapter, 16 lines. Expandable to 64 lines.	Digital UNIX Windows NT	One ISA/3b, 4, 5, 6
CXI01-AD	ISA Asynchronous MUX Adapter, 16 lines. Expandable to 224 lines.	Digital UNIX Windows NT	One ISA/3b, 4, 5, 6
DW110-AA	ISA Token Ring adapter	Digital UNIX OpenVMS Windows NT	One ISA/3b, 4, 5, 6
PBXDI-AA	ISA-based Two Port Synchronous Communications controller with interface support for EIA-232/V.24/V.28,	Windows NT	One ISA/3b, 4, 5, 6
PBXDI-AB	ISA-based Two Port Synchronous Communications controller with interface support for V.35	Windows NT	One ISA/3b, 4, 5, 6
PBXDI-AC	ISA-based Two Port Synchronous Communications controller with interface support for X.21 and EIA-530	Windows NT	One ISA/3b, 4, 5, 6
DIIAA-AA	ISA-based ISDN terminal adapter (U.S.)	Windows NT	One ISA/3b, 4, 5, 6
DIIAA-AB	ISA-based ISDN terminal adapter (non-U.S.)	Windows NT	One ISA/3b, 4, 5, 6
PBXDF-AA	Modem 14.4K	Windows NT	One ISA/3b, 4, 5, 6

1 Digital UNIX and OpenVMS systems require driver floppy.

Step 8—Printers

The AlphaServer 400 4/233 includes two serial ports and one bi-directional parallel port on rear of system enclosure. Either port may be used as a printer port depending on printer type.

Step 9—Software

Windows NT Servers

- Windows NT packaged and Base systems include Windows NT Server plus 5-client access V3.51 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ Windows NT Server documentation kit

Digital UNIX Concurrent Use Licenses

Software Processor Code = E

Select user licenses and additional software as required. Media and documentation is recommended for first system on site. Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F Digital UNIX Concurrent Use 16-user license
QL-MT7AE-AA Digital UNIX Traditional unlimited user license
QL-MT6AE-AA Digital UNIX server extension license
QL-MT5AE-AA Digital UNIX C developer's extension license

Digital UNIX Media and Documentation

QA-MT4AA-H8 Digital UNIX media and documentation (end user, developer, server) on CD-ROM
QA-MT4AA-GZ Digital UNIX full hardcopy documentation
QA-MT4AB-GZ Digital UNIX end user documentation
QA-MT5AA-GZ Digital UNIX developer's documentation
QA-MT6AA-GZ Digital UNIX server extension documentation

Digital UNIX Layered Products (CD-ROM)

Digital UNIX systems include Multimedia Services License, order media and documentation separately. Media and documentation for Multimedia Services is included in Digital UNIX Layered Products CD-ROM.

QA-054AA-H8 Layered products media and documentation for Digital UNIX on CD-ROM

Internet for AlphaServers

QB-4GQAA-KA Internet AlphaServer Software (USA and Canada Only)
QB-4GQAA-KB Internet AlphaServer Software (International)

Digital UNIX Logical Storage Manger

QL-2GVAE-AA Digital UNIX Logical Storage Manager License
QT-2GVAE-AA Digital UNIX Logical Storage Manger Product Support Services

POLYCENTER NetWorker Save and Restore Licenses

QL-2ALAE-AA POLYCENTER NetWorker Save and Restore Server License
QL-3P2AE-AA POLYCENTER NetWorker Save and Restore Archive Server Add-on License. **Note:** NetWorker Server License is a requirement for Archive License.

Step 9—Software *(continued)*

DECsafe Available Server for Digital UNIX

QL-05SAE-AA	DECsafe ASE U/A Traditional license
QB-05SAE-AA	DECsafe ASE U/A Traditional license and configuration guide

Server Extension License

QL-MT6AE-AA	Digital UNIX server extension license
QL-MT5AE-AA	Digital UNIX C developer's extension license

Digital NAS Base Server 200 for Digital UNIX

QL-36MAE-RA	Digital NAS Base Server 200 for Digital UNIX Update license
QT-36MAE-L9	Digital NAS Base Server 200 for Digital UNIX Layered Product Support Service

DECnet for Digital UNIX

QL-MTJAE-AA	DECnet/OSI end-system license for Digital UNIX
QL-MTKAE-AA	DECnet/OSI extended function license for Digital UNIX

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AE-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS V6.2 media and documentation on CD-ROM
QA-MT1AP-H8	OpenVMS V6.1-1H2 media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products (CD-ROM)

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

Digital NAS Base Server 200 for OpenVMS

QL-23EAE-RA	Digital NAS Base Server 200 for OpenVMS upgrade license
QT-23EAE-L9	Digital NAS Base Server 200 for OpenVMS Layered Product Support Service

DECnet for OpenVMS

QL-MTGAE-AA	DECnet extended function license for OpenVMS
QL-MTHAE-AA	DECnet end-system to extended function upgrade license for OpenVMS

Step 9—Software *(continued)*

Support Services Software for Microsoft Windows NT

ZLXp-Ex graphics options for Windows NT servers include the following license, media and documentation.

QM-356AA-AA	License for ZLXp-Ex Support Services Software for Microsoft Windows NT
QB-356AA-SA	ZLXp-Ex Support Services Software for Microsoft Windows NT—license, media (diskette) and documentation
QA-356AA-GZ	ZLXp-Ex Support Services Software for Microsoft Windows NT (documentation only)

Step 10—Power Cords, Keyboards, and Documentation

- Packaged systems ordered in the Americas and Asia Pacific (AP) include 120 V U.S. power cord packaged with keyboard, and English hardware documentation. Select country-specific power cord, keyboard and documentation for all Packaged systems ordered in Europe.
- Base systems **require** country-specific power cord
- Windows NT Base systems **require** a keyboard. Selection of keyboard is optional for Digital UNIX and OpenVMS Base systems.
- Packaged and Base systems include mouse.
- LK471-xx are 101/102 key PC style keyboards. LK461-xx are 108 key VT style keyboards.

Power Cord	PC style keyboards	VT style keyboards	Country
BN19P-1K	**LK471-A2**	**LK461-A2**	North America, Japan (English)
BN19C-2E	**LK471-AB**	**LK461-AB**	Belgium (French)
BN19K-2E	**LK471-AD**	**LK461-AD**	Denmark
BN19C-2E	**LK471-AP**	**LK461-AP**	France
BN19C-2E	**LK471-AM**	**LK461-AM**	Sweden (Finnish)
BN19C-2E	**LK471-AG**	**LK461-AG**	Germany
BN19M-2E	**LK471-AI**	**LK461-AI**	Italy
BN19C-2E	**LK471-AN**	**LK461-AN**	Norway
BN19C-2E	**LK471-AV**	**LK461-AV**	Portugal
BN19C-2E	**LK471-AS**	**LK461-AS**	Spain
BN19E-2E	**LK471-AK**	**LK461-AK**	Switzerland (French)
BN19A-2E	**LK471-AE**	**LK461-AE**	UK, Ireland
BN18L-2E	**LK471-AT**	**LK461-AT**	Israel (Hebrew)
BN19S-2E	**LK471-AA**	**LK461-AA**	Africa, India (English)
BN19H-2E	**LK471-AA**	**LK461-AA**	Australia, New Zealand (English)

Mouse—included in all Packaged and Base systems

PCXAS-AA	PS/2 compatible 3-button Mouse

User Documentation—select for 240 V systems

User Documentation	
EK-PCSVA-UI	User Documentation—English
EK-PCSVF-UI	User Documentation—French
EK-PCSVG-UI	User Documentation—German
EK-PCSVI-UI	User Documentation—Italian
EK-PCSVS-UI	User Documentation—Spanish
EK-PCSVD-UI	User Documentation—Dutch
EK-PCSVJ-UI	User Documentation—Japanese

Step 11—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include three-year, on-site, 24 hr. response hardware warranty.
- Select optional Hardware Supplemental Support Services if required.

FM-CH4HR-36	Years 1-3, 5 x 9, 4 hour response
FM-CH512 -36	Years 1-3, 5 x 12, 4 hour response
FM-CH616 -36	Years 1-3, 6 x 16, 4 hour response
FM-CH724 -36	Years 1-3, 7 x 24, 4 hour response
FM-CHXHW-48	Year 4, 5x9, next day, On-site
FM-CH512-48	Years 1-4, 5x9, 4 hour response
FM-CH616-48	Years 1-4, 6x16, 4 hour response
FM-CH724-48	Years 1-4, 7x24, 4 hour response
FM-CHXHW-60	Years 1-5, next day, On-site
FM-CH4HR-60	Years 1-5, 5 x 9, 4 hour response
FM-CH512 -60	Years 1-5, 5 x 12, 4 hour response
FM-CH616 -60	Years 1-5, 6 x 16, 4 hour response
FM-CH724 -60	Years 1-5, 7 x 24, 4 hour response

Software—Americas and Asia Pacific only

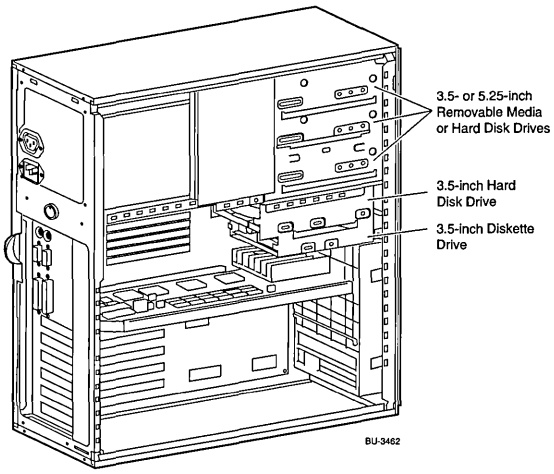
- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software Supplemental Support Service options upgrade 90-day service to time period indicated below.
- Software Supplemental Support Services for Digital UNIX includes advisory and remedial software support with new version license rights for Digital UNIX and NAS 200.
- Software Supplemental Support Services for OpenVMS include advisory and remedial software support with new version license rights for OpenVMS and NAS 200.
- Software Supplemental Support Services for Windows NT include advisory and remedial software support for the time period indicated

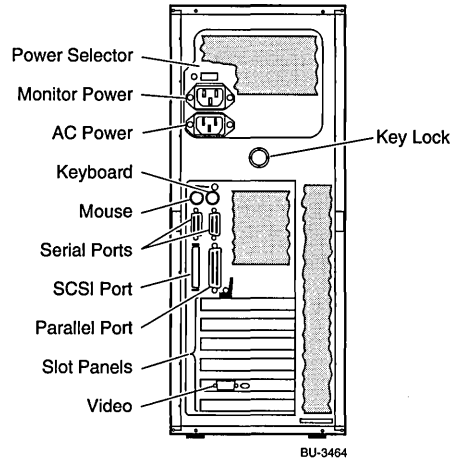
FM-CHOSF-12	1 year Software Supplemental Support Services for **Digital UNIX** systems
FM-CHOSF-36	3 year Software Supplemental Support Services for **Digital UNIX** systems
FM-CHOSF-60	5 year Software Supplemental Support Services for **Digital UNIX** systems
FM-CHVMS-12	1 year Software Supplemental Support Services for **OpenVMS** systems
FM-CHVMS-36	3 year Software Supplemental Support Services for **OpenVMS** systems
FM-CHVMS-60	5 year Software Supplemental Support Services for **OpenVMS** systems
FM-CHNTS-12	1 year Software Supplemental Support Services for **Windows NT** systems
FM-CHNTS-36	3 year Software Supplemental Support Services for **Windows NT** systems
FM-CHNTS-60	5 year Software Supplemental Support Services for **Windows NT** systems

Step 11a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

AlphaServer 400 System Diagram





Enclosure – Rear

Specifications

PCI	132 MB/second
ISA	16 MB/second
Fast SCSI-2 bus	10 MB/s transfer rate
Ethernet	DE435-xx 10-Mbit/s Twisted Pair/Thin Wire and AUI thick wire
Power Requirements	
Line voltage	120/240 V
Voltage tolerance	88-132/176-264 V
Frequency single phase	50/60 Hz
Frequency tolerance	47-63 Hz
Maximum running current	8.0A/4.0A
Maximum power consumption	300 W
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity Maximum wet bulb	20% to 80% relative humidity 40° C (104° F)
Storage temperature	-20° C to 65° C (-4° F to 149° F)
Storage Humidity Maximum wet bulb	10% to 90% relative humidity 65° C (149° F)
Maximum altitude Operating Nonoperating	 2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Nonoperating shock	30G, 25 ms halfsine
Physical Characteristics	
Height	43 cm (17 inches)
Width	18 cm (7 inches)
Depth	43 cm (17 inches)
Weight	12+ kg (28+ lb)

Prestige Model 800 "On-line" UPS

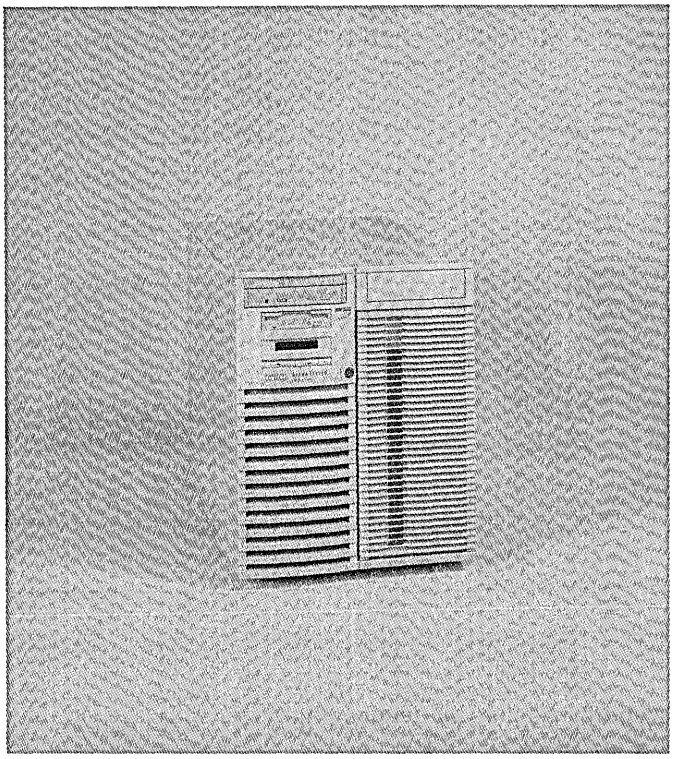
For complete protection, UPS products should be used with data line surge protectors.

4N-AEABD-AF	For 120 Vac, 50 or 60 Hz systems Includes detachable 6-foot input power cord with 5-15P plug and four NEMA 5-15R output receptacles.
4N-AEABD-BF	For 240 Vac, 50 or 60 Hz systems Selectable 220, 230 or 240V ac output. Uses system power cord for detachable IEC 320 input connection at UPS. Unit has 3 IEC 320 receptacles and includes two output jumpers with IEC 320 connectors to connect to system.
4N-GA249-AB	Surge Protectors for 2 wire modem
4N-GA249-CA	Surge Protectors for 10BaseT
4N-GA510-BF	Surge Protectors for ThinWire
4N-AEAEO-PA/PB	Optional hot-swap power pass with built in surge protected outlets including one extra off-line for laser printer. -PA for 120 V, -PB for 220 V models.
4N-AEWAR-G1	5 year vendor on-site exchange warranty upgrade (available in Intercontinental U.S. only at time of purchase).

Monitoring and Unattended Shutdown Software for above UPS systems only

- Include cables, media and documentation.
- SNMP Network connectivity adapters (4N-AEAEO-DA/DC) Twisted Pair/ThinWire are available.

4N-AEAES-AA/AB	Windows NT for Alpha and Intel x86
4N-AEAES-AK	Digital UNIX
4N-AEAES-EM	OpenVMS



AlphaServer 1000 Pedestal–Rackmount–Cabinet

Product Description The AlphaServer 1000 5/300 system is a 300 MHz Alpha microprocessor server, with 2 MB ECC cache. For investment protection, customers get a choice of three popular operating systems: Digital UNIX, OpenVMS, and Microsoft Windows NT Server. Integrated on system motherboard are SVGA controller, diskette controller, two serial ports, one parallel port, and keyboard and mouse controller.

Advanced server management features are provided with all AlphaServer 1000 shipments via the bundled ServerWORKS Manager kit. The kit includes Simple Network Management Protocol (SNMP) agents for Windows NT 3.51 and Digital UNIX V3.2D. The SNMP agents for OpenVMS will be available with the next release of TCP/IP Services for OpenVMS. The management console software runs on a Windows PC and the SNMP agents are installed on the AlphaServer. The SNMP agents collect critical server information including system status, I/O information, storage and disk information and network status information. Thresholds can be set to monitor key server events and alarms are forwarded to the ServerWORKS console.

AlphaServer 1000 5/300 Pedestal System offers up to 10 internal storage devices including a floppy diskette drive, a CD-ROM drive and provision for an additional removable media device. Pedestal systems support up to 1 GB of memory and over 30 GB of internal storage with seven 4.3 GB narrow StorageWorks disk drives. The AlphaServer 1000 pedestal enclosure offers high-reliability features such as fully redundant power supplies, internal RAID, hot swap disk, dual Fast Narrow/Wide SCSI backplane, and ECC memory.

AlphaServer 1000 5/300 Rackmount and Cabinet Systems offer up to six internal storage devices including a floppy diskette drive, a CD-ROM drive and provision for an additional removable media device. Rackmount systems support up to 1 GB of memory and over 12.9 GB of internal storage with three 4.3 GB narrow disk drives. Rackmount systems support additional storage through four SCSI expansion ports located on rear panel of system for connecting StorageWorks shelves, each external expansion port requires a SCSI controller. Rackmount and Cabinet systems do not offer redundant power supplies or hot swap internal disk support, hot swap disk are supported in rackmount StorageWorks shelves.

Step 1—AlphaServer 1000 Pedestal Systems

- Windows NT systems include Windows NT Server plus 5-client access license, media (CD-ROM) kit North American English.
- Digital UNIX and OpenVMS Packaged systems and Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- Options ordered that are factory installable, will be factory installed unless specified as **spares.**

Pedestal Systems include

- Alpha microprocessor 21164 300-MHz CPU with 2 MB ECC onboard cache
- Pedestal enclosure which includes:
  - 10 expansion slots: Seven EISA slots, two PCI slots and one PCI/EISA combination slot
  - Integrated Fast Narrow SCSI-2 controller with DMA and external SCSI-2 connector
  - Integrated SVGA graphics controller
  - 20 industry-standard SIMM slots
  - 10 storage slots:
    One diskette drive slot
    One CD-ROM drive slot
    One additional removable media slot
    Seven StorageWorks hard drive slots
  - 450-Watt self-sensing, self-switching (120/240V, 60/50Hz) power supply
  - Two serial ports, support full duplex asynchronous modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 1.44 MB diskette drive (RX23L) in dedicated slot
- 3-button mouse
- North American variants include 120V power cord (North America, Japan). Mandatory selection of country-specific power cord for all non-North American variants, see Step 10.
- English language documentation. Certain language selections are available, see Step
- EISA Configuration Utility (ECU)
- Integrated Server Management
- Hardware Warranty
- Three-year on-site*
- Software Warranty: 90-day SPD conformance with advisory telephone support*
- Windows NT Server plus 5-client access license, media (CD-ROM) kit, **or**
- Digital UNIX 2-user base license, Digital NAS 200 Base Server license and Server Extension license **or**
- OpenVMS base license with System Manager license and Digital NAS 200 license

Pedestal Packaged Systems include

- PCI-based Ethernet—uses one PCI slot.
- 600 MB CD-ROM—uses one removable media slot.
- One hard drive, see below
- One memory option, see below
- North American variants include a 101-key, PC style North American English keyboard. Select country-sepcific keyboard for non-North American variants, see Step 10.

* Service upgrades are available; see Step 12, Hardware and Software Supplemental Services.

5/300 Pedestal Packaged Systems

Order Number	Operating System	O/S Media	Power cord	Keyboard	Memory	Hard Drive	Monitor
PB75B-AA	Windows NT	Included*	120 V	Included	64 MB	2.1 GB	Required
PB75B-AB	Windows NT	Mandatory	Mandatory	Required	64 MB	2.1 GB	Required
PB75B-FA	Ditital UNIX	FIS	Included	Included	64 MB	2.1 GB	Recommended
PB75B-FB	Ditital UNIX	FIS	Mandatory	Recommended	64 MB	2.1 GB	Recommended
PB75B-MA	OpenVMS	FIS	Included	Included	64 MB	2.1 GB	Recommended
PB75B-MB	OpenVMS	FIS	Mandatory	Recommended	64 MB	2.1 GB	Recommended

* Windows NT Server license, media (CD-ROM) kit North American English.

KEY: Mandatory items **must** be on purchase order at initial order acceptance
Required items are essential for full system operation.
Recommended items enhance system functionality
FIS = Factory Installed Software

Step 1—AlphaServer 1000 Pedestal Systems *(continued)*

Pedestal Base systems

5/300 Pedestal Base systems

Order Number	Operating System	O/S Media	Power cord	Keyboard	Memory	Hard Drive	CD-ROM	Monitor
PB75C-AA	Windows NT	Included[1]	120 V	Included[2]	Required	Required	Required	Required
PB75C-AB	Windows NT	Mandatory	Mandatory	Required	Required	Required	Required	Required
PB75C-FA	Digital UNIX	FIS[3]	120 V	Included	Required	Required	Recommended	Recommended
PB75C-FB	Digital UNIX	FIS[3]	Mandatory	Recommended	Required	Required	Recommended	Recommended
PB75C-MA	OpenVMS	FIS[3]	120 V	Included	Required	Required	Recommended	Recommended
PB75C-MB	OpenVMS	FIS[3]	Mandatory	Recommended	Required	Required	Recommended	Recommended

1. Windows NT Server license, media (CD-ROM) kit North American English.
2. 101-key, PC style, North American English, keyboard.
3. Digital UNIX and OpenVMS Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software (FIS).

KEY: Mandatory items **must** be on purchase order at initial order acceptance
Required items are essential for full system operation
Recommended items enhance system functionality
FIS = Factory Installed Software

Step 1a—AlphaServer 1000 Rackmount Systems

- Windows NT North American variants include Windows NT license, media (CD-ROM) kit, North American English
  - Selection of language specific Windows NT license, media (CD-ROM) kit is **mandatory** for all non-North American variants.
- Digital UNIX and OpenVMS Packaged systems include factory installed software (FIS) on hard disk drive. Base systems ordered with minimum of 1.05 Gbyte hard disk drive include factory installed software.
- See Uninterruptible Power Supplies (UPS) information following System Specifications.
- Options ordered will be factory installed unless specified as spares.

Note: AlphaServer 1000 rackmount systems do **not** support dual power supply configurations

Rackmount Systems include

- Alpha microprocessor 21164 300 MHz CPU with 2 MB ECC on-board cache
- Rackmountable enclosure with
  - Ten expansion slots: Seven EISA slots, two PCI slots and one PCI/EISA combination slot
  - Integrated Fast Narrow Single Ended SCSI-2 controller with DMA and external SCSI-2 connector.
  - Integrated SVGA graphics controller
  - 20 industry-standard SIMM slots
  - 6 internal storage slots:
    One dedicated diskette slot
    One CD-ROM slot
    One additional removable media slot
    Three fixed hard disk drive slots
  - 450-Watt self-sensing, self-switching (120/240V, 60/50Hz) power supply
  - Two serial ports, support full duplex asynchronous modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 1.44 Mbyte diskette drive (RX23L) in dedicated slot.
- Three-button mouse.
- 15-foot Power cord (120V/240V as appropriate).
- Rackmount hardware (shelf and rails)
- English Language documentation kit.
- EISA Configuration Utility
- Integrated Server Management.
- Hardware Warranty: Three-year on-site*
- Software Warranty: 90-day SPD conformance with advisory telephone support*
- Windows NT Server plus 5-client access license, media (CD-ROM) kit **or**†
- Digital UNIX 2-user base license, Digital NAS Base Server 200 license, **or**
- OpenVMS base license with System Manager license, Digital NAS Base Server 200 license.

* Service upgrades are available; see Step 12, Hardware and Software Supplemental Services on AlphaServer 1000 4/266 deskside system menu.
† Windows NT language specific media kit is **mandatory** for non-North American variants; see Step 9.

Rackmount Packaged Systems include

- PCI based Ethernet (DE435-AA)—uses one PCI slot.
- One 2.1 Gbyte narrow hard disk drive
- 64 MB memory
- 600 Mbyte CD-ROM—uses one removable media slot.
- North American variants include a 101-key, PC style North American English keyboard. Select country-sepcific keyboard for non-North American variants, see Step 10.
- Cabinet enclosure available separately, see Step 11.

5/300 Rackmount Packaged systems

Order Number	Operating System	O/S Media	Power cord	Keyboard	Memory	Hard Drive	Monitor
PB75P-AA	Windows NT	Included*	120 V	Included	64 MB	2.1 GB	Required
PB75P-AB	Windows NT	Mandatory	240 V	Required	64 MB	2.1 GB	Required
PB75P-FA	Digital UNIX	FIS	120 V	Included	64 MB	2.1 GB	Recommended
PB75P-FB	Digital UNIX	FIS	240 V	Recommended	64 MB	2.1 GB	Recommended
PB75P-MA	OpenVMS	FIS	120 V	Included	64 MB	2.1 GB	Recommended
PB75P-MB	OpenVMS	FIS	240 V	Recommended	64 MB	2.1 GB	Recommended

* Windows NT Server license, media (CD-ROM) kit North American English.

KEY: Mandatory items **must** be on purchase order at initial order acceptance
Required items are essential for full system operation
Recommended items enhance system functionality
FIS = Factory Installed Software

Step 1a—AlphaServer 1000 Rackmount Systems *(continued)*

Rackmount Base System

- Base systems include 120V or 240V power cord depending on variant chosen.
- Cabinet enclosure available separately, see Step 11.

5/300 Rackmount Base Systems

Order Number	Operating System	O/S Media	Power cord	Keyboard	Memory	Hard Drive	CD-ROM	Monitor
PB75S-AA	Windows NT	Included[1]	120 V	Included[2]	Required	Required	Required	Required
PB75S-AB	Windows NT	Mandatory	240 V	Required	Required	Required	Required	Required
PB75S-FA	Digital UNIX	FIS[3]	120 V	Recommended	Required	Required	Recommended	Recommended
PB75S-FB	Digital UNIX	FIS[3]	240 V	Recommended	Required	Required	Recommended	Recommended
PB75S-MA	OpenVMS	FIS[3]	120 V	Recommended	Required	Required	Recommended	Recommended
PB75S-MB	OpenVMS	FIS[3]	240 V	Recommended	Required	Required	Recommended	Recommended

1. Windows NT Server license, media (CD-ROM) kit North American English
2. 101-key, PC style, North American English, keyboard.
3. Digital UNIX and OpenVMS Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software (FIS).

KEY: Mandatory items **must** be on purchase order at initial order acceptance
Required items are essential for full system operation
Recommended items enhance system functionality
FIS = Factory Installed Software

Step 1b—AlphaServer 1000 Cabinet Systems

5/300 Cabinet Packaged systems include

- Cabinet enclosure (H9A10-CE/-CF, 120 V or 240 V) with AlphaServer 1000 5/300 Rackmount Packaged System, plus
  - One BA36R-AF front-mounted StorageWorks shelf*
- AlphaServer 1000 Rackmount Cabinet Systems ship with dual (2) H7600-xx cabinet power distribution units and the following power cords.
  - 120 V systems (H7600-AA) = 2 x 24A terminated with NEMA L5-30P (plugs) and require NEMA L5-30R (receptacles)
  - 240 V systems (H7600-AB) = 2 x 16A terminated with NEMA L6-20P (plugs) and require NEMA L6-20R (receptacles)
- H9A10-CE/-CF Cabinet Dimensions
  - Outside: 66.9-inches high, 23.62-inches wide, 33.8-inches deep
  - Usable internal rackmount: 56-inches high, 19-inches wide, 32.2-inches deep

* BA36R-SF StorageWorks wide shelf requires a Fast Wide SCSI controller and SCSI cable, see Step 4b. Select SCSI devices for installation in BA36R-SF StorageWorks shelf from Step 4e.

5/300 Cabinet Packaged systems

Order Number	Description
PB75R-AA*	Windows NT Rackmount Packaged system (PB75P-AA)
PB75R-AB	Windows NT Rackmount Packaged system (PB75P-AB)
PB75R-FA/FB	Digital UNIX Rackmount Packaged system (PB75P-Fx)
PB75R-MA/MB	OpenVMS Rackmount Packaged system (PB75P-Mx)

* Windows NT Server license, media (CD-ROM) kit North American English.

Step 2—Memory

- Packaged Systems include 64 MB memory (one PB7MA-AC) memory kit.
- System supports up to four memory kits (each kit includes five industry-standard SIMMs, the fifth SIMM in each kit is for ECC support.
- System maximum of 1 GB can be obtained by selecting Base System and four PB7MA-CE 256 MB memory kits.

PB7MA-CB	32 MB 70ns (8 MB SIMMs) memory kit
PB7MA-CC	64 MB 70ns (16 MB SIMMs) memory kit
PB7MA-CD	128 MB 70ns (32 MB SIMMs) memory kit
PB7MA-CE	256 MB 70ns (64 MB SIMMs) memory kit
DJ-ML200-BA	PCI-based 4 MB PrestoServe I/O Performance Enhancement Option; maximum one per system.

Step 3—Monitors

- Windows NT systems require a graphics monitor to run **all** functions.
- EISA Configuration Utility (ECU) is accessible via the console port for Digital UNIX and OpenVMS systems. Optional graphics capability is available. Select graphics adapter, monitor, and country specific keyboard for Digital UNIX and OpenVMS systems if required.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.
  - OpenVMS supports 640 x 480 x 256 @ 60Hz, 800 x 600 x 256 @ 60Hz
  - Digital UNIX supports 640 x 480 x 256 @ 60 Hz, 800 x 600 x 256 @ 60Hz
  - Windows NT supports 640 x 480 x 256 @ 60 Hz, 640 x 480 x 256 @ 72 Hz, 800 x 600 x 256 @ 56 Hz, 800 x 600 x 256 @ 60 Hz, 800 x 600 x 256 @ 72 Hz.

Note: Higher resolution available with optional EISA or PCI graphics adapters (see Step 5).

VRC15-KA/K4 15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 must be ordered separately, see Step 10.

VRT17-PA/P4 17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 must be ordered separately, see Step 10.

VRC21-LA/L4 21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 must be ordered separately, see Step 10.

Step 4—Storage

Configuration rules for Pedestal Internal Storage

- Integral Fast Narrow Single Ended (FNSE) SCSI-2 controller supports maximum of seven devices:
  - Two internal 5.25-inch removable media devices
  - Four 3.5-inch hard disk drives in internal storage assembly
  - One external storage device.
- Pedestal enclosure supports seven 3.5-inch narrow disk drives in internal storage assembly
- Internal storage assembly is normally configured for split-bus with four drives on first bus and three drives on second bus. By attaching the jumper cable and moving the terminator internal storage assembly can be re-configured for single-bus mode with support for a maximum of seven disk drives on one additional SCSI adapter.
- An additional SCSI-2 controller is required to support internal storage assembly if set for split-bus mode.

Configuration rules for Rackmount Internal Storage

- Integral Fast Narrow Single Ended (FNSE) SCSI-2 controller supports maximum of seven devices:
  - Two internal 5.25-inch removable media devices
  - Three internal 3.5-inch disk drives
  - Two external storage devices. Maximum external cable length cannot exceed 1.5 meters.
- Rackmount enclosure supports three 3.5-inch narrow disk drives.

Step 4a—Internal Storage

All Pedestal and Rackmount systems include 1.44 MB diskette drive in dedicated slot.

- Pedestal and Rackmount Packaged systems include:
  - One CD-ROM drive
  - One 2.1 GB narrow hard drive

Removable Media Devices

PBXRD-CA	600 MB 5.25 inch half-height dual-speed CD-ROM drive (RRD45)
PBXTZ-AA	2.0 GB 5.25-inch half-height SCSI QIC tape drive (TZK11)
PBXTL-DA	8.0 GB 5.25-inch half-height SCSI 4 mm DAT drive (TLZ09)

Pedestal System Hard Drives

Wide disk drives require wide SCSI-2 controllers to operate in 16-bit wide mode.

RZ26N-VA	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VA	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VA	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" SCSI hard disk drive
RZ26N-VW	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VW	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VW	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VW	4.3 GB 16-bit wide 7200 RPM 3.5 x 1.6" SCSI hard disk drive

Pedestal system internal SCSI cables and terminators

PB7HA-AA	Internal SCSI cable and terminator for FNSE SCSI controllers and 8-bit narrow devices (50 pin)
PB7HA-BB	Internal SCSI cable and terminator for FNSE SCSI controllers and 16-bit wide devices (68-pin)
PB7HA-BA	Internal SCSI cable and terminator for FWSE SCSI controllers and 16-bit wide devices (68-pin)

Step 4a—Internal Storage *(continued)*

Rackmount System Hard Disk Drives (internal only)

- Order -EJ variants when configuring initial order
- Order PBXR*-xx variants when ordering as **spares** and/or for field installation

Note: Rackmount systems support "VA" and "VW" variants only when installed in external narrow BA35R or wide BA36R StorageWorks Shelves.

RZ26N-EJ	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive (PBXRZ-EB for field installation)
RZ28M-EJ	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive (PBXRZ-HB for field installation)
RZ28D-EJ	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI hard disk drive (PBXRZ-JB for field installation)
RZ29B-EJ	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" hard disk drive (PBXRZ-NA for field installation)

Step 4b—Storage Controllers

- Maximum two KZESC-xx one- and three-port EISA-based RAID controllers supported per system.
  - KZESC-xx StorageWorks RAID Array 210 includes EISA backplane RAID controller and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT.
  - KZESC-xx controller installed in Pedestal system requires a PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf, two kits required for split bus mode.
  - Maximum number of EISA-based controllers of all types is limited by the total number of available EISA slots and available IRQs.
- Maximum of three KZPSC-xx one- and three port PCI-based RAID controllers supported per system. **Note:** Packaged systems have two PCI slots available due to installed PCI-based Ethernet controller.
  - KZPSC-xx controllers are supported in PCI slots 0, 1 and 2 only
  - KZPSC-xx StorageWorks RAID Array 230 includes PCI backplane RAID controller and StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT.
  - KZPSC-AA controller installed in Pedestal system requires a PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf, two kits required for split bus mode.
- KZPSA-BB PCI-based one-port Fast Wide Differential SCSI controller supports externally connected wide disks in StorageWorks enclosures and Rackmount shelves with DWZZB signal converter, or narrow disks in narrow StorageWorks enclosures and Rackmount shelves with DWZZA signal converter. Internal storage assembly hard drives are **not** supported on Fast Wide Differential Controller.
- Each controller requires one bus slot, except KFESB which requires two bulkhead slots when system is middle node in an OpenVMS cluster.
- SCSI cables are not included and must be ordered separately.
- External DSSI cables are not included and must be ordered separately.

SCSI Controllers

Note: Pedestal systems **require** SCSI terminator and cable kit to connect SCSI controller to internal storage assembly:

- PB7HA-AA from FNSE SCSI-2 controller to 8-bit **narrow** devices in internal storage assembly(50 pin)
- PB7HA-BA from FWSE SCSI-2 controller to 16-bit **wide** devices in internal storage assembly(68-pin)
- PB7HA-BB from FNSE SCSI-2 controller to 16-bit **wide** devices in internal storage assembly (68-pin)

Rackmount Cabinet systems **include** KZPAA FNSE SCSI-2 controller and one BN21H-02 SCSI cable to connect to BA35R-SF StorageWorks shelf.

KZPAA-AA	PCI-based one-port high-performance Fast Narrow Single Ended (FNSE) SCSI-2 controller
BN21H-xx	Connects from KZPAA-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf
KZPDA-AA	PCI-based one-port Fast Wide Single Ended (FWSE) SCSI controller
BN21K-02	Connects from KZPDA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves.

Step 4b—Storage Controllers *(continued)*

KZPSA-BB	PCI-based one-port high-performance Fast Wide Differential (FWD) SCSI controller. Supports external disks only.
BN21K-01	Connects from KZPSA to DWZZA-VA in narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves, or DWZZB-VW in wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZESC-AA*	One-port EISA backplane RAID (FNSE) controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf
BN21H-02	Connects from KZPAA-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves
BN21N-02	Connects from KZESC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf.
CK-SWXCR-AA	SCSI cable/bulkhead assembly kit for KZESC-BA, required for connecting second and third ports to builkhead slot
BN21H-02	Connects from KZESC-BA to narrow StorageWorks enclosures and wide StorageWorks rackmount shelves
BN21N-02	Connects from KZESC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZPSC-AA*	One-port PCI backplane RAID Fast Wide Single Ended (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Pedestal system requires PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf.
BN31S-1E	Connects from KZPSC-AA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
BN31L-1E	Connects from KZPSC-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves
KZPSC-BA*	Three-port PCI backplane RAID (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Pedestal system requires PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf.
BN31K-0E	SCSI cable/bulkhead assembly kit for KZPSC-BA; required for connection to third port; uses one PCI bulkhead slot.
BN31S-1E	Connects from KZPSC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
BN31L-1E	Connects from KZPSC-BA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves
KZPSM-AA	PCI-based SCSI Ethernet combination controller. (FWSE) SCSI controller, 10 Mbit Ethernet.
BC25V-1A	SCSI cable/bulkhead assembly kit for KZPSM-AA; connects from KZPSM-AA to bulkhead for external storage; requires BN21K-xx SCSI cable
BN21K-xx	Connects from KZPSM-AA bulkhead assembly kit wide StorageWorks enclosures and wide StorageWorks rackmount shelves

* See *Storage Devices* for additional information on StorageWorks RAID Array 2x0 Subsystems

DSSI Controllers

KFPSA-AA	PCI-based single-DSSI controller (OpenVMS systems only). See Step 4f DSSI cables.
KFESB-AA	EISA-based single-DSSI controller (OpenVMS systems only). Uses one EISA slot if system is end node in OpenVMS cluster, or two slots if system is middle node in OpenVMS cluster. Maximum two (if end node in cluster) or maximum of one (if middle node in cluster). See Step 4f DSSI cables.

Step 4c—External Tape Expansion

- Integral Fast Narrow SCSI-2 controller can be extended outside the system enclosure via the SCSI-out port to support external SCSI devices. Maximum external bus length including cable and device cannot exceed 1.0 meter.
- External tape drives are also supported on optional PCI-based high-performance SCSI controllers; KZPAA-AA (maximum external bus length including cable and tape device cannot exceed 3.0 meter) and KZPSA-BB (maximum external bus length including cable and tape device cannot exceed 25.0 meters).
- External tape drives are not supported on one- and three-port (KZESC-xx) high performance Fast-SCSI-2 controllers.
- External tape drives supported on one- and three-port (KZPSC-xx) high performance SCSI controllers on Windows NT only.
- Each tabletop tape device requires a three-foot high density 50-pin to low density 50-pin SCSI cable (BN23G-0E).

External Tapes supported on Windows NT servers

TLZ09	8.0 GB 4 mm DAT tape drive
TLZ7L[1,2]	32.0 GB 4 mm DAT autoloader
TZK11-DA	2.0 GB 5.25-inch tabletop QIC tape drive
TZ87[2]	20 GB, DLT tape drive
TZ875[2]	100 GB, DLT tape autoloader
TZ877[2]	140 GB, DLT tape autoloader
BN23G-0E	3 Foot Molded SCSI Cable, required for each tabletop tape device

External Tapes supported on Digital UNIX and OpenVMS servers

TLZ09[3]	8.0 GB 4 mm DAT tape drive
TLZ7L[1,2,3]	32.0 GB 4 mm DAT autoloader
TZK11-DA[3]	2.0 GB 5.25-inch tabletop QIC tape drive
TKZ60-FA/FC	400 MB IBM 3480/3490 compatible tabletop tape drive
TKZ60-EA[3]	400 MB IBM 3480/3490 compatible tabletop tape drive
TKZ61	400 MB IBM compatible tape autoloader
TKZ61-AC[3]	400 MB IBM compatible tape autoloader
TKZ62	2.4 GB IBM compatible tape autoloader
TKZ62-AC[3]	2.4 GB IBM compatible tape autoloader
TKZ15-TA	10 GB, 8 mm, tabletop tape drive
TKZ15-VA[3,5]	10 GB, 8 mm, tabletop tape drive
TSZ07-CA	40/140 MB, reel/reel, tabletop tape drive
TSZ07-AA[3]	40/140 MB, reel/reel, tabletop tape drive
TZ87[2]	20 GB, DLT tape drive
TZ87-VA[3]	20 GB, DLT tape drive
TZ875[2]	100 GB, DLT tape autoloader
TZ877[2]	140 GB, DLT tape autoloader
TZ88[2]	20/40 GB, DLT tape drive
TKZ9E-TA[4]	2/5/7/10/14GB 8mm helical scan tape drive, tabletop
TKZ9E-VA[3]	2/5/7/10/14GB 8mm helical scan tape drive in StorageWorks SBB carrier
BN23G-0E	3 Foot Molded SCSI Cable, required for each tabletop tape device.

1 Includes four cartridge loader. Larger magazines are supported.
2 Base operating systems support sequential back-up mode only; additional software is required for random access backup. See *Storage Devices* for details.
3 Variants for use in Rackmount systems
4 8mm drive requires OpenVMS MK-driver patch when connected to KZPSA controller in OpenVMS system.
5 Windows NT require layered driver software QB-4STAA-SA

Step 4d—External Disk Expansion for Pedestal Systems

- BA353 expansion units are supported on wide and narrow SCSI controllers. Devices operate in narrow mode when BA353 is connected to a Fast Wide SCSI controller.
- BA356 and BA346 expansion units are supported on Fast Wide SCSI controllers.

StorageWorks Modular Storage Options

BA353-AA	StorageWorks 8-bit **Narrow** Desktop expansion unit includes enclosure and 120 V power cord. Supports up to three 3.5" narrow hard disk drives. Not supported with RAID controllers.
BA356-KC	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
BA346-KB	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to nine devices, two 5.25" narrow and seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
DWZZA-VA	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 bit Fast Narrow Single-Ended SCSI-2 on other end.
DWZZB-VW	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 or 16 bit Fast Wide or Fast Narrow Single-Ended SCSI-2 on other end.

See *Storage Device* for additional ordering information for StorageWorks modular storage expansion and supported devices.

Step 4e—External Disk Expansion for Rackmount and Cabinet Systems

- External BA35R Rackmount StorageWorks shelves are supported on all Fast SCSI-2 controllers.
- External BA36R Rackmount StorageWorks shelves are supported on Fast Wide SCSI controller.
- AlphaServer 1000 Rackmount systems provide four SCSI expansion ports on rear panel of system.
- Order BN21H-02 cable to connect a single BA35R StorageWorks shelf to controllers.
- Order BN31*-xx cable to connect a single BA36R StorageWorks shelf to controllers.

Rackmount StorageWorks Shelves

BA35R-SF	Rackmounted BA350 front mounted StorageWorks shelf for **Narrow** SCSI disks
BA35R-SR	Rackmounted BA350 rear mounted StorageWorks shelf for **Narrow** SCSI disks
BA36R-AF	Rackmounted BA356 front mounted StorageWorks shelf for **Wide** SCSI disks
BA36R-AR	Rackmounted BA356 rear mounted StorageWorks shelf for **Wide** SCSI disks
DWZZA-VA	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 bit Fast Narrow Single-Ended SCSI-2 on other end. **Requires** BN21K-** cable.
DWZZB-VW	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 or 16 bit Fast Wide Single-Ended SCSI-2 on other end. **Requires** BN21K-** cable.

Hard Disk Drives for Rackmount StorageWorks Shelves (External only)

- Wide drives require wide controller to operate in 16-bit wide mode.
- Wide drives are supported in BA36R Rackmount StorageWorks shelves
- Narrow drives are supported in BA35R Rackmount StorageWorks shelves

RZ26N-VA	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VA	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VA	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" SCSI hard disk drive

Step 4e—External Disk Expansion for Rackmount and Cabinet Systems *(continued)*

Hard Disk Drives for Rackmount StorageWorks Shelves (External only)

RZ26N-VW	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VW	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VW	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VW	4.3 GB 16-bit wide 7200 RPM 3.5 x 1.6" SCSI hard disk drive

* Wide drives operate in 8-bit narrow mode when connected to integral Fast Narrow Single Ended SCSI-2 controller

Step 4f—DSSI Cables

- EISA-based DSSI controller (KFESB-AA) uses "Micro-Ribbon" connection.
- KFESB to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC22Q-xx DSSI cable.
- KFESB to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx DSSI cable.
- KFESB to any external "Micro-Ribbon" DSSI right-angle connection (all other DSSI systems and storage devices requiring right-angle connection) requires BC29S-xx DSSI cable.

Step 5—Graphics Adapters

- Integrated SVGA graphics controller supports the following monitors:
  - Digital UNIX supports 640 x 480 x 256 @ 60 Hz monitors, 800 x 600 x 256 @ 60 Hz monitors
  - OpenVMS supports 640 x 480 x 256 @ 60 Hz monitors, 800 x 600 x 256 @ 60 Hz monitors
  - Windows NT supports 640 x 480 x 256 @ 60 Hz, 640 x 480 x 256 @ 72 Hz, 800 x 600 x 256 @ 56 Hz, 800 x 600 x 256 @ 60 Hz, 800 x 600 x 256 @ 72 Hz
- EISA Configuration Utility (ECU) is accessible via the console port for Digital UNIX and OpenVMS systems. Optional graphics capability is available. Select graphics adapter, monitor, and country specific keyboard for Digital UNIX and OpenVMS systems if required.

PB2GA-JB	PCI TRIO64 S3 1-MB DRAM graphics accelerator, 1280 x 1024 x 256, 72 Hz (Windows NT, Digital UNIX, OpenVMS systems)
PBXGA-AA	PCI-based ZPXp-E1 8-plane 1024 x 768 graphics adapter (Digital UNIX and OpenVMS)
PBXGA-AN	PCI-based ZPXp-E1 8-plane 1024 x 768 graphics adapter (Windows NT)
PBXGA-BA	PCI-based ZPXp-E2 24-plane 1024 x 768 graphics adapter (Digital UNIX and OpenVMS)
PBXGA-BN	PCI-based ZPXp-E2 24-plane 1024 x 768 graphics adapter (Windows NT)

Step 6—Networks and Communications

- Packaged systems include PCI-based Ethernet controller, uses one PCI slot
- Two additional PCI-based controllers supported per system.
- Select networking cable for Ethernet controller
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
  - BC16M-xx for ThinWire
- Maximum number of **each** EISA-based network controllers supported per system:
  - Three DE425-AA, Three DEFEA-xA
  - Four DW300-AA, Four DNSES

DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card
DE500-XA	PCI-based Fast Ethernet network interface card (see PCI Option Slot Table)
DEFPA-AA*	PCI-based DEC FDDIcontroller, Single Attachment
DEFPA-DA*	PCI-based DEC FDDIcontroller, Dual Attachments
DEFPA-UA*	PCI-based DEC FDDI (UTP) controller
DGLPB-AB	PCI-based ATMworks 350 adapter
PBXNP-AA	PCI-based Token Ring adapter, no boot support. Digital UNIX and OpenVMS systems require driver floppy.

Step 6—Networks and Communications *(continued)*

DE425-AA	EISA-based Ethernet, OpenVMS and Digital UNIX only
DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DEFEA-UA	EISA-based DEC FDDI (UTP) controller
DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment (requires two slots)
DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS)
DNSES-AA	EISA-based synchronous communications controller, Digital UNIX and OpenVMS systems **only**
CXI01-AA	ISA Asynchronous MUX Adapter, 16 lines. Expandable to 64 lines. Supported on Windows NT and Digital UNIX only.
CXI01-AD	ISA Asynchronous MUX Adapter, 16 lines. Expandable to 224 lines. Supported on Windows NT and Digital UNIX only.
PBXDI-AA	ISA-based Two Port Synchronous Communications controller with interface support for EIA-232/V.24/V.28, Windows NT **only**
PBXDI-AB	ISA-based Two Port Synchronous Communications controller with interface support for V.35, Windows NT **only**
PBXDI-AC	ISA-based Two Port Synchronous Communications controller with interface support for X.21 and EIA-530, Windows NT **only**
DIIAA-AA	ISA-based ISDN terminal adapter (U.S.); Windows NT **only**
DIIAA-AB	ISA-based ISDN terminal adapter (non-U.S.); Windows NT **only**

* Supported as data device only.

Step 7—Additional Power Supply—Pedestal Systems Only

Note: AlphaServer 1000 Rackmount and Cabinet systems do **not** support dual power supply configurations

- Additional power supply may be added to AlphaServer 1000 Pedestal system for n+1 redundancy.
- Country specific power cord must be ordered separately, see Step 10.

H7290-AA	450-Watt Redundant Power Supply Option

See UPS information following System Specifications.

Step 8—Terminals and Printers

Systems include two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required for each connection. A cable must be ordered unless otherwise provided.

Step 9—Software

- North American variants of Windows NT Packaged and Base systems include Windows NT Server plus 5-client access license, media (CD-ROM) kit North American English. Selection of language specific Windows NT media kit is mandatory for non-North American variants.

Windows NT Server plus 5-client access license, media (CD-ROM) kits

QB-23CAA-SB	Windows NT Server license, media kit American/North American English
QB-23C8A-SB	Windows NT Server license, media kit International English
QB-23CPA-SB	Windows NT Server license, media kit French
QB-23CGA-SB	Windows NT Server license, media kit German
QB-23CSA-SB	Windows NT Server license, media kit Spanish
QB-23CUA-SB	Windows NT Server license, media kit Italian

Step 9—Software *(continued)*

Windows NT Server plus 5-client access license, media (CD-ROM) kits

QB-23CJA-SB	Windows NT Server license, media kit Japanese
QB-23CDA-SB	Windows NT Server license, media kit Danish
QB-23CMA-SB	Windows NT Server license, media kit Swedish
QB-23CNA-SB	Windows NT Server license, media kit Norwegian
QB-23CFA-SB	Windows NT Server license, media kit Finnish
QB-23CHA-SB	Windows NT Server license, media kit Dutch
QB-23CVA-SB	Windows NT Server license, media kit Portuguese
QB-23C4A-SB	Windows NT Server license, media kit Korean
QB-23C3A-SB	Windows NT Server license, media kit Taiwanese
QB-23C2A-SB	Windows NT Server license, media kit PRC Chinese

Windows NT Server Optional software and documentation

QA-23CAA-GZ	Windows NT Server documentation kit
QA-23C8A-GZ	Windows NT International Server documentation kit
QB-4G45A-AA	Purveyor Web Server Software V1.1 for Process Software Corp.

Digital UNIX Concurrent Use Licenses

Software Processor Code = E

- Digital UNIX Packaged and Base systems **require** operating system media and documentation for **first** system on site.

Digital UNIX Concurrent Use Licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AE-AA	Digital UNIX Traditional unlimited user license
QL-MT5AE-AA	Digital UNIX developer's extension license

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8	Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX on CD-ROM

DECnet for Digital UNIX

QL-MTJAE-AA	DECnet/OSI end-system license for Digital UNIX
QL-MTKAE-AA	DECnet/OSI extended function license for Digital UNIX

Internet AlphaServer Software for Digital UNIX

- Internet AlphaServer Software consists of license, CD-ROM media, and documentation for software listed below.
- Please reference the Internet AlphaServer 1000 4/233 menu for complete list of available Internet software and services.

QB-4GQAA-KA	Internet AlphaServer Software (USA and Canada **only**)
QB-4GQAA-KB	Internet AlphaServer Software (International)

Step 9—Software *(continued)*

OpenVMS Concurrent Use Licenses

Software Processor Code = E

- OpenVMS Packaged and Base systems **require** operating system media and documentation for **first** system on site.

OpenVMS Concurrent Use Licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS Concurrent Use Licenses can also be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AE-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS media and on-line documentation CD-ROM
QA-001AA-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet for OpenVMS

QL-MTGAE-AA	DECnet extended function license for OpenVMS
QL-MTHAE-AA	DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information

EK-410AB-MG	DSSI VMScluster Installation Guide
EK-D4AXP-TS	DSSI VMScluster Troubleshooting Guide

Step 10—Power Cords, Keyboards, and Documentation

Pedestal and Monitor Power Cords

- North American variants include BN26J-1K 120 V (North American, Japan) power cord. If an other power cord is selected, both power cords ship with system.

BN26J-1K	North American, Japan, 120 V
BN19H-2E	Australia, New Zealand, 2.5 meters long
BN19C-2E	Central Europe, 2.5 meters long
BN19A-2E	U.K., Ireland, 2.5 meters long
BN19E-2E	Switzerland, 2.5 meters long
BN19K-2E	Denmark, 2.5 meters long
BN19N-2E	Italy, 2.5 meters long
BN19S-2E	Egypt, India, South Africa, 2.5 meters long
BN18L-2E	Israel, 2.5 meters long

Step 10—Power Cords, Keyboards, and Documentation *(continued)*

Rackmount Power Cords

- 120V and 240V 15 foot power cords are included with all systems, variant designates power cord voltage (See Step 1).

Note: AlphaServer 1000 Pedestal system power cords are less then 15-feet long and are **not** supported in Rackmount cabinet enclosure

BN20Q-4E	15-feet 50Hz power cord connects system to power distribution unit located inside cabinet
BN20Z-4E	15-feet 60Hz power cord connects system to power distribution unit located inside cabinet

Keyboards

- North American variants include LK471-AA keyboard (see Step 1). For these variants, if an additional keyboard is ordered, both keyboards ship with system.
- LK471-xx are 101 key PC style keyboards. LK461-xx are 108 key VT style keyboards.

LK471-A2	**LK461-A2***	North American, Japan (English)
LK471-AB	**LK461-AB**	Belgium (French
LK471-AD	**LK461-AD**	Denmark
LK471-AE	**LK461-AE**	United Kingdom (English)
LK471-AG	**LK461-AG**	Germany
LK471-AI	**LK461-AI**	Italy
LK471-AK	**LK461-AK**	Switzerland (Generic)
LK471-AN	**LK461-AN**	Norway
LK471-AP	**LK461-AP**	France
LK471-AS	**LK461-AS**	Spain
LK471-AV	**LK461-AV**	Portugal
LK471-AQ	**LK461-AQ**	Canada (English)
LK471-AC	**LK461-AC**	Canada (French)
	LK461-AL	Switzerland (German)
	LK461-AM	Sweden

Mouse and Extension Cable Kit

PBXWS-AA	3-button mouse (included with all systems, order as spare or replacement)
2T-450KM-AA	Extension cable kit for VGA, PC style keyboard, and mouse, for use with Rackmount systems.

Pedestal Documentation: Customer and Service Kit

Customer Kit	Service Kit	
QZ-00MAA-GZ	**QA-00MAB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—English
QZ-00MPA-GZ	**QA-00MPB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—French
QZ-00MSA-GA	**QZ-00MSB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—Spanish
QZ-00MJA-GZ	**QZ-00MJB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—Japanese
QZ-00MUA-GZ	**QZ-00MUB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—Italian
QZ-00MGA-GZ	**QZ-00MGB-GZ**	Customer and Service kit for AlphaServer 1000 4/266—German
AG-Q95HA-BE		Customer and Service kit On-line documentation—English

Step 11—Cabinet Enclosure

Select cabinet enclosure for Packaged and Base AlphaServer 1000 Rackmount systems, if required.

- H9A10 19-inch EIA Cabinet Enclosure Dimensions
  - Outside: 66.9-inches high, 23.62-inches wide, 33.8-inches deep
  - Internal usable rackmountable space: 56-inches high, 19-inches wide, 32.2-inches deep

H9A10-CE	120V Retma Cabinet assembly with dual power controller
H9A10-CF	240V Retma Cabinet assembly with dual power controller
H9A10-CG	120V Retma Cabinet assembly with dual power controller and front door
H9A10-CH	240V Retma Cabinet assembly with dual power controller and front door
H9A10-AB	Retma Cabinet assembly with no power controller
H9A10-AD	Retma Cabinet assembly with front door, with no power controller

Step 12—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Select optional Hardware Supplemental Support Services if required.

FM-MK4HR-36	5 x 9, 4-hour response time
FM-MK512-36	5 x 12, 4-hour response time
FM-MK616-36	6 x 16, 4-hour response time
FM-MK724-36	7 x 24, 4-hour response time
FM-MKXHW-60	Years 1-5, next day, Onsite
FM-MK4HR-60	Years 1-5, 5x9, 4-hour response time
FM-MK512-60	Years 1-5, 5x12, 4-hour response time
FM-MK616-60	Years 1-5, 6x16, 4-hour response time
FM-MK724-60	Years 1-5, 7x24, 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for Windows NT include advisory and remedial software support for the time period indicated.
- Software service upgrades for Digital UNIX and OpenVMS include advisory and remedial software support with new version license rights for operating system and Digital NAS 200 for the time period indicated.

FM-MKNTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 1000 4/266 systems
FM-MKNTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 1000 4/266 systems
FM-MKNTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 1000 4/266 systems
FM-MKOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000 4/266 systems
FM-MKOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000 4/266 systems
FM-MKOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000 4/266 systems
FM-MKVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 1000 4/266 systems
FM-MKVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 1000 4/266 systems
FM-MKVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 1000 4/266 systems

Step 12a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

Specifications

Shipping Dimensions	Pedestal	Rackmount
Height	60 cm (23.8 in.)	26.7 cm (10.5 in.)
Width[1]	43 cm (16.9 in)	48.2 cm (19.0 in.)
Depth[1]	65 cm (25.6 in)	73.7 cm (29.0 in.) system chassis & rackmount hardware 63.5 cm (25.0 in.) system chassis
Weight	43 kg (95 lb) typical 71 kg (156 lb) maximum	29 kg (65 lb) typical
Installed Dimensions		
Height	44.2 cm (18.1 in.)	
Width	35.8 cm (14.1 in.)	
Depth	53.3 cm (23 in.)	
Weight	39 kg (86 lb) typical 51 kg (113 lb) maximum	
Clearances		**Service clearance**
Front	75 cm (29.5 in.)	124.04 cm (50.0 in.)
Rear	15 cm (6 in.)	61.00 cm (24.0 in.)
Sides	None	None
Environmental	**Pedestal**	**Rackmount**
Temperature		
Operating[2]	10–40° C (50–104° F)	10-35° C (50-95° F)
Nonoperating	Not tested	Not tested
Storage (60 days)	-40–66° C (-40–151° F)	-40–66° C (-40–151° F)
Rate of change	11° C/hr (20° F/hr)	11° C/hr (20° F/hr)
Relative humidity		
Operating	20–80%	20–80%
Nonoperating	20–80%	20–80%
Storage (60 days)	10–95%	10–95%
Rate of change	20%/hr	20%/hr
Maximum wet bulb temperature operating	28° C (82° F)	
Storage (60 days)	39° C (115°F)	
Minimum dew point temperature operating	12° C (36° F)	
Maximum heat dissipation	Current	
Single supply	2390 Btu/hr	
Dual supply	4097 Btu/hr	
Air flow and quality		
Intake location	Front	Front
Exhaust location	Rear	Rear
Altitude		
Operating	2000 m (6562 ft)	2000 m (6562 ft)
Nonoperating	3600 m (12,000 ft)	3600 m (12,000 ft)
Mechanical shock		
Operating	7.5 G 10 ms	
Nonoperating	20 G peak 30 ms	20 G peak 30 ms
Vibration		
Operating	10-500 Hz .1 G peak	10-500 Hz .1 G peak
Acoustics AverageDeclared		
Operating	6.2 LwA, B6.5 LwAd, B	6.2 LwA, B6.5 LwAd, B
Idle	6.0 LwA, B6.3 LwAd, B	6.0 LwA, B6.3 LwAd, B

1 Dimensions of shipping pallet; fork-lift access is on the width dimension.

2 Maximum operating temperature at Sea Level. Reduce by 1 C (1.8 F) for each 600 m (2000 ft) above Sea Level.

3 Higher altitudes are possible if maximum operating temperature is reduced (see Temperature, above); other restrictions may apply, such as maximum permissible altitude for hard drive.

Specifications *(continued)*

Electrical—Universal Power Supplies are 120/240 Vac		
	Pedestal	**Rackmount**
Nominal ac voltage	100-120 Vac / 220-240 Vac	120 Vac / 220-240 Vac
Operating Voltage range	90-128 Vac / 180-264 Vac	90-132 Vac / 180-264 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50-60 Hz
Frequency range	59-61 Hz / 47-53 Hz	47-53 Hz
Maximum inrush current	50 Amps / 50 Amps	50 Amps
RMS current at nominal Voltage (steady state)		
Single power supply	8.0 Amps / 4.0 Amps	
Dual power supply	4.6 Amps each supply / 2.2 Amps each supply	
Power cord		
Type	IEC 320 C13	
Length	190 cm (75 in.)	4.57 m (15 ft.)
U.S. plug	NEMA 5-15	NEMA L5-30P Socket NEMA L5-30R
240 V plug		NEMA L6-20P Socket NEMA L6-20R
Regulatory		
Agency approvals	UL Listed to UL1950 (2nd edition) CSA Certified to CAN/CSA-C22.2 No. 950-M89 TUV EN 60950 VDE 0805 GS marked ZH1/618 FCC 15J Part 15 Class B Verified CE Class B Verified VCCI Class II ITE	UL Listed to UL1950 (2nd edition) CSA Certified to CAN/CSA-C22.2 No. 950-M89 TUV EN 60950 VDE 0805 GS marked ZH1/618 EMKO-TSE (74-SEC), summary of Nordic deviations FCC 15J Part 15 Verified Class A Verified CE Class A verified VCCI Class II ITE
Reviewed to	AS 3260 Australian Standard SS 436 14 50 Swedish Standard NZS 6661:1989 New Zealand Standard EN 60 950: 1992 European Norm IEC 950 (2nd edition)	EN 60 950/A1, JAN. 1993 European norm, January 1993 IEC950 (2nd edition)

Prestige 1250EXT

UPS offerings include EIA232 port for local or netowrk monitoring. For complete protection, UPS products should be used with data line surge protectors and UPS monitoring software.

Pedestal UPS

4N-AEABF-AA	Prestige 1250EXT, 1250 VA/900W, 1 phase, 60 Hz, 120V 6-foot cord with 5-15P plug, (4) 5-15R receptacle, 9 minutes battery at full UPS load.
4N-AEABF-BF	Prestige 1250EXT, 1250 VA/900W, 1 phase, 50 Hz, 200-240V in/out selectable. Uses system power cord for detachable IEC320 input connection at UPS. Includes (3) IEC320 10A output receptacles, (2) output jumpers with IEC320 connectors to system.
4N-AEAEO-PA	Hot-swap Power-Pass Module for 60 Hz UPS with (7) 5-15R Surge Protected outlets.
4N-AEAEO-PB	Hot-swap Power-Pass Module for 50 Hz UPS with (6) IEC320, 10A surge protected outlets.
4N-AEWAR-G1	Prestige 5 year on-site exchange warranty upgrade (U.S. only).

Specifications *(continued)*

Rackmount UPS

4N-AEABF-CA	1.5k va Rackmount 120V UPS. Rackmount kit included for mounting dimensions 6.17-inches high x 17-inches wide x 24-inches deep, Weight 81 lbs.
4N-AEABF-BG	1.5k va Rackmount 240V UPS. Requires rackmount kit for dimensions 9.6-inches high x 5.6-inches wide x 15.8-inches deep, Weight 33 lbs
4N-AEAEO-RA	Rackmount kit for dimensions 22-27-inches deep
4N-AEAEO-RB	Rackmount kit for dimensions 28-34-inches deep

Data Surge Protection

4N-GA249-AB*	Surge potector, modem connection, wall plug-in
4N-GA249-CA*	Surge protector, 10BaseT connection, wall plug-in
4N-GA510-BF	Surge Protector, ThinWire connection, device port
4N-GA245-xx	Surge Protector, multi-port connection, din rail/rackmount

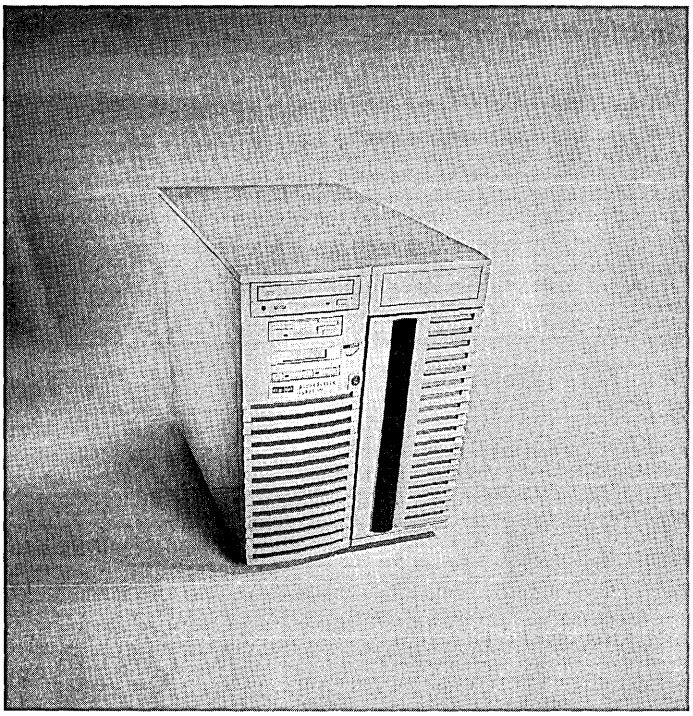
* Additional plug-in data modules (4N-GA240-xx) available.

Monitoring and Unattended Shutdown Software for above UPS systems only

- Include cables, media and documentation

4N-AEAES-AA	Single system shutdown for Windows NT
4N-AEAES-BA	NW management and multi system shutdown for Windows NT*
4N-AEAES-AK	Single system shutdown for Digital UNIX
4N-AEAES-BK	NW management and multi system shutdown for Digital UNIX*
4N-AEAES-EM	Single system shutdown for OpenVMS

* Require network adapters: 4N-AEAEO-DA/DC for 120V 60 Hz; or 4N-AEAEO-DB/DD for 220V 50 Hz
-DA and -DB = Twisted Pair; -DC and -DD = ThinWire



AlphaServer 1000A Pedestal–Rackmount–Cabinet

Product Description The AlphaServer 1000A is an Alpha microprocessor server, available in 333 MHz and 400 MHz versions, with 2 MB ECC cache, available in three packages, Pedestal, Rackmount, and Cabinet systems.. Customers have a choice of three popular operating systems: Digital UNIX, OpenVMS, and Microsoft Windows NT Server . The AlphaServer 1000A offers the following high-reliability features: heat sensor, fan failure and power supply sensors, and ECC memory. Integrated on system motherboard are fast wide single-ended SCSI-2 controller, diskette controller, two serial ports, one parallel port, and keyboard and mouse controller.

Advanced server management features are provided with all AlphaServer 1000A shipments via the bundled ServerWORKS Manager kit. The kit includes Simple Network Management Protocol (SNMP) agents for Windows NT 3.51 and Digital UNIX V3.2D. The SNMP agents for OpenVMS will be available with the next release of TCP/IP Services for OpenVMS. The management console software runs on a Windows PC and the SNMP agents are installed on the AlphaServer. The SNMP agents collect critical server information including system status, I/O information, storage and disk information and network status information. Thresholds can be set to monitor key server events and alarms are forwarded to the ServerWORKS console. Additionally, remote management can be handled via a simple serial link.

The AlphaServer 1000A Pedestal System offers up to 10 internal storage devices including a floppy diskette drive and a CD-ROM, one 5.25-inch bay for an optional removable media drive, and seven hot swap StorageWorks wide or narrow disk drives. The system supports up to 1 GB of memory and over 30 GB of internal storage with seven 4.3 GB disks.

The AlphaServer 1000A Rackmount System offers up to 6 internal storage devices including a floppy diskette drive and a CD-ROM, one 5.25-inch bay for an optional removable media drive, and three wide and/or narrow disk drives. The system supports up to 1 GB of memory and over 12.9 GB of internal storage with three 4.3 GB disks. Cabinet systems are rackmount systems mounted with front facing StorageWorks shelf and two power distribution units into a standard 19" EIA Cabinet.

Step 1—AlphaServer 1000A Pedestal Systems

- Windows NT Packaged and Base systems
  - North American variants include Windows NT license, media (CD-ROM) kit North American English
  - Selection of language specific Windows NT license, media (CD-ROM) kit is **mandatory** for all non-North American variants, see Step 9.
- Digital UNIX and OpenVMS Packaged systems include factory installed (FIS) software on hard disk drive. Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- Options ordered that are factory installable, will be factory installed unless specified as **spares.**

Pedestal Systems include

- Alpha microprocessor 21164
  - 333 MHz CPU with 2 MB ECC onboard cache, or
- Alpha microprocessor 21164
  - 400-MHz CPU with 2 MB ECC onboard cache
- Pedestal enclosure with:
  - Seven PCI slots
    Two EISA slots
  - Integral Fast Wide Single-Ended SCSI-2 controller supports wide and narrow devices
  - 20 SIMM memory slots support 4 memory options
  - 10 storage slots:
    One diskette drive slot
    One CD-ROM drive slot
    One additional removable media slot
    Seven StorageWorks wide and/or narrow hard drive slots
  - 450-Watt self-sensing, self-switching (120/240V, 60/50Hz) power supply
  - Two serial ports, support full duplex asynchronous modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 1.44 MB diskette drive in dedicated slot
- 3-button mouse
- North American variants include 120V power cord (North America, Japan). Mandatory selection of country-specific power cord for all non-North American variants, see Step 10.
- English language documentation. Certain language selections are available; see Step 10.
- EISA Configuration Utility (ECU)
- Integrated Advanced Server Management features, including ServerWorks Manager kit
- Hardware Warranty: Three-year on-site*
- Software Warranty: 90-day SPD conformance with advisory telephone support*
- Windows NT Server plus 5-client access license, media (CD-ROM) kit **or**†
- Digital UNIX 2-user base license, Internet AlphaServer System Software kit, Digital NAS Base Server 200 license **or**
- OpenVMS base license with System Manager license and Digital NAS Base Server 200 license

* Service upgrades are available; see Step 12, Hardware and Software Supplemental Services
† Windows NT language specific media kit is **mandatory** for non-North American variants; see Step 9.

Pedestal Packaged Systems include

- PCI-based Fast 100 Ethernet (Twisted Pair) —uses one PCI slot
- 600 MB CD-ROM—uses one removable media slot
- One hard drive, see below
- One memory option, see below
- North American Windows NT and Digital UNIX variants include a 101-key, PC style U.S. English keyboard.
- North American OpenVMS variants include a 108 key, VT style U.S. English keyboard.
- Select country-specific keyboard for all non-U.S. variants, see Step 10.

Note: Selection of graphics option is **mandatory** for Windows NT Pedestal Packaged Systems

5/333 Pedestal Packaged Systems with 1.05 GB hard disk drive								
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory**	**Disk**	**Graphics**	**Monitor**
PB76B-AA	Windows NT	Included*	120 V	Included	64 MB	1.05 GB	Mandatory	Required
PB76B-AB	Windows NT	Mandatory	Mandatory	Required	64 MB	1.05 GB	Mandatory	Required

Step 1—AlphaServer 1000A Pedestal Systems *(continued)*

Pedestal Packaged Systems

5/333 Pedestal Packaged Systems with 2.1 GB hard disk drive								
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory**	**Disk**	**Graphics**	**Monitor**
PB76B-FA	Digital UNIX	FIS	120 V	Included	64 MB	2.1 GB	Recommended	Recommended
PB76B-FB	Digital UNIX	FIS	Mandatory	Recommended	64 MB	2.1 GB	Recommended	Recommended
PB76B-MA	OpenVMS	FIS	120 V	Included	64 MB	2.1 GB	Recommended	Recommended
PB76B-MB	OpenVMS	FIS	Mandatory	Recommended	64 MB	2.1 GB	Recommended	Recommended

5/400 Pedestal Packaged Systems with 2.1 GB hard disk drive								
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory**	**Disk**	**Graphics**	**Monitor**
PB78B-AA	Windows NT	Included*	120 V	Included	128 MB	2.1 GB	Mandatory	Required
PB78B-AB	Windows NT	Mandatory	Mandatory	Required	128 MB	2.1 GB	Mandatory	Required
PB78B-FA	Digital UNIX	FIS	120 V	Included	128 MB	2.1 GB	Recommended	Recommended
PB78B-FB	Digital UNIX	FIS	Mandatory	Recommended	128 MB	2.1 GB	Recommended	Recommended
PB78B-MA	OpenVMS	FIS	120 V	Included	128 MB	2.1 GB	Recommended	Recommended
PB78B-MB	OpenVMS	FIS	Mandatory	Recommended	128 MB	2.1 GB	Recommended	Recommended

* Windows NT Server license, media (CD-ROM) kit North American English.

KEY: Mandatory items **must** be on purchase order at initial order acceptance.
Required items are essential for full system operation.
Recommended items enhance system functionality.
FIS = Factory Installed Software

Pedestal Base Systems

Note: Selection of graphics option is **mandatory** for Windows NT Pedestal Base Systems

4/333 Pedestal Base Systems								
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory & Hard Drive**	**Graphics**	**CD-ROM**	**Monitor**
PB76C-AA	Windows NT	Included[1]	120 V	Required	Mandatory	Mandatory	Required	Required
PB76C-AB	Windows NT	Mandatory	Mandatory	Required	Mandatory	Mandatory	Required	Required
PB76C-FA	Digital UNIX	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76C-FB	Digital UNIX	FIS[2]	Mandatory	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76C-MA	Open VMS	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76C-MB	Open VMS	FIS[2]	Mandatory	Recommended	Mandatory	Recommended	Recommended	Recommended

5/400 Pedestal Base Systems								
PB78C-AA	Windows NT	Included[1]	120 V	Included[2]	Mandatory	Mandatory	Required	Required
PB78C-AB	Windows NT	Mandatory	Mandatory	Required	Mandatory	Mandatory	Required	Required
PB78C-FA	Digital UNIX	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78C-FB	Digital UNIX	FIS[2]	Mandatory	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78C-MA	Open VMS	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78C-MB	Open VMS	FIS[2]	Mandatory	Recommended	Mandatory	Recommended	Recommended	Recommended

1. Windows NT Server license, media (CD-ROM) kit North American English.
2. Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software (FIS).

KEY: Mandatory items **must** be on purchase order at initial order acceptance.
Required items are essential for full system operation.
Recommended items enhance system functionality.
FIS = Factory Installed Software

Step 1—AlphaServer 1000A Pedestal Systems (continued)

PCI Option Slot Table

- Use table for options restricted to slots **0, 1 and 2 only**.

Order Number	Description	Max #	Restriction applies to
KZPSC-AA	One-port PCI-based RAID Controller	3	Digital UNIX, OpenVMS, Windows NT
KZPSC-BA	Three port PCI-based RAID Controller	3	Windows NT only
DJ-ML200-BA	4 MB PCI Prestoserve option	1	Digital UNIX, OpenVMS, Windows NT
DE500-XA	PCI-based Fast Ethernet network interface card	2	Digital UNIX, OpenVMS, Windows NT
PBXGA-JB	PCI based S3 TRIO Graphics Adapter	1	OpenVMS only

Step 1a—AlphaServer 1000A Rackmount Systems

- Windows NT Packaged and Base systems
  - North American variants include Windows NT license, media (CD-ROM) kit North American English
  - Selection of language specific Windows NT license, media (CD-ROM) kit is **mandatory** for all non-North American variants, see Step 9.
- Digital UNIX and OpenVMS Packaged systems include factory installed (FIS) software on hard disk drive. Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- Options ordered that are factory installable, will be factory installed unless specified as **spares.**

Note: AlphaServer 1000A rackmount systems do **not** support dual power supply configurations

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Rackmount Systems include

- Alpha microprocessor 21164 333-MHz CPU with 2 MB ECC onboard cache, or
- Alpha microprocessor 21164 400-MHz CPU with 2 MB ECC onboard cache
- Rackmount enclosure with:
  - Seven PCI slots
    Two EISA slots
  - Integral Fast Wide Single-Ended SCSI-2 controller supports wide and narrow devices
  - 20 SIMM memory slots support 4 memory options
  - 6 storage slots:
    One diskette drive slot
    One CD-ROM drive slot
    One additional removable media slot
    Three fixed wide and/or narrow hard disk drive slots
  - 450-Watt self-sensing, self-switching (120/240V, 60/50Hz) power supply
  - Two serial ports, support full duplex asynchronous modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 1.44 MB diskette drive in dedicated slot
- Three-button mouse
- 15-foot power cord (120V/240V as appropriate)
- Rackmount hardware (shelf and rails)
- English language documentation kit.
- EISA Configuration Utility (ECU)
- Integrated Advanced Server Management features, including ServerWorks Manager kit
- Hardware Warranty: Three-year on-site[1]
- Software Warranty: 90-day[1] SPD conformance with advisory telephone support
- Windows NT Server plus 5-client access license, media (CD-ROM) kit **or**[2]
- Digital UNIX 2-user base license, Digital NAS Base Server 200 license **or**
- OpenVMS base license with System Manager license and Digital NAS Base Server 200 license.

1 Service upgrades are available; see Step 12, Hardware and Software Supplemental Services
2 Windows NT language specific media kit is **mandatory** for non-North American variants; see Step 9.

Step 1—AlphaServer 1000A Rackmount Systems *(continued)*

Rackmount Packaged Systems include

- PCI-based Fast 100 Ethernet (Twisted Pair)—uses one PCI slot
- One hard disk drive, see below
- Memory, see below
- 600 MB CD-ROM—uses one removable media slot
- North American Windows NT and Digital UNIX variants include a 101-key, PC style U.S. English keyboard.
- North American OpenVMS variants include a 108 key, VT style U.S. English keyboard.
- Select country-specific keyboard for non-North American variants, see Step 10.
- Systems include 120V or 240V power cord depending on variant chosen.
- Cabinet enclosure available separately, see Step 11.

Note: Selection of graphics option is **mandatory** for Windows NT Rackmount Packaged Systems

5/333 Rackmount Packaged Systems with 1.05 GB hard disk drive							
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory**	**Graphics**	**Monitor**
PB76P-AA	Windows NT	Included*	120 V	Included	64 MB	Mandatory	Required
PB76P-AB	Windows NT	Mandatory	240 V	Required	64 MB	Mandatory	Required
PB76P-FA	Digital UNIX	FIS	120 V	Included	64 MB	Recommended	Recommended
PB76P-FB	Digital UNIX	FIS	240 V	Recommended	64 MB	Recommended	Recommended
PB76P-MA	OpenVMS	FIS	120 V	Included	64 MB	Recommended	Recommended
PB76P-MB	OpenVMS	FIS	240 V	Recommended	64 MB	Recommended	Recommended
5/400 Rackmount Packaged systems with 2.1 GB hard disk drive							
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory**	**Graphics**	**Monitor**
PB78P-AA	Windows NT	Included*	120 V	Included	128 MB	Mandatory	Required
PB78P-AB	Windows NT	Mandatory	240 V	Required	128 MB	Mandatory	Required
PB78P-FA	Digital UNIX	FIS	120 V	Included	128 MB	Recommended	Recommended
PB78P-FB	Digital UNIX	FIS	240 V	Recommended	128 MB	Recommended	Recommended
PB78P-MA	OpenVMS	FIS	120 V	Included	128 MB	Recommended	Recommended
PB78P-MB	OpenVMS	FIS	240 V	Recommended	128 MB	Recommended	Recommended

* Windows NT Server license, media (CD-ROM) kit North American English.

KEY: Mandatory items **must** be on purchase order at initial order acceptance.
Required items are essential for full system operation.
Recommended items enhance system functionality.
FIS = Factory Installed Software

Step 1—AlphaServer 1000A Rackmount Systems *(continued)*

Rackmount Base System

- Base systems include 120V or 240V power cord depending on variant chosen.
- Cabinet enclosure available separately, see Step 11.

Note: Selection of graphics option is **mandatory** for Windows NT Rackmount Base Systems

5/333 Rackmount Base Systems								
Order Number	**Operating System**	**O/S Media**	**Power cord**	**Keyboard**	**Memory & Hard Drive**	**Graphics**	**CD-ROM**	**Monitor**
PB76S-AA	Windows NT	Included[1]	120 V	Required	Mandatory	Mandatory	Required	Required
PB76S-AB	Windows NT	Mandatory	240 V	Required	Mandatory	Mandatory	Required	Required
PB76S-FA	Digital UNIX	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76S-FB	Digital UNIX	FIS[2]	240 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76S-MA	OpenVMS	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB76S-MB	OpenVMS	FIS[2]	240 V	Recommended	Mandatory	Recommended	Recommended	Recommended
5/400 Rackmount Base Systems								
PB78S-AA	Windows NT	Included[1]	120 V	Required	Mandatory	Mandatory	Required	Required
PB78S-AB	Windows NT	Mandatory	240 V	Required	Mandatory	Mandatory	Required	Required
PB78S-FA	Digital UNIX	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78S-FB	Digital UNIX	FIS[2]	240 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78S-MA	OpenVMS	FIS[2]	120 V	Recommended	Mandatory	Recommended	Recommended	Recommended
PB78S-MB	OpenVMS	FIS[2]	240 V	Recommended	Mandatory	Recommended	Recommended	Recommended

1. Windows NT Server license, media (CD-ROM) kit North American English
2. Base systems ordered with a minimum of a 1.05 GB disk, include factory installed software (FIS).

KEY: Mandatory items **must** be on purchase order at initial order acceptance.
Required items are essential for full system operation.
Recommended items enhance system functionality.
FIS = Factory Installed Software

PCI Option Slot Table

- Use table for options restricted to slots **0, 1 and 2 only**.

Order Number	Description	Max #	Restriction applies to
KZPSC-AA	One-port PCI-based RAID Controller	3	Digital UNIX, OpenVMS, Windows NT
KZPSC-BA	Three port PCI-based RAID Controller	3	Windows NT only
DJ-ML200-BA	4 MB PCI Prestoserve option	1	Digital UNIX, OpenVMS, Windows NT
DE500-XA	PCI-based Fast Ethernet network interface card	2	Digital UNIX, OpenVMS, Windows NT
PBXGA-JB	PCI based S3 TRIO Graphics Adapter	1	OpenVMS only

Step 1b—AlphaServer 1000A Cabinet Systems

Cabinet Packaged Systems include

- AlphaServer 1000A Cabinet Systems ship with dual (2) H7600-xx cabinet power distribution units and the following power cords.
  - 120 V systems (H7600-AA) = 2 x 24A terminated with NEMA L5-30P (plugs) and require NEMA L6-20R (receptacles)
  - 240 V systems (H7600-AB) = 2 x 16A terminated with NEMA L6-20P (plugs) and require NEMA L6-20R (receptacles)
- H9A10-CE/-CF Cabinet Dimensions
  - Outside: 66.9-inches high, 23.62-inches wide, 33.8-inches deep
  - Usable internal rackmount: 59.5-inches high, 19-inches wide, 30.83-inches deep.

5/333 and 5/400 Cabinet Packaged Systems include

- Cabinet enclosure (H9A10-CE/-CF, 120 V or 240 V) with AlphaServer 1000A Rackmount Packaged System, **plus**
  - One BA36R-AF front-mounted StorageWorks shelf. **Note:** BA36R-AF StorageWorks wide shelf requires a Fast wide SCSI controller, SCSI disk drive, and SCSI cable, see Step 4b. Select SCSI devices for installation in BA36R-AF StorageWorks shelf from Step 4e.

5/333 Cabinet Packaged Systems	
PB76R-AA*	Windows NT Rackmount Packaged system (PB76P-AA)
PB76R-AB	Windows NT Rackmount Packaged system (PB76P-AB)
PB76R-FA/FB	Digital UNIX Rackmount Packaged system (PB76P-FA/FB)
PB76R-MA/MB	OpenVMS Rackmount Packaged system (PB76P-MA/MB)
5/400 Cabinet Packaged Systems	
PB78R-AA*	Windows NT Rackmount Packaged system (PB78P-AA)
PB78R-AB	Windows NT Rackmount Packaged system (PB78P-AB)
PB78R-FA/FB	Digital UNIX Rackmount Packaged system (PB78P-FA/FB)
PB78R-MA/MB	OpenVMS Rackmount Packaged system (PB78P-MA/MB)

* Windows NT Server license, media (CD-ROM) kit North American English..

Step 2—Memory

- Packaged Systems include one 64 MB or one 128 MB memory kit.
- System supports up to four memory kits (each kit includes industry-standard SIMMs and ECC support).
- System maximum of 1 GB can be obtained by selecting Base System and four PB7MA-AE/CE 256 MB memory kits.

Memory kits for 5/333 and 5/400 systems	Description
PB7MA-CB	32 MB 70ns (8 MB SIMMs) memory kit
PB7MA-CC	64 MB 70ns (16 MB SIMMs) memory kit
PB7MA-CD	128 MB 70ns (32 MB SIMMs) memory kit
PB7MA-CE	256 MB 70ns (64 MB SIMMs) memory kit
DJ-ML200-BA	PCI-based 4 MB PrestoServe I/O Performance Enhancement Option; maximum one per system.

Step 3—Monitors

- Windows NT systems require a graphics monitor to run **all** functions.
- EISA Configuration Utility (ECU) is accessible via the console port for Digital UNIX and OpenVMS systems. Optional graphics capability is available. Select graphics adapter, monitor, and country specific keyboard for Digital UNIX and OpenVMS systems if required.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.
  - OpenVMS supports 640 x 480 x 256 @ 72Hz, 800 x 600 x 256 @ 72Hz
  - Digital UNIX supports 640 x 480 x 256 @ 72Hz, 800 x 600 x 256 @ 72Hz
  - Windows NT supports 640 x 480 x 256 @ 72Hz, 640 x 480 x 256 @ 72 Hz, 800 x 600 x 256 @ 56 Hz, 800 x 600 x 256 @ 60 Hz, 800 x 600 x 256 @ 72 Hz.

Note: Higher resolution available with optional EISA or PCI graphics adapters (see Step 5).

VRC15-KA/K4 15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 must be ordered separately, see Step 10.

VRT17-PA/P4 17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 must be ordered separately, see Step 10.

VRC21-LA/L4 21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 must be ordered separately, see Step 10.

Step 4—Storage

Configuration rules for Pedestal Internal Storage

- Integral Fast Wide Single Ended (FWSE) SCSI-2 controller supports maximum of seven wide and/or narrow devices:
  - Two internal narrow 5.25-inch removable media devices
  - Six narrow or wide 3.5-inch hard disk drives in internal storage assembly
  - One external narrow storage device. Maximum external SCSI cable length cannot exceed .5 meters
- Pedestal enclosure supports ten storage devices: one dedicated diskette drive slot, two removable media slots, seven 3.5-inch internal hard disk drives.
- Pedestal system internal storage assembly is configured in single-bus mode and can be reconfigured in split bus mode.
- An additional SCSI-2 controller is required to support internal storage assembly if set for split-bus mode.

Configuration rules for Rackmount Internal Storage

- Integral Fast Wide Single Ended (FWSE) SCSI-2 controller supports maximum of five wide and/or narrow devices:
  - Two internal narrow 5.25-inch removable media devices.
  - Three narrow or wide 3.5-inch internal hard disk drives (each narrow drive ordered requires a wide to narrow SCSI adapter (PBXKP-BA).
- Rackmount enclosure supports six storage devices: one dedicated diskette drive slot, two removable media slots, three 3.5-inch internal hard disk drives.

Step 4a—Internal Storage

All Pedestal and Rackmount systems include 1.44 MB diskette drive in dedicated slot.

- Pedestal and Rackmount Packaged systems include:
  - One CD-ROM drive
  - One 1.05 GB or 2.1 GB wide hard drive (see Step 1)

Removable Media Devices

PBXRD-CA	600 MB 5.25 inch half-height dual-speed CD-ROM drive (RRD45)
PBXTZ-AA	2.0 GB 5.25-inch half-height SCSI QIC tape drive (TZK11)
PBXTL-DA	8.0 GB 5.25-inch x 1.6-inch SCSI 4 mm DAT drive (TLZ09)

Pedestal System Hard Drives

RZ26N-VW	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VW	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VW	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VW	4.3 GB 16-bit wide 7200 RPM 3.5 x 1.6" SCSI hard disk drive

Pedestal system internal SCSI Cable Kits

PB7HA-AA	Includes 50 conductor cable from 8-bit narrow SCSI controller to internal storage assembly, cable from internal storage assembly to external bulkhead, and external terminator.
PB7HA-BA	Includes 68 conductor cable from 16-bit wide SCSI controller to internal storage assembly, cable from internal storage assembly to wide SCSI external bulkhead, jumper cable to put internal storage assembly into single bus mode, and external single-ended wide SCSI terminator.
BC25V-1H	Includes one 68 conductor cable from 16-bit wide SCSI controller to wide SCSI external bulkhead.

Rackmount System Hard Disk Drives (internal only)

- Order -W variants when configuring initial order
- Order PBXRW-xx variants when ordering as **spares** and/or for field installation
- Order -VA and -VW variants when adding external storage to Narrow BA35R or Wide BA36R Rackmount StorageWorks shelves

Rackmount Hard Disk Drives (Internal only)

RZ26N-W	1.05 GB 16-bit wide 5400 RPM 3.5-inch half-height disk drive
RZ28M-W	2.1 GB 16-bit wide 5400 RPM 3.5-inch half-height disk drive
RZ28D-W	2.1 GB 16-bit wide 7200 RPM 3.5-inch half-height disk drive
RZ29B-W	4.3 GB 16-bit wide 7200 RPM 3.5-inch half-height disk drive
PBXRW-EB	1.05 GB 16-bit wide 5400 RPM 3.5-inch, half-height disk drive
PBXRW-HB	2.1 GB 16-bit wide 5400 RPM 3.5-inch, half-height disk drive
PBXRW-JB	2.1 GB 16-bit wide 7200 RPM 3.5-inch, half-height disk drive
PBXRW-NA	4.3 GB 16-bit wide 7200 RPM 3.5-inch half-height disk drive

Step 4b—Storage Controllers

- Maximum three PCI-based KZPSC-xx SCSI controllers supported per system. KZPSC-xx controllers are supported in PCI slots 0, 1 and 2 only.
- Maximum two EISA-based KZESC-xx SCSI controllers supported per system. Maximum number of EISA-based controllers of all types is limited by the total number of available EISA slots and available IRQs.
- KZPSC-xx StorageWorks RAID Array 230 includes PCI backplane RAID controller and StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT.
  - KZPSC-AA one-port controller installed in Pedestal system requires a PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf, two kits required for split bus mode.
  - KZPSC-BA three-port controller installed in Pedestal system requires one PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf, split-bus mode requires two SCSI cable kits.
    Note: If all three ports on KZPSC-BA controller are used, third external port blocks an additional PCI bulkhead slot.
- KZESC-xx StorageWorks RAID Array 210 includes EISA backplane RAID controller and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT.
  - KZESC-AA one-port controller installed in Pedestal system requires one PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf, split-bus mode requires two SCSI cable kits.
  - KZESC-BA three-port controller installed in Pedestal system requires one PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf, split-bus mode requires two SCSI cable kits.
    Note: If all three ports on KZESC-BA controller are used for external storage, third external port blocks an additional PCI bulkhead slot.
- KZPSA-BB PCI-based one-port Fast Wide Differential SCSI controller supports externally connected wide disks in BA356/BA36R with DWZZB signal converter, or narrow disks in BA35R with DWZZA signal converter. Internal hard disk drives are not supported on FWD controller.
- SCSI cables are not included and must be ordered separately.
- External DSSI cables are not included and must be ordered separately.

SCSI Controllers

KZPAA-AA	PCI-based one-port high-performance Fast Narrow Single Ended (FNSE) SCSI-2 controller
BN21H-xx	Connects from KZPAA-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf
KZPSA-BB	PCI-based one-port high-performance Fast Wide Differential (FWD) SCSI controller. Supports external disks only.
BN21K-01	Connects from KZPSA to DWZZA-VA in narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves, or DWZZB-VW in wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZPDA-AA	PCI-based one-port Fast Wide Single Ended (FWSE) SCSI controller
BN21K-02	Connects from KZPDA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves.
KZPSC-AA*	One-port PCI backplane RAID Fast Wide Single Ended (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Pedestal system requires PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf.
BN31S-1E	Connects from KZPSC-AA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
BN31L-1E	Connects from KZPSC-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves
KZPSC-BA*	Three-port PCI backplane RAID (FWSE) controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit. Pedestal system requires PB7HA-BA SCSI cable kit for connection to internal StorageWorks shelf.
BN31K-0E	SCSI cable/bulkhead assembly kit for KZPSC-BA; required for connection to third port; uses one PCI bulkhead slot.
BN31S-1E	Connects from KZPSC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
BN31L-1E	Connects from KZPSC-BA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves

Step 4b—Storage Controllers *(continued)*

SCSI Controllers

KZESC-AA*	One-port EISA backplane RAID (FNSE) controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf
BN21H-02	Connects from KZPAA-AA to narrow StorageWorks enclosures and narrow StorageWorks rackmount shelves
BN21N-02	Connects from KZESC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit. Pedestal system requires PB7HA-AA SCSI cable kit for connection to internal StorageWorks shelf.
CK-SWXCR-AA	SCSI cable/bulkhead assembly kit for KZESC-BA, required for connecting second and third ports to builkhead slot
BN21H-02	Connects from KZESC-BA to narrow StorageWorks enclosures and wide StorageWorks rackmount shelves
BN21N-02	Connects from KZESC-BA to wide StorageWorks enclosures and wide StorageWorks rackmount shelves
KZPSM-AA	PCI-based SCSI Ethernet combination controller. (FWSE) SCSI controller, 10 Mbit Ethernet.
BC25V-1A	SCSI cable/bulkhead assembly kit for KZPSM-AA; connects from KZPSM-AA to bulkhead for external storage; requires BN21K-xx SCSI cable
BN21K-xx	Connects from KZPSM-AA bulkhead assembly kit wide StorageWorks enclosures and wide StorageWorks rackmount shelves

* See *Storage Devices* for additional information on StorageWorks RAID Array 2x0 Subsystems

DSSI Controllers

KFPSA-AA	PCI-based single-DSSI controller (OpenVMS systems only). See Step 4f DSSI cables.
KFESB-AA	EISA-based single-DSSI controller (OpenVMS systems only). Uses one EISA slot if system is end node in OpenVMS cluster, or two slots if system is middle node in OpenVMS cluster. Maximum two (if end node in cluster) or maximum of one (if middle node in cluster). See Step 4f DSSI cables.

Step 4c—External Tape Expansion

- Integral Fast Wide Single Ended SCSI-2 controller installed in Pedestal systems can be extended outside the system enclosure for narrow devices only.
  - 0.5 meters when internal narrow device is connected and StorageWorks assembly is configured in single-bus mode in Pedestal enclosure only.
  - 1.0 meters when internal narrow device is connected and StorageWorks assembly is configured in split-bus mode in Pedestal enclosure only.
- External tape drives are also supported on optional PCI-based SCSI controllers.
  - KZPAA-AA—maximum bus length including cable and tape device cannot exceed 3.0 meters.
  - KZPSA-BB—maximum bus length including cable and tape device cannot exceed 25.0 meters.
- External tape drives supported on one- and three-port (KZPSC-xx) SCSI controllers on Windows NT systems **only**.
- External tape drives are **not** supported on one- and three-port (KZESC-xx) Fast-SCSI-2 controllers.
- Each tabletop tape device **requires** high density 50-pin to low density 50-pin SCSI cable (BN23G-0E).

External Tapes supported on Windows NT Servers

TLZ09	8.0 GB 4 mm DAT tape drive
TLZ7L[1,2]	32.0 GB 4 mm DAT autoloader
TZK11-DA	2.0 GB 5.25-inch tabletop QIC tape drive
TZ87[2]	20 GB, DLT tape drive
TZ875[2]	100 GB, DLT tape autoloader
TZ877[2]	140 GB, DLT tape autoloader
BN23G-0E	3 Foot Molded SCSI Cable, required for each tabletop tape device

Step 4c—External Tape Expansion *(continued)*

External Tapes supported on Digital UNIX and OpenVMS servers

TLZ09[3]	8.0 GB 4 mm DAT tape drive
TLZ7L[1,2,3]	32.0 GB 4 mm DAT autoloader
TZK11-DA[3]	2.0 GB 5.25-inch tabletop QIC tape drive
TKZ60-FA/FC	400 MB IBM 3480/3490 compatible tabletop tape drive
TKZ60-EA[3]	400 MB IBM 3480/3490 compatible tabletop tape drive
TKZ61	400 MB IBM compatible tape autoloader
TKZ61-AC[3]	400 MB IBM compatible tape autoloader
TKZ62	2.4 GB IBM compatible tape autoloader
TKZ62-AC[3]	2.4 GB IBM compatible tape autoloader
TKZ15-TA	10 GB, 8 mm, tabletop tape drive
TKZ15-VA[3,5]	10 GB, 8 mm, tabletop tape drive
TSZ07-CA	40/140 MB, reel/reel, tabletop tape drive
TSZ07-AA[3]	40/140 MB, reel/reel, tabletop tape drive
TZ87[2]	20 GB, DLT tape drive
TZ87-VA[3]	20 GB, DLT tape drive
TZ875[2]	100 GB, DLT tape autoloader
TZ877[2]	140 GB, DLT tape autoloader
TZ88[2]	20/40 GB, DLT tape drive
TKZ9E-TA[4]	2/5/7/10/14 GB 8 mm helical scan tape drive, tabletop
TKZ9E-VA[3]	2/5/7/10/14 GB 8 mm helical scan tape drive in StorageWorks SBB carrier
BN23G-0E	3 Foot Molded SCSI Cable, required for each tabletop tape device.

1 Includes four cartridge loader. Larger magazines are supported.
2 Base operating systems support sequential back-up mode only; additional software is required for random access backup. See *Storage Devices* for details.
3. Variants for use in Rackmount systems
4. 8 mm drive requires OpenVMS MK-driver patch when connected to KZPSA controller in OpenVMS system.
5. Windows NT require layered driver software QB-4STAA-SA

Step 4d—External Disk Expansion for Pedestal Systems

- BA353 expansion units are supported on wide and narrow SCSI controllers. Devices operate in narrow mode when BA353 is connected to a Fast Wide SCSI controller.
- BA356 and BA346 expansion units are supported on Fast Wide SCSI controllers.

StorageWorks Modular Storage Options

BA353-AA	StorageWorks 8-bit **Narrow** Desktop expansion unit includes enclosure and 120 V power cord. Supports up to three 3.5" narrow hard disk drives. Not supported with RAID controllers.
BA356-KC	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
BA346-KB	StorageWorks 16-bit **Wide** Pedestal expansion unit includes BA356 basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord. Supports up to nine devices, two 5.25" narrow and seven 3.5" wide or narrow drives; narrow drives operate in narrow mode.
DWZZA-VA	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 bit Fast Narrow Single-Ended SCSI-2 on other end.
DWZZB-VW	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 or 16 bit Fast Wide or Fast Narrow Single-Ended SCSI-2 on other end.

See *Storage Device* for additional ordering information for StorageWorks modular storage expansion and supported devices.

Step 4e—External Disk Expansion for Cabinet Systems

- External BA35R Rackmount StorageWorks shelves are supported on all Fast SCSI-2 controllers.
- External BA36R Rackmount StorageWorks shelves are supported on Fast Wide SCSI controller.
- AlphaServer 1000 Rackmount systems provide four SCSI expansion ports on rear panel of system.
- Order BN21H-02 cable to connect a single BA35R StorageWorks shelf to controllers.
- Order BN31*-xx cable to connect a single BA36R StorageWorks shelf to controllers.

Rackmount StorageWorks Shelves

BA36R-AF	Rackmounted BA356 front mounted StorageWorks shelf for **Wide** SCSI disks
BA36R-AR	Rackmounted BA356 rear mounted StorageWorks shelf for **Wide** SCSI disks
BA35R-SF	Rackmounted BA350 front mounted StorageWorks shelf for **Narrow** SCSI disks
BA35R-SR	Rackmounted BA350 rear mounted StorageWorks shelf for **Narrow** SCSI disks
DWZZA-VA	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 bit Fast Narrow Single-Ended SCSI-2 on other end. **Requires** BN21K-** cable.
DWZZB-VW	Bi-directional SCSI signal converter and bus extender kit. 16 bit Fast Wide Differential SCSI-2 on one end and 8 or 16 bit Fast Wide Single-Ended SCSI-2 on other end. **Requires** BN21K-** cable.

See *Storage Devices* for additional ordering information for StorageWorks modular storage expansion and supported devices.

Hard Disk Drives for Rackmount StorageWorks Shelves (External only)

- Wide drives require wide controller to operate in 16-bit wide mode.
- Wide drives are supported in BA36R Rackmount StorageWorks shelves
- Narrow drives are supported in BA35R Rackmount StorageWorks shelves

RZ26N-VA	1.05 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VA	2.1 GB 8-bit narrow 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VA	4.3 GB 8-bit narrow 7200 RPM 3.5 x 1.6" SCSI hard disk drive
RZ26N-VW	1.05 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28M-VW	2.1 GB 16-bit wide 5400 RPM 3.5 x 1" SCSI hard disk drive
RZ28D-VW	2.1 GB 16-bit wide 7200 RPM 3.5 x 1" SCSI hard disk drive
RZ29B-VW	4.3 GB 16-bit wide 7200 RPM 3.5 x 1.6" SCSI hard disk drive

* Wide drives operate in 8-bit narrow mode when connected to integral Fast Narrow Single Ended SCSI-2 controller

Step 4f—DSSI Cables

- EISA-based DSSI controller (KFESB-AA) uses "Micro-Ribbon" connection.
- KFESB to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC22Q-xx DSSI cable.
- KFESB to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx DSSI cable.
- KFESB to any external "Micro-Ribbon" DSSI right-angle connection (all other DSSI systems and storage devices requiring right-angle connection) requires BC29S-xx DSSI cable.

Step 5—Graphics Adapters

Note: Selection of graphics option is **mandatory** for Windows NT Pedestal Packaged Systems

EISA Configuration Utility (ECU) is accessible via the console port for Digital UNIX and OpenVMS systems. Optional graphics capability is available. Select graphics adapter, monitor, and country specific keyboard for Digital UNIX and OpenVMS systems if required.

PB2GA-JB	PCI based Trio64 S3 1 MB DRAM graphics adapter 1024 x 768 (Digital UNIX, OpenVMS, Windows NT)
PB2GA-FB	ISA based ATI Mach64 2 MB DRAM graphics adapter 1280 x 1024 (Digital UNIX, OpenVMS, Windows NT)
PBXGA-AA	PCI based ZPXp-E1 8-plane 1024 x 768 graphics adapter (Digital UNIX)
PBXGA-AN	PCI based ZPXp-E1 8-plane 1024 x 768 graphics adapter (Windows NT)
PBXGA-BA	PCI based ZPXp-E2 24-plane 1024 x 768 graphics adapter (Digital UNIX)
PBXGA-BN	PCI based ZPXp-E2 24-plane 1024 x 768 graphics adapter (Windows NT)
PB2GA-JA	PCI based PowerStorm 3D10 8-plane 1280x1024 graphics, (Digital UNIX, OpenVMS, Windows NT)

Step 6—Networks and Communications

- Packaged systems include PCI-based Fast 100 Ethernet (Twisted Pair) controller (DE500-XA), uses one PCI slot.
- All options use one slot except DEFEA-DA which uses two slots
- Select networking cable for Ethernet controller
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum number of **each** EISA-based network controllers supported per system:
  - Two DE425-AA, Two DEFEA-xA, Two DW300-AA, Two DNSES

DE500-XA	PCI-based Fast Ethernet network interface card (see PCI Option Slot Table)
DE425-AA	EISA-based Ethernet; OpenVMS and Digital UNIX only
DE450-CA	PCI based Digital Etherworks 32-bit network interface card (twisted pair, Thick wire, ThinWire)
DEFPA-AA*	PCI-based DEC FDDIcontroller, Single Attachment; maximum seven on OpenVMS and Windows NT, four on Digital UNIX.
DEFPA-DA*	PCI-based DEC FDDIcontroller, Dual Attachment, maximum seven on OpenVMS and Windows NT, four on Digital UNIX.
DEFPA-UA*	PCI-based DEC FDDI (UTP) controller; maximum seven on OpenVMS and Windows NT, four on Digital UNIX.
DGLPB-AB	PCI-based ATMworks 350 adapter
PBXNP-AA	PCI-based Token Ring adapter, no boot support. Digital UNIX and OpenVMS systems require driver floppy.

* Supported as data device only.

DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment (requires two slots)
DEFEA-UA	EISA-based DEC FDDI (UTP) controller
DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS)
DNSES-AA	EISA-based synchronous communications controller; Digital UNIX and OpenVMS systems only
CXI01-AA	ISA Async MUX Adapter, 16 lines—expandable to 64 lines; Windows NT and Digital UNIX only
CXI01-AD	ISA Async MUX Adapter, 16 lines—expandable to 224 lines; Windows NT and Digital UNIX only
PBXDI-AA	ISA-based Two Port Synchronous Communications controller with interface support for EIA-232/V.24/V.28; Windows NT only
PBXDI-AB	ISA-based Two Port Synchronous Communications controller with interface support for V.35; Windows NT only
PBXDI-AC	ISA-based Two Port Synchronous Communications controller with interface support for X.21 and EIA-530; Windows NT only
DIIAA-AA	ISA-based ISDN terminal adapter (U.S.); Windows NT only
DIIAA-AB	ISA-based ISDN terminal adapter (non-U.S.); Windows NT **only**

Step 7—Additional Power Supply—Pedestal Systems Only

Note: AlphaServer 1000A Rackmount and Cabinet systems do **not** support dual power supply configurations

- Additional power supply may be added to AlphaServer 1000A Pedestal system for n+1 redundancy.
- Country specific power cord must be ordered separately, see Step 10.

H7290-AA	450-Watt Redundant Power Supply Option

See UPS information following System Specifications.

Step 8—Printers and Remote Console

The KCRCM is an EISA form-factor card that enables a remote user to gain access to the system's console terminal port, and reset, halt, and power cycle the system. It functions independently of the operating system.

KCRCM-AA	Remote System access for 110V North American
KCRCM-BA	Remote System access for 220V Europe
KCRCM-CA	Remote System access for 220V U.K.
KCRCM-DA	Remote System access for 240V Australia/New Zealand

Systems include two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Select serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required for each connection. A cable must be ordered unless otherwise provided.

Step 9—Software

- North American variants of Windows NT Packaged and Base systems include Windows NT license, media (CD-ROM) kits (see Step 1). **Note:** Selection of language specific Windows NT media kit is **mandatory** for non North American variants.
- Order documentation kit if required.

Windows NT Server plus 5-client access license, media (CD-ROM) kits

QB-23CAA-SB	Windows NT Server license, media kit North American English
QB-23C8A-SB	Windows NT Server license, media kit International English
QB-23CPA-SB	Windows NT Server license, media kit French
QB-23CGA-SB	Windows NT Server license, media kit German
QB-23CSA-SB	Windows NT Server license, media kit Spanish
QB-23CUA-SB	Windows NT Server license, media kit Italian
QB-23CJA-SB	Windows NT Server license, media kit Japanese
QB-23CDA-SB	Windows NT Server license, media kit Danish

Windows NT Server plus 5-client access license, media (CD-ROM) kits

QB-23CMA-SB	Windows NT Server license, media kit Swedish
QB-23CNA-SB	Windows NT Server license, media kit Norwegian
QB-23CFA-SB	Windows NT Server license, media kit Finnish
QB-23CHA-SB	Windows NT Server license, media kit Dutch
QB-23CVA-SB	Windows NT Server license, media kit Portuguese
QB-23C4A-SB	Windows NT Server license, media kit Korean
QB-23C3A-SB	Windows NT Server license, media kit Taiwanese
QB-23C2A-SB	Windows NT Server license, media kit PRC Chinese

Windows NT Server Optional software and documentation

QA-23CAA-GZ	Windows NT Server documentation kit
QA-23C8A-GZ	Windows NT International English Server documentation kit
QB-4G45A-AA	Purveyor Web Server Software V1.1 for Process Software Corp.

Step 9—Software *(continued)*

Digital UNIX Concurrent Use Licenses

Software Processor Code = E

- Digital UNIX Packaged and Base systems **require** operating system media and documentation for **first** system on site.

Digital UNIX Concurrent Use Licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AE-AA	Digital UNIX Traditional unlimited user license
QL-MT5AE-AA	Digital UNIX developer's extension license

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8	Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX on CD-ROM

DECnet for Digital UNIX

QL-MTJAE-AA	DECnet/OSI end-system license for Digital UNIX
QL-MTKAE-AA	DECnet/OSI extended function license for Digital UNIX

OpenVMS Concurrent Use Licenses

Software Processor Code = E

- OpenVMS Packaged and Base systems include OpenVMS V6.2-1H2 kit (QA-MT1AG-H8), it must be installed over OpenVMS V6.2 media when reloading operating system.

OpenVMS Concurrent Use Licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS Concurrent Use Licenses can also be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AE-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS V6.2 media and on-line documentation CD-ROM
QA-MT1AG-H8	OpenVMS V6.2-1H2 media and on-line documentation CD-ROM
QA-001AA-GZ	OpenVMS hardcopy documentation

Step 9—Software *(continued)*

OpenVMS Layered Products CD-ROM

QA-03XAA-H8 Layered products media and documentation for OpenVMS on CD-ROM

DECnet for OpenVMS

QL-MTGAE-AA DECnet extended function license for OpenVMS
QL-MTHAE-AA DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information

EK-410AB-MG DSSI VMScluster Installation Guide
EK-D4AXP-TS DSSI VMScluster Troubleshooting Guide

Step 10—Power Cords, Keyboards, and Documentation

Pedestal and Monitor Power Cords

- North American variants include BN26J-1K 120 V (North American, Japan) power cord. If an other power cord is selected, both power cords ship with system.

BN26J-1K North American, Japan, 120 V, 75-inches long
BN19H-2E Australia, New Zealand, 2.5 meters long
BN19C-2E Central Europe, 2.5 meters long
BN19A-2E U.K., Ireland, 2.5 meters long
BN19E-2E Switzerland, 2.5 meters long
BN19K-2E Denmark, 2.5 meters long
BN19M-2E Italy, 2.5 meters long
BN19S-2E Egypt, India, South Africa, 2.5 meters long
BN18L-2E Israel, 2.5 meters long

Rackmount Power Cords

- 120V and 240V 15 foot power cords are included with all systems, variant designates power cord voltage (see Step 1).

Note: AlphaServer 1000A Pedestal system power cords are less then 15-feet long and are **not** supported in cabinet enclosures.

BN20Q-4E 15-feet 240 V, 50Hz power cord connects system to power distribution unit located inside cabinet
BN20Z-4E 15-feet 120 V, 60Hz power cord connects system to power distribution unit located inside cabinet

Keyboards

- Some variants include a keyboard (see Step 1). For these variants, if an additional keyboard is ordered, both keyboards ship with system.

101 key PC style keyboard		Language	108 key VT style keyboard	
Windows NT	Digital UNIX		OpenVMS	Digital UNIX
LK471-A2	LK471-A2	U.S./English	LK461-A2	LK461-A2
LK471-AB	LK471-AB	Belgian	LK461-AB	LK461-AB
LK471-AC	LK471-AC *	Canadian/French	LK461-AC	LK461-AC
LK471-AD	LK471-AD	Danish	LK461-AD	LK461-AD
LK471-AE	LK471-AE	United Kingdom	LK461-A2	LK461-A2
LK471-AF	LK471-AF	Finnish	LK461-AF	LK461-AF
LK471-AG	LK471-AG	German	LK461-AG	LK461-AG
LK471-AH	LK471-AH	Dutch	LK461-AH	LK461-AH

* Requires Digital UNIX V4.0 or higher

Step 10—Power Cords, Keyboards, and Documentation *(continued)*

Keyboards

101 key PC style keyboard		Language	108 key VT style keyboard	
Windows NT	Digital UNIX		OpenVMS	Digital UNIX
LK471-AI	LK471-AI	Italian	LK461-AI	LK461-AI
		Swiss/French	LK461-AK	LK461-AK
		Swiss/German	LK461-AL	LK461-AL
LK471-AK	LK471-AK	Swiss/Generic		
LK471-AF	LK471-AF	Swedish	LK461-AM	LK461-AM
LK471-AN	LK471-AN	Norwegian	LK461-AN	LK461-AN
LK471-AP	LK471-AP	French	LK461-AP	LK461-AP
		Canadian/English		LK641-AQ *
LK471-AS	LK471-AS	Spanish	LK461-AS	LK461-AS
LK471-AV	LK471-AV	Portuguese	LK461-AV	LK461-AV

* Requires Digital UNIX V4.0 or higher

Mouse and Extension Cable Kit

PBXWS-AA 3-button mouse (included with all systems, order as spare or replacement)
2T-450KM-AA Extension cable kit for VGA, PC style keyboard, and mouse, for use with Rackmount systems.

Pedestal Documentation: Customer and Service Kits

- All variants include (QZ-00MAA-GZ) English customer kit documentation. Select other language customer kits if required. If an other customer kit is selected, both will ship.
- Select service kits for all systems if required.

Customer Kit	Service Kit	
QZ-00MAA-GZ	QA-00MAB-GZ	Customer and Service kit for AlphaServer 1000A—English
QZ-00MPA-GZ		Customer and Service kit for AlphaServer 1000A—French
QZ-00MSA-GA		Customer and Service kit for AlphaServer 1000A—Spanish
QZ-00MJA-GZ		Customer and Service kit for AlphaServer 1000A—Japanese
QZ-00MUA-GZ		Customer and Service kit for AlphaServer 1000A—Italian
QZ-00MGA-GZ		Customer and Service kit for AlphaServer 1000A—German
	AG-Q95HA-BE	Customer and Service kit On-line documentation—English

Step 11—Cabinet Enclosure

Select cabinet enclosure for Packaged and Base AlphaServer 1000A Rackmount systems, if required.

- H9A10 19-inch EIA Cabinet Enclosure Dimensions
  - Outside: 66.9-inches high, 23.62-inches wide, 33.8-inches deep
  - Internal usable rackmountable space: 59.5-inches high, 19-inches wide, 30.83-inches deep

H9A10-CE 120V Retma Cabinet assembly with dual power controller
H9A10-CF 240V Retma Cabinet assembly with dual power controller
H9A10-CG 120V Retma Cabinet assembly with dual power controller and front door
H9A10-CH 240V Retma Cabinet assembly with dual power controller and front door
H9A10-AB Retma Cabinet assembly with no power controller
H9A10-AD Retma Cabinet assembly with front door, with no power controller

Step 11—Cabinet Enclosure *(continued)*

H9A10 Cabinets for Europe

Select H9A10-CJ/CK/CT/CU/GG/GH

- Variants denote depth dimensions, as well as door placement (front or rear and lift or swing)
- European geography cabinets contain H7600-DB IEC 309 power distribution unit (200V-240V, 50-60HZ, 16A 12 IEC 320 C13 outlets)

H9A15 Cabinets for U.S.

- For applications requiring additional internal cabinet rackmount space

H9A15-BA/BB	120 V EIA Cabinet 71.75" high x 19" wide x 29.75" deep, with dual power controllers, rear swing door
H9A15-BC/BD	120 V EIA Cabinet 71.87" high x 19" wide x 29.75" deep, with dual power controllers, front and rear swing doors
H9A15-CA/CB	120 V EIA Cabinet 71.75" high x 19" wide x 37-12" deep, with dual power controllers, rear swing door
H9A15-CC/CD	120 V EIA Cabinet 71.75" high x 19" wide x 37-12" deep, with dual power controllers, front and rear swing doors
H9A15-BE	120 V EIA Cabinet 71.87" high x 19" wide x 29.75" deep, with dual power controllers, front and rear swing doors

H9A15 Cabinets for Europe

H9A15-BE	EIA Cabinet 71.87" high x 19" wide x 29.75" deep, requires H7600-DB power controllers, rear swing doors
H9A15-CE	EIA Cabinet 71.75" high x 19" wide x 37-12" deep, requires H7600-DB power controllers, rear swing door
H7600-DB	Power Distribution Unit, 2 pole 16A circuit breaker, 200V-240V, 50-60HZ, 16A for use in 19 inch cabinets, 12 IEC 320 C13 outlets, with EIA/ANSI (RETMA) rails, IEC 309 power plug

Step 12—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Select optional Hardware Supplemental Support Services if required.

FM-MK4HR-36	5 x 9, 4-hour response time
FM-MK512-36	5 x 12, 4-hour response time
FM-MK616-36	6 x 16, 4-hour response time
FM-MK724-36	7 x 24, 4-hour response time
FM-MKXHW-60	Years 1-5, next day, Onsite
FM-MK4HR-60	Years 1-5, 5x9, 4-hour response time
FM-MK512-60	Years 1-5, 5x12, 4-hour response time
FM-MK616-60	Years 1-5, 6x16, 4-hour response time
FM-MK724-60	Years 1-5, 7x24, 4-hour response time

Step 12—Hardware and Software Supplemental Support Services *(continued)*

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for Windows NT include advisory and remedial software support for the time period indicated.
- Software service upgrades for Digital UNIX and OpenVMS include advisory and remedial software support with new version license rights for operating system and Digital NAS 200 for the time period indicated.

FM-MKNTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 1000A systems
FM-MKNTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 1000A systems
FM-MKNTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 1000A systems
FM-MKOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000A systems
FM-MKOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000A systems
FM-MKOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 1000A systems
FM-MKVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 1000A systems
FM-MKVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 1000A systems
FM-MKVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 1000A systems

Step 12a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

AlphaServer 1000A Pedestal System Specifications

Shipping Dimension		
Height	60 cm (23.8 in.)	
Width	43 cm (16.9 in)	
Depth	65 cm (25.6 in)	
Weight	43 kg (95 lb) typical 71 kg (156 lb) maximum	
Installed Dimensions		
Height	46 cm (18.1 in.)	
Width	35.8 cm (14.1 in.)	
Depth	58.6 cm (23.1 in.)	
Weight	39 kg (86 lb) typical 51 kg (113 lb) maximum	
Clearances	**Operating**	**Service**
Front	75 cm (29.5 in.)	75 cm (29.5 in.)
Rear	15 cm (6 in.)	75 cm (29.5 in.)
Sides	None	75 cm (29.5 in.)
Environmental		
Temperature	Operating* Nonoperating Storage (60 days) Rate of change	10–40° C (50–104° F) Not tested -40–66° C (-40–151° F) 11° C/hr (20° F/hr)
Relative humidity	Operating Nonoperating Storage (60 days) Rate of change	20–80% 20–80% 10–95% 20%/hr
Maximum wet bulb temperature	Operating Storage (60 days)	28° C (82° F) 39° C (115°F)
Minimum dew point temperature	Operating Storage (60 days)	12° C (36° F) Not tested
Maximum heat dissipation Single supply Dual supply	Current 2390 Btu/hr 4097 Btu/hr	
Air flow and quality	Intake location Exhaust location Particle size Concentration	Front Rear N/A N/A
Altitude	Operating† Nonoperating	2000 m (6562 ft) 3600 m (12,000 ft)
Mechanical shock	Operating Nonoperating	7.5 G 10 ms 20 G peak 30 ms
Vibration	Operating	10-500 Hz .1 G peak
Acoustics	 Operating Idle	AverageDeclared 6.2 L^{wA}, B6.5 L^{wAd}, B 6.0 L^{wA}, B6.3 L^{wAd}, B
Electrical—Power Supplies are universal 120/240 Vac		
Nominal ac voltage	100-120 Vac	220-240 Vac
Operating Voltage range	90-128 Vac	180-256 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50 Hz
Frequency range	59-61 Hz	49-51 Hz
Maximum inrush current	50 Amps	50 Amps
RMS current at nominal voltage (steady state) Single power supply Dual power supply	 8.0 Amps 4.6 Amps each supply	 4.0 Amps 2.2 Amps each supply
Power cord	Type Length U.S. plug	IEC 320 C13 190 cm (75 in.) NEMA 5-15

* Maximum operating temperature at Sea Level. Reduce by 1 C (1.8 F) for each 600 m (2000 ft) above Sea Level.

† Higher altitudes are possible if maximum operating temperature is reduced (see Temperature, above); other restrictions may apply, such as maximum permissible altitude for hard drives.

AlphaServer 1000A Pedestal System Specifications *(continued)*

Regulatory	
Agency approvals	UL Listed to UL1950 (2nd edition) CSA Certified to CAN/CSA-C22.2 No. 950-M89 TUV EN 60950 VDE 0805 GS marked ZH1/618 FCC 15J Part 15 Class B Verified CE Class B Verified VCCI Class II ITE
Reviewed to	AS 3260 Australian Standard SS 436 14 50 Swedish Standard NZS 6661:1989 New Zealand Standard EN 60 950: 1992 European Norm IEC 950 (2nd edition)

AlphaServer 1000A Rackmount System Specifications

Shipping Dimension		
Height	26.7 cm (10.5 in.)	
Width	48.2 cm (19.0 in)	
Depth	63.5 cm (25.0 in) system chassis 73.7 cm (29.0 in) system chassis & rackmount hardware	
Weight	29 kg (65 lb)	
Clearances	**Service**	
Front	124.04 cm (50.0 in)	
Rear	61.0 cm (24.0 in)	
Sides	None	
Environmental		
Temperature		
Operating	10–35° C (50–95° F)	
Nonoperating	Not tested	
Storage (60 days)	-40–66° C (-40–151° F)	
Relative humidity	20–80%	
Operating	20–80%	
Nonoperating	10–95%	
Storage (60 days)	20%/hr	
Rate of change		
Air flow and quality		
Intake location	Front	
Exhaust location	Rear	
Electrical—Power Supplies are universal 120/240 Vac		
Nominal ac voltage	100-120 Vac	220-240 Vac
Operating Voltage range	90-128 Vac	180-256 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50 Hz
Frequency range	59-61 Hz	49-51 Hz
Maximum inrush current	50 Amps	50 Amps
RMS current at nominal voltage (steady state)		
Single power supply	8.0 Amps	4.0 Amps
Power cord	Type	IEC 320 C13
	Length	4.57 m (15 ft.)
	U.S. plug	NEMA 5-15
Regulatory		
Agency approvals	UL Listed to UL1950 (2nd edition) CSA Certified to CAN/CSA-C22.2 No. 950-M89 TUV EN 60950 VDE 0805 GS marked ZH1/618 EMCO-TSE (74-SEC), Summary of Nordic deviations FCC 15J Part 15 Class A verified CE Class A verified VCCI Class II ITE	
Reviewed to	AD 3260 Australian Standard AS/NZS 3260:1963, Australian/New Zealand Standard EN 60 950: January 1993 European Norm IEC 950 (2nd edition)	

AlphaServer 1000A System Specifications *(continued)*

Prestige 1250EXT

UPS offerings include EIA232 port for local or netowrk monitoring. For complete protection, UPS products should be used with data line surge protectors and UPS monitoring software.

4N-AEABF-AA	Prestige 1250EXT, 1250 VA/900W, 1 phase, 60 Hz, 120V 6-foot cord with 5-15P plug, (4) 5-15R receptacle, 9 minutes battery at full UPS load.
4N-AEABF-BF	Prestige 1250EXT, 1250 VA/900W, 1 phase, 50 Hz, 200-240V in/out selectable. Uses system power cord for detachable IEC320 input connection at UPS. Includes (3) IEC320 10A output receptacles, (2) output jumpers with IEC320 connectors to system.
4N-AEAEO-PA	Hot-swap Power-Pass Module for 60 Hz UPS with (7) 5-15R Surge Protected outlets.
4N-AEAEO-PB	Hot-swap Power-Pass Module for 50 Hz UPS with (6) IEC320, 10A surge protected outlets.
4N-AEWAR-G1	Prestige 5 year on-site exchange warranty upgrade (U.S. only).

Data Surge Protection

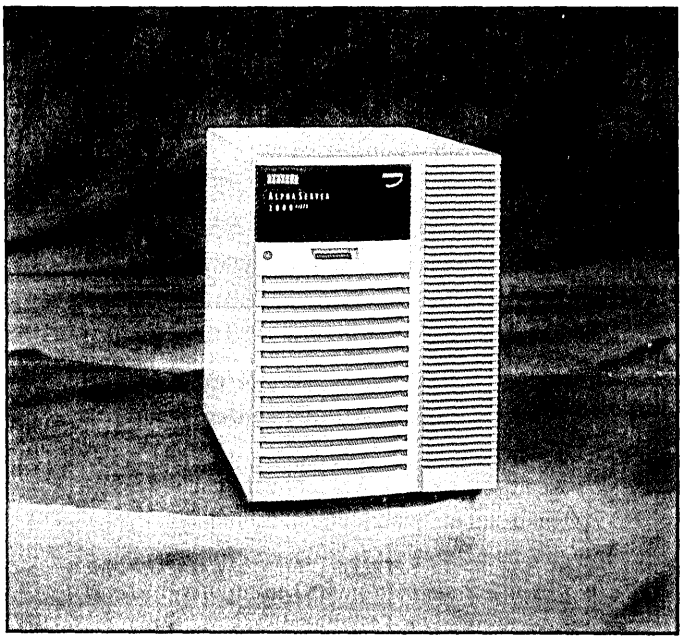
4N-GA249-AB*	Surge protector, modem connection, wall plug-in
4N-GA249-CA*	Surge protector, 10BaseT connection, wall plug-in
4N-GA510-BF	Surge Protector, ThinWire connection, device port
4N-GA245-xx	Surge Protector, multi-port connection, din rail/rackmount

* Additional plug-in data modules (4N-GA240-xx) available.

Monitoring and Unattended Shutdown Software for above UPS systems only (Include cables, media and documentation)

4N-AEAES-AA	Single system shutdown for Windows NT
4N-AEAES-BA	NW management and multi system shutdown for Windows NT*
4N-AEAES-AK	Single system shutdown for Digital UNIX
4N-AEAES-BK	NW management and multi system shutdown for Digital UNIX*
4N-AEAES-EM	Single system shutdown for OpenVMS

* Require network adapters: 4N-AEAEO-DA/DC for 120V 60 Hz; or 4N-AEAEO-DB/DD for 220V 50 Hz
-DA and -DB = Twisted Pair; -DC and -DD = ThinWire



AlphaServer 2000

Product Description

The AlphaServer 2000 systems are low-cost Alpha symmetric multiprocessing (SMP) PCI/EISA-based servers. They offer support for OpenVMS, Digital UNIX and Windows NT, and are suitable for general-purpose commercial, high-performance application and database, and PC LAN Superserver computing environments.

The AlphaServer 2000 family consists of:

- AlphaServer 2000 5/300 (21164 microprocessor) features a 291 MHz CPU with 4 MB cache
- AlphaServer 2000 5/375 (21164A microprocessor) features a 375 MHz CPU with 8 MB cache.

Each can be configured with up to two processors with symmetric multiprocessing. They also support up to 1 GB of memory and 32 GB of internal disk storage.

The system bus bandwidth is 667 MB/second and the high-performance PCI I/O subsystem has a peak bandwidth of 132 MB/second. The 33 MB/ second EISA I/O bus supports a variety of industry-standard EISA options.

The AlphaServer 2000 systems support StorageWorks storage devices. High-availability features, including internal RAID and hot swap of disks, offer data security in mission-critical environments. RAID levels supported are 0 (striping), 1 (shadowing), 0+1 (striped shadowing), and 5 (striping with parity).

AlphaServer 2000 systems are offered in a compact pedestal enclosure that easily fits beneath a desk.

Step 1—Systems

- Digital UNIX and OpenVMS operating system media and documentation kit is required for first system on site; see Step 9
- Windows NT system includes Windows NT Server plus 5-client access V3.51 media (CD-ROM) and license in shrink-wrapped package.
- Systems ordered in the Americas and Asia Pacific (AP) include 120 V power cord and U.S. keyboard unless alternate is specified. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Uninterruptable Power Supplies are available; see UPS Information in System Specifications.
- Options ordered will be factory installed unless specified as **spares.**

AlphaServer 2000 5/300, and 5/375 Systems include

- Alpha microprocessor 21164
  - 291 MHz CPU with 4 MB onboard cache or
- Alpha microprocessor 21164A
  - 375 MHz CPU with 8 MB onboard cache
- BA720 pedestal enclosure which includes:
  - Integral 10 MB/s Fast SCSI-2 controller (8-bit)
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One bi-directional enhanced parallel port, 25-pin D-subminiature connector
  - Keyboard port and mouse port
  - 8-slot RZxx storage assembly supports 8-bit (narrow) or 16-bit (wide) disk drives
  - Two 5.25-inch, half-height removable media slots
  - Seven EISA slots
  - Three PCI slots
  - 400-Watt power supply
- 2.88 MB diskette drive in dedicated slot
- 600 MB CD-ROM (uses one removable media slot)
- 4.3 GB hard drive (uses one storage assembly slot)
- Video Graphics Adapter (uses one EISA slot)
  - 1280 x 1024 graphics resolution
- Ethernet DE435-AA Card (uses one PCI slot)
- Memory indicated below
- 3-button mouse
- Keyboard (Americas and AP orders only)
- Power cord (Americas and AP orders only)
- Customer documentation
- EISA Configuration Utility (ECU)
- Hardware Warranty: Three-year, on-site, with 5 x 9, 24-hour response time*
- Software Warranty: 90-day SPD conformance with advisory telephone support*

* Service upgrades are available; see Step 11, Hardware and Software Supplemental Services.

Windows NT systems include

Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package

Order Number	CPU's	Memory	Storage	Slots available for additional options
AlphaServer 2000 5/300—291 MHz Windows NT Systems				
DN-244D1-B9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DN-244D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI
AlphaServer 2000 5/375—375 MHz Windows NT Systems				
DN-245D1-S9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DN-245D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI

* Includes 2nd Power Supply

Step 1—Systems *(continued)*

Digital UNIX systems include

- Digital UNIX operating system base license.
- Digital NAS Base Server 200 for Digital UNIX license (QL-306AG-AA) includes the following layered products: (order media and documentation separately).
  - PrintServer Software (Licensed with appropriate Digital Printer)
  - DECmessageQ for Digital UNIX Run-Time only
  - Digital DCE Run-Time Services for Digital UNIX
  - Objectbroker for Digital UNIX Run-Time only
  - POLYCENTER Advanced File System utilities
  - POLYCENTER NetWorker Save and Restore for Digital UNIX (Server)
  - PATHWORKS for Digital UNIX LAN Manager
  - PATHWORKS for Digital UNIX Netware
  - Digital UNIX Server Extensions
  - Logical Storage Manager
- Digital UNIX operating system is factory installed.

Order Number	CPU's	Memory	Storage	Slots available for additional options
AlphaServer 2000 5/300—291 MHz Digital UNIX Systems				
DA-244D1-B9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DA-244D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI
AlphaServer 2000 5/375—375 MHz Digital UNIX Systems				
DA-245D1-S9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DA-245D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI

* Includes 2nd Power Supply

OpenVMS systems include

- OpenVMS operating system base license.
- Digital NAS Base Server 200 for OpenVMS license (QL-23EAG-AA) includes the following layered products: (order media and documentation separately).
  - DECwindows Motif for OpenVMS Alpha
  - DECwindows Motif Worldwide support for OpenVMS Alpha
  - DECprint Supervisor for OpenVMS Alpha, (Base, Plus, Open)
  - PrintServer Software (Licensed with appropriate Digital printer)
  - DECmessageQ for OpenVMS Alpha Run-time option only
  - Objectbroker for OpenVMS Alpha Run-time option only
  - Polycenter Software Distribution for OpenVMS Alpha (Client)
  - DECnet for OpenVMS Alpha End System
  - DECnet/OSI for OpenVMS Alpha End System
  - DEC TCP/IP services for OpenVMS Alpha
  - PATHWORKS for OpenVMS (LAN Manager)
  - PATHWORKS for OpenVMS (Macintosh)
  - PATHWORKS for OpenVMS (Netware)
- OpenVMS operating system is factory installed.

Order Number	CPU's	Memory	Storage	Slots available for additional options
AlphaServer 2000 5/300—291 MHz OpenVMS Systems				
DY-244D1-B9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DY-244D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI
AlphaServer 2000 5/375—375 MHz OpenVMS Systems				
DY-245D1-S9	1	128 MB	1 x 4.3 GB	6 EISA/2 PCI
DY-245D1-D9*	2	128 MB	1 x 4.3 GB	6 EISA/2 PCI

* Includes 2nd Power Supply

Step 2—Additional CPUs (Symmetrical Multiprocessing (SMP) Upgrades)

Order up to one additional CPU, for a maximum of two.

- Additional CPU **must** match the speed of CPU in system.
- Two CPU systems require additional power supply (see Step 7).

480NR-AA	Windows NT Server upgrade includes one 5/300 MHz CPU processor; SMP license is not required.
490NR-AA	Windows NT Server upgrade includes one 5/375 MHz CPU processor; SMP license is not required.
480AR-AA	Digital UNIX SMP upgrade includes one 5/300 MHz CPU processor and Digital UNIX SMP license.
490AR-AA	Digital UNIX SMP upgrade includes one 5/375 MHz CPU processor and Digital UNIX SMP license.
480YR-AA	OpenVMS SMP upgrade includes one 5/300 MHz CPU processor, OpenVMS SMP license.
490YR-AA	OpenVMS SMP upgrade includes one 5/375 MHz CPU processor, OpenVMS SMP license.

Step 3—Memory

- Select memory from Step 3a for 128 MB systems

Step 3a—Memory for 128 MB systems

- D*-24*D1-J9 system include 128 MB memory (MS-452-BA); order additional memory using the following table. **No other combinations are supported.**

Table for system maximum of 1.0 GB

Total Memory Required	Order Quantities Shown	
	MS452-BA	**MS452-UB**
256 MB	0	1
384 MB	1	1
512 MB	0	3
640 MB	1	3
768 MB	1	4
1.0 GB	1	6

MS452-BA	128 MB memory board (carrier with 8 x 16 MB SIMMs)
MS452-UB	128 MB add-on memory (8 x 16 MB SIMMs) for MS452-BA

Step 3b—Prestoserve Non-Volatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems **only.** Requires Digital UNIX V3.0b or above operating system software.
- Maximum one Prestoserve option per system.

DJ-ML200-AA	2-MB PCI Prestoserve option
DJ-ML200-BA	4-MB PCI Prestoserve option
DJ-ML200-CA	8-MB PCI Prestoserve option

Step 4—Monitors

Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

Windows NT systems

- Windows NT systems require a graphics monitor to run **all** system functions.
- Video adapter included in system supports up to 1280 x 1024 resolution, 72-Hz monitors.

Digital UNIX and OpenVMS systems

- All console functions, including the EISA Configuration Utility (ECU) and the RAID Configuration Utility (RCU) can be performed using a standard video terminal (VT2xx, VT3xx, VT4xx, VT5xx) connected to one of the system's serial ports (See Step 8).
- For graphics console functionality, order a graphics monitor.
- Video adapter included in system supports up to 1280 x 1024 resolution, 72-Hz monitors.

VRC15-KA/K4	15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 not included, order separately.
VRT17-PA/P4	17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.
VRC21-LA/L4	21" (19.6" viewable image size) ultra high-resolution color monitor with Ligh Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.

Step 5—Storage

Internal Disk Storage Assembly

- Included storage assembly supports eight 3.5-inch disk drives.
- Internal storage assembly is normally configured for split-bus (two SCSI buses), four drives per bus. By reversing the positions of the terminator and jumper. plugs, internal storage assembly can be reconfigured for single-bus operation with a maximum of seven disk drives per storage assembly.
- Manufacturing normally configures internal storage assembly in split-bus mode. If there are not enough storage controllers to support the number of internal disk drives ordered, manufacturing will configure the internal storage assembly for single-bus mode.
- Internal storage assembly drive slots are physically interleaved with electrically contiguous drives in every other slot.
- Internal storage assembly supports 8-bit (**narrow**) and 16-bit (**wide**) modes of operation.
  - For **Wide** mode, select controllers and disks from Step 5a.
  - For **Narrow** mode, select controllers and disks from Step 5b.
- Integral Fast SCSI-2 controller supports maximum of seven devices in system enclosure (two 5.25-inch removable media devices and five 3.5-inch disk drives). All disk drives connected to this controller will operate in **narrow** mode.
- **Note: Wide** disk drives configured on a **narrow** bus will operate in **narrow** mode. **Narrow** disk drives configured on a **wide** bus will operate in **narrow** mode. **Wide** and **narrow** devices can be mixed on a single bus.

Step 5a—Controllers and Storage Devices for 16-bit (Wide) Mode

- Wide Storage Assembly Shelf
  - 16-bit devices require **wide** (16-bit) shelves.
  - System has wide-ready shelf. Internal StorageWorks shelf is electrically compatible with 16-bit drives.
- PCI-based one- and three-port (KZPSC-AA/AB) controllers, and one-port Fast Wide Differential (KZPSA-BB) controller allow wide devices to operate in 16-bit mode.
- Wide drives operate in narrow (8-bit) mode when connected to narrow SCSI controllers, such as Integral Internal Fast SCSI-2 controller, PCI-based Fast SCSI-2 controller (KZPAA-AA), and EISA-based controller (KZESC-xx).
- Maximum of two PCI-based one- and three-port KZPSC-xx controllers supported per system.
- One- and three-port StorageWorks RAID Array 230 controllers (KZPSC-xx) support hard drives **only**; tape drives not supported.
- Three-port StorageWorks RAID 230 (KZPSC-BA) supports up to 21 disk drives in up to eight logical groups. RAID slots must be created to support more than eight physical disk drives.
- PCI-based Fast Wide Differential (FWD) SCSI controller (KZPSA-BB) supports externally connected wide disks in BA356 using DWZZB wide differential to wide single-ended converter, or narrow disks using DWZZA wide differential to narrow single-ended converter in BA356.
- KZPSA-BB controller on Windows NT systems support supports up to 15 disks. Digital UNIX and OpenVMS systems support 7 disks.
- Cabling information for Fast-SCSI-2 controllers
  - Internal cables are supplied as needed for factory installed configurations. BC25U-2H cable is used from KZPSC-xx controller to internal shelf.
  - External cables are **not** included and must be ordered separately.
  - KZPSA-BB External cables:
    BN21K-xx from KZPSA to DWZZA, DWZZB and HSZ40 (straight to right angle)
    BN21W-0B Y SCSI-2 cable 68-pin for KZPSA in mid-bus configurations
  - KZPSC-xx External cables:
    BN31S-1E from KZPSC-xx to BA356
  - If all three ports on KZPSC-BA controller are used, use SCSI cable BN31K-0E for third port external connection. **Note:** Third external port blocks one EISA slot.

Storage Controllers for Wide Mode

KZPSC-AA	One-port PCI backplane RAID controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT
KZPSC-BA	Three-port PCI backplane RAID controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT
KZPSA-BB	PCI-based Fast Wide Differential (FWD) SCSI controllers
KZPSM-AA	PCI-based combination Ethernet and Fast Wide Single-Ended (FWSE) SCSI controller

Hard Drives for Wide Mode

RZ26N-VW	1.05 GB, 3.5-inch half-height disk drive
RZ28D-VW	2.1 GB, 3.5-inch half-height disk drive
RZ29B-VW	4.3 GB, 3.5-inch half-height disk drive

External Disk Expansion for Wide Mode

- External BA356 StorageWorks modular storage pedestals are supported on all Fast Wide SCSI-2 controllers listed above.
- External BA356 is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- SCSI cable BN21K-xx for KZPSA, and BN31S-1E for KZPSC, is required to connect an external BA356 modular storage pedestal to controller.

BA356-KC	Modular storage pedestal includes BA356-xx basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN31S-1E)) for KZPSC-xx controllers. Order country specific power cord for 240 V use from Step 10.

Step 5b—Internal Removable Media Devices

- Systems include 600 MB CD-ROM; system supports one additional 5.25-inch half-height removable media device.

Removable Media Devices

RRD45-AC	600 MB, 5.25-inch half-height Quad-Speed CD-ROM
TLZ09-LG	8.0 GB, 5.25-inch half-height SCSI 4-mm DAT drive
TZK11-LG	2.0 GB, 5.25-inch half-height SCSI QIC tape drive

Step 5c—External Storage

Tabletop Tape Expansion

- Integral Fast SCSI-2 controller, if not connected to internal storage assembly, can be extended outside the system enclosure via the SCSI-out port to support external SCSI devices. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.
- External tape drives are also supported on optional KZPAA Fast SCSI-2 (**Narrow**) controllers **only**; maximum external bus length, including cable and tape device cannot exceed 3.0 meters. External tape drives not supported on KZESC-xx or KZPSC-xx controllers.
- Each tabletop tape device **requires** three-foot SCSI cable (BC09D-03).

TLZ09-DA	8.0 GB, 4mm DAT tabletop tape drive
TLZ7L-DA[1,2]	32.0-96.0 GB 4-mm DAT autoloader
TZ87-TA	20.0 GB 5.25-inch tabletop tape drive
SZ107-AA	140.0 GB loader(Digital UNIX and OpenVMS only)
TSZ07-BA/CA	1600/6250-bit/inch 9-track tabletop magtape drive (Digital UNIX and OpenVMS only)
TKZ15-TA	5.0 GB 8mm tabletop tape drive (Digital UNIX and OpenVMS only)

1 Includes four cartridge loader. Twelve cartridge magazine supported (TLZ7L-12).
2 Windows NT operating system does not support unattended back-up mode without third-party software.

Step 5d—DSSI Storage (OpenVMS systems only)

- System supports up to two KFESA or four KFESB EISA/DSSI adapters; KFESA and KFESB adapters can be mixed on the same system.
  - Maximum of two adapters if all KFESA.
  - Maximum of two adapters if one is KFESA.
  - Maximum of four adapters if all KFESB.
  - Maximum of three KFPSA adapters.
- Maximum number of EISA-based controllers of all types in combination is governed by EISA bus IRQ address assignments; see EISA Bus IRQ Address Table.
- Each internal storage assembly in system in single/split-bus mode supports one/two HSD10 DSSI/SCSI converters.
- Disk drives installed "behind" HSD10 must be **narrow.**
- Cabling information for DSSI controllers:
  - DSSI devices supported on OpenVMS only.
  - DSSI cables must be ordered separately.
  - KFESB/KFPSA uses "Micro-Ribbon" connection.
  - KFESB/KFPSA to any external "Pin-Socket" DSSI connection requires BC22Q-xx.
  - KFESB/KFPSA to any external "Micro-Ribbon" DSSI straight connection requires BC21Q-xx.
  - KFESB/KFPSA to any external "Micro-Ribbon" DSSI right-angle connection requires BC29S-xx DSSI cable.
  - KFESB/KFPSA to HSD10 requires BC29S-xx. If HSD10 is factory installed, BC29S-06 cable is included.
  - HSD10 to HSD10 (inside system) requires BC29U-02.
  - BC29U-06 (KFESB to HSD10) is provided if factory installed.
  - HSD10 to HSD10 (between systems) requires BC29T-09.
  - HSD10 to any external "Micro-Ribbon" DSSI connection (all other DSSI systems and storage devices) requires BC29S-xx for straight connection to external device; or BC29T-09 for right-angle connection to external device.

Step 5d—DSSI Storage (OpenVMS systems only) *continued*

DSSI Adapters

KFESB-AA	EISA-based single-DSSI controller (OpenVMS systems **only**); maximum four per system
KFPSA-AA	PCI-to-DSSI controller (OpenVMS Systems **only**); maximum three per system.
HSD10-AA	StorageWorks Array Controller mounts in BA350-xx shelf; supports up to seven SCSI-2 disks, see Storage section for additional devices supported.

Step 5e—PCI to CI Storage Host Adapter (OpenVMS Systems only)

CIPCA-AA	PCI-to-CI adapter Maximum two per system; requires one PCI slot and one EISA slot. Minimum Operating System Version: OpenVMS 6.2-1H2 Minimum Console Revision: V4.4 Requires one of the following CI cables per adapter:
BNCIA-10	10-meter CI cable
BNCIA-20	20-meter CI cable
BNCIA-45	45-meter CI cable

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI, ThinWire, 10BaseT selectable).
- Select networking cable:
  - BNE4G-xx for AUI
  - BC16M-xx for ThinWire (H8255-00 terminator cable required)
  - BN25G-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported.
- See EISA Bus IRQ Address Table for maximum number of **each** EISA-based network controller, and total number of EISA-based controllers of all types in combination, supported per system.

		Maximum # supported		
Order Number	**Description**	**Digital UNIX**	**OpenVMS**	**Windows NT**
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment	2	2	2
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment (requires 2 EISA slots)	1	1	1
DEFEA-UA	EISA-based DEC FDDIcontroller UTP Attachment	2	2	2
DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS)	4	4	1
DNSES-AA	EISA-based synchronous communications controller	3	3	0
CXI01-AA/AD	EISA-based asynchronous multiplexer	2	2	2
DIIAA-AA	Digiboard ISA Datafire-U ISDN controller (available as **spare** only)	0	0	1
DIIAA-AB	Digiboard ISA Datafire-ST ISDN controller (available as **spare** only)	0	0	1
DE500-XA	PCI-based Fast Ethernet controller	2	2	2
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card	3	3	3
DEFPA-AA*	PCI to FDDI Adapter, SAS, MMF, SC	2	2	2
DEFPA-DA*	PCI to FDDI Adapter, DAS, MMF, SC	2	2	2
DEFPA-UA*	PCI to FDDI Adapter, SAS, TP-PMD	2	2	2
PBXNP-AA	PCI Token Ring Adapter	1	1	0

* Cables: Fiber, Duplex, "SC" to "MIC" (concentrator): BN34D-xx; Fiber, Duplex, "SC" to "SC": BN34B-xx; Fiber, Duplex, "SC" to "ST": BN34A-xx; Copper STP, 8 cond, wired pin-pin: BN26M-xx; Copper STP, 8 cond, wired cross-over: BN26S-03.

Step 6a—MEMORY CHANNEL Interconnect

Digital UNIX Systems

- Require Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster license

MEMORY CHANNEL requirements for currently installed AlphaServer 2000's:

- Console firmware at revision 4.4 or higher.
- B2111-AA module at revision H or higher; if not at this level order H3095-AA option.

Note: Since systems with MEMORY CHANNEL typically employ robust disk storage arrays that benefit from multiple high-performance controllers, new customers should consider AlphaServer 2100A systems which include eight PCI slots.

Check installed AlphaServer 2000 for MEMORY CHANNEL readiness:

- P00>>> examine -b econfig:20008
  - At the console prompt, enter **examine -b econfig:20008**
- econfig: 20008 04
  - If a hexidecimal value, **04** or greater is returned, I/O module supports MEMORY CHANNEL.
  - If a hexidecimal value is less than **04** is returned, order the following:

H3095-AA	CPU backplane, Revision H

Note: New AlphaServer 2000's systems shipped from the factory are MEMORY CHANNEL ready.

- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-AA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported on AlphaServer 2000
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAG-AA	TruCluster Software for Digital UNIX
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAG-AA	OpenVMS Cluster license

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation. For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 7—Additional Power Supply

- Additional power supply required if configured system includes two CPUs. In single CPU configurations, the additional power supply may be added for n+1 redundancy.
- **Americas and Asia Pacific orders:**
  - If additional power supply is factory installed, 120 V U.S. power cord is included when alternate is not selected.
  - If additional power supply is ordered as **spare,** power cord **must** be ordered separately, see Step 10.
- **European orders:**
  - If additional power supply is factory installed or ordered as **spare,** country specific power cord **must** be ordered separately, see Step 10.
- See UPS information following System Specifications

H7895-AA 400-Watt power supply

Step 8—Terminals and Printers

Systems include two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Digital UNIX and OpenVMS systems

Console terminals can either be graphics monitor connected to the included video graphics adapter (See Step 4), or a serial video terminal. If a serial video terminal is used as the console terminal, it must be VT220, VT320, VT420, or VT520 compatible. These terminals have the graphics capability required for the EISA Configuration Utility.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required for each connection. A cable must be ordered unless otherwise provided.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required for each connection. A cable must be ordered unless otherwise provided.

Step 9—Software

Windows NT systems

System includes Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ Windows NT Server documentation kit

Digital UNIX Concurrent Use Licenses

Select user licenses and additional software as required. Media and documentation is **required** for first system on site.

Software Processor Code = G for all software, 1-2 processors

Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F Digital UNIX Concurrent Use 16-user license
QL-MT7AG-AA Digital UNIX Traditional unlimited user license
QL-MT5AG-AA Digital UNIX developer's extension license

Step 9—Software *(continued)*

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8	Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX on CD-ROM

DECnet Licenses

QL-MTJAG-AA	DECnet/OSI end-system license for Digital UNIX
QL-MTKAG-AA	DECnet/OSI extended function license for Digital UNIX

OpenVMS Concurrent Use User Licenses

Select user licenses and additional software as required. Media and documentation is **required** for first system on site.

Software Processor Code = G for all software, 1-4 processors

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AG-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-MT1AG-H8	OpenVMS V6.2-1H1 media and documentation on CD-ROM, included with system
QA-001AA-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet Licenses

QL-MTGAG-AA	DECnet extended function license for OpenVMS
QL-MTHAG-AA	DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information

EK-410AB-MG	DSSI VMScluster Installation Guide
EK-D4AXP-TS	DSSI VMScluster Troubleshooting Guide

Step 10—Keyboards and Power Cords

Systems ordered in the Americas and Asia Pacific include 120 V U.S. power cord and keyboard unless alternate is specified. Select country specific power cord and keyboard for **all** systems ordered in Europe.

Keyboards

Windows NT/ Digital UNIX	OpenVMS	
LK471-A2	**LK461-A2**	U.S./English
LK471-AB	**LK461-AB**	Belgian
	LK461-AC	Canadian/French
LK471-AD	**LK461-AD**	Danish
LK471-AE	**LK461-AE**	United Kingdom
	LK461-AF	Finnish
LK471-AG	**LK461-AG**	German
	LK461-AH	Dutch
LK471-AI	**LK461-AI**	Italian
LK471-AK	**LK461-AK**	Swiss/Generic
	LK461-AL	Swiss/German
	LK461-AM	Swedish
LK471-AN	**LK461-AN**	Norwegian
LK471-AP	**LK461-AP**	French
	LK461-AQ	Canadian/English
LK471-AS	**LK461-AS**	Spanish
LK471-AV	**LK461-AV**	Portuguese

Power Cords

BN09A-1K*	U.S., Canada, Japan, 120 V
BN19H-2E	Australia/New Zealand
BN19C-2E	Central Europe
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India/South Africa
BN18L-2E	Israel

* Orderable as 17-00083-09

Step 11—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- System includes three-year hardware warranty, on-site with 5 x 9, 24-hour response time. Select optional Hardware Supplemental Support Services if required.

AlphaServer 2000 Systems 5/300 Systems

FM-S64HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-S64HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-S6512-36	Years 1-3, 5 x 12, 4-hour response time
FM-S6512-60	Years 1-5, 5 x 12, 4-hour response time
FM-S6616-36	Years 1-3, 6 x 16, 4-hour response time
FM-S6616-60	Years 1-5, 6 x 16, 4-hour response time
FM-S6724-36	Years 1-3, 7 x 24, 4-hour response time
FM-S6724-60	Years 1-5, 5 x 24, 4-hour response time

AlphaServer 2000 Systems 5/375 Systems

FM-S84HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-S84HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-S8512-36	Years 1-3, 5 x 12, 4-hour response time
FM-S8512-60	Years 1-5, 5 x 12, 4-hour response time
FM-S8616-36	Years 1-3, 6 x 16, 4-hour response time
FM-S8616-60	Years 1-5, 6 x 16, 4-hour response time
FM-S8724-36	Years 1-3, 7 x 24, 4-hour response time
FM-S8724-60	Years 1-5, 5 x 24, 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for Windows NT include advisory and remedial software support for the time period indicated.
- Software service upgrades for **Digital UNIX** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.
- Software service upgrades for **OpenVMS** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 2000 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2000 systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2000 systems
FM-45NTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 2000 systems
FM-DSOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 2000 systems
FM-DSOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 2000 systems
FM-DSOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 2000 systems
FM-DSVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 2000 systems
FM-DSVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 2000 systems
FM-DSVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 2000 systems

Step 11a—Hardware and Software Supplemental Support Services—Europe only

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

AlphaServer 2000 System EISA Bus IRQ Address Table

	EISA Bus IRQ Addresses									Maximum of Each Supported		
Option	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**OpenVMS**	**Digital UNIX**	**Windows NT**
DE422	0	–	–	N	0	0	–	–	–	3	3	3
PB2GA	–	–	–	0	–	–	–	–	–	1	1	1
DEFEA	–	–	–	N	0	0	–	–	0	2	2	2
DNSES	–	–	–	N	0	0	0	0	0	5	5	0
DW300-AA	0	–	–	N	0	0	–	–	0	4	4	4
KZESC	–	–	–	–	–	0	0	0	0	2	2	2
KFESA	–	–	–	N	0	0	0	0	0	2	0	0
KFESB	–	–	–	N	0	0	0	0	0	4	0	0
PB2SX	–	–	–	–	–	–	–	–	–	0	1	0
CXI01	–	–	–	–	–	–	–	–	–	0	2	2

Table Codes:
0 = address is available for device
– = address not available for device
N in address location **9** = address is assigned, but its use is precluded due to presence of PB2GA-xx Video Graphics Adapter

Configuration Rules and Information

- EISA Bus IRQ address assignments are for Digital UNIX and OpenVMS systems only.
- Video Graphics Adapter is included in all systems listed in Step 1. It occupies one EISA bus slot, leaving seven physical slots for all other EISA-based controllers.
- In some cases, the **maximum each** [device] **supported** is less than the number of EISA bus addresses available; this is due to other limitations.
- Only one device can occupy any given IRQ address; if multiples of a device are configured, each device occupies a separate address.
- Match **each** device to be configured to **one** available address. (**Note:** With the table as a worksheet, use a pencil to fill in an "0" for each device; fill in only one "0" per column.)
- The actual IRQ address assignment will be made by the EISA Configuration Utility (ECU) which is run during system manufacture, or in the installed system if the EISA bus is re-configured.
- Prestoserve option (PB2SX) does not require an IRQ address. PB2SX is supported on Digital UNIX systems only.

Specifications

Shipping Dimension		
Height[1]	109 cm (43.3 in.)	
Width[1]	102 cm (40.0 in.)	
Depth[1]	61 cm (24.0 in.)	
Weight	79 kg (174 lb) typical 97 kg (213 lb) maximum	
Installed Dimensions		
Height	60.5 cm (23.8 in.)	
Width	43 cm (16.9 in.)	
Depth	65 cm (25.6 in.)	
Weight	54 kg (109 lb) typical 71 kg (156 lb) maximum	
Clearances	**Operating**	**Service**
Front	75 cm (29.5 in.)	75 cm (29.5 in.)
Rear	15 cm (6 in.)	75 cm (29.5 in.)
Sides	None	75 cm (20/5 in.)
Environmental		
Temperature	Operating[2] Nonoperating Storage (60 days) Rate of change	10° - 40° C (50° - 104° F) Not tested -40° - 66° C (-40° - 151° F) 11° C/hr (20° F/hr)
Relative humidity	Operating Nonoperating Storage (60 days) Rate of change	20–80% 20–80% 10–95% 20%/hr
Maximum wet bulb temperature	Operating Storage (60 days)	28° C (82° F) 46° C (115° F)
Minimum dew point temperature	Operating Storage (60 days)	2° C (36° F) Not tested
Maximum heat dissipation Single supply Dual supply	Current 2390 Btu/hr 4097 Btu/hr	
Air flow and quality	Intake location Exhaust location Particle size Concentration	Front Rear N/A N/A
Altitude	Operating[3] Nonoperating	2000 m (6562 ft) 3600 m (12,000 ft)
Mechanical shock	Operating Nonoperating	7.5 G 10 ms 20 G peak 30 ms
Vibration	Operating	10-500 Hz .1 G peak
Acoustics	 Operating Idle	AverageDeclared 6.2 LwA, B6.5 LwAd, B 6.0 LwA, B6.3 LwAd, B
Regulatory		
Agency approvals	UL Listed to UL1950 (2nd edition) CSA Certified to CAN/CSA-C22.2 No. 950-M89 TUV EN 60950 VDE 0805 GS marked ZH1/618 FCC 15J Part 15 Class B Verified CE Class B Verified VCCI Class II ITE	
Reviewed to	AS 3260 Australian Standard SS 436 14 50 Swedish Standard NZS 6661:1989 New Zealand Standard EN 60 950: 1992 European Norm IEC 950 (2nd edition)	

1 Dimensions of shipping pallet; fork-lift access is on the width dimension
2 Maximum operating temperature at Sea Level. Reduce by 1 C (1.8 F) for each 600 m (2000 ft) above Sea Level.
3 Higher altitudes are possible if maximum operating temperature is reduced (see Temperature, above); other restrictions may apply, such as maximum permissible altitude for hard drives.

Recommended Power Protection/UPS Solutions for AlphaServer 2000 systems

Digital's UPS offerings feature robust On-line design and include EIA232 port for local or network monitoring and plug & play battery extentions. U.S.models feature 3 year hot-swap warranty.

Note: For complete protection all UPS products should be used with data line surge protector.

Prestige UPS - North American Model	
4N-AEABG-AF	Prestige 2kVA (1.3kW), single phase, 60HZ, 120V with 6 ft. cord, 5-20P and (4) 5-15R and (1) 5-20R receptacle; internal 4 minute battery at full UPS load. For unit with extended battery substitute -AG (7 minutes) or -AH (14 minutes).
4N-AEABF-BA/BB	Half/Full add-on battery pack for above UPS. Adds 7/15min per pack.
Prestige UPS - International Model	
4N-AEAAH-AS	Prestige 2.5kVA (1750W) single phase, 50 HZ, 200-240V in/out selectable, 2 module design. 6 ft. input cord with VDE stripped pigtail connection for attachment of country specific plug (by customer). Unit includes (1) IEC320, 20A output receptacle which can be optionally extended to choice of Schuko, French,Brittish or Australian (4N-AEACH-DA - DD) receptacle modules; 8 minute battery at full UPS load.
4N-AEAAH-AB	Add on battery pack for above UPS. Adds 15 minute per pack.
4N-AEWAR-G1	Prestige five year on-site exchange warranty upgrade, U.S. only
Companion Data Surge Protection	
4N-GA249-AB	Modem connection (wall plug-in unit)
4N-GA249-CA	10BaseT connection (wall plug-in unit)
4N-GA510-BF	ThinWire connection (device port)
4N-GA245-xx	Multi-port connection (din rail/rackmount)
4N-GA240-xx	Additional plug-in data modules for 4N-GA249 series devices. All devices include 5 year hot-swap warranty.

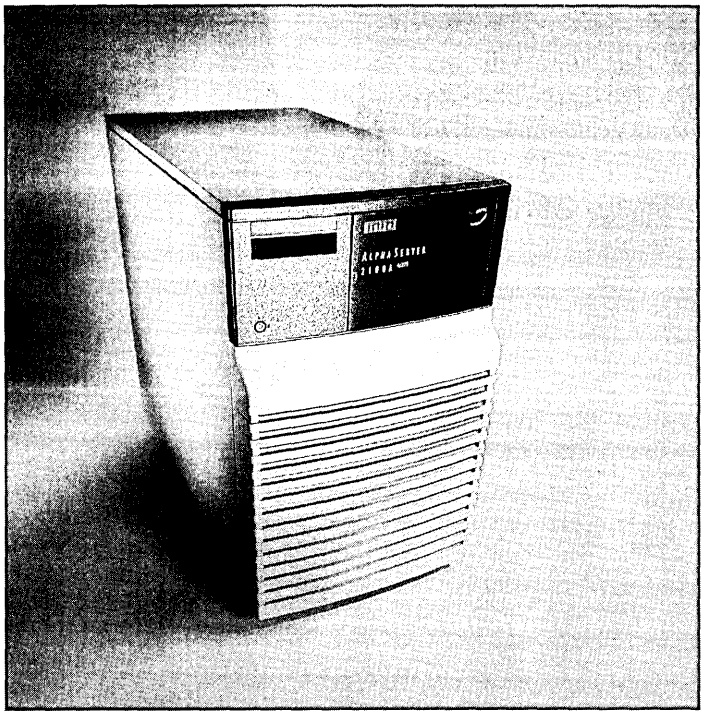
UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Includes cable, media and documentation.

Monitoring Software	Windows NT	Digital UNIX	OpenVMS
Single system shutdown	**4N-AEAES-AA**	**4N-AEAES-AK**	**4N-AEAES-EM**
Network Management and multiple system shutdown*	**4N-AEAES-BA**	**4N-AEAES-BK**	**Call for information**

* Connect-UPS Adapter required: DA/DB=twisted pair, DC/DD=ThinWire

4N-AEAEO-DA/DC	Connect UPS Adapter 120V (North American)
4N-AEAEO-DB/DD	Connect UPS Adapter 220V (International)



AlphaServer 2100A

Product Description

AlphaServer 2100A systems are low-cost Alpha symmetric multiprocessing (SMP) PCI/EISA-based servers. They offer support for OpenVMS, Digital UNIX and Windows NT, and are suitable for general-purpose commercial, high-performance application and database, and PC LAN Superserver computing environments.

AlphaServer 2100A 4/275 (Alpha 21064A microprocessor) features a 275-MHz CPU with 4 MB cache; AlphaServer 2100A 5/250 (Alpha 21164 microprocessor) features a 250-MHz CPU with 4 MB cache; AlphaServer 2100A 5/300 (Alpha 21164 microprocessor) features a 291-MHz CPU with 4 MB cache. Each can be configured with up to four processors of the same speed for symmetric multiprocessing. The systems support up to 2 GB of memory and 64 GB of internal disk storage.

The system bus bandwidth is 667 MB/second and the high-performance PCI I/O subsystem has a peak bandwidth of 132 MB/second. The 33 MB/second EISA I/O bus supports a variety of industry-standard EISA options. The AlphaServer 2100A is configured with 8 PCI slots and 3 EISA slots.

AlphaServer 2100A systems supports StorageWorks storage devices. High-availability features, including optional internal RAID and hot swap of disks, offer data security in mission-critical environments. RAID levels supported are 0 (striping), 1 (shadowing), 0+1 (striped shadowing), and 5 (striping with parity).

AlphaServer 2100A systems are also offered in a rackmountable enclosure.

Step 1—Systems

- See System Bus Slot Table and PCI Option Slot Chart for slot configuration rules.
- Digital UNIX and OpenVMS systems require operating system media and documentation kit for first system on site; see Step 9.
- Windows NT systems include Windows NT Server plus 5-client access V3.51 media (CD-ROM) and license in shrink-wrapped package.
- Systems ordered in the Americas and Asia Pacific (AP) include 120 V U.S. power cord and keyboard unless alternate is specified. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- Options ordered will be factory installed unless specified as **spares**.

AlphaServer 2100A 4/275, 5/250, and 5/300 Systems include

- Alpha microprocessor 21064
  - 275-MHz CPU with 4 MB onboard cache or
- Alpha microprocessor 21164
  - 250 MHz CPU with 4 MB onboard cache or
  - 291 MHz CPU with 4 MB onboard cache
- BA740 large pedestal enclosure which includes
  - Integral 10 MB/s Fast SCSI-2 controller, 8-bit (narrow)
  - Ethernet Card (uses 1 PCI slot)
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - Keyboard port and mouse port
  - 8-slot RZxx storage assembly, 8-bit (narrow) or 16-bit (wide)
  - Three 5.25-inch, half-height removable media slots
  - Eight PCI slots
  - Three EISA slots
  - 602-Watt power supply
- 1.44 MB diskette drive in dedicated slot
- 600 MB Quad-Speed CD-ROM (uses one removable media slot)
- 2.1 GB 7200 RPM disk drive (uses one storage assembly slot)
- Video Graphics Adapter (uses 1 PCI slot)
- Memory (indicated below)
- 3-button mouse
- Keyboard (Americas and AP only)
- Power cord (Americas and AP only)
- Customer documentation
- EISA Configuration Utility
- Hardware Warranty: Three-year, on-site, with 5 x 9, 24-hour response time*
- Software Warranty: 90-day SPD conformance with advisory telephone support*

* Service upgrades are available; see Step 11, Hardware and Software Supplemental Services.

Windows NT Systems include

- Windows NT Server plus 5-client access 3.51 media (CD-ROM) and license in shrink-wrapped package.

Order Number	Memory	Hard Drive	PCI /EISA slots available for additional options
AlphaServer 2100A 4/275—275 MHz Windows NT Systems			
DN-252S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DN-252S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/250—250 MHz Windows NT Systems			
DN-253S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DN-253S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/300—291 MHz Windows NT Systems			
DN-254S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DN-254S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA

Step 1—Systems *(continued)*

Digital UNIX Systems include

- Digital UNIX operating system base license (V3.2D-2)
- Digital NAS Base Server 200 for Digital UNIX license (QL-306AG-AA) includes the following layered products (order media and documentation separately).
  - PrintServer Software (Licensed with appropriate Digital Printer)
  - DECmessageQ for Digital UNIX Run-Time only
  - Digital DCE Run-Time Services for Digital UNIX
  - Objectbroker for Digital UNIX Run-Time only
  - POLYCENTER Advanced File System utilities
  - POLYCENTER NetWorker Save and Restore for Digital UNIX (Server)
  - PATHWORKS for Digital UNIX LAN Manager
  - PATHWORKS for Digital UNIX Netware
  - Digital UNIXServer Extensions
  - Logical Storage Manager
- Digital UNIX operating system is factory installed.

Order Number	Memory	Hard Drive	PCI/EISA slots available for additional options
AlphaServer 2100A 4/275—275 MHz Digital UNIX systems			
DA-252S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DA-252S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/250—250 MHz Digital UNIX systems			
DA-253S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DA-253S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/300—291 MHz Digital UNIX systems			
DA-254S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DA-254S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA

OpenVMS Systems include

- OpenVMS operating system base license. (V6.2-1H1)
- NAS 200 for OpenVMS license (QL-23EAG-AA), includes the following layered products (order media and documentation separately).
  - DECwindows Motif for OpenVMS Alpha
  - DECwindows Motif Worldwide support for OpenVMS Alpha
  - DECprint Supervisor for OpenVMS Alpha, (Base, Plus, Open)
  - PrintServer Software (Licensed with appropriate Digital printer)
  - DECmessageQ for OpenVMS Alpha Run-time option only
  - Objectbroker for OpenVMS Alpha Run-time option only
  - Polycenter Software Distribution for OpenVMS Alpha (Client)
  - DECnet for OpenVMS Alpha End System
  - DECnet/OSI for OpenVMS Alpha End System
  - DEC TCP/IP services for OpenVMS Alpha
  - PATHWORKS for OpenVMS (LAN Manager)
  - PATHWORKS for OpenVMS (Macintosh)
  - PATHWORKS for OpenVMS (Netware)
- OpenVMS operating system is factory installed.
- OpenVMS V6.2 1-1H1 media on CD (QA-MT1AG-H8) included.

Order Number	Memory	Hard Drive	PCI/EISA slots available for additional options
AlphaServer 2100A 4/275—275 MHz OpenVMS systems			
DY-252S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DY-252S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/250—250 MHz OpenVMS systems			
DY-253S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DY-253S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA
AlphaServer 2100A 5/300—291 MHz OpenVMS systems			
DY-254S1-J9	128 MB	1 x 2.1 GB	6 PCI / 3 EISA
DY-254S1-K9	512 MB	1 x 2.1 GB	6 PCI / 3 EISA

Step 1—Systems *(continued)*

- Use System Bus Slot Table for slot configuration rules when adding additional CPUs and memory.
- See PCI Option Slot Table for options supported in specific PCI slots.

System Bus Slot Table

Recommended Slots	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
1 CPU system	—	CPU 0	—	Memory 0	Memory 1	Memory 2	Memory 3
2 CPUs system	—	CPU 0	CPU 1	Memory 0	Memory 1	Memory 2	Memory 3
3 CPUs system	CPU 2	CPU 0	CPU 1	Memory 0	Memory 1	Memory 2	Memory 4
4 CPUs system	CPU 3	CPU 0	CPU 1	Not available	CPU 2	Memory 0	Memory 1

PCI Option Slot Table

- Some PCI options are **not** supported behind a PCI-PCI bridge on specific operating systems. Use the following table for options restricted to slots **4, 5, 6 and 7 only**. All other options supported on the AlphaServer 2100A not listed here are supported in any PCI slot (0, 1, 2, 3, 4, 5, 6, 7).

Order Number	Description	Max #	Supported in PCI slots only	Operating System
KZPSA-BB	One-port Fast Wide Differential SCSI controller	3	4, 5, 6, 7	Windows NT
PB2GA-JB[1]	S3-Trio64 Graphics option 1MB	1	4, 5, 6, 7	Windows NT
CCMAA-BA	PCI to MEMORY CHANNEL controller	2	4, 5, 6, 7	Digital UNIX

1 Graphics option standard in all systems

Step 2—Additional CPUs (Symmetrical Multiprocessing (SMP) Upgrades)

Order up to three additional CPUs, for a maximum of four—See System Bus Slot Table for configuration rules.

- Additional CPUs **must** match the speed of CPU in system.
- Four-CPU systems are restricted to two memory slots.

Note: Adding CPUs may require an additional power supply (see Step 7).

Additional CPUs

460NR-AA	Windows NT SMP upgrade, includes one 4/275 MHz CPU processor; SMP license is not required.
470NR-AA	Windows NT SMP upgrade, includes one 5/250 MHz CPU processor; SMP license is not required.
480NR-AA	Windows NT SMP upgrade, includes one 5/300 MHz CPU processor; SMP license is not required.
460AR-AA	Digital UNIX SMP upgrade includes one 4/275 MHz CPU processor and Digital UNIX SMP license.
470AR-AA	Digital UNIX SMP upgrade includes one 5/250 MHz CPU processor and Digital UNIX SMP license.
480AR-AA	Digital UNIX SMP upgrade includes one 5/300 MHx CPU processor and Digital UNIX SMP license.
460YR-AA	OpenVMS SMP upgrade includes one 4/275 MHz CPU processor and OpenVMS SMP license.
470YR-AA	OpenVMS SMP upgrade includes one 5/250 MHz CPU processor and OpenVMS SMP license.
480YR-AA	OpenVMS SMP upgrade includes one 5/300 MHz CPU processor and OpenVMS SMP license.

Step 3—Memory

See System Bus Slot Table for slot configuration rules.

- One, two, and three CPU systems support a total of four memory boards in any combination.
- Four CPU systems support total of two memory boards in any combination.
- Windows NT 3.51 supports up to 2 GB of memory, requires Windows NT 3.51 Service Pack 4
- Digital UNIX V3.2D-2 supports up to 2 GB of memory.
- OpenVMS V6.2 1-1H1 supports up to 2 GB of memory.

MS450-BA	64 MB memory module (AlphaServer 2100A 4/275 systems only)
MS451-DA	128 MB memory module
MS451-FA	512 MB memory module

Step 3a—Prestoserve Nonvolatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems only
- Maximum one Prestoserve option per system

DJ-ML200-AA	2 MB PCI Prestoserve option
DJ-ML200-BA	4 MB PCI Prestoserve option
DJ-ML200-CA	8 MB PCI Prestoserve option

Step 4—Monitors

Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

Windows NT systems

- Windows NT systems **require** a graphics monitor to run **all** system functions.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.

Digital UNIX and OpenVMS systems

- All console functions, including the EISA Configuration Utility (ECU) and the Standalone Configuration Utility can be performed using a standard video terminal (VT2xx, VT3xx, VT4xx, VT5xx) connected to one of the system's serial ports (See Step 8).
- For graphics console functionality, order a graphics monitor.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.

VRC15-KA/K4	15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 not included, order separately.
VRT17-PA/P4	17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.
VRC21-LA/L4	21" (19.6" viewable image size) ultra high-resolution color monitor with Ligh Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.

Step 5—Storage

Internal Disk Storage Assembly

- Included storage assembly supports eight 3.5-inch disk drives.
- Integral 8-bit Fast SCSI-2 controller supports maximum of seven devices in system enclosure (three 5.25-inch removable media devices and four 3.5-inch disk drives). All disk drives connected to this controller operate in **narrow** mode.
- One additional storage assembly in system enclosure supports eight additional 3.5-inch disk drives. Additional storage assembly requires an additional power supply (see Step 7).
- Internal storage assemblies are normally configured for split-bus (two buses), four drives per bus. By reversing the positions of the terminator and jumper plugs, internal storage assemblies can be reconfigured for single-bus operation with a maximum of seven disk drives per storage assembly.
- Manufacturing normally configures internal storage assemblies in split-bus mode. If there are not enough storage controllers to support the number of internal disk drives ordered, Manufacturing will configure the internal storage assemblies for single-bus mode.
- Internal storage assembly drive slots are physically interleaved with electrically contiguous drives in every other slot.
- **Note: Wide** disk drives configured on a **narrow** bus will operate in **narrow** mode. **Narrow** disk drives configured on a **wide** bus will operate in **narrow** mode. **Wide** and **narrow** devices can be mixed on a single bus.

Additional Storage Assembly for Internal Disk Storage

- Storage assembly supports 16-bit (wide) and/or 8-bit (narrow) modes.
- Requires an additional power supply (see Step 7).
- Includes SCSI cables for factory integration and for field installation if ordered as spare.

BA35E-SA	Storage assembly supports eight 3.5-inch, half-height hard drives

Step 5a—Controllers and Storage Devices for 16-bit (Wide) Mode

- Internal StorageWorks 16-bit Wide Shelves:
  - 16-bit devices require 16-bit (wide) shelves.
  - Internal StorageWorks shelf is electrically compatible with 16-bit (wide) drives.
- Wide Storage Controllers allow wide devices to operate in 16-bit mode.
  - KZPSC-xx PCI-based one- and three-port StorageWorks RAID 230 controllers support hard drives only; tapes are not supported.
  - Three-port StorageWorks RAID 230 controller KZPSC-BA supports up to 21 disk drives in up to eight logical groups. RAID sets must be created to support more than eight physical disk drives.
  - Maximum of four KZPSC-xx controllers supported per system.
  - KZPSA-BB PCI-based one-port Fast Wide Differential SCSI controller supports externally connected wide disks in BA356 using DWZZB fast wide differential to wide single-ended converter, or narrow disks using DWZZA fast wide differential to narrow single-ended converter in BA356.
  - KZPSA-BB controller on Windows NT systems support supports up to 15 disks. Digital UNIX and OpenVMS systems support 7 disks.
- Maximum of four PCI- or EISA-based RAID controllers supported per system.
- **Note:** Wide drives operate in narrow (8-bit) mode when connected to narrow SCSI controllers, such as Integral Fast SCSI-2 controller.
- Cabling information for Fast SCSI-2/3 controllers
  - Internal cables are supplied as needed for factory installed configurations. BC25T-3L cable is used from KZPSC-xx or KZPSM-AA controllers to internal shelf.
  - External cables are **not** included and must be ordered separately.
  - KZPSA-BB External cables:
    BN21K-xx from KZPSA to DWZZA, DWZZB and HSZ40 (straight to right angle)
    BN21W-0B Y SCSI-3 cable 68-pin for KZPSA in mid-bus configurations
  - KZPSC-xx External cables:
    BN31S-1E from KZPSC-xx to BA356
  - If all three ports on KZPSC-BA controller are used, use SCSI cable BN31K-0E for third port external connection. **Note:** Third external port blocks one PCI or EISA bulkhead.

Storage Controllers for Wide Mode

KZPSC-AA	One-port PCI backplane RAID controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT
KZPSC-BA	Three-port PCI backplane RAID controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX and Windows NT

Step 5a—Controllers and Storage Devices for 16-bit (Wide) Mode *(continued)*

Storage Controllers for Wide Mode

KZPSA-BB	One-port PCI-based Fast Wide Differential (FWD) SCSI controller
KZPSM-AA	PCI-based Combination Ethernet and Fast Wide SCSI controller

Hard Drives for Wide Mode

RZ26N-VW	1.05 GB, 3.5-inch half-height disk drive
RZ28D-VW	2.1 GB, 3.5-inch 7200 RPM half-height disk drive
RZ29B-VW	4.3 GB, 3.5-inch 7200 RPM half-height disk drive

External Disk Expansion for Wide Mode

- External BA356 StorageWorks modular storage pedestals are supported on all Fast Wide SCSI-2/3 controllers listed in Step 5a.
- External BA356 is not supported on integral Fast SCSI-2.
- SCSI cable BN21K-xx for KZPSA, and BN31S-1E for KZPSC, is required to connect an external BA356 modular storage pedestal to controller.

BA356-KC	Modular storage pedestal includes BA356-xx basic shelf, BA35X-HF universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN31S-1E) for KZPSC-xx controllers. Order country specific power cord for 240 V use from Step 10.

Step 5b—Internal Removable Media Devices

Systems include 600 MB CD-ROM; system supports two additional 5.25-inch half-height removable media devices, or one 5.25-inch, full-height removable media device.

Removable Media Devices

RRD45-AC	600 MB 5.25-inch half-height quad-speed CD-ROM
TLZ09-LG	8.0 GB 5.25-inch half-height SCSI 4-mm DAT
TZK11-LG	2.0 GB 5.25-inch half-height SCSI QIC tape

Step 5c—External Storage

Tabletop Tape Expansion

- The integral Fast SCSI-2 controller **cannot** be extended outside the system enclosure to support external SCSI devices.
- External tape drives are supported on optional Fast SCSI-2 8-bit narrow controller (KZPAA-AA) only.
- Each tabletop tape device **requires** three-foot SCSI cable (BC09D-03)

Storage Controller for Narrow Mode (required for external tape expansion)

KZPAA-AA	PCI-based one-port high performance Fast SCSI-2 controller

Step 5c—External Storage (continued)

Tape Drives for Narrow Mode

TLZ09-DA	8.0 GB, 4mm DAT tabletop tape drive
TLZ7L-DA[1,2]	32.0-96.0 GB 4-mm DAT autoloader
TZ87-TA	20.0 GB DLT 5.25-inch tabletop tape drive
SZ107-AA	140.0 GB DLT loader (Digital UNIX and OpenVMS only)
TSZ07-BA/CA	1600/6250-bit/inch 9-track tabletop magtape drive (Digital UNIX and OpenVMS only)
TKZ15-TA	5.0 GB 8mm tabletop tape drive (Digital UNIX and OpenVMS only)

(1) Includes four cartridge loader. Twelve cartridge magazine supported (TLZ7L-12).

(2) Windows NT operating system does not support unattended back-up mode without third-party Arcada software.

Step 5d—DSSI Storage (OpenVMS systems only)

- System supports up to two KFESA or KFESB EISA/DSSI adapters; KFESA and KFESB adapters can be mixed on the same system.
- System supports four KFPSA PCI DSSI adapters.
- Each internal storage assembly in system in single/split-bus mode supports one/two HSD10 DSSI/SCSI converters.
- Disk drives installed "behind" HSD10 must be 8-bit (narrow).
- Cabling information for DSSI controllers:
- DSSI cables must be ordered separately.
  - KFESB/KFPSA uses "Micro-Ribbon" connection.
  - KFESB/KFPSA to any external "Pin-Socket" DSSI. connection requires BC22Q-xx.
  - KFESB/KFPSA to any external "Micro-Ribbon" DSSI straight connection requires BC21Q-xx.
  - KFESB/KFPSA to any external "Micro-Ribbon" DSSI right-angle connection requires BC29S-xx DSSI cable.
  - KFESB/KFPSA to HSD10 requires BC29S-xx. If HSD10 is factory installed, BC29S-06 cable is included.
  - HSD10 to HSD10 (inside system) requires BC29U-02.
  - BC29U-06 (KFESB to HSD10) is provided if factory installed.
  - HSD10 to HSD10 (between systems) requires BC29T-09.
  - HSD10 to any external "Micro-Ribbon" DSSI connection (all other DSSI systems and storage devices) requires BC29S-xx for straight connection to external device; or BC29T-09 for right-angle connection to external device.

DSSI Adapters

KFPSA-AA	PCI-to-DSSI controller (OpenVMS systems **only**); maximum four per system.
KFESB-AA	EISA-based single-DSSI controller (OpenVMS systems **only**); maximum two per system
HSD10-AA	StorageWorks Array controller; supports seven SCSI-2 disks, tape, and optical devices. (See Storage section for supported devices.)

DSSI Option Pack

- OpenVMS DSSI starter option pack includes:
  - Two KFESB-AA EISA-based DSSI adapters
  - Two HSD10-AA DSSI/SCSI converter
  - Three RZ28 2-GB disk drives
  - Two BC29S-06 DSSI cables*
  - VMScluster license (QL-MUZAG-AA)

SD002-AA OpenVMS DSSI Starter Option Pack

* Additional cables are required to connect to external DSSI storage devices or systems

Step 5e—PCI to CI Storage Host Adapter (OpenVMS Systems only)

CIPCA-AA	PCI-to-CI adapter, Maximum two per system; requires one PCI slot and one EISA slot. Minimum Operating System Version: OpenVMS 6.2-1H2 Minimum Console Revision: V4.4 Requires one of the following CI cables per adapter:
BNCIA-10	10-meter CI cable
BNCIA-20	20-meter CI cable
BNCIA-45	45-meter CI cable

Step 6—Networks and Communications

- See PCI Option Slot Chart for slot configuration rules.
- Systems include Ethernet controller (AUI, 10BaseT, or ThinWire selectable)
- Select networking cable
  - BNE4C-xx for AUI
  - BN25G-xx for 10BaseT
  - BC16M-xx for ThinWire, and H8225-00 Terminator
- Maximum of 4 PCI-based network controllers supported.

		Maximum # supported		
Order Number	**Description**	**Digital UNIX**	**OpenVMS**	**Windows NT**
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment	2	2	2
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment (requires 2 EISA slots)	1	1	1
DEFEA-UA	EISA-based DEC FDDIcontroller UTP Attachment	2	2	2
DNSES-AA	EISA-based synchronous communications controller	3	3	0
CXI01-AA/AD	ISA-based asynchronous multiplexer	2	2	2
DIIAA-AA	Digiboard ISA datafire-U ISDN Controller (Available as a SPARE Only)	0	0	1
DIIAA-AB	Digiboard ISA datafire-ST ISDN Controller (Available as a SPARE Only)	0	0	1
DEFPA-AA*	PCI to FDDI Adapter, SAS, MMF, SC	4	4	4
DEFPA-DA*	PCI to FDDI Adapter, DAS, MMF, SC	4	4	4
DEFPA-UA*	PCI to FDDI Adapter, SAS, TP-PMD	4	4	4
DE435-AA	PCI-based Digital Etherworks 32-bit High Performance Network Interface Card	4	4	4
DE500-XA	PCI-based Fast Ethernet controller	2	2	2
PBXNP-AA	PCI Token Ring Adapter	1	1	0

* Cables: Fiber, Duplex, "SC" to "MIC" (concentrator): BN34D-xx; Fiber, Duplex, "SC" to "SC": BN34B-xx; Fiber, Duplex, "SC" to "ST": BN34A-xx; Copper STP, 8 cond, wired pin-pin: BN26M-xx; Copper STP, 8 cond, wired cross-over: BN26S-03.

Step 6a—MEMORY CHANNEL Interconnect

Digital UNIX Systems

- Require Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster license

Configuring information:

- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.

Note: CCMAA-BA (PCI to MEMORY CHANNEL controller) must be installed in PCI slots 4-7

Step 6a— MEMORY CHANNEL Interconnect *(continued)*

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported on AlphaServer 2100A
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAG-AA	TruCluster Software for Digital UNIX
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAG-AA	OpenVMS Cluster license for Alpha systems

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation. For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 7—Additional Power Supply

- Additional power supply is **required** if configured system includes second storage assembly, **or**
  - More than two CPUs are installed, or
  - Two CPUs and more than one memory board is installed
- In lesser configurations, the additional power supply may be ordered for n+1 redundancy.
- Americas and Asia Pacific orders:
  - If additional power supply is factory installed, 120 V U.S. power cord is included when alternate is not selected.
  - If additional power supply is ordered as **spare,** power cord **must** be ordered separately, see Step 10.
- European orders:
  - If additional power supply is factory installed **or** ordered as **spare,** country specific power cord **must** be ordered separately, see Step 10.

H7893-AA 602-watt power supply

Step 8—Terminals and Printers

Systems include two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Digital UNIX and OpenVMS systems

Console terminals can either be graphics monitor connected to the included video graphics adapter (See Step 4), or a serial video terminal. If a serial video terminal is used as the console terminal, it must be VT320, VT420, or VT520 compatible. These terminals have the graphics capability required for the EISA Configuration Utility.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required for each connection. A cable must be ordered unless otherwise provided.

Step 9—Software

Windows NT systems

Systems include Windows NT Server plus 5-client access V3.51 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ Windows NT Server documentation kit

Step 9—Software *(continued)*

Digital UNIX systems

Select user licenses and additional software as required. Media and documentation is **required** for first system on site.

Software Processor Code = G for all software, 1-4 processors

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated Digital UNIX system. Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AM-3G	Digital UNIX Concurrent Use 32-user license
QL-MT7AM-3H	Digital UNIX Concurrent Use 64-user license
QL-MT7AG-AA	Digital UNIX Traditional unlimited user license
QL-MT5AG-AA	Digital UNIX developer's extension license

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8	Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX on CD-ROM

DECnet Licenses

QL-MTJAG-AA	DECnet/OSI end-system license for Digital UNIX
QL-MTKAG-AA	DECnet/OSI extended function license for Digital UNIX

OpenVMS systems

Select user licenses and additional software as required. Media and documentation is **required** for first system on site.

Software Processor Code = G for all software, 1-4 processors
OpenVMS Concurrent Use User Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AG-AA	OpenVMS Traditional unlimited user license

Step 9—Software *(continued)*

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-MT1AG-H8	OpenVMS V6.2-1H1 media and documentation on CD-ROM, included with system
QA-001AA-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet Licenses

QL-MTGAG-AA	DECnet extended function license for OpenVMS
QL-MTHAG-AA	DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information

EK-410AB-MG	DSSI VMScluster Installation Guide
EK-D4AXP-TS	DSSI VMScluster Troubleshooting Guide

Step 10—Keyboards and Power Cords

Systems ordered in the Americas and Asia Pacific include 120 V U.S. power cord and keyboard unless alternate is specified. Select country specific power cord and keyboard for **all** systems ordered in Europe.

Keyboards

Windows NT and Digital UNIX	OpenVMS	
LK471-A2	**LK461-A2**	U.S./English
LK471-AB	**LK461-AB**	Belgian
	LK461-AC	Canadian/French
LK471-AD	**LK461-AD**	Danish
LK471-AE	**LK461-AE**	United Kingdom
	LK461-AF	Finnish
LK471-AG	**LK461-AG**	German
	LK461-AH	Dutch
LK471-AI	**LK461-AI**	Italian
LK471-AK	**LK461-AK**	Swiss/Generic
	LK461-AL	Swiss/German
	LK461-AM	Swedish
LK471-AN	**LK461-AN**	Norwegian
LK471-AP	**LK461-AP**	French
	LK461-AQ	Canadian/English
LK471-AS	**LK461-AS**	Spanish
LK471-AV	**LK461-AV**	Portuguese

Step 10—Keyboards and Power Cords *(continued)*

Power Cords

BN27Y-1J*	U.S., Canada, Japan, 120 V
BN19H-2E	Australia/New Zealand
BN19C-2E	Central Europe
BN19A-2E	UK/Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India/South Africa
BN18L-2E	Israel

* Orderable as 17-00083-15

Step 11—Hardware and Software Supplemental Support Services

Hardware and Software Supplemental Support Services—Americas and Asia Pacific only

- Systems include three-year warranty, on-site with 5x9, 24-hour response time.

AlphaServer 2100 4/275 Systems

FM-454HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-454HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-45512-36	Years 1-3, 5 x 12, 4-hour response time
FM-45512-60	Years 1-5, 5 x 12, 4-hour response time
FM-45616-36	Years 1-3, 6 x 16, 4-hour response time
FM-45616-60	Years 1-5, 6 x 16, 4-hour response time
FM-45724-36	Years 1-3, 7 x 24, 4-hour response time
FM-45724-60	Years 1-5, 7 x 24, 4-hour response time

AlphaServer 2100 5/250 and 5/300 Systems

FM-S54HR-36	Years 1 - 3, 5 x 9, 4-hour response time
FM-S54HR-60	Years 1 - 5, 5 x 9, 4-hour response time
FM-S5512-36	Years 1 - 3, 5 x 12, 4-hour response time
FM-S5512-60	Years 1 - 5, 5 x 12, 4-hour response time
FM-S5616-36	Years 1 - 3, 6 x 16, 4-hour response time
FM-S5616-60	Years 1 - 5, 6 x 16, 4-hour response time
FM-S5724-36	Years 1 - 3, 7 x 24, 4-hour response time
FM-S5724-60	Years 1 - 5, 7 x 24, 4-hour response time

Step 11—Hardware and Software Supplemental Support Services *(continued)*

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for **Windows NT** include advisory and remedial software support for the time period indicated.
- Software service upgrades for **Digital UNIX** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.
- Software service upgrades for **OpenVMS** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 2100A 4/275, 5/250, and 5/300 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-SEOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems

Step 11b—Hardware and Software Supplemental Support Services—Europe only

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

Specifications

Shipping Dimension		
Height	119 cm (46.9 in.)	
Width*	102 cm (40.0 in.)	
Depth*	61 cm (24.0 in.)	
Weight	85 kg (187 lb) typical 114 kg (250 lb) maximum	
Installed Dimensions		
Height	70 cm (27.6 in.)	
Width	43 cm (16.9 in.)	
Depth	81 cm (31.9 in.)	
Weight	75 kg (165 lb) typical 100 kg (220 lb) maximum	
Clearances	**Operating**	**Service**
Front	75 cm (29.5 in.)	75 cm (29.5 in.)
Rear	15.2 cm (6 in.)	76.2 cm (30 in.)
Sides	None	76.2 cm (30 in.)
Environmental		
Temperature	Operating** Nonoperating Storage (60 days) Rate of change	10°-35° C (50°-95° F) -40°-66° C (-40°-151° F) 11° C/hr (20° F/hr)
Relative humidity	Operating Nonoperating Storage (60 days) Rate of change	20–80% 20–80% 10–95% 20%/hr
Maximum wet bulb temperature	Operating Storage (60 days)	28° C (82° F) 46° C (115°F)
Minimum dew point temperature	Operating Storage (60 days)	2° C (36° F) Not tested
Maximum heat dissipation Single supply Dual supply	Current 800 Watt, 3005 Btu/hr 1280 Watt, 4371 Btu/hr	Theoretical 920 Watt, 3142 Btu/hr 1675 Watt, 5720 Btu/hr
Air flow and quality	Intake location Exhaust location	Front Rear
Altitude	Operating† Nonoperating	2000 m (6562 ft) 3600 m (12,000 ft)
Mechanical shock	Operating Nonoperating	7.5 G 10 ms 20 G peak 30 ms
Vibration	Operating	10-500 Hz .1 G peak
Acoustics	Operating	LNPEc (Bels) 6.6 maximum per ISO 7779
Electrical		
Nominal ac voltage	100-120 Vac	220-240 Vac
Voltage range (Vac)	88-132 Vac	180-264 Vac
Power source phase	Single	Single
Nominal frequency (Hz)	60 Hz	50 Hz
Frequency range (Hz)	47-63 Hz	47-63 Hz
Maximum inrush current	50 Amps	50 Amps
RMS current at nominal voltage (steady state)	8.5 Amps	4.0 Amps
Power cord	Type Length U.S. plug	IEC 320 C16 240 cm (113 in.) NEMA 5-15, Socket EIC 320 Sheet, C-15

* Dmensions of shipping pallet; fork-lift access is on the width dimension.

** Maximum operating temperature at Sea Level. Reduce by 1° C (1.8° F) for each 600 m (2000 ft) above Sea Level.

† Higher altitudes are possible if maximum operating temperature is reduced (see Temperature, above); other restrictions may apply, such as maximum permissible altitude for hard drives.

Specifications *(continued)*

Regulatory	
Agency approvals	UL Listed to UL1950 CSA Certified to CAN/ C22.2 No. 950-M89 TUV EN 60950 GS VDE 0805 Gsmarke ZH1/61 IEC 950 FCC 15J Part 15 (Class A) CE
Reviewed to	AS 3260 Australian Standard SS 436 14 50 Swedish Standard NZS 6661:1989 New Zealand Standard EN 60 950: 1992 European Norm

Recommended Power Protection/UPS Solutions for AlphaServer 2100A Systems

UPS offerings feature on-line design and include EIA232 port for local or network monitoring. Prestige units feature a three piece modular design that allows users to safely swap out components without disconnecting the critical load and "plug and play" battery and receptacle extensions. Units include 7 minute battery at full UPS rated output (14 minutes for fully configured system). U.S. models include a three-year, 24-hour hot swap warranty.

Prestige UPS - North American Model	
4N-AEAAH-AM	UPS, 3.0kVA/2.0KW Rating, 208V in, 120/208V out, L6-30P Input Plug, (1) L5-30R, (4) 5-15R Output Receptacles—call for information on 120V input models
4N-AEACH-xx	Optional Receptacle Extension, -AA - AE available
4N-AEAAH-AB	Add-on Battery

Prestige UPS - International Model	
4N-AEAAH-AS	UPS, 3.0kVA/2.1KW Rating, 200-240V selectable in/out, IEC 309 Input Plug, (3) IEC 320 10A, (1) IEC 320 20A
4N-AEACH-xx	Optional Receptacle Extension, -DA - DD available (Shuko, French, British, Australian)
4N-AEAAH-AB	Add-on Battery
4N-AEWAR-G2	Prestige 5-year on-site exchange warranty upgrade for models sold and serviced in the U.S.
4N-AEACH-HA	Optional mobile module stacker standard unit for above UPS HB/HC/HD=1/2/3 added battery modules

Companion Data Surge Protection

4N-GA249-AB	Modem connection (wall plug-in unit)
4N-GA249-CA	10BaseT connection (wall plug-in unit)
4N-GA510-BF	ThinWire connection (device port)
4N-GA245-xx	Multi-port connection (din rail/rackmount)
4N-GA240-xx	Additional plug-in data modules for 4N-GA249 series devices. AC panel protection also available. All devices include 5 year hot-swap warranty.

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Includes cable, media and documentation.

Monitoring Software	Windows NT	Digital UNIX	OpenVMS
Single system shutdown	**4N-AEAES-AA**	**4N-AEAES-AK**	**4N-AEAES-EM**
Network Management and multiple system shutdown*	**4N-AEAES-BA**	**4N-AEAES-BK**	**Call for information**

* Connect-UPS Adapter required
DA/DB=twisted pair, DC/DD=ThinWire

4N-AEAEO-DA/DC	Connect UPS Adapter 120V (North American)
4N-AEAEO-DB/DD	Connect UPS Adapter 220V (International)

AlphaServer 2100A Rackmount

Product Description

AlphaServer 2100A 4/275, 5/250, and 5/300 Rackmount Systems are rackmountable versions of the respective AlphaServer 2100A systems having the same features and functionality but with minimal internal storage capacity: most data is stored in StorageWorks modular shelves. The AlphaServer 2100A family is configured with eight PCI slots and three EISA slots.

The AlphaServer 2100A Rackmount system unit is designed to be installed in a 30-inch deep cabinet equipment with standard EIA or METRIC rails using only 14-inches of vertical space. It is an ideal system building block.

AlphaServer 2100A, 4/275, 5/250, and 5/300 Cabinet Systems include AlphaServer 2100A Rackmount system and two StorageWorks Shelves configured into industry standard H9A10 cabinets.

AlphaServer 2100A Rackmount and Cabinet systems are designed for those installations where floor space is at a premium, where large disk storage arrays and/or other expansion is required, or when high availability systems are required.

Points to consider when selecting a Packaged Cabinet System:

- Rackmount unit installed in cabinet systems supports two removable media devices and two hard disk drives. Rackmount unit includes one quad-speed CD-ROM drive and one 7200 RPM 2 GB hard disk drive. Additional disk, controllers, and cables **must** be ordered separately.
- Power cords are included for AlphaServer Rackmount unit and other rackmountable options on same purchase order as AlphaServer Cabinet.
- Each Rackmount BA36R-AF/AR 16-bit wide SCSI StorageWorks shelf requires seven inches of vertical space; an -AF front mounted and -AR rear mounted shelf can be placed back to back in the same seven-inch space.
- Power controller as well as voltage and total current requirements.

Step 1—Systems

- AlphaServer 2100A Cabinet systems ship with two each of the following power cords (power controller to cabinet).
  - 120 VAC systems: NEMA Locking, 4.57 m (15 feet), NEMA L5-30P, Socket NEMA L5-30R
  - 240 VAC systems: NEMA Locking 4.57 m (15 feet), NEMA L6-20P, Socket NEMA L6-20R
- AlphaServer 2100A Rackmount systems include 120V or 240V Cabinet system compatible power cords. Select country-specific power cord for other 240V use.
- All systems include keyboard. Select country-specific keyboard for 240 V use. Selected keyboard ships in lieu of U.S. variants.
- All systems ship with extender cables for use with mouse and keyboard.
- AlphaServer 2100A Rackmount unit and rackmountable options ordered on same purchase order as AlphaServer 2100A Cabinet system ship with correct power cords for that configuration.
- Options ordered will be factory installed unless specified as **spares.**
- Uninterruptable Power Supplies are available; see UPS information following Specifications, or call for specific Rackmount configuration support.

AlphaServer 2100A Cabinet Units include

- One H9A10-Cx cabinet enclosure
- One AlphaServer 2100A 4/275, 5/250 or 5/300 rackmountable unit.
- Two 16-bit Wide StorageWorks shelves; one BA36R-AF (front mounted) and one BA36R-AR (rear mounted). 35 inches of H9A10-Cx cabinet rack space remains available.

AlphaServer 2100A Rackmount Units include

- Alpha microprocessor 21064 275-Mhz CPU with 4 MB onboard cache, **or**
- Alpha microprocessor 21164 250-Mhz CPU with 4 MB onboard cache, **or**
- Alpha microprocessor 21164 291-Mhz CPU with 4 MB onboard cache
- BA744 Rackmountable enclosure which includes:
  - Integral 10 MB/s 8-bit narrow Fast SCSI controller
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - Two RZxx hard disk drives slots
  - Two 5.25-inch, half-height removable media slots
  - Eight PCI slots
  - Three EISA slots
  - 840-Watt power supply
- Ethernet AUI, 10BaseT (twisted pair), or ThinWire selectable (uses one PCI slot),
- 1.44-MB diskette drive in dedicated slot
- 2.0 GB 7200 rpm hard disk drive (uses one RZxx disk slot)
- 600 MB Quad Speed CD-ROM (uses one removable media slot)
- Video Graphics Adapter (uses one PCI slot)
- Three-button mouse
- Keyboard (Americas and AP orders only)
- Memory indicated below
- Customer documentation
- EISA configuration utility
- Hardware Warranty Three-year, on-site with 5 x 9, 24-hour response time*
- Operating System Warranty 90-day SPD conformance with advisory telephone support*

* Service upgrades are available; see Step 11, Hardware and Software Supplemental Services.

Windows NT Rackmount and Cabinet Systems include

- Windows NT Server plus 5-client access, 3.5 media (CD-ROM) and license in shrink-wrapped package.

Windows NT Rackmount Systems—Requires cabinet

Order Number	Model	Memory	PCI/EISA slots available
DN-252Y1-B9	4/275	128 MB	6 PCI / 3 EISA
DN-252Y1-C9	4/275	512 MB	6 PCI / 3 EISA
DN-253Y1-B9	5/250	128 MB	6 PCI / 3 EISA
DN-253Y1-C9	5/250	512 MB	6 PCI / 3 EISA
DN-254Y1-B9	5/300	128 MB	6 PCI / 3 EISA
DN-254Y1-C9	5/300	512 MB	6 PCI / 3 EISA

Step 1—Systems *(continued)*

Windows NT Cabinet Systems—Includes cabinet

Order Number	Model	Memory	PCI/EISA slots available	Cabinet Power Required
DN-262F1-B2/B3	4/275	128 MB	6 PCI / 3 EISA	120 V / 240 V
DN-262F1-C2/C3	4/275	512 MB	6 PCI / 3 EISA	120 V / 240 V
DN-263F1-B2/B3	5/250	128 MB	6 PCI / 3 EISA	120 V / 240 V
DN-263F1-C2/C3	5/250	512 MB	6 PCI / 3 EISA	120 V / 240 V
DN-264F1-B2/B3	5/300	128 MB	6 PCI / 3 EISA	120 V / 240 V
DN-264F1-C2/C3	5/300	512 MB	6 PCI / 3 EISA	120 V / 240 V

Digital UNIX Rackmount and Cabinet Systems include

- Digital UNIX V3.2D-2 operating system base license
- NAS Base Server 200 for Digital UNIX license QL-306AG-AA);
  includes the following layered products (order media and documentation separately):
  - PATHWORKS for Digital UNIX (kit only, no license)
  - Polycenter Advanced File System utilities
  - Objectbroker for Digital UNIX Runtime
  - DECmessageQ for Digital UNIX Runtime
  - DCE Runtime
  - Digital UNIX Server Extensions
  - PrintServer software (kit only, licensed with printer)
- Base operating system is factory installed

Note: Operating system media and documentation is **required** for first system on site; see Step 9.

Digital UNIX Rackmount Systems—Requires cabinet

Order Number	Model	Memory	PCI/EISA slots available
DA-252Y1-B9	4/275	128 MB	6 PCI / 3 EISA
DA-252Y1-C9	4/275	512 MB	6 PCI / 3 EISA
DA-253Y1-B9	5/250	128 MB	6 PCI / 3 EISA
DA-253Y1-C9	5/250	512 MB	6 PCI / 3 EISA
DA-254Y1-B9	5/300	128 MB	6 PCI / 3 EISA
DA-254Y1-C9	5/300	512 MB	6 PCI / 3 EISA

Digital UNIX Cabinet Systems—Includes cabinet

Order Number	Model	Memory	PCI/EISA slots available	Cabinet Power Required
DA-262F1-B2/B3	4/275	128 MB	6 PCI / 3 EISA	120 V / 240 V
DA-262F1-C2/C3	4/275	512 MB	6 PCI / 3 EISA	120 V / 240 V
DA-263F1-B2/B3	5/250	128 MB	6 PCI / 3 EISA	120 V / 240 V
DA-263F1-C2/C3	5/250	512 MB	6 PCI / 3 EISA	120 V / 240 V
DA-264F1-B2/B3	5/300	128 MB	6 PCI / 3 EISA	120 V / 240 V
DA-264F1-C2/C3	5/300	512 MB	6 PCI / 3 EISA	120 V / 240 V

Step 1—Systems *(continued)*

OpenVMS Rackmount and Cabinet Systems include

- OpenVMS V6.2-1H1 operating system base license.
- NAS Base Server 200 for OpenVMS license (QL-23EAG-AA), includes the following layered products (order media and documentation separately):
  - DECnet for OpenVMS End System
  - DECnet/OSI for OpenVMS End Node
  - PATHWORKS for OpenVMS (LAN Manager); kit only, no license
  - DEC TCP/IP services for OpenVMS
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS
  - Objectbroker for OpenVMS (ACA Services)
  - DECmessageQ for OpenVMS Runtime
  - DECprint Supervisor for OpenVMS , Base
  - DECprint Supervisor for OpenVMS , Plus
  - DECprint Supervisor for OpenVMS , Open
  - PrintServer software (kit only, licensed with printer
- OpenVMS operating system is factory installed.
- OpenVMS V6.2-1H1 media on CD-ROM included

OpenVMS Rackmount Systems—Requires cabinet

Order Number	Model	Memory	PCI/EISA slots available
DY-252Y1-B9	4/275	128 MB	6 PCI / 3 EISA
DY-252Y1-C9	4/275	512 MB	6 PCI / 3 EISA
DY-253Y1-B9	5/250	128 MB	6 PCI / 3 EISA
DY-253Y1-C9	5/250	512 MB	6 PCI / 3 EISA
DY-254Y1-B9	5/300	128 MB	6 PCI / 3 EISA
DY-254Y1-C9	5/300	512 MB	6 PCI / 3 EISA

OpenVMS Cabinet Systems—Includes cabinet

Order Number	Model	Memory	PCI/EISA slots available	Cabinet Power Required
DY-262F1-B2/B3	4/275	128 MB	6 PCI / 3 EISA	120 V / 240 V
DY-262F1-C2/C3	4/275	512 MB	6 PCI / 3 EISA	120 V / 240 V
DY-263F1-B2/B3	5/250	128 MB	6 PCI / 3 EISA	120 V / 240 V
DY-263F1-C2/C3	5/250	512 MB	6 PCI / 3 EISA	120 V / 240 V
DY-264F1-B2/B3	5/300	128 MB	6 PCI / 3 EISA	120 V / 240 V
DY-264F1-C2/C3	5/300	512 MB	6 PCI / 3 EISA	120 V / 240 V

System Bus and PCI Bus Configuration Rules

- Use System Bus Slot Table for slot configuration rules when adding additional CPUs and memory.
- See PCI Option Slot Table for options supported in specific PCI slots.

System Bus Slot Table

Recommended Slots	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
1 CPU system	—	CPU 0	—	Memory 0	Memory 1	Memory 2	Memory 3
2 CPUs system	—	CPU 0	CPU 1	Memory 0	Memory 1	Memory 2	Memory 3
3 CPUs system	CPU 2	CPU 0	CPU 1	Memory 0	Memory 1	Memory 2	Memory 3
4 CPUs system	CPU 3	CPU 0	CPU 1	Memory 0	CPU 2	Not available	Memory 1

Step 1—Systems *(continued)*

PCI Option Slot Table

- Some PCI options are **not** supported behind a PCI-PCI bridge on specific operating systems. Use the following table for options restricted to slots **4, 5, 6 and 7 only**. All other options supported on the AlphaServer 2100A not listed here are supported in any PCI slot (0, 1, 2, 3, 4, 5, 6, 7).

Order Number	Description	Max #	Supported in PCI slots only	Operating System
KZPSA-BB	One-port Fast Wide Differential SCSI controller	3	**4, 5, 6, 7**	Windows NT
PB2GA-JB[1]	S3-Trio64 Graphics option 1MB	1	**4, 5, 6, 7**	Windows NT
CCMAA-AA	PCI to MEMORY CHANNEL controller	2	**4, 5, 6, 7**	Digital UNIX

1 Graphics option standard in all systems.

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

CPU Upgrades

- Order up to three additional CPUs, for a maximum of four; see System Bus Slot Table.
- Additional CPUs must match the speed of CPU in system.
- Four-CPU systems are restricted to two memory slots.

460NR-AA **Windows NT** SMP upgrade includes one 4/275 MHz CPU processor; SMP license is not required.
470NR-AA **Windows NT** SMP upgrade includes one 5/250 MHz CPU processor; SMP license is not required.
480NR-AA **Windows NT** SMP upgrade includes one 5/300 MHz CPU processor; SMP license is not required.

460AR-AA **Digital UNIX** SMP upgrade includes one 4/275 MHz CPU processor and Digital UNIX SMP license.
470AR-AA **Digital UNIX** SMP upgrade includes one 5/250 MHz CPU processor and Digital UNIX SMP license.
480AR-AA **Digital UNIX** SMP upgrade includes one 5/300 MHz CPU processor and Digital UNIX SMP license.

460YR-AA **OpenVMS** SMP upgrade includes one 4/275 MHz CPU processor and OpenVMS SMP license.
470YR-AA **OpenVMS** SMP upgrade includes one 5/250 MHz CPU processor and OpenVMS SMP license.
480YR-AA **OpenVMS** SMP upgrade includes one 5/300 MHz CPU processor and OpenVMS SMP license.

Step 3—Memory

See System Bus Slot Table for slot configuration rules.

- One- to three- CPU systems support a total of four memory boards in any combination.
- Four CPU systems support total of two memory boards in any combination.
- Windows NT V 3.5 support up to 2 GB memory, requires Windows NT 3.51 Service Pack 4.
- Digital UNIX V 3.2 support up to 2 GB memory.
- OpenVMS V6.2 supports up to 2 GB memory.

MS450-BA 64 MB memory module (supported on 4/275 systems only)
MS451-DA 128 MB memory module
MS451-FA 512 MB memory module

Step 3a—Prestoserve Nonvolatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems only
- Maximum one Prestoserve option per system

DJ-ML200-AA 2 MB PCI Prestoserve option
DJ-ML200-BA 4 MB PCI Prestoserve option
DJ-ML200-CA 8 MB PCI Prestoserve option

Step 4—Monitors

Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

Windows NT systems

- Windows NT systems require a graphics monitor to run **all** system functions.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.

Digital UNIX and OpenVMS systems

- All console functions, including the EISA Configuration Utility (ECU) and the RAID Configuration Utility (RCU) can be performed using a standard video terminal (VT2xx, VT3xx, VT4xx, VT5xx) connected to one of the system's serial ports (See Step 8).
- For graphics console functionality, order a graphics monitor.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.

VRC15-KA/K4	15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 not included, order separately.
VRT17-PA/P4	17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.
VRC21-LA/L4	21" (19.6" viewable image size) ultra high-resolution color monitor with Ligh Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.

Step 5—Storage

- Integral Fast SCSI-2 controller supports maximum of seven devices (CD-ROM, one additional 5.25-inch half-height removable media device and two hard disk drives inside base chassis), All disk drives connected to this controller operate in **Narrow** (8-bit) mode.
- Select **Wide** (16-bit) mode controllers, disks and StorageWorks shelves from Step 5b for external expansion.

Note: **Wide** disk drives configured on a **Narrow** bus operate in **narrow** mode. **Narrow** disk drives configured on a **wide** bus operate in **narrow** mode. **Wide** and **narrow** devices can be mixed on a single bus.

Step 5a—Internal Storage

Systems include one internal RZ28 disk drive, and one CD-ROM drive.

Removable Media Devices (select one additional device)

RRD45-AC	600 MB 5.25-inch quad-speed half-height CD-ROM
TZK11-LG	2.0 GB 5.25-inch half-height SCSI QIC tape drive
TLZ09-LG	8.0 GB 5.25-inch half-height SCSI 4mm DAT drive

Step 5a—Internal Storage *(continued)*

Hard Disk Drives (select one additional hard disk drive)

RZ26N-EJ	1.05 GB 3.5-inch 5400 RPM half-height disk drive
RZ28D-EJ	2.0 GB 3.5-inch 7200 RPM half-height disk drive
RZ29B-EJ	4.3 GB 3.5-inch 7200 RPM half-height disk drive

Step 5b—External Storage for 16-bit (Wide) Mode

- Additional storage is supported outside AlphaServer 2100A Rackmount system unit. BA36R-AF/-AR rackmountable 16-bit StorageWorks shelves are recommended.
- AlphaServer 2100A Cabinet systems include one BA36R-AF (front mounted) and one BA36R-AR (rear mounted) 16-bit wide StorageWorks shelves. A controller is required to support installed StorageWorks shelves in Cabinet systems.

Configuration Rules

- 16-bit Wide devices require Wide StorageWorks Shelves (BA36R) to operate in wide mode.
- PCI-based one- and three-port (KZPSC-AA/BA) RAID controllers, and one-port Fast Wide Differential (KZPSA-BB) controller allow wide devices to operate in 16-bit mode.
- Maximum of four PCI-based one- and three-port (KZPSC-xx) RAID controllers supported per system.
  - One- and three-port StorageWorks RAID 230 controllers (KZPSC-xx) support hard disk drives **only**; tape drives are not supported.
  - Three-port StorageWorks RAID 230 (KZPSC-BA) supports up to 21 disk drives in up to eight logical groups. RAID slots must be created to support more than eight physical disk drives.
- Maximum of four PCI or EISA RAID controllers supported per system.
- PCI-based Fast Wide Differential (FWD) SCSI controller (KZPSA-BB) supports externally connected wide disks in BA36R using DWZZB wide differential to wide single-ended converter, or narrow disks using DWZZA wide differential to narrow single-ended converter in BA35R.
- KZPSA-BB controller on Windows NT systems supports up to 15 disks. Digital UNIX and OpenVMS systems support 7 disks.
- SCSI cables are **not** included and must be ordered separately.
- KZPSA-BB Cables
  - BN21K-xx from KZPSA to DWZZA, DWZZB, and HSZ40 (straight to right angle)
  - BN21W-0B Y SCSI-2 cable 68-pin for KZPSA in mid-bus or DECsafe configurations.
- KZPSC-xx Cables
  - BN31L-1E from KZPSC-xx to BA35R
  - BN31S-1E from KZPSC-xx to BA36R
- If all three ports on KZPSC-BA are used, use 2T-KZPSC-KT cable kit for third port connection. Does **not** block EISA slot.
- KZPSM-AA Cables
  - BC25V-1H from KZPSM to external 68-pin bulkhead
  - BN21K-02 from bulkhead to external BA36R wide storage.
- KZPDA-AA Cables
  - BN21K-02 from KZPDA to BA36R wide storage

Storage Controllers for Wide Mode

KZPSC-AA	One-port PCI-based controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX, and Windows NT
KZPSC-BA	Three-port PCI-based controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX, and Windows NT
MS100-AA	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller
MS100-AB	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller
KZPSC-UB	Battery back-up for Cache memory option
KZPSA-BB	PCI-based Fast Wide Differential (FWD) SCSI controller
KZPSM-AA	PCI-based combination Ethernet and Fast Wide SCSI controller
KZPDA-AA	PCI based Fast Wide Single Ended (FWSE) SCSI-2 controller

Hard Disk Drives for Wide Mode

RZ26N-VW	1.05 GB 3.5-inch half-height disk drive
RZ28D-VW	2.1 GB 3.5-inch half-height disk drive
RZ29B-VW	4.3 GB 3.5-inch half-height disk drive

Step 5b—External Storage for 16-bit (Wide) Mode *(continued)*

Rackmountable StorageWorks Shelves for Wide Mode

- BA36R StorageWorks shelves are supported on all Fast Wide SCSI-2 controllers listed in Step 5b.
- External BA36R is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- SCSI cable BN21K-xx for KZPSA, and BN31S-1E for KZPSC, is required to connect BA36R to controller.
- See Step 10 for additional power cords.

BA36R-AF	Rackmountable BA356 StorageWorks Shelf; front accessible
BA36R-AR	Rackmountable BA356 StorageWorks Shelf; rear accessible

Step 5c—DSSI Storage (OpenVMS systems only)

- System supports up to two KFESA or two KFESB EISA/DSSI adapters. KFESA and KFESB adapters can be mixed on same system.
- Each BA35R StorageWorks shelf in single/split-bus mode supports one/two HSD10 DSSI/SCSI converters.
- Wide disks installed "behind" HSD10 will run in **narrow** mode.
- Cabling information for DSSI controllers:
  - DSSI devices supported on OpenVMS only
  - DSSI cables must be ordered separately
  - KFESB uses "Micro-Ribbon" connection
  - KFESB to any external "Pin-Socket" DSSI connection requires BC22Q-xx
  - KFESB to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx
  - KFESB to any external "Micro-Ribbon" DSSI right-angle connection (all other DSSI systems and storage devices requiring right-angle connection) requires BC29S-xx DSSI cable
  - Order BC29S-09 DSSI cable for HSD10 in BA36R-Ax shelves (see 'A' on DSSI-based Storage Diagram)
  - Order BC29U-02 DSSI cable for HSD10 in adjacent BA36R-Ax shelves (see 'B' DSSI-based on Storage Diagram)
  - Order BC29V-06 DSSI cable for HSD10 in non-adjacent BA36R-Ax shelves (see 'C' DSSI-based on Storage Diagram)

DSSI Adapters

KFPSA-AA	PCI-to-DSSI controller (OpenVMS systems **only**); maximum four per system.
KFESB-AA	EISA-based single-DSSI controller (OpenVMS systems only); maximum two per system.
HSD10-AA	StorageWorks Array controller; supports seven SCSI-2 disks, tape, and optical devices. (See Storage section for supported devices.)

DSSI Option Pack

- OpenVMS DSSI starter option pack includes:
  - Two KFESB-AA EISA-based DSSI adapters
  - Two HSD10-AA DSSI/SCSI converters
  - Three RZ28 2 GB disk drives
  - Two BC29S-06 DSSI cables (KFESB to HSD10)*
  - VMScluster license (QL-MUZAG-AA)

SD002-AA	OpenVMS DSSI Starter Option Pack

Step 5d—External Storage for Storage Controllers

- Requires seven inches of vertical space, although a front and rear shelf can be mounted back-to-back in the same seven inch space.
- See Step 10 for additional power cords.

BA35R-MF	Rackmountable BA350-MA controller shelf; front access
BA35R-MR	Rackmountable BA350-MA controller shelf, rear access

Step 5e—PCI to CI Storage Host Adapter (OpenVMS Systems only)

CIPCA-AA	PCI-to-CI adapter, Maximum two per system; requires one PCI slot and one EISA slot. Minimum Operating System Version: OpenVMS 6.2-1H2 Minimum Console Revision: V4.4 Requires one of the following CI cables per adapter:
BNCIA-10	10-meter CI cable
BNCIA-20	20-meter CI cable
BNCIA-45	45-meter CI cable

Step 6—Networks and Communications

- See PCI Option Slot Chart for slot configuration rules.
- Systems include Ethernet controller (AUI, 10BaseT, or ThinWire selectable)
- Select networking cable
  - BNE4C-xx for AUI
  - BN25G-xx for 10BaseT
  - BC16M-xx for ThinWire, and H8225-00 Terminator
- Maximum of 4 PCI-based network controllers supported.

		Maximum # supported		
Order Number	**Description**	**Digital UNIX**	**OpenVMS**	**Windows NT**
DE435-AA	PCI-based Digital Etherworks 32-bit High Performance Network Interface Card	4	4	4
DE500-XA	PCI-based Fast Ethernet controller	2	2	2
DEFPA-AA*	PCI to FDDI Adapter, SAS, MMF, SC	4	4	4
DEFPA-DA*	PCI to FDDI Adapter, DAS, MMF, SC	4	4	4
DEFPA-UA*	PCI to FDDI Adapter, SAS, TP-PMD	4	4	4
PBXNP-AA	PCI Token Ring Adapter	1	1	0
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment	2	2	2
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment (requires 2 EISA slots)	1	1	1
DEFEA-UA	EISA-based DEC FDDIcontroller UTP Attachment	2	2	2
DNSES-AA	EISA-based synchronous communications controller	3	3	0
CXI01-AA/AD	ISA-based asynchronous multiplexer	2	2	2
DIIAA-AA	Digiboard ISA datafire-U ISDN Controller (Available as a SPARE Only)	0	0	1
DIIAA-AB	Digiboard ISA datafire-ST ISDN Controller (Available as a SPARE Only)	0	0	1

* OpenVMS does not have boot support. Cables: Fiber, Duplex, "SC" to "MIC" (concentrator): BN34D-xx; Fiber, Duplex, "SC" to "SC": BN34B-xx; Fiber, Duplex, "SC" to "ST": BN34A-xx; Copper STP, 8 cond, wired pin-pin: BN26M-xx; Copper STP, 8 cond, ired cross-over: BN26S-03.

Step 6a—MEMORY CHANNEL Interconnect

Digital UNIX Systems

- Requires Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster license

Configuring information:

- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.
- CCMRA-AA Rackmount Kit for Hub; takes 8.75-in rail space.

Note: CCMAA-BA (PCI to MEMORY CHANNEL controller) must be installed in PCI slots 4-7.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported .
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMRA-AA	MEMORY CHANNEL Hub Rackmount Kit (8.75-in)
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAG-AA	TruCluster Software for Digital UNIX, includes Digital UNIX driver
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAG-AA	OpenVMS Cluster license for Alpha systems

Step 7—Additional Power Supply

- Dual power distribution is provided to internal, mounted equipment. There are no power supplies in H9A10 Cabinet.
- Standard 840-Watt power supply in AlphaServer 2100A Rackmount system is sufficient for a fully configured system.
- An additional power supply for n+1 redundancy may be ordered

H7804-AA	Additional power supply with 120 VAC cord
H7804-AB	Additional power supply with 240 VAC cord
H7804-AC	Additional power supply with 240 VAC IEC cord

Note: The H7893-AA power supply for AlphaServer 2100A pedestal is **not** compatible with, and will not mount in the Rackmount system.

Step 8—Terminals and Printers

System includes two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Digital UNIX and OpenVMS systems

Console terminals can either be graphics monitor connected to the included video graphics adapter (See Step 4), or a serial video terminal. If a serial video terminal is used as the console terminal, it must be VT220, VT320, VT420, or VT520 compatible. These terminals have the graphics capability required for the EISA Configuration Utility.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required (one included with system) for each connection. A cable must be ordered unless otherwise provided.

Step 9—Software

Windows NT Systems

Systems include Windows NT Server plus 5-client access 3.5 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ Windows NT Server documentation kit

Digital UNIX Systems

Select user licenses as required. Media and documentation is **required** for first system on site.
Software processor code = **G** for **all** software, one to four processors.

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designed Digital UNIX system. Digital UNIX Concurrent Use licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7AM-3B Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F Digital UNIX Concurrent Use 16-user license
QL-MT7AG-AA Digital UNIX Traditional unlimited user license

QL-MT5AG-AA Digital UNIX developer's extension license

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8 Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for Digital UNIX on CD-ROM

DECnet Licenses

QL-MTJAG-AA DECnet/OSI end-system license for Digital UNIX
QL-MTKAG-AA DECnet/OSI extended function license for Digital UNIX

OpenVMS Systems

Select user licensees as required. Media and documentation is **required** for first system on site.
Software processor code = **G** for **all** software, one to four processors

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G OpenVMS Concurrent Use 32-user license

Step 9—Software *(continued)*

OpenVMS Concurrent Use Licenses

QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AG-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-MT1AG-H8	OpenVMS V6.2-1H1 media and documentation on CD-ROM, included with system
QA-MT1AH-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet Licenses

QL-MTGAG-AA	DECnet extended function license for OpenVMS
QL-MTHAG-AA	DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information (OpenVMS systems only)

EK-410AB-MG	DSSI VMScluster Installation Guide
EK-D4AXP-TS	DSSI VMScluster Troubleshooting Guide

Step 10—Power Cords and Keyboards

Cabinet System Power Cords

- Power connection to H9A10-xx Cabinet is site specific.
- AlphaServer 2100A Cabinet systems ship with two each of the following power cords for power to the cabinet
  - 120 VAC systems: NEMA locking, 4.57 m (15 feet), NEMA L5-30P, Socket NEMA L5-30R
  - 240 VAC systems: NEMA locking, 4.57 m (15 feet), NEMA L6-20P, Socket NEMA L6-20R

Rackmount System Power Cords

- Systems ordered include U.S. power cord or 240V cabinet system compatible power cord. Select other 240V country-specific power cord.
- Select power cord for each power supply installed in AlphaServer Rackmount system.

Included*	U.S., Canada, Japan, 120 V
BN19J-2E	Australia, New Zealand
BN19D-2E	Central Europe
BN19B-2E	U.K., Ireland
BN04B-2E	Switzerland
BN19L-2E	Denmark
BN19N-2E	Italy
BN19T-2E	Egypt, India, South Africa
BN19Y-2E	Israel

* Orderable as 17-00083-51

Step 10—Power Cords and Keyboards *(continued)*

Monitor Power Cords

- Select country-specific power cord for 240 V use.

BN27S-03	U.S., Canada, Japan, 120 V
BN19H-2E	Australia, New Zealand
BN19C-2E	Central Europe
BN19A-2E	U.K., Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	Egypt, India, South Africa
BN18L-2E	Israel

StorageWorks Power Cords

Select additional power cords for N+1 power use.

BN27S-03	U.S., Canada, Japan
BN27Z-03	240V Cabinet Systems

Keyboards

Systems ordered in the Americas and Asia Pacific include U.S. English keyboard unless alternate is specified. Select country-specific keyboard for **all** systems ordered in Europe.

Windows NT/ Digital UNIX	**OpenVMS**	
LK471-A2	**LK461-A2**	U.S./English
LK471-AB	**LK461-AB**	Belgian
	LK461-AC	Canadian/French
LK471-AD	**LK461-AD**	Danish
LK471-AE	**LK461-AE**	United Kingdom
	LK461-AF	Finnish
LK471-AG	**LK461-AG**	German
	LK461-AH	Dutch
LK471-AI	**LK461-AI**	Italian
LK471-AK	**LK461-AK**	Swiss/Generic
	LK461-AL	Swiss/German
	LK461-AM	Swedish
LK471-AN	**LK461-AN**	Norwegian
LK471-AP	**LK461-AP**	French
	LK461-AQ	Canadian/English
LK471-AS	**LK461-AS**	Spanish
LK471-AV	**LK461-AV**	Portuguese

Step 11—Hardware and Software Supplemental Support Services

Hardware Supplemental Support Services—Americas and Asia Pacific only

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Select optional Hardware Supplemental Support Services if required.

AlphaServer 2100A 4/275 Systems

FM-454HR-36	3 year 5 x 9 4-hour response time
FM-454HR-60	5 year 5 x 9 4-hour response time
FM-45724-36	3 year 7 x 24 4-hour response time
FM-45724-60	5 year 7 x 24 4-hour response time

AlphaServer 2100A 5/250 and 5/300 Systems

FM-S54HR-36	3 year 5 x 9 4-hour response time
FM-S54HR-60	5 year 5 x 9 4-hour response time
FM-S5724-36	3 year 7 x 24 4-hour response time
FM-S5724-60	5 year 7 x 24 4-hour response time

Software–Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for **Windows NT** include advisory and remedial software support for the time period indicated.
- Software service upgrades for **Digital UNIX** and **OpenVMS** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 2100A 4/275, 5/250, and 5/300 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-SEOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems

Step 11a—Hardware and Software Supplemental Support Services–Europe only

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

Specifications

Installed Dimensions	Rackmount	Cabinet
Height	35 cm (14 in.)	170 cm (66.9 in)
Width	45 cm (19 in.)	60 cm (23.6 in.)
Depth	70.5 cm (27.75 in.)	85 cm (34 in.)
Weight	45.5kg (100 lb)	286 kg (630 lb)
Clearances	**Operating**	**Service**
Front	20.3 cm (8 in.)	142 cm (56 in.)
Rear	20.3 cm (8 in.)	61 cm (24 in.)
Sides	None	61 cm (24 in.)
Environmental		
Temperature		
Operating*	10°-40° C (50°-104° F)	10°-35° C (50°-95° F)
Nonoperating		
Storage (60 days)	-40°-66° C (-40°-151° F)	-40°-66° C (-40°-151° F)
Rate of change	11° C/hr (20° F/hr)	11° C/hr (20° F/hr)
Relative humidity		
Operating	10-90% noncondensing	10-90% noncondensing
Nonoperating	10-90% noncondensing	10-90% noncondensing
Storage (60 days)	10-95% noncondensing	10-95% noncondensing
Rate of change	20% / hr	20% / hr
Maximum heat dissipation	1200 Watt AC, 4,080 BTU/hr	3450 Watt AC, 11,730 BTU/hr
Air flow and quality		
Operating	200 CFM	400 CFM
Intake location	Front	Front
Exhaust location	Rear	Top and Rear
Altitude		
Operating	2000 m (6562 ft)	2000 m (6562 ft)
Nonoperating	3600 m (12,000 ft)	3600 m (12,000 ft)
Mechanical shock		
Operating	10 g pk for 10 ± 3 ms	5 g pk for 10 ± 3 ms
Nonoperating	20 g pk for 10 ± 3 ms	20 g pk for 10 ± 3 ms
Vibration		
Operating	16-200 Hz @0.25g max 200-500 Hz @0.1g peak	10-500 Hz @ 0.1 g peak
Acoustics		
Operating LNPEc (Bels)	6.5 max per ISO 7779	6.4 max per ISO 7779
Electrical		
Voltage range (AVS)	100-120/220-240 Vac	100-120/ 20-240 Vac
Power source phase	Single	Single
Nominal frequency (Hz)	50 - 60 Hz	50 - 60 Hz
Frequency range (Hz)	49 - 61 Hz	49 - 61 Hz
Maximum rated current	10 a / 5 a	16 a / 8 a
Maximum power consumption (Watts)	1,200 W (PFC = 0.99, 10A @ 120 V)	3,450 W
Power cord Type	IEC 320 C16	NEMA locking
Length	452 cm (178 in.)	4.57 m (15 feet)
U.S. plug	NEMA 5-15, Socket IEC 320 Sheet, C-15	NEMA L5-30P, Socket NEMA L5-30R NEMA L6-20P, Socket NEMA L6-20R
Agency approvals	UL Listed to UL1950 CSA Certified to CAN/C22.2 No. 950-M89 TUV EN 60950GS VDE 0805 IEC 950 FCC 15J Part 15 (Class A) CE	
Reviewed to	AS3260 Australian Standard NZS 6661:1989 New Zealand Standard EN 60 950:1992 European Norm	

* Msaximum operating temperature at Sea Level. Reduced by 1°C(1.8°F) for each 600 m (2000 feet) above Sea Level.

† Higher altitudes are possible if maximum operating temperature is reduced (see Temperature above); other restrictions may apply, such as maximum permissable altitude for hard disk drives.

6kVA Prestige Modular "On Line" UPS

For complete protection, UPS products should be used with data line surge protectors.

Maximum stacked dimension: 33.6 H x 9.9 W x 15.9 D.

4N-AEAAJ-CM	Prestige 6kVA (4kW), 1 phase, 60Hz, 208V-120V/208V. Includes 6-foot input power cord with L6-30P, 2 L5-30R and 8 5-15R receptacles. Modular hot-swap design with 7 minute battery at full load, plug and play batteries and receptacle provisions. 3-Year hot-swap warranty. Select 4N-AEAAJ-CP for 240V-240/120V operation.
4N-AEAAJ-CS	Same as above except with 2 l6-20R, 8 5-15R receptacles. 4N-AEAAJ-CR for 240V-240/120V operation.
4N-GA249-AB	Surge Protectors for 2 wire modem
4N-GA249-CA	Surge Protectors for 10BaseT
4N-GA510-BF	Surge Protectors for ThinWire

PUPS Plus for Storage Arrays

PUPS Plus models are 200-240V selectable output, hardwired input/output with optional plug-in output receptacle modules.

4N-AEAAL-BA	PUPS Plus 10 kVA (7kW), 1 phase, 50/60 Hz, 173-276V in, 9 minutes battery at full load.
4N-BEAAN-BA	PUPS Plus 15 kVA (7kW), 3 phase, 50/60 Hz, 173-276V in, 10 minutes battery at full load. Select 4N-AEACM-BP and 4N-AEACM-BJ for plug in connection to 120 V to AlphaServer 2100A and auxiliary SW800 Cabinet.
4N-AEACM-BP	PUPS Plus 15kVA Receptacle module 4 L5-30R, 1 L21-30R
4N-AEACM-BJ	PUPS plus 15kVA Receptacle module 1 L21-30R, 1 5-15R

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

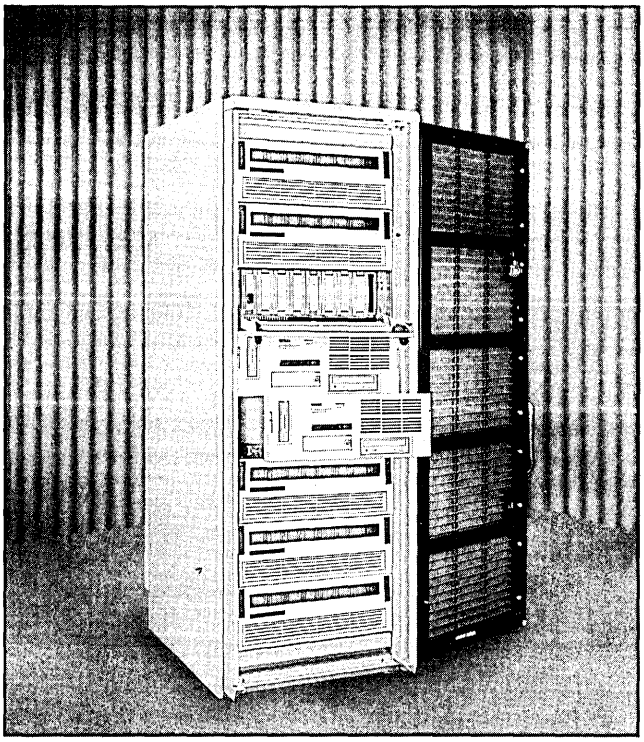
- Include cables, media and documentation.
- SNMP Network connectivity adapters (4N-AEAEO-DA/DC) Twisted Pair/ThinWire are available.

6kVA Prestige Modular UPS

4N-AEAES-AA	Windows NT for Alpha and Intel x86
4N-AEAES-AK	Digital UNIX
4N-AEAES-EM	OpenVMS

PUPS Plus UPS

4N-AEAES-AA	Windows NT for Alpha and Intel x86
4N-AEAES-AK	Digital UNIX
4N-AEAES-FM	OpenVMS



AlphaServer 2100A LP Rackmount

Product Description

AlphaServer 2100A LP 5/300 and 5/375 Rackmount Systems are compact versions of the AlphaServer 2100A Rackmount family. They have the same C-bus architecture, use the same CPUs and memory, support the same options, and run the same operating systems as the AlphaServer 2100A System. But they occupy only seven inches of vertical rack space. This makes the AlphaServer 2100A LP the ideal building block for densely-packed rackmounted systems and single-cabinet clusters.

AlphaServer 2100A LP rackmount systems have two PCI buses with four PCI slots per bus. The high performance PCI I/O subsystem has a peak bandwidth of 264 MB per second. This feature makes the AlphaServer 2100A LP a superior I/O system for environments in which the I/O throughput/bandwidth of a single PCI bus would be functionally challenged.

AlphaServer 2100A LP rackmount systems support up to two 5/300 or 5/375 CPUs. Packaged Systems that include two CPU boards are now available.

Step 1—Systems

- Select AlphaServer 2100A LP Rackmount systems with one CPU or two CPUs installed.
- AlphaServer 2100A LP Rackmount systems include 120V or 240V Cabinet compatible power cord. Select country-specific power cord for other 240V use.
- Options ordered will be factory installed unless specified as **spares.**
- Systems **do not** include video graphics adapter, CD-ROM, keyboard or mouse. These options can ordered separately.
- Systems are for rackmount use only, in Digital or customer provided cabinet.
- Uninterruptable Power Supplies are available; call for specific Rackmount configuration support.

AlphaServer 2100A LP Rackmount Systems include

- One or two Alpha microprocessor 21164 291-MHz CPU(s), each include 4 MB onboard cache, **or**
- One or two Alpha Microprocessor 21164A 375-MHz CPU(s), each include 8 MB onboard cache
- BA743 Rackmountable enclosure with:
  - Integral 10 MB/s 8-bit narrow Fast SCSI controller
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connector
  - One RZxx hard disk slot (includes drive)
  - One 5.25-inch, half-height removable media slot
  - Nine expansion slots: Seven PCI slots, one EISA slot, one PCI/EISA combination slot
    Note: PCI slots are split between two PCI buses with four slots each
  - 570-Watt power supply
- Integral Ethernet AUI or 10BaseT (twisted pair)
- 1.44 MB diskette drive in dedicated slot
- 4.3 GB 7200 RPM hard disk (installed in only internal hard disk slot)
- Memory indicated below
- Customer documentation
- EISA configuration utility
- Chassis rackmount slide kit
- Video/keyboard/mouse extension cables
- Hardware Warranty Three-year, on-site with 5 x 9 24-hour response time*
- Operating System Warranty 90-day SPD conformance with advisory telephone support*

* Service upgrades are available; see Step 11, Hardware and Software Supplemental Services.

Digital UNIX Systems include

- Digital UNIX V3.2D-2 operating system base license
- NAS Base Server 200 for Digital UNIX license QL-306AG-AA); includes the following layered products (order media and documentation separately)
  - PATHWORKS for Digital UNIX (kit only, no license)
  - Polycenter Advanced File System utilities
  - Objectbroker for Digital UNIX Runtime
  - DECmessageQ for Digital UNIX Runtime
  - DCE Runtime
  - Digital UNIX Server Extensions
  - PrintServer software (kit only, licensed with printer)
- Base operating system is factory installed

Note: Operating system media and documentation is **required** for first system on site; see Step 8.

Digital UNIX Rackmount Systems—Requires cabinet

Single-CPU Systems	Model	Memory	PCI/EISA slots available
CT-A254V-B9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A254V-C9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A255V-B9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A255V-C9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
Two-CPU Systems	**Model**	**Memory**	**PCI/EISA slots available**
CT-A254V-D9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A254V-E9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A255V-D9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-A255V-E9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA

Step 1—Systems *(continued)*

OpenVMS Systems include

- OpenVMS V6.2-1H1 operating system base license.
- NAS Base Server 200 for OpenVMS license (QL-23EAG-AA), includes the following layered products (order media and documentation separately)
  - DECnet for OpenVMS End System
  - DECnet/OSI for OpenVMS End Node
  - PATHWORKS for OpenVMS (LAN Manager); kit only, no license
  - DEC TCP/IP services for OpenVMS
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS
  - Objectbroker for OpenVMS (ACA Services)
  - DECmessageQ for OpenVMS Runtime
  - DECprint Supervisor for OpenVMS , Base
  - DECprint Supervisor for OpenVMS , Plus
  - DECprint Supervisor for OpenVMS , Open
  - PrintServer software (kit only, licensed with printer
- OpenVMS operating system is factory installed.
- OpenVMS V6.2-1H1 media on CD-ROM included

Note: Operating system media and documentation is required for first system on site; see Step 8

OpenVMS Rackmount Systems—Requires cabinet

Single-CPU Systems	Model	Memory	PCI/EISA slots available
CT-Y254V-B9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y254V-C9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y255V-B9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y255V-C9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
Two-CPU Systems	**Model**	**Memory**	**PCI/EISA slots available**
CT-Y254V-D9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y254V-E9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y255V-D9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-Y255V-E9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA

Windows NT Rackmount Systems include

- Windows NT Server plus 5-client access, 3.51 media (CD-ROM) and license in shrink-wrapped package.
- Windows NT systems require a graphics option, see Step 4.

Windows NT Rackmount Systems—Requires cabinet

Single-CPU Systems	Model	Memory	PCI/EISA slots available
CT-N254V-B9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N254V-C9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N255V-B9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N255V-C9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
Two-CPU Systems	**Model**	**Memory**	**PCI/EISA slots available**
CT-N254V-D9	5/300	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N254V-E9	5/300	512 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N255V-D9	5/375	128 MB	7 PCI , 1 EISA, 1 PCI/EISA
CT-N255V-E9	5/375	512 MB	7 PCI , 1 EISA, 1 PCI/EISA

PCI Option Slot Table

Order Number	Description	Max #	Supported in PCI Hose 0 slots only	Restrictions apply to
PB2GA-JB	S3-Trio64 Graphics option 1MB	**1**	**6, 7, 8, 9**	Digital UNIX, Windows NT, OpenVMS
CCMAA-BA	PCI to MEMORY CHANNEL controller	**2**	**6, 7, 8, 9**	Digital UNIX

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

System Bus Slot Table

Slot Assignments	Slot 1	Slot 2	Slot 3	Slot 4
1 CPU system	Memory	Memory	CPU	Memory
2 CPUs system	Memory	Memory	CPU	CPU

CPU Upgrades

- Order up to one additional CPU for a maximum of two.
- Additional CPUs must match the speed of CPU in system.
- Two-CPU systems are restricted to two memory slots.

Note: Two-CPU Packaged systems include two CPUs and are restricted to two memory options

480NR-AA	**Windows NT** SMP upgrade includes one 5/300 MHz CPU processor; SMP license is not required.
490NR-AA	**Windows NT** SMP upgrade includes one 5/375 MHz CPU processor; SMP license is not required.
480AR-AA	**Digital UNIX** SMP upgrade includes one 5/300 MHz CPU processor and Digital UNIX SMP license.
490AR-AA	**Digital UNIX** SMP upgrade includes one 5/375 MHz CPU processor and Digital UNIX SMP license.
480YR-AA	**OpenVMS** SMP upgrade includes one 5/300 MHz CPU processor and OpenVMS SMP license.
490YR-AA	**OpenVMS** SMP upgrade includes one 5/375 MHz CPU processor and OpenVMS SMP license.

Step 3—Memory

- One-CPU systems support a total of three memory boards in any combination.
- Two-CPU systems support total of two memory boards in any combination.
- Windows NT V 3.5 support up to 1.5 MB memory (requires Windows NT 3.51 Service Pack 4).
- Digital UNIX V 3.2 support up to 1.5 GB memory.
- OpenVMS V6.2 supports up to 1.5 GB memory.

MS451-DA	128 MB memory module
MS451-FA	512 MB memory module

Step 3a—Prestoserve Nonvolatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems only
- Maximum one Prestoserve option per system

DJ-ML200-AA	2 MB PCI Prestoserve option
DJ-ML200-BA	4 MB PCI Prestoserve option
DJ-ML200-CA	8 MB PCI Prestoserve option

Step 4—Graphics Option and Monitors

Windows NT systems

- Windows NT systems require a graphics option to run **all** system functions.

Digital UNIX and OpenVMS systems

- All console functions, including the EISA Configuration Utility (ECU) and the RAID Configuration Utility (RCU) can be performed using a standard video terminal (VT2xx, VT3xx, VT4xx, VT5xx) connected to one of the system's serial ports (See Step 7).
- For graphics console functionality, select graphics option, mouse, keyboard and monitor.

Video Graphics Adapter (VGA)

PB2GA-JB	S3-Trio64 Graphics option, supports 1024x768 resolution, 72-Hz monitors, uses one PCI slot

Mouse

PBXWS-AA	3-button mouse

Keyboard

Select keyboard from Step 9.

Monitor

Graphics monitors other than those listed below can be used if compatible with graphics adapter ordered with system.

VRC15-KA/K4	15" (13.9" viewable image size) high-resolution color monitor with Light Gray enclosure. Flat-square CRT with 0.28 mm dot pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 1.4 meter HD15 male to male video cable. Select -KA for Northern Hemisphere or -K4 for Southern Hemisphere operation. If purchased in North America, -KA includes 120V power cord, otherwise power cords for -KA and -K4 not included, order separately.
VRT17-PA/P4	17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.
VRC21-LA/L4	21" (19.6" viewable image size) ultra high-resolution color monitor with Light Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.

Step 5—Storage

- Integral Fast SCSI-2 controller supports internal devices only (CD-ROM or tape, and hard disk drive inside base chassis). Disk drive connected to this controller operates in **Narrow** (8-bit) mode.
- Select **Wide** (16-bit) mode controllers, disks and StorageWorks shelves from Step 5b for external expansion.

Note: Wide disk drives configured on a **Narrow** bus operate in **narrow** mode. **Narrow** disk drives configured on a **wide** bus operate in **narrow** mode. **Wide** and **narrow** devices can be mixed on a single bus.

Step 5a—Internal Storage

- Systems include one internal RZ29B disk drive and one internal RX23L floppy drive.

Removable Media Devices (select one device)

RRD45-AC	600 MB 5.25-inch quad-speed half-height CD-ROM
TZK11-LG	2.0 GB 5.25-inch half-height SCSI QIC tape drive
TLZ09-LG	8.0 GB 4 mm DAT 93 Mb/minute 5.25" half-height SCSI tape drive (Digital UNIX, OpenVMS)

Step 5b—External Storage for 16-bit (Wide) Mode

- Additional storage is supported outside AlphaServer 2100A LP Rackmount system unit. BA36R-AF/-AR rackmountable 16-bit StorageWorks shelves are recommended.

Configuration Rules

- 16-bit Wide devices require Wide StorageWorks Shelves (BA36R) to operate in wide mode.
- PCI-based one- and three-port (KZPSC-AA/BA) RAID controllers, and one-port Fast Wide Differential (KZPSA-BB) controller allow wide devices to operate in 16-bit mode.
- Maximum of four PCI-based one- and three-port (KZPSC-xx) RAID controllers supported per system.
  - One- and three-port StorageWorks RAID 230 controllers (KZPSC-xx) support hard disk drives **only**; tape drives are not supported.
- Three-port StorageWorks RAID 230 (KZPSC-BA) supports up to 21 disk drives in up to eight logical groups. RAID slots must be created to support more than eight physical disk drives.
- PCI-based Fast Wide Differential (FWD) SCSI controller (KZPSA-BB) supports externally connected wide disks in BA36R using DWZZB wide differential to wide single-ended converter, or narrow disks using DWZZA wide differential to narrow single-ended converter in BA35R.
- KZPSA-BB controller on Windows NT systems supports up to 15 disks. Digital UNIX and OpenVMS systems support 7 disks.
- SCSI cables are **not** included and must be ordered separately.
- KZPSA-BB Cables
  - BN21K-xx from KZPSA to DWZZA, DWZZB, and HSZ40 (straight to right angle)
  - BN21W-0B Y SCSI-2 cable 68-pin for KZPSA in mid-bus or DECsafe configurations.
- KZPSC-xx Cables
  - BN31L-1E from KZPSC-xx to BA35R
  - BN31S-1E from KZPSC-xx to BA36R
  - If all three ports on KZPSC-BA are used, select 2T-KZPSC-KT cable kit for third port connection.
- KZPSM-AA Cables
  - BC25V-1H from KZPSM to external 68-pin bulkhead
  - BN21K-02 from bulkhead to external BA36R wide storage.
- KZPDA-AA Cables
  - BN21K-02 from KZPDA to BA36R wide storage

Step 5b—External Storage for 16-bit (Wide) Mode (*continued*)

Storage Controllers for Wide Mode

KZPSC-AA	One-port PCI-based controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX, and Windows NT
KZPSC-BA	Three-port PCI-based controller; includes StorageWorks RAID Array 230 Subsystem family software and documentation kit for OpenVMS, Digital UNIX, and Windows NT
MS100-AA	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller
MS100-AB	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller
KZPSC-UB	Battery back-up for Cache memory option
KZPSA-BB	PCI-based Fast Wide Differential (FWD) SCSI controller
KZPSM-AA	PCI-based combination Ethernet and Fast Wide SCSI controller
KZPDA-AA	PCI based Fast Wide Single Ended (FWSE) SCSI controller

Hard Disk Drives for Wide Mode

RZ26N-VW	1.05 GB 3.5-inch half-height disk drive
RZ28D-VW	2.1 GB 3.5-inch half-height disk drive
RZ29B-VW	4.3 GB 3.5-inch half-height disk drive

Rackmountable StorageWorks Shelves for Wide Mode

- BA36R StorageWorks shelves are supported on all Fast Wide SCSI-2 controllers listed in Step 5b.
- SCSI cable BN21K-xx for KZPSA, and BN31S-1E for KZPSC, is required to connect BA36R to controller.
- See Step 9 for additional power cords.

BA36R-AF	Rackmountable BA356 StorageWorks Shelf; front accessible
BA36R-AR	Rackmountable BA356 StorageWorks Shelf; rear accessible

Step 5c—DSSI Storage (OpenVMS systems only)

- System supports up to four KFPSA PCI/DSSI adapters.
- Each BA35R StorageWorks shelf in single/split-bus mode supports one/two HSD10 DSSI/SCSI converters.
- Wide disks installed "behind" HSD10 will run in **narrow** mode.
- Cabling information for DSSI controllers:
  - DSSI devices supported on OpenVMS only
  - DSSI cables must be ordered separately
  - KFPSA uses “Micro-Ribbon” connection
  - KFPSA to any external “Pin-Socket” DSSI connection requires BC22Q-xx
  - KFPSA to any external “Micro-Ribbon” DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx
  - KFPSA to any external “Micro-Ribbon” DSSI right-angle connection (all other DSSI systems and storage devices requiring right-angle connection) requires BC29S-xx DSSI cable
  - Order BC29S-09 DSSI cable for HSD10 in BA36R-Ax shelves
  - Order BC29U-02 DSSI cable for HSD10 in adjacent BA36R-Ax shelves
  - Order BC29V-06 DSSI cable for HSD10 in non-adjacent BA36R-Ax shelves

DSSI Adapter

KFPSA-AA	PCI-based single-DSSI controller, maximum four per system (OpenVMS systems only)
HSD10-AA	StorageWorks Array controller; supports seven SCSI-2 disks, tape, and optical devices. (See Storage section for supported devices.)

Step 5d—External Storage for Storage Controllers

Rackmount BA350-xx controller shelves requires seven inches of vertical space; a front and rear shelf can be mounted back-to-back in the same seven inch space. See Step 9 for additional power cords

BA35R-MF	Rackmountable BA350-MA controller shelf; front access
BA35R-MR	Rackmountable BA350-MA controller shelf; rear access

Step 5e—PCI to CI Storage Host Adapter (OpenVMS Systems only)

CIPCA-AA	PCI-to-CI adapter, maximum two per system; requires one PCI slot and one EISA slot. Requires one of the following CI cables per adapter:
BNCIA-10	10-meter CI cable
BNCIA-20	20-meter CI cable
BNCIA-45	45-meter CI cable

Step 6—Networks and Communications

- See PCI Option Slot Chart for slot configuration rules.
- Systems include integral Ethernet adapter (AUI or 10BaseT selectable)
- Select networking cable
  - BNE4G-xx for AUI
  - BN25G-xx for 10BaseT
- Maximum of 4 PCI-based network controllers supported.

		Maximum # supported		
Order Number	**Description**	**Digital UNIX**	**OpenVMS**	**Windows NT**
DNSES-AA	EISA-based synchronous communications controller	2	2	0
CXI01-AA/AD	ISA-based asynchronous multiplexer	2	2	2
DIIAA-AA	Digiboard ISA datafire-U ISDN Controller (available as **spare** only)	0	0	1
DIIAA-AB	Digiboard ISA datafire-ST ISDN Controller (available as **spare** only)	0	0	1
DEFPA-AA*	PCI to FDDI Adapter, SAS, MMF, SC	4	4	4
DEFPA-DA*	PCI to FDDI Adapter, DAS, MMF, SC	4	4	4
DEFPA-UA*	PCI to FDDI Adapter, SAS, TP-PMD	4	4	4
DE435-AA	PCI-based Digital Etherworks 32-bit High Performance Network Interface Card	4	4	4
DE500-XA	Fast EtherWORKS PCI 10/100 network interface card	2	2	2
PBXNP-AA	PCI-based Token ring network adapter	1	1	0

* OpenVMS does not have boot support. Cables: Fiber, Duplex, "SC" to "MIC" (concentrator): BN34D-xx; Fiber, Duplex, "SC" to "SC": BN34B-xx; Fiber, Duplex, "SC" to "ST": BN34A-xx; Copper STP, 8 cond, wired pin-pin: BN26M-xx; Copper STP, 8 cond, wired cross-over: BN26S-03.

Step 6a—MEMORY CHANNEL Interconnect

Digital UNIX Systems

- Require Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster license

Configuring information:

- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.
- CCMRA-AA Rackmount Kit for Hub; takes 8.75-in rail space.

Note: CCMAA-BA (PCI to MEMORY CHANNEL controller) must be installed in PCI Hose 0 slots 6-9, and in redundant mode both CCMAA-BAs must be installed in PCI Hose 0 slots 6-9.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported .
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMRA-AA	MEMORY CHANNEL Hub Rackmount Kit (8.75-in)
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAG-AA	TruCluster Software for Digital UNIX, includes Digital UNIX driver
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAG-AA	OpenVMS Cluster license for Alpha systems

Step 7—Terminals and Printers

System includes two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors.

Digital UNIX and OpenVMS systems

Console terminals can either be graphics monitor connected to the ordered video graphics adapter (See Step 4), or a serial video terminal. If a serial video terminal is used as the console terminal, it must be VT220, VT320, VT420, or VT520 compatible. These terminals have the graphics capability required for the EISA Configuration Utility.

Select terminals and serial printers as required. A 9-pin to MMJ adapter (H8571-J) is required (one included with system) for each connection. A cable must be ordered unless otherwise provided.

Step 8—Software

Windows NT Systems

Systems include Windows NT Server plus 5-client access 3.51 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ Windows NT Server documentation kit

Digital UNIX Systems

Select user licenses as required. Media and documentation is **required** for first system on site.
Software processor code = **G** for **all** software, one to four processors.

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designed Digital UNIX system. Digital UNIX Concurrent Use licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7AM-3B Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F Digital UNIX Concurrent Use 16-user license
QL-MT7AG-AA Digital UNIX Traditional unlimited user license
QL-MT5AG-AA Digital UNIX developer's extension license

Digital UNIX Media and Documentation—required for first system on site

QA-MT4AA-H8 Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for Digital UNIX on CD-ROM

DECnet Licenses

QL-MTJAG-AA DECnet/OSI end-system license for Digital UNIX
QL-MTKAG-AA DECnet/OSI extended function license for Digital UNIX

OpenVMS Systems

Select user licensees as required. Media and documentation is **required** for first system on site.
Software processor code = **G** for **all** software, one to four processors

Step 8—Software *(continued)*

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AG-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-MT1AG-H8	OpenVMS V6.2-1H1 media and documentation on CD-ROM (included with system)
QA-MT1AH-GZ	OpenVMS hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet Licenses

QL-MTGAG-AA	DECnet extended function license for OpenVMS
QL-MTHAG-AA	DECnet end-system to extended function upgrade license for OpenVMS

DSSI Information (OpenVMS systems only)

EK-410AB-MG	DSSI VMScluster Installation Guide
EK-D4AXP-TS	DSSI VMScluster Troubleshooting Guide

Step 9—Power Cords and Keyboards

System Power Cords

Systems include 120V or 240V cabinet compatible power cord. Select country-specific power cord for other 240V use.

Included*	U.S., Canada, Japan, 120 V
BN19J-2E	Australia, New Zealand
BN19D-2E	Central Europe
BN19B-2E	U.K., Ireland
BN04B-2E	Switzerland
BN19L-2E	Denmark
BN19N-2E	Italy
BN19T-2E	Egypt, India, South Africa
BN19Y-2E	Israel

* Orderable as 17-00083-51

Step 9—Power Cords and Keyboards *(continued)*

Monitor Power Cords

Select country-specific power cord for 240V use.

BN27S-03	U.S., Canada, Japan, 120V
BN19H-2E	Australia, New Zealand
BN19C-2E	Central Europe
BN19A-2E	U.K., Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	Egypt, India, South Africa
BN18L-2E	Israel

StorageWorks Power Cords

Select additional power cords for N+1 power use.

BN27S-03	U.S., Canada, Japan
BN27Z-03	240V Cabinet Systems

Keyboards

Order keyboard if graphics monitor was ordered in Step 4.

Windows NT/ Digital UNIX	**OpenVMS**	
LK471-A2	**LK461-A2**	U.S./English
LK471-AB	**LK461-AB**	Belgian
	LK461-AC	Canadian/French
LK471-AD	**LK461-AD**	Danish
LK471-AE	**LK461-AE**	United Kingdom
	LK461-AF	Finnish
LK471-AG	**LK461-AG**	German
	LK461-AH	Dutch
LK471-AI	**LK461-AI**	Italian
LK471-AK	**LK461-AK**	Swiss/Generic
	LK461-AL	Swiss/German
	LK461-AM	Swedish
LK471-AN	**LK461-AN**	Norwegian
LK471-AP	**LK461-AP**	French
	LK461-AQ	Canadian/English
LK471-AS	**LK461-AS**	Spanish
LK471-AV	**LK461-AV**	Portuguese

Step 10—Cabinet Enclosure

Select cabinet enclosure for AlphaServer 2100A LP rackmount systems, if required.

- H9A10 19-inch EIA Cabinet Enclosure Dimensions
  - Outside 66.9-inches high, 23.62-inches wide, 33.8-inches deep
  - Internal useable rackmountable space: 56-inches high, 19-inches wide, 30.8 inches deep.
- H9A15 19-inch EIA Cabinet Enclosure Dimensions
  - Outside 78.7-inches high, 23.62-inches wide, 33.4-inches deep
  - Internal useable rackmountable space: 68.25-inches high, 19-inches wide, 29.8 inches deep.
- H9A11 19-inch EIA Cabinet Enclosure Dimensions
  - Outside 43.3-inches high, 23.62-inches wide, 33.8-inches deep
  - Internal useable rackmountable space: 35-inches high, 19-inches wide, 30.8 inches deep.

H9A10-CE	Retma Cabinet, 56" x 30.83", No front door, Dual Power controller, 120V
H9A10-CJ	Retma Cabinet, 56" x 30.83", No front door, Dual Power controller, 240V
H9A10-CG	Retma Cabinet, 56" x 30.83", Front door, Dual Power controller, 120V
H9A10-CK	Retma Cabinet, 56" x 30.83", Front door, Dual Power controller, 240V
H9A15-BA	Retma Cabinet, 68.25" x 29.75", No front door, Dual Power controller, 120V
H9A11-BA	Retma Cabinet, 35" x 30.83", No front door, 120V

Step 11—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Select optional Hardware Supplemental Support Services if required.

AlphaServer 2100A LP 5/300 Systems

FM-S54HR-36	3 year 5 x 9 4-hour response time
FM-S54HR-60	5 year 5 x 9 4-hour response time
FM-S5724-36	3 year 7 x 24 4-hour response time
FM-S5724-60	5 year 7 x 24 4-hour response time

AlphaServer 2100A LP 5/375 Systems

FM-S94HR-36	3 year 5 x 9 4-hour response time
FM-S94HR-60	5 year 5 x 9 4-hour response time
FM-S9724-36	3 year 7 x 24 4-hour response time
FM-S9724-60	5 year 7 x 24 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for **Windows NT** include advisory and remedial software support for the time period indicated.
- Software service upgrades for **Digital UNIX** and **OpenVMS** include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 2100A LP 5/300 and 5/375 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems
FM-45NTS-60	60-month Software Supplemental Support for **Windows NT** AlphaServer 2100A systems

Step 11—Hardware and Software Supplemental Support Services *(continued)*

AlphaServer 2100A LP 5/300 and 5/375 Systems

FM-SEOSF-12	12-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-36	36-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEOSF-60	60-month Software Supplemental Support for **Digital UNIX** AlphaServer 2100A systems
FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems
FM-SEVMS-60	60-month Software Supplemental Support for **OpenVMS** AlphaServer 2100A systems

Step 11a—Hardware and Software Supplemental Support Services (Europe only)

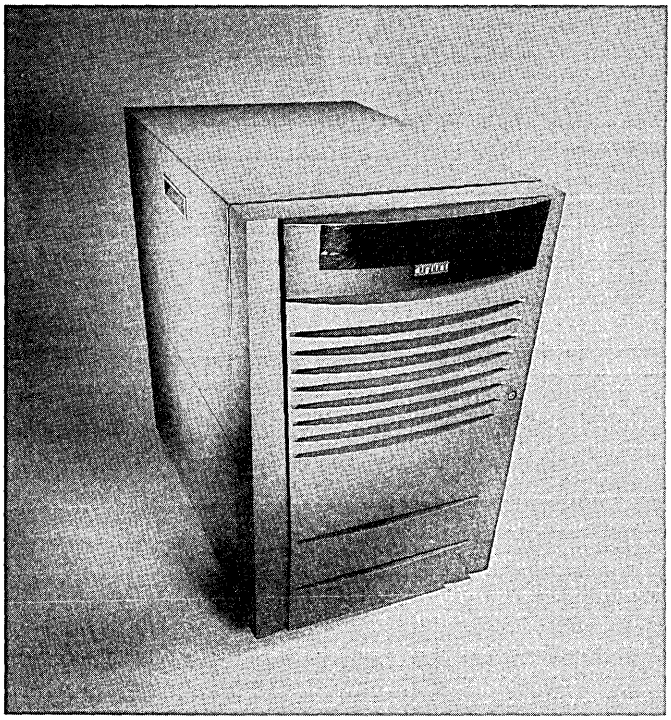
Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

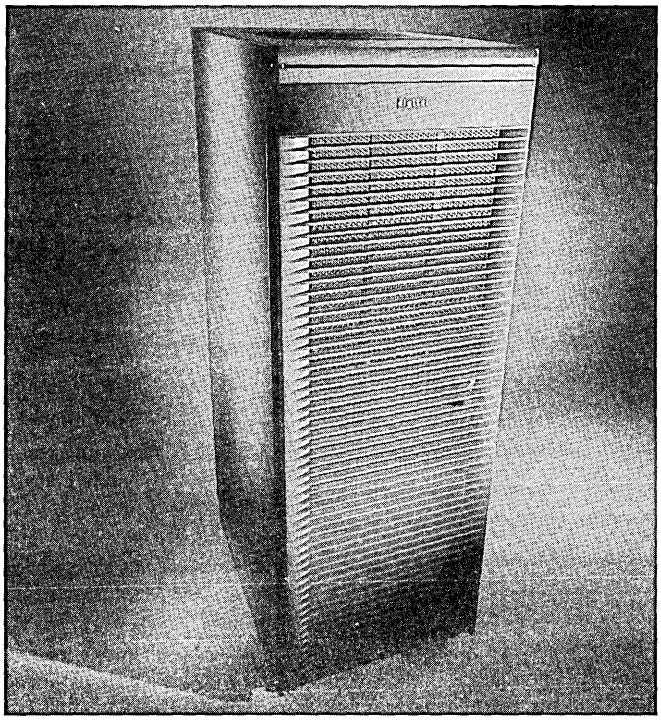
Specifications

Installed Dimensions		
Height		17 cm (7 in.)
Width		45 cm (19 in.)
Depth		67.3 cm (26.5 in.)
Weight		34.1 kg (75 lb)
Environmental		
Temperature		
Operating*		10-35° C (50°-95° F)
Nonoperating		-40°-66° C (-40°-151° F)
Rate of change		11° C/hr (20° F/hr)
Relative humidity		
Operating		10-90% noncondensing
Maximum wet bulb temp		
Nonoperating		28° C (82° F) 10-95% noncondensing
Maximum wet bulb temp		46° C (115° F)
Rate of change		20% / hr
Maximum heat dissipation		800 Watt (2,766 BTU/hr)
Air flow		100 CFM
Intake location		Front
Exhaust location		Rear
Altitude		
Operating **		3048 m (10,000 ft)
Nonoperating		12,192 m (40,000 ft)
Mechanical shock		
Operating		20 g pk for 10 ± 3 ms
Nonoperating		20 g pk for 10 ± 3 ms
Vibration		
Operating		5-15.65 Hz @0.020" DA 15.65-200 Hz @0.25g peak 200-500 Hz @0.10g peak
Non-operating		5-300 Hz @1.034g rms
Acoustics		
Operating LNPEc (Bels)		6.5 max per ISO 7779
Electrical		
Voltage range (AVS)		100-120/220-240 Vac
power source phase		Single
Nominal frequency (Hz)		50 - 60 Hz
Frequency range (Hz)		47 - 63 Hz
Maximum rated current		8.2 a / 4.1 a
Maximum power consumption (Watts)		810 W (PFC = 0.99, 8.2A @ 100 V)
Agency approvals		UL Listed to UL1950 CSA Certified to CAN/CSA 22.2 No. 950-M93 TUV EN 60950GS VDE 0805 IEC 950 FCC 15J Part 15 (Class A) CE
Power cord	Type	IEC 320 C13
	Length	300 cm (118 in.)
	U.S. plug	NEMA 5-15, Socket IEC 320 Sheet, C-15
Reviewed to		AS3260 Australian Standard NZS 6661:1989 New Zealand Standard EN 60 950:1992 European Norm

* Maximum operating temperature at Sea Level. Reduced by 1°C (1.8°F) for each 600 m (2000 feet) above Sea Level.

** Higher altitudes are possible if maximum operating temperature is reduced (see Temperature above); other restrictions may apply, such as maximum permissable altitude for hard disk drives.





AlphaServer 4100/4000

Product Description

The AlphaServer 4000, Digital's low-end price performer and very attractive entry point into the AlphaServer 4100 family of server systems, now teams with the top-of-the-line AlphaServer 4100 to further explode the mid-range server market.

The AlphaServer 4000 is based on the same technology as the AlphaServer 4100. Both systems support eight PCI slots and industry-standard fast wide SCSI devices. And, both also support next generation Alpha microprocessors on Digital UNIX, Windows NT and OpenVMS operating systems. Systems include Fast Wide SCSI controller, PCI-based Fast Ethernet, graphics adapter, one memory option, and 4.3 GB wide SCSI disk drive installed in a StorageWorks shelf.

Highlights

- Cabinet systems support for up to four System Drawers and up to eight StorageWorks shelves. Pedestal systems support one System Drawer and up to three StorageWorks shelves
- AlphaServer 4100 5/400 and 5/300 CPU board upgrades are available as well as system upgrades from AlphaServer 4000 to AlphaServer 4100 systems.
- MEMORY CHANNEL Cluster support
- System management enhancements for managing multiple System Drawers

New ordering rules

- The basic "building block" is the System Drawer—complete with CPU, memory, Ethernet controller, SCSI controller, S3 TRIO graphics adapter, licenses, documentation, and 3-year warranty.
- Second essential "building block" is the enclosure—pedestal or cabinet, complete with StorageWorks shelf (BA36R-SB/RA) and 4.3 GB SCSI disk. Cabinet enclosures include System Drawer mounting kit/power cord.

Both "building blocks" must be ordered to complete an AlphaServer 4100/4000 system.

Note: AlphaServer 4100 5/300E ordering rules have not changed. See May 1996 harcopy *Digital Systems and Options Catalog* for configuration rules.

Step 1—AlphaServer 4100/4000 Systems

- Configuration menus **require** the selection of **two part numbers.**
  - Minimum of **one** System Drawer from Step 1a, and
  - System Enclosure from Step 1b.

Note: System Drawer can be ordered to add to an existing AlphaServer 4100 or 4000 Cabinet system, selection of an additional enclosure is not required.

Step 1a—AlphaServer System Drawer

- Selection of **one** System Drawer for installation in a Pedestal or Cabinet Enclosure selected from Step 1b is required.
  - **AlphaServer 4100 System Drawer** supports up to **four** CPUs and up to **four** memory options.
  - **AlphaServer 4000 System Drawer** supports up to **two** CPUs and up to **two** memory options.
- Cabinet Enclosure includes mounting kit and power cord for first System Drawer.
  - Each additional System Drawer ordered for Cabinet Enclosure **requires** a Mounting Kit (CK-BA30A-AA) and Power Kit (CK-H9A10-EB/EC).

Note: Ordering a System Drawer to add to an existing AlphaServer 4100/4000 Cabinet system **requires** a Mounting Kit (CK-BA30A-AA) and Power Kit (CK-H9A10-EB/EC). Ordering a System Drawer to add to a non-H9A10-EE/ED cabinet (i.e. third-party) requires a suitable Mounting Kit and Power Kit.

System Drawer includes

- **AlphaServer 4100 System Drawer** with
  Alpha microprocessor 21164 5/300 MHz CPU, 2 MB secondary cache, **or**
  Alpha microprocessor 21164 5/400 MHz CPU, 4 MB secondary cache
  4100 System Drawer supports
  3 additional CPU slots (same type)
  3 additional memory option slots
- **AlphaServer 4000 System Drawer** with
  Alpha microprocessor 21164 5/300 MHz CPU, 2 MB secondary cache, **or**
  Alpha microprocessor 21164 5/400 MHz CPU, 4 MB secondary cache
  4000 System Drawer supports
  1 additional CPU slot (same type)
  1 additional memory option slot
- Eight PCI Slots (five available)
- Integral FNSE (internal-only SCSI bus) to support removable media (CD-ROMs and tapes)
- Integral CD-ROM drive (standard)
- 1.44 MB Diskette Drive (standard)
- Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
- One parallel port, 25-pin D-subminiature connectors
- Keyboard and mouse ports
- Power supply
- Memory listed below (included memory uses one memory slot)
- Ethernet (10/100 Mbit) Controller (uses one PCI slot)
- One-port Fast Wide Single-Ended (FWSE) SCSI Controller (uses one PCI slot)
- S3 TRIO 1 MB RAM Graphics Adapter (uses one PCI slot)
- 3-button Mouse
- Keyboard (Americas and AP orders only). Select country specific keyboard for all systems ordered in Europe.
- Integral Remote System Console
- Operating System license
- Customer documentation
- Hardware and Software Warranty, see Step 12

Selection of one System Drawer is required for each Pedestal or Cabinet Enclosure ordered from Step 1b

AlphaServer 4100 5/400 and 5/300 Systems

AlphaServer 4100 Windows NT System Drawer—Selection of one System Drawer required.

- Video monitor is required for system management; order separately if not available at customer site.
- Systems include Windows NT Server plus 5-client access 3.51 media (CD-ROM) and license in shrink-wrapped package. Microsoft Service Pack 4 or greater is required, and is available from Microsoft.

Order Number	CPU	Cache	Memory	Available Slots
DN-51HAA-CA	5/400	4 MB	128 MB	5 PCI
DN-51HAA-EA	5/400	4 MB	512 MB	5 PCI
DN-51HAA-FA	5/400	4 MB	1 GB	5 PCI
DN-51HAA-GA	5/400	4 MB	2 GB	5 PCI
DN-51FAA-CC	5/300	2 MB	128 MB	5 PCI
DN-51FAA-EC	5/300	2 MB	512 MB	5 PCI
DN-51FAA-FC	5/300	2 MB	1 GB	5 PCI
DN-51FAA-GA	5/300	2 MB	2 GB	5 PCI

AlphaServer 4100 Digital UNIX System Drawer—Selection of one System Drawer required

- Systems include Digital UNIX operating system base license, and Digital NAS Base Server 200 for Digital UNIX license (order media and documentation separately).
- Digital UNIX operating system is factory installed.

Order Number	CPU	Cache	Memory	Available Slots
DA-51HAB-CA	5/400	4 MB	128 MB	5 PCI
DA-51HAB-EA	5/400	4 MB	512 MB	5 PCI
DA-51HAB-FA	5/400	4 MB	1 GB	5 PCI
DA-51HAB-GA	5/400	4 MB	2 GB	5 PCI
DA-51FAB-CC	5/300	2 MB	128 MB	5 PCI
DA-51FAB-EC	5/300	2 MB	512 MB	5 PCI
DA-51FAB-FC	5/300	2 MB	1 GB	5 PCI
DA-51FAB-GA	5/300	2 MB	2 GB	5 PCI

AlphaServer 4100 OpenVMS System Drawer—Selection of one System Drawer required.

- Systems include OpenVMS operating system base license, operating system media and documentation, and Digital NAS Base Server 200 for OpenVMS license (order Digital NAS media and documentation separately).
- OpenVMS operating system is factory installed.

Order Number	CPU	Cache	Memory	Available Slots
DY-51HAB-CA	5/400	4 MB	128 MB	5 PCI
DY-51HAB-EA	5/400	4 MB	512 MB	5 PCI
DY-51HAB-FA	5/400	4 MB	1 GB	5 PCI
DY-51HAB-GA	5/400	4 MB	2 GB	5 PCI
DY-51FAB-CC	5/300	2 MB	128 MB	5 PCI
DY-51FAB-EC	5/300	2 MB	512 MB	5 PCI
DY-51FAB-FC	5/300	2 MB	1 GB	5 PCI
DY-51FAB-GA	5/300	2 MB	2 GB	5 PCI

AlphaServer 4000 5/400 and 5/300 Systems

AlphaServer 4000 Windows NT System Drawer—Selection of one System Drawer is required.

- Video monitor is required for system management; order separately if not available at customer site.
- Systems include Windows NT Server plus 5-client access 3.51 media (CD-ROM) and license in shrink-wrapped package. Microsoft Service Pack 4 or greater is required, and is available from Microsoft.

Order Number	CPU	Cache	Memory	Available Slots
DN-52HAA-CA	5/400	4 MB	128 MB	5 PCI
DN-52HAA-EA	5/400	4 MB	512 MB	5 PCI
DN-52HAA-FA	5/400	4 MB	1 GB	5 PCI
DN-52HAA-GA	5/400	4 MB	2 GB	5 PCI
DN-52FAA-CA	5/300	2 MB	128 MB	5 PCI
DN-52FAA-EA	5/300	2 MB	512 MB	5 PCI
DN-52FAA-FA	5/300	2 MB	1 GB	5 PCI
DN-52FAA-GA	5/300	2 MB	2 GB	5 PCI

AlphaServer 4000 Digital UNIX System Drawer—Selection of one System Drawer is required.

- Systems include Digital UNIX operating system base license, and Digital NAS Base Server 200 for Digital UNIX license (order media and documentation separately).
- Digital UNIX operating system is factory installed.

Order Number	CPU	Cache	Memory	Available Slots
DA-52HAB-CA	5/400	4 MB	128 MB	5 PCI
DA-52HAB-EA	5/400	4 MB	512 MB	5 PCI
DA-52HAB-FA	5/400	4 MB	1 GB	5 PCI
DA-52HAB-GA	5/400	4 MB	2 GB	5 PCI
DA-52FAB-CA	5/300	2 MB	128 MB	5 PCI
DA-52FAB-EA	5/300	2 MB	512 MB	5 PCI
DA-52FAB-FA	5/300	2 MB	1 GB	5 PCI
DA-52FAB-GA	5/300	2 MB	2 GB	5 PCI

AlphaServer 4000 OpenVMS System Drawer—Selection of one System Drawer is required.

- Systems include OpenVMS operating system base license, operating system media and documentation, and Digital NAS Base Server 200 for OpenVMS license (order Digital NAS media and documentation separately).
- OpenVMS operating system is factory installed.

Order Number	CPU	Cache	Memory	Available Slots
DY-52HAB-CA	5/400	4 MB	128 MB	5 PCI
DY-52HAB-EA	5/400	4 MB	512 MB	5 PCI
DY-52HAB-FA	5/400	4 MB	1 GB	5 PCI
DY-52HAB-GA	5/400	4 MB	2 GB	5 PCI
DY-52FAB-CA	5/300	2 MB	128 MB	5 PCI
DY-52FAB-EA	5/300	2 MB	512 MB	5 PCI
DY-52FAB-FA	5/300	2 MB	1 GB	5 PCI
DY-52FAB-GA	5/300	2 MB	2 GB	5 PCI

Step 1b—Enclosures and Cabinet Accessories

- Selection of an Enclosure or Mounting Kit is **required.**
  - Pedestal Enclosure supports **one** System Drawer, up to three StorageWorks shelves.
  - Cabinet Enclosure supports up to **four** System Drawers, up to eight StorageWorks shelves.
- Pedestal and Cabinet enclosure include StorageWorks Shelf and one 4.3 GB hard disk drive.

Note: Ordering a System Drawer to add to an existing AlphaServer 4100/4000 Cabinet system requires a Mounting Kit (CK-BA30A-AA) and Power Kit (CK-H9A10-EB/EC). Ordering a System Drawer to add to a non-H9A10-EE/ED cabinet (i.e., third-party) requires a suitable Mounting Kit and Power Kit.

Pedestal Enclosure

BA30P-AB	Pedestal with StorageWorks Shelf and 4.3 GB hard drive for Americas, AP
BA30P-BB	Pedestal with StorageWorks Shelf and 4.3 GB hard drive for Europe; order two country-specific power cords from Step 8.

Cabinet Enclosure—includes System Drawer mounting kit (CK-BA30A-AA), power cord, AC distribution with one CK-H9A10-EB/EC power kit. Two additional power kits are supported.

H9A10-ED	19" RETMA Cabinet with StorageWorks Shelf and 4.3 GB hard drive for Americas, AP
H9A10-EE	19" Metric Cabinet with StorageWorks Shelf and 4.3 GB hard drive for Europe

Mounting Kits—includes 6-foot keyboard and mouse extender cable, 10 foot video cable, and AC power cord

CK-BA30A-AA	System Drawer Mounting Kit; required for each additional drawer added to cabinet

Cabinet Power Kits

- Initial systems include five available AC outlets; each cabinet power kit provides six additional AC outlets.
- Required for installation of additional System Drawers in H9A10-ED/EE cabinets.
- May be required for installation of BA36R-JA/RA StorageWorks shelves; see Step 5c.
- Maximum of three power kits per cabinet, one included with enclosure.
- Power kit is not required for fourth drawer installed in cabinet.

CK-H9A10-EB	AlphaServer 4x00 RETMA Cabinet Power Kit
CK- H9A10-EC	AlphaServer 4x00 Metric Cabinet Power Kit

Step 2—Additional CPU Modules (SMP Upgrades)

- **AlphaServer 4100** System Drawer supports **three** additional CPU
- **AlphaServer 4000** System Drawer supports **one** additional CPU
- CPUs (i.e., 5/300 2 MB) and operating system must be of the same type in each System Drawer.

KN302-BC	**Windows NT** SMP upgrade, includes one 5/300 (2 MB) CPU; SMP license not required
KN304-BC	**Windows NT** SMP upgrade, includes one 5/400 (4 MB) CPU; SMP license not required
KN302-BA	**Digital UNIX** SMP upgrade includes one 5/300 (2 MB) CPU and Digital UNIX SMP license
KN304-BA	**Digital UNIX** SMP upgrade includes one 5/400 (4 MB) CPU and Digital UNIX SMP license
KN302-BB	**OpenVMS** SMP upgrade includes one 5/300 (2 MB) CPU and OpenVMS SMP license
KN304-BB	**OpenVMS** SMP upgrade includes one 5/400 (4 MB) CPU and OpenVMS SMP license

Step 3—Additional Power Supply

- Power supply included with System Drawer provides support for two processors, memory, and I/O adapters.

H7291-AA 450 watt power supply

	AlphaServer 4100	AlphaServer 4000
1st 450 Watt Power supply (included)	Supports up to two CPUs	Supports up to two CPUs
2nd 450 Watt Power supply	Supports third or fourth CPU **or** Provides N+1 for up to two CPUs	Provides N+1 for two CPU systems
3rd 450 Watt Power supply	Provides N+1 for up to four CPUs	N/A

Step 4—Memory

- All System Drawers include one memory option.
- **AlphaServer 4100** System Drawer supports **three** additional memory option slots for maximum of 4 GB total.
- **AlphaServer 4000** System Drawer supports **one** additional memory option slot for maximum of 2 GB total.

Note: Field installation of memory requires largest memory option to be placed in Memory Slot 0.

MS320-CA 128 MB memory option
MS330-EA 512 MB memory option
MS330-FA 1 GB memory option
MS330-GA 2 GB memory option

Step 5—Storage

- System Drawer includes one 16-bit Fast Wide Single-Ended (FWSE) SCSI controller with SCSI cable.
- Pedestal and Cabinet enclosure includes:
  - One BA356 16-bit Wide StorageWorks shelf kit (BA36R-xx), and one 4.3 GB 7200 RPM 16-bit wide disk drive

Step 5a—Disk Drives

RZ28D-VA 2.1 GB 7200 RPM 8-bit **Narrow** SCSI disk drive
RZ29B-VA 4.3 GB 7200 RPM 8-bit **Narrow** SCSI disk drive

RZ28D-VW 2.1 GB 7200 RPM 16-bit **Wide** SCSI disk drive
RZ29B-VW 4.3 GB 7200 RPM 16-bit **Wide** SCSI disk drive

Step 5b—Removable Media

- All System Drawers include CD-ROM drive in integral 5.25" drive slot connected to integral FNSE SCSI-2 controller.
- System Drawer installed in Pedestal Enclosure supports one additional removable media device. Optional 5.25" half-height removable media slot in Pedestal systems is connected to integral FNSE SCSI-2 controller.

Tape Drive and additional CD-ROM for Pedestal systems only

TLZ09-LK[1] 8 GB 4 mm DAT 93 MB/min (compressed) 5.25-inch SCSI tape drive, frost white
RRD45-AB 600 MB quad speed CD-ROM 5.25-inch drive

1 Supported on OpenVMS and Digital UNIX only

Step 5b—Removable Media *(continued)*

Tape Drives and additional CD-ROM for StorageWorks shelves in Pedestal and Cabinet systems

TLZ09-VA[1]	8 GB 4 mm DAT 93 MB/min (compressed) 5.25-inch SCSI tape drive in StorageWorks carrier
TLZ7L-VA	32/96 GB 4 mm 1.5 GB/hr 5.25-inch SCSI tape loader in StorageWorks carrier
TKZ15-VA[1]	5/10 GB 8 mm Helical Scan 5.25-inch SCSI tape drive in StorageWorks carrier
TZ88N-VA[2]	20/40 GB DLT 3 MB/s SCSI cartridge tape drive in 5.25-inch StorageWorks carrier
TZK11-VA	2 GB QIC tape drive in StorageWorks carrier
RRD45-VA	600 MB quad speed CD-ROM drive in StorageWorks carrier

1 Supported on Digital UNIX and OpenVMS systems only.
2 Supported under Windows NT with Service Pack 4 (available from Microsoft).

DLT Tape Loaders for Cabinet systems

TZ885-NE	100/200 GB SCSI five cartridge rackmount SCSI tape subsystem for SW500, SW800, and H9A10-ED/EE cabinets; one loader supported per cabinet
TZ887-NE	140 GB native/280 GB compressed, seven cartridge rackmount SCSI tape subsystem for SW500/ W800 and H9A10-ED/EE cabinets, requires BN30B-02 cable if mounted in H9A10-ED/EE cabinet, two loaders supported per cabinet

Tabletop Tape Drives

TZ875-TA	100 GB five data cartridge tabletop tape subsystem, 120-V/240-V selectable power, TK compatible

Step 5c—StorageWorks Shelves

Pedestal and Cabinet enclosures include one BA36R StorageWorks Shelf Kit.

- **Pedestal** Enclosure supports maximum of **three** BA36R-xx StorageWorks Shelves.
- **Cabinet** Enclosure supports maximum of **eight** BA36R-xx StorageWorks Shelves.
- Maximum of two BA35R-MR or BA350-MB controller shelves supported in RETMA/METRIC cabinet.
- Additional StorageWorks shelves **require** controller(s) and cables.
- Field installation of StorageWorks shelves may require additional Cabinet Power Kits (CK-H9A10-EB/EC). Check available outlets to determine number of kits needed.

Split-bus Configuration Rules

- StorageWorks shelves are configured by default in single bus mode (seven SCSI devices/shelf). If split-bus mode is required, the following components must be on the order and specified as **configured.**
  - Split-bus mode active terminator (BA35X-ME) for BA36R-xx shelf
  - SCSI controller for each active SCSI port
  - Cables to connect each active SCSI port to BA36R-xx shelf
  - Include the devices to be configured for each active SCSI port
  - Shelves will be split in the sequence installed, unless specified otherwise.

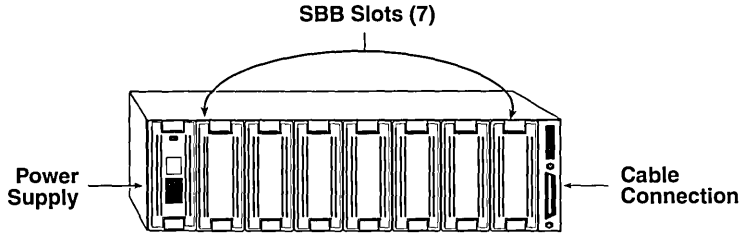
BA36R StorageWorks Shelf Kits

BA36R StorageWorks Shelf Kits include BA356 16-bit Wide StorageWorks shelf, and 16-bit personality module with power supply in system building block (SBB), mounting hardware and power cord.

- Each BA356 shelf supports:
  - seven 3.5-inch hard disk drives or
  - one 5.25-inch device and four 3.5-inch hard disk drives or
  - two 5.25-inch devices and one 3.5-inch hard disk drive
- Installation of redundant power supply reduces number of 3.5-inch devices by one.

Step 5c—StorageWorks Shelves

BA36R-SB	Pedestal StorageWorks shelf kit (Worldwide)
BA36R-RA	RETMA Cabinet StorageWorks shelf kit (Americas and AP)
BA36R-JA	Metric Cabinet StorageWorks shelf kit (Europe)
CK-BA35X-HF	Optional 150-Watt universal ac input redundant power supply, includes power cord
BA35X-ME	Split-bus mode active terminator for BA36R shelf



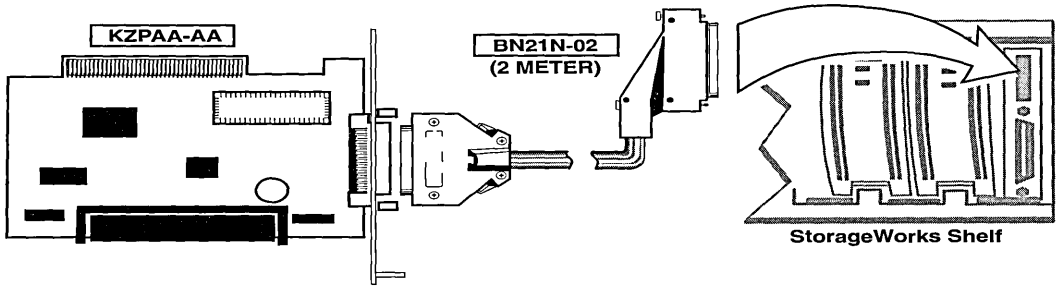
StorageWorks Shelf

Step 5d—Backplane Storage Controllers

- Systems include KZPDA-AA PCI one-port Fast Wide Single Ended (FWSE) SCSI controller, and BN21K-02 cable.
- The following controllers can be configured in AlphaServer 4100/4000 System Drawers.
- Charts indicate minimum level of operating system support. Note: Minimum operating system level support for Digital UNIX with MEMORY CHANNEL is V3.2G.

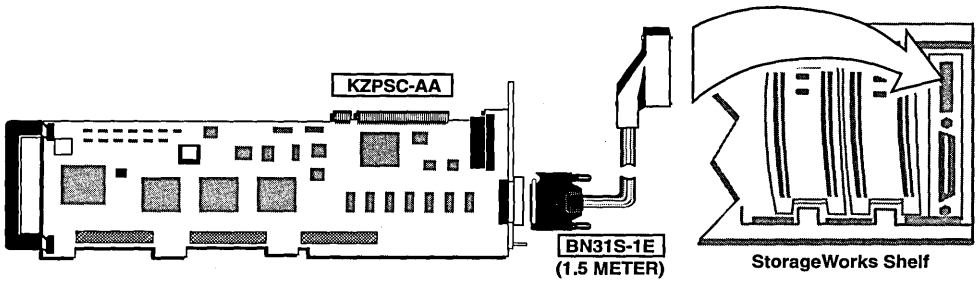
		Maximum # Supported		
Order Number	**Description**	**Windows NT 3.51**	**Digital UNIX V3.2F/V3.2G**	**OpenVMS V6.2-1H3**
KZPDA-AA	**PCI one port FWSE SCSI controller**	2	2	2
BN21K-02	2-meter SCSI cable, required for each StorageWorks shelf SCSI port attached to KZPDA controller. Note: 1 KZPDA per PCI bus.			

		Maximum # Supported		
Order Number	**Description**	**Windows NT 3.51**	**Digital UNIX V3.2F/V3.2G**	**OpenVMS V6.2-1H3**
KZPAA-AA	**PCI one port FNSE SCSI controller**	2	2	2
BN21N-02	2-meter 8-bit to 16-bit SCSI cable			



Step 5d—Backplane Storage Controllers *(continued)*

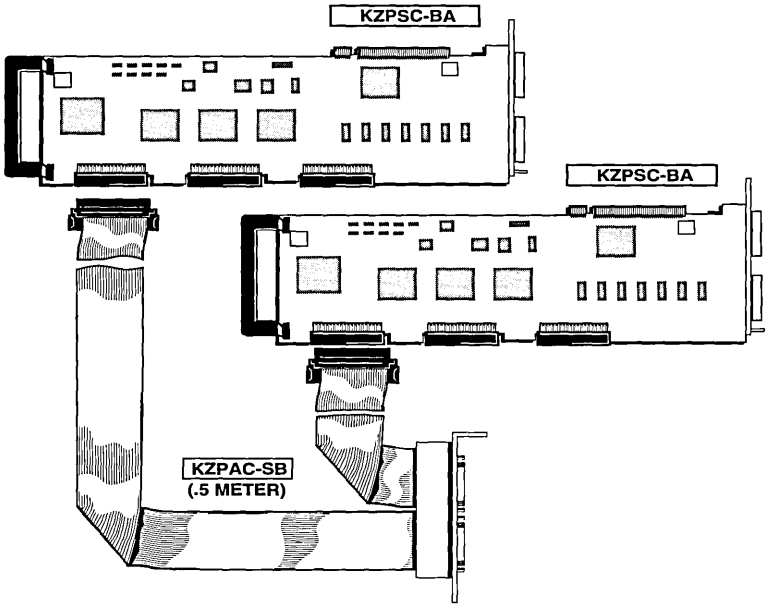
		Maximum # Supported		
Order Number	**Description**	**Windows NT 3.51**	**Digital UNIX V3.2F/V3.2G**	**OpenVMS V6.2-1H3**
KZPSC-AA	**PCI one-port RAID controller**; includes RAID array 230 Subsystem family software and documentation kit; tape drives not supported	3	3	3
KZPSC-UB	Cache battery-backup for KZPSC controller			
BN31S-1E	1.5-meter SCSI cable, required for each StorageWorks shelf attached to KZPSC controller			
BN31S-02	02-meter SCSI cable—**Note**: Manufacturing may substitute this cable for certain cabinet configurations.			



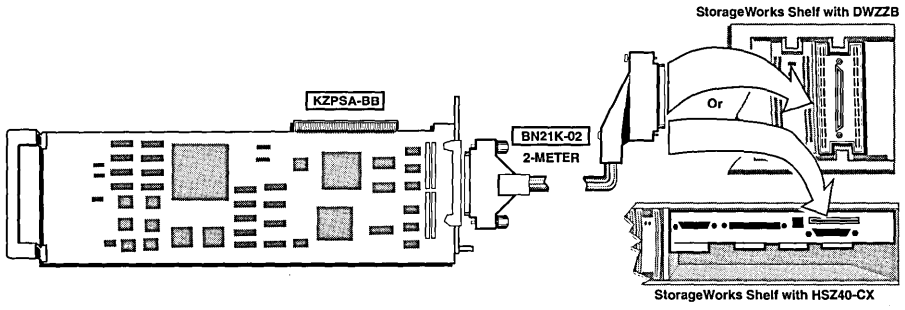
		Maximum # Supported		
Order Number	**Description**	**Windows NT 3.51**	**Digital UNIX V3.2F/V3.2G**	**OpenVMS V6.2-1H3**
KZPSC-BA	**PCI three-port RAID controller**, includes RAID array 230 Subsystem family software and documentation kit; tape drives not supported; must order BN31S-1E cable for each active port. Order BN31K-0E or KZPAC-SB for third port connection.	3*	3*	3*
KZPSC-UB	Cache battery-backup for KZPSC controller			
BN31S-1E	1.5-meter SCSI cable, required for each StorageWorks shelf attached to KZPSC controller. **Note**: Manufacturing may substitute the BN31S-02 cable for certain cabinet configurations.			
BN31S-02	02-meter SCSI cable			
BN31K-0E	SCSI cable/bulkhead assembly kit for KZPSC-BA; required for connection to third port; uses one PCI bulkhead slot.			
KZPAC-SB	SCSI cable/bulkhead assembly kit with two ports for KZPSC-BA, allows connection of 2 third-port outputs using one PCI bulkhead slot			

* Maximum of three controllers supported when KZPAC-SB two port SCSI cable/bulkhead assembly kit is used for two third-port connections.

Step 5d—Backplane Storage Controllers *(continued)*



		Maximum # Supported		
Order Number	Description	Windows NT 3.51	Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
KZPSA-BB	**PCI one-port FWD SCSI controller;** requires DWZZB-VW signal converter if connecting directly to StorageWorks shelf.	5	5	5
BN21K-02	02-meter 16-bit SCSI cable (internal)			
BN21K-03	03-meter 16-bit SCSI cable (external)			
BN21K-05	05-meter 16-bit SCSI cable (external)			
BN21K-10	10-meter 16-bit SCSI cable (external)			
BN21K-15	15-meter 16-bit SCSI cable (external)			
BN21K-20	20-meter 16-bit SCSI cable (external)			



Step 5d—Backplane Storage Controllers *(continued)*

		Maximum # Supported		
Order Number	**Description**			**OpenVMS V6.2-1H3**
KFPSA-AA	**PCI-DSSI controller.** Connecting to StorageWorks shelf directly, requires HSDxx controller.			4
BC29S-06	Connection to HSD10 installed in BA36R Pedestal shelf			
BC29S-09	Connection to HSD10 installed in BA36R Cabinet shelf			

		Maximum # Supported		
Order Number	**Description**			**OpenVMS V6.2-1H3**
CIPCA-AA	**PCI-to-CI adapter** Requires one PCI slot and one EISA slot. Requires one of the following CI cables per adapter.			2
BNCIA-10 **BNCIA-20** **BNCIA-45**	10-meter CI cable 20-meter CI cable 45-meter CI cable			

Step 5e—Non-Backplane External Storage Controllers

- Maximum of two BA35R-MR or BA350-MB controller shelves are supported in the H9A10-ED/EE or H9B10-EB/EC cabinets.
- The following controllers are supported for mounting in AlphaServer 4000/4100 systems.

SCSI controllers

- Minimum operating system support: Digital UNIX V3.2G, OpenVMS V6.2-1H3, Windows NT 3.51.
- Controllers require KZPSA-BB Fast Wide Differential SCSI controller.
- HSZ40-Cx requires BA35R-MR or BA350-MB controller shelf.
- HSZ40-Cx requires BN21N-02 for connection from HSZ40-Cx to BA36R StorageWorks shelf.

HSZ40-CA StorageWorks Array controller; supports 42 SCSI-2 disks, optical disks, RAID 0, includes base firmware and license

HSZ40-CD StorageWorks Array controller with 16 MB cache; supports 42 SCSI-2 disks, optical disks, RAID 0, includes base firmware and license

HSZ40-CF StorageWorks Array controller with 32 MB cache; supports 42 SCSI-2 disks, optical disks, RAID 5, includes base firmware and license

DSSI controllers

- Supported on OpenVMS systems only.
- HSD10-Bx mounts in BA36R-xx StorageWorks shelf.
- HSD10-Bx requires BC29S-06/09 for connection from KFPSA to BA36R shelf.
- HSD30-Cx requires BA35R-MR or BA350-MB StorageWorks Controller shelf.
- HSD30-Cx requires BN21N-02 for connection from HSD30-Cx to BA36R StorageWorks shelf.

HSD10-BA StorageWorks DSSI Array controller, supports 7 SCSI-2 disks, tapes, optical devices

HSD10-BD StorageWorks DSSI Array controller with 16 MB cache, supports 7 SCSI-2 disks, tapes, optical disks

HSD10-BF StorageWorks DSSI Array controller with 32 MB cache, supports 7 SCSI-2 disks, tapes, optical disks

HSD30-CA StorageWorks DSSI Array controller; supports 18 SCSI-2 disks, tapes, optical devices, RAID 0, and includes base firmware and license

HSD30-CD StorageWorks DSSI Array controller with 16 MB cache; supports 18 SCSI-2 disks, tapes, optical disks, RAID 0; includes base firmware and license

HSD30-CF StorageWorks DSSI Array controller with 32 MB cache; supports 18 SCSI-2 disks, tape, optical disks, RAID 0; includes base firmware and license

Step 5e—Non-Backplane External Storage Controllers *(continued)*

CI Controllers

- Supported on OpenVMS systems only.
- Requires CIPCA-AA Storage controller and cables (Step 5d).
- Requires BA35R-MR or BA350-MB StorageWorks Controller shelf.
- HSZ40-Cx requires BN21N-02 for connection from HSZ40-Cx to BA36R StorageWorks shelf.

HSJ40-CD	CI Array controller 16 MB cache
HSJ40-CF	CI Array controller 32 MB cache

Controller Accessories

H879-AA	External SCSI 68-pin, male 8-bit or 16-bit differential terminator
H885-AA	SCSI Tri-link connector, 68-pin, two female and one male connector
BN21W-0B	SCSI Y cable, 68-pin, two female and one male
BN30B-02	IEC to IEC power cord, gray, for H9A10-ED/EE cabinet connection
BN35S-02	IEC to IEC power cord, black, for H9A10-ED/EE cabinet connection
BA35R-MR	Rackmount StorageWorks controller shelf with RETMA mounting kit, order BN30B-02 separately
BA350-MB	Rackmount StorageWorks controller shelf with METRIC mounting kit, order BN30B-02 separately
CK-BA35X-HF	Power supply for n+1 redundant support in BA35R-MR/BA350-MB StorageWorks controller shelf
SC008-AC/AD	Star Coupler Passive Hub device, supports eight CI ports

Step 5f—I/O Expansion Options

AlphaServer 4100/4000 Expander Cabinet

To expand AlphaServer 4100/4000 systems, cabinet enclosures (H9A10-EB/EC) can be joined to RETMA or Metric expander cabinets (H9B10-EB/EC). Loading rules are the same as for H9A10-EB/EC cabinet enclosures. CK-BA30A-AA System Drawer mounting kit must be ordered for first drawer loaded into the H9B10-EB/EC cabinet.

H9B10-EB/EC	AlphaServer 4100/4000 RETMA/METRIC expander cabinet with joiner kit and single CK-H9A10-EB/EC power kit. Order additional power kits as required.

AlphaServer 4100/4000 System Management Station Kit

To efficiently manage multiple System Drawers in a cabinet system, the AlphaServer 4100/4000 supports a System Management Station Kit that allows multiple System Drawers to be controlled from a single terminal, keyboard and mouse housed inside an AlphaServer 4100/4000 cabinet.

- System Management Station Kit requires a cabinet and 19" of space. Station kit includes:
  - 15" color monitor, keyboard and mouse
  - Console switch box and mounting shelf
  - Cables for first two System Drawers (up to 8 System Drawers can be supported with additional cables)
  - Door with console monitor access (factory installation only)

H4020-AA	System Management Station Kit for AlphaServer 4100/4000 systems
2T-H7085-10	System Management Station Kit dual cable, 10-feet in length; each cable kit supports up to two additional System Drawers

Step 5f—I/O Expansion Options *(continued)*

StorageWorks Cabinets

SW800-GA	SW800 Data Center Cabinet, 60Hz, Top Gun Blue, 1700 mm high, 800 mm wide
SW800-GB	SW800 Data Center Cabinet, 50Hz, Top Gun Blue, 1700 mm high, 800 mm wide
SW500-GC	SW500 Departmental Cabinet, 60Hz, Top Gun Blue, 1100 mm high, 600 mm wide
SW500-GD	SW500 Departmental Cabinet, 50Hz, Top Gun Blue, 1100 mm high, 600 mm wide
SW300-GA	SW300 Departmental Cabinet, 60Hz, Top Gun Blue, 1100 mm high, 600 mm wide

StorageWorks Accessories

DWZZB-VW	FWD SCSI-2 signal converter on one end and FWSE on other end; requires BN21K-xx cables.
BN21K-02	02-meter 16-bit SCSI cable
BN21K-03	03-meter 16-bit SCSI cable
BN21K-05	05-meter 16-bit SCSI cable
BN21K-10	10-meter 16-bit SCSI cable
BN21K-15	15-meter 16-bit SCSI cable
BN21K-20	20-meter 16-bit SCSI cable

Step 6—Networks and Communications

- Systems include DE500-XA PCI 10/100-Mbit Ethernet controller (uses one PCI slot).

Order Number	Description	Windows NT 3.51	Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
DE500-XA	PCI 10/100-Mbit Fast Ethernet controller (Twisted Pair)	4	4	4
BN25G-03 **BN25G-04** **BN25G-07**	3-meter (9.8 ft.) cable for 10BaseT Twisted Pair connection 4-meter (13.1 ft.) cable for 10BaseT Twisted Pair connection 7-meter (22.3 ft.) cable for 10BaseT Twisted Pair connection			

Order Number	Description	Windows NT 3.51	Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
DE450-CA	PCI 10-Mbit Ethernet controller; AUI, 10BaseT, or 10Base2	4	4	4
BNE4C-02 **BNE4C-05**	2-meter cable for AUI connection, Ethernet/IEEE 802.3 devices 5-meter cable for AUI connection			
BN25G-03 **BN25G-04** **BN25G-07**	3-meter cable for 10BaseT Twisted Pair connection 4-meter cable for 10BaseT Twisted Pair connection 7-meter cable for 10BaseT Twisted Pair connection			
BC16M-06 **BC16M-15** **BC16M-30**	6-ft cable for 10Base2 ThinWire connection 15-ft cable for 10Base2 ThinWire connection 30-ft cable for 10Base2 ThinWire connection			

Order Number	Description	Windows NT 3.51	Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
DEFPA-AB	PCI to FDDI Adapter, single attachment station (SAS), multi-mode fiber (MMF), SC connector	4	4	4
DEFPA-DB	PCI to FDDI Adapter, DAS, MMF, SC connector	4	4	4
BN34D-03 **BN34D-10** **BN34B-03** **BN34B-10** **BN34B-20** **BN34B-30**	3-meter MIC-SC dual fiber optic cable 10-meter MIC-SC dual fiber optic cable 3-meter SC to SC dual fiber optic cable 10-meter SC to SC dual fiber optic cable 20-meter SC to SC dual fiber optic cable 30-meter SC to SC dual fiber optic cable			

Step 6—Networks and Communications *(continued)*

Order Number	Description	Windows NT 3.51	Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
DEFPA-UB	PCI to FDDI Adapter, SAS, TP-PMD, requires BN25H-03	4	4	4
DEFPA-MB	PCI to FDDI Dual Adapter, DAS, TP-PMD, requires BN25H-03	4	4	4
BN25H-03	3-meter FDDI crossover cable			

Order Number	Description		Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
PBXNP-AA	PCI Token Ring adapter		1	1
BN25G-03 BN25G-04 BN25G-07	3-meter (9.8 ft.) cable 4-meter (13.1 ft.) cable 7-meter (22.3 ft.) cable			

Order Number	Description		Digital UNIX V3.2F/V3.2G	OpenVMS V6.2-1H3
DNSES-AA	EISA-based synchronous communications controller		2	2

Order Number	Description		Digital UNIX V3.2F/V3.2G	
CXI01-AA	ISA-based asynchronous multiport MUX 16 port XEM		1	
CXI01-AD	ISA-based asynchronous multiport MUX 16 port EPC		1	
CXI01-AB CXI01-AC CXI01-AE CXI01-AF	ISA-based asynchronous multiport MUX expander XEM ISA-based asynchronous MUX cable converter (RJ45-DB25) ISA-based asynchronous multiport MUX expander EPC ISA-based asynchronous MUX adapter (RJ45-MJ11), 8 pack			

Step 6a—MEMORY CHANNEL Controller

Digital UNIX Systems

- Require Digital UNIX V3.2G and System Console Firmware Revision 2.0.
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster license

Configuring information:

- Two PCI to MEMORY CHANNEL Controllers (CCMAA-BA) supported for redundancy/failover.
- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to directly connect adapters.
- For three or four system nodes order one CCMHA-AA (MEMORY CHANNEL Hub), and one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.
- Maximum two CCMAA-BA supported per System Drawer.

Nodes	MEMORY CHANNELs	MEMORY CHANNEL Hubs	Line Cards
2	2 CCMAA-BA		
3-4	3-4 CCMAA-BA	1 CCMHA-AA	
5-8	5-8 CCMAA-BA	1 CCMHA-AA	1-4 CCMLA-AA

Step 6a—MEMORY CHANNEL Controller *(continued)*

CCMAA-BA	PCI to MEMORY CHANNEL Controller —Single port MEMORY CHANNEL option
CCMHA-AA	100 MB MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
CCMRA-AA	Rackmount kit for mounting MEMORY CHANNEL hub; CCMHA-AA requires BN35S-02 power cord for rackmount configurations
BC12N-10	MEMORY CHANNEL cable
BN35S-02	MEMORY CHANNEL Hub power cord
QB-3RLAG-AA	TruCluster Software for Digital UNIX
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAG-AA	OpenVMS Cluster license for Alpha systems

For stand alone configurations, CCMHA-AA MEMORY CHANNEL Hub, includes BN19P-2E power cord for Canada, Japan, US operation. For other regions, order power cords from Step 8.

Step 7—Monitors

Systems include PCI-based S3 Trio (PB2GA-JB) graphics option, uses one PCI slot.

- Windows NT systems: a monitor is **require** unless available on site.
- Digital UNIX and OpenVMS systems: all console functions, including RAID Configuration Utility (RCU) can be performed using a standard video terminal (VT2xx, VT3xx, VT4xx, VT5xx) connected to one of system serial ports.

VRC15-WA/W3/W4 15" (13.9" viewable image size) high-resolution color monitor, Flat-square CRT with 0.28 dot pitch and anti-reflection, anti-glare, anti-static coating. Auto-scanning from VGA to 1024 x 768 at 75Hz refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes video cable.
-WA = NH (Northern Hemisphere) monitor with 120V power cord
-W3 = Northern Hemisphere monitor without power cord
-W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

VRT17-WA/W3/W4 17" (16.0" viewable image size) high-resolution color monitor. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes video cable.
-WA = NH (Northern Hemisphere) monitor with 120V power cord;
-W3 = Northern Hemisphere monitor without power cord
-W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

VRC21-WA/W3/W4 21" (19.6" viewable image size) high-resolution color monitor. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti-static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes video cable.
-WA = NH (Northern Hemisphere) monitor with 120V power cord
-W3 = Northern Hemisphere monitor without power cord
-W4 = SH (Southern Hemisphere) monitor without power cord; select country specific power cord for -W3 and -W4 variants.

Step 8—Keyboards and Power Cords

Pedestal systems ordered in the Americas and Asia Pacific Area include 120 V U.S. power cord and keyboard unless alternate is specified. Select country specific power cord (quantity of two) and keyboard for **all** Pedestal systems ordered in Europe.

Cabinet systems are 208-240 V single phase and include country specific wiring. No power cord selection is required. Select country specific keyboard for **all** Cabinet systems ordered in Europe.

Windows NT/ Digital UNIX keyboard	OpenVMS keyboard	Frost White
LK47W-A2	**LK46W-A2**	U.S./English
LK47W-AB	**LK46W-AB**	Belgian
	LK46W-AC	Canadian/French
LK47W-AD	**LK46W-AD**	Danish
LK47W-AE	**LK46W-AE**	United Kingdom
	LK46W-AF	Finnish
LK47W-AG	**LK46W-AG**	German
	LK46W-AH	Dutch
LK47W-AI	**LK46W-AI**	Italian
LK47W-AK	**LK46W-AK**	Swiss/Generic
	LK46W-AL	Swiss/German
	LK46W-AM	Swedish
LK47W-AN	**LK46W-AN**	Norwegian
LK47W-AP	**LK46W-AP**	French
	LK46W-AQ	Canadian/English
LK47W-AS	**LK46W-AS**	Spanish
LK47W-AV	**LK46W-AV**	Portuguese

Power Cords (**Note:** Quantity of two required for Pedestals)	
BN19A-2E	U.K./Ireland
BN19C-2E	Central Europe
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN18L-2E	Israel
BN19M-2E	Italy
BN19S-2E	India/South Africa

Step 9—Terminals and Printers

Systems include two EIA-232 asynchronous serial ports with 9-pin D-subminiature connectors, and two 9-pin to MMJ adapters (H8571-J).

Digital UNIX and OpenVMS systems

Console terminals can either be a graphics monitor connected to the included video graphics adapter or a serial video terminal. If a serial video terminal is used as the console terminal, it must be VT220, VT320, VT420, or VT520 compatible.

Select terminals, printers, and cables as required.

Step 10—Upgrades

CPU Upgrades

304XR-BW	Upgrades 5/300 MHz CPU to 5/400 MHz CPU; requires mandatory return of 300 MHz CPU
302XR-AW	Upgrades 5/300E MHz CPU to 5/300 MHz CPU; requires mandatory return of 300E MHz CPU
304XR-AW	Upgrades 5/300E MHz CPU to 5/400 MHz CPU; requires mandatory return of 300E MHz CPU

System Upgrades

Order Number	From	To	Includes
DN-51Z1L-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer for Windows NT. Requires mandatory return of AlphaServer 4000 System Drawer.
DA-51Z1J-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer and Digital UNIX base system license. Requires mandatory return of AlphaServer 4000 System Drawer and Digital UNIX license.
DY-51Z1K-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer and OpenVMS base system license. Requires mandatory return of AlphaServer 4000 System Drawer and OpenVMS license.

Step 11—Software

Windows NT systems

Systems include Windows NT Server plus 5-client access 3.51 media (CD-ROM) and license in shrink-wrapped package. Order documentation kit if required.

QA-23CAA-GZ	Windows NT Server documentation kit

Digital UNIX systems

Select user licenses and additional software as required.

Software Processor Code = G for all software, 1-4 processors

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AM-3G	Digital UNIX Concurrent Use 32-user license
QL-MT7AM-3H	Digital UNIX Concurrent Use 64-user license
QL-MT7AG-AA	Digital UNIX Traditional unlimited user license
QL-MT5AG-AA	Digital UNIX developer's extension license

Step 11—Software *(continued)*

Digital UNIX Media and Documentation

QA-MT4AA-H8	Digital UNIX media and on-line documentation on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation

Digital UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX on CD-ROM

DECnet Licenses

QL-MTJAG-AA	DECnet/OSI end-system license for Digital UNIX

OpenVMS systems

Select user licenses and additional software as required

Software Processor Code = G for all software, 1-4 processors

OpenVMS Concurrent Use User Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AG-AA	OpenVMS Traditional unlimited user license

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-09SAA-GZ	OpenVMS base hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS on CD-ROM

DECnet Licenses

QL-MTGAG-AA	DECnet extended function license for OpenVMS
QL-MTHAG-AA	DECnet end-system to extended function upgrade license for OpenVMS

Step 12—Hardware and Software Support Supplemental Services

Hardware Warranty

The AlphaServer 4100/4000 System Drawer and components installed in the System Drawer (such as CPU, memory, PCI controllers, power supplies) have a 3-year onsite, 5-day per week, 9-hour per day hardware warranty, with next day response time.

StorageWorks components contained in the Pedestal or Cabinet Systems are supported by the comprehensive StorageWorks Warranty: 5-years for disks, 3-years for controllers, 2-years for tape devices, and 1-year for other components. The first year includes onsite next day response time.

Network products in the Pedestal or Cabinet Systems carry the Network Products Warranty.

Users can upgrade to higher levels of service through a variety of hardware supplemental services.

Software Warranty

The AlphaServer 4100/4000 Software warranty for all three operating systems features 90-day telephone advisory support with 1-year conformance to SPD. Users can upgrade to higher levels of service through a variety of software supplemental services.

Value Added Services

The AlphaServer Support Plan is designed to accommodate critical system availability needs. The comprehensive suite of recommended services will maximize uptime and satisfaction, by enabling customers to select, at the time of their system purchase, the right level of support for their information technology (IT) and business environment.

The AlphaServer Support Plan builds on the foundation of Installation and Supplemental Services to include Startup Services, Silver/Gold Support, System Healthcheck, and Availability Review/Partnership.

Installation

It is recommended that onsite installation service be included as a separate entry on any quotation.

FM-51CPU-IN	Add-on SMP Installation
FM-51MEM-IN	Add-on Memory Installation
FM-51DWR-IN	AlphaServer 4100/4000 Drawer Installation
FM-51PED-IN	AlphaServer 4100/4000 Pedestal Installation
FM-51CAB-IN	AlphaServer 4100/4000 Cabinet Installation
FM-TRAVL-IN	One time travel charge per installation

AlphaServer 4100/4000 Software Support Supplemental Services

Windows NT

FM-51NTS-12	1-year, Software Support Supplemental Service
FM-51NTS-36	3-year, Software Support Supplemental Service
FM-51NTS-60	5-year, Software Support Supplemental Service

Digital UNIX

FM-51UNS-12	1-year, Full Software Support Supplemental Service
FM-51UNS-36	3-year, Full Software Support Supplemental Service
FM-51UNS-60	5-year, Full Software Support Supplemental Service
FM-51UNN-12	1-year, Node Software Support Supplemental Service
FM-51UNN-36	3-year, Node Software Support Supplemental Service
FM-51UNN-60	5-year, Node Software Support Supplemental Service

Step 12— Hardware and Software Support Supplemental Services

OpenVMS

FM-51VMS-12	1-year, Full Software Support Supplemental Service
FM-51VMS-36	3-year, Full Software Support Supplemental Service
FM-51VMS-60	5-year, Full Software Support Supplemental Service
FM-51VNS-12	1-year, Node Software Support Supplemental Service
FM-51VNS-36	3-year, Node Software Support Supplemental Service
FM-51VNS-60	5-year, Node Software Support Supplemental Service

Digital UNIX or OpenVMS SMP Upgrade

FM-51VMP-12	1-year, Digital UNIX or OpenVMS SMP Upgrade
FM-51VMP-36	3-year, Digital UNIX or OpenVMS SMP Upgrade
FM-51VMP-60	5-year, Digital UNIX or OpenVMS SMP Upgrade

AlphaServer 4100/4000 Hardware Supplemental Maintenance Services

AlphaServer 4100/4000 Drawer

FM-5AXHW-60	2-5-year 5 x 9, next day, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A4HR-36	3-year 5 x 9, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A4HR-60	5-year 5 x 9, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A512-36	3-year 5 x 12, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A512-60	5-year 5 x 12, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A616-36	3-year 6 x 16, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A616-60	5-year 6 x 16, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A724-36	3-year 7 x 24, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5A724-60	5-year 7 x 24, four hour, 128 / 512 MB AlphaServer 4100/4000 Drawer
FM-5G5ND-60	2-5-year 5 x 9, next day, 1 GB AlphaServer 4100/4000 Drawer
FM-5G4HR-36	3-year 5 x 9, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G 4HR-60	5-year 5 x 9, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G512-36	3-year 5 x 12, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G512-60	5-year 5 x 12, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G616-36	3-year 6 x 16, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G616-60	5-year 6 x 16, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G724-36	3-year 7 x 24, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5G724-60	5-year 7 x 24, four hour, 1 GB AlphaServer 4100/4000 Drawer
FM-5RXHW-60	5-year 5 x 9, next day, 2 GB AlphaServer 4100/4000 Drawer
FM-5R4HR-36	3-year 5 x 9, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R4HR-60	5-year 5 x 9, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R512-36	3-year 5 x 12, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R512-60	5-year 5 x 12, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R616-36	3-year 6 x 16, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R616-60	5-year 6 x 16, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R724-36	3-year 7 x 24, four hour, 2 GB AlphaServer 4100/4000 Drawer
FM-5R724-60	5-year 7 x 24, four hour, 2 GB AlphaServer 4100/4000 Drawer

Step 12— Hardware and Software Support Supplemental Services *(continued)*

AlphaServer 4100/4000 Pedestal

FM-5BXHW-60	2-5-year 5 x 9, next day, 128 / 512 MB AlphaServer 4100/4000 Pedestal
FM-5H512-36	3-year 5 x 12, four hour, 1 GB AlphaServer 4100/4000 Pedestal
FM-5H512-60	5-year 5 x 12, four hour, 1 GB AlphaServer 4100/4000 Pedestal
FM-5H724-36	3-year 7 x 24, four hour, 1 GB AlphaServer 4100/4000 Pedestal
FM-5H724-60	5-year 7 x 24, four hour, 1 GB AlphaServer 4100/4000 Pedestal

AlphaServer 4100/4000 Pedestal/Cabinet

FM-5B4HR-36	3-year 5 x 9, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B4HR-60	5-year 5 x 9, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B512-36	3-year 5 x 12, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B512-60	5-year 5 x 12, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B616-36	3-year 6 x 16, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B616-60	5-year 6 x 16, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B724-36	3-year 7 x 24, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5B724-60	5-year 7 x 24, four hour, 128 / 512 MB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5HXHW-60	2-5-year 5 x 9, next day, 1 GB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5H4HR-36	3-year 5 x 9, four hour, 1 GB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5H4HR-60	5-year 5 x 9, four hour, 1 GB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5H616-36	3-year 6 x 16, four hour, 1 GB AlphaServer 4100/4000 Pedestal/Cabinet
FM-5H616-60	5-year 6 x 16, four hour, 1 GB AlphaServer 4100/4000 Pedestal/Cabinet

AlphaServer 4100/4000 Memory

FM-5LXHW-60	2-5-year 5 x 9, next day, 128 / 512 MB Memory option
FM-5L4HR-36	3-year, 5 x 9, four hour, 128 / 512 MB Memory option
FM-5L4HR-60	5-year, 5 x 9, four hour, 128 / 512 MB Memory option
FM-5L512-36	3-year 5 x 12, four hour, 128 / 512 MB Memory option
FM-5L512-60	5-year 5 x 12, four hour, 128 / 512 MB Memory option
FM-5L616-36	3-year 6 x 16, four hour, 128 / 512 MB Memory option
FM-5L616-60	5-year 6 x 16, four hour, 128 / 512 MB Memory option
FM-5L724-36	3-year 7 x 24, four hour, 128 / 512 MB Memory option
FM-5L724-60	5-year 7 x 24, four hour, 128 / 512 MB Memory option
FM-5QXHW-60	2-5-year 5 x 9, next day, 1 GB Memory option
FM-5Q4HR-36	3-year, 5 x 9, four hour, 1 GB Memory option
FM-5Q4HR-60	5-year, 5 x 9, four hour, 1 GB Memory option
FM-5Q512-36	3-year 5 x 12, four hour, 1 GB Memory option
FM-5Q512-60	5-year 5 x 12, four hour, 1 GB Memory option
FM-5Q616-36	3-year 6 x 16, four hour, 1 GB Memory option
FM-5Q616-60	5-year 6 x 16, four hour, 1 GB Memory option
FM-5Q724-36	3-year 7 x 24, four hour, 1 GB Memory option
FM-5Q724-60	5-year 7 x 24, four hour, 1 GB Memory option

Step 12— Hardware and Software Support Supplemental Services *(continued)*

AlphaServer 4100/4000 CPU Add-on Options

FM-5JXHW-60	2-5-year 5 x 9, next day, CPU SMP Add-on option
FM-5J4HR-36	3-year, 5 x 9, four hour, CPU SMP Add-on option
FM-5J4HR-60	5-year, 5 x 9, four hour, CPU SMP Add-on option
FM-5J512-36	3-year 5 x 12, four hour, CPU SMP Add-on option
FM-5J512-60	5-year 5 x 12, four hour, CPU SMP Add-on option
FM-5J616-36	3-year 6 x 16, four hour, CPU SMP Add-on option
FM-5J616-60	5-year 6 x 16, four hour, CPU SMP Add-on option
FM-5J724-36	3-year 7 x 24, four hour, CPU SMP Add-on option
FM-5J724-60	5-year 7 x 24, four hour, CPU SMP Add-on option

Specifications

Specifications	Pedestal System		Cabinet System		System Drawer	
External Dimensions						
Height	75 cm (29.5 in)		170 cm (67.0 in)		30 cm (11.8 in)	
Width	49 cm (19.3 in)		60 cm (23.6 in) Rack 71 cm (28.0 in) Stabilizer[1]		45 cm (17.7 in)	
Depth	90 cm (35.4 in)		97 cm (38.2 in)		69 cm (27.2 in)	
Weight	113.6 kg (250 lb)		350.9 kg (772 lb)		45.5 kg (100 lb)	
Clearances	**Operating/**	**Service**	**Operating/**	**Service**	**Operating/**	**Service**
Front	20 cm (7.9 in)	61 cm (24.1 in)	60 cm (23.6 in)	100 cm (39.4 in)	20 cm (7.9 in)	20 cm (7.9 in)
Rear	20 cm (7.9 in)	61 cm (24.1 in)	60 cm (23.6 in)	100 cm (39.4 in)	20 cm (7.9 in)	20 cm (7.9 in)
Sides	20 cm (7.9 in)	61 cm (24.1 in.)	20 cm (7.9 in)	61 cm (24.0 in.)	0	0
Environmental						
Temperature (min/max)						
Operating[2]	10°- 35°C (50°- 95°F)		10°- 35°C (50°- 95°F)		10°- 35°C (50°- 95°F)	
Nonoperating	-40°- 66°C (-40°- 150.8°F)		-40°- 66°C (-40°- 150.8°F)		-40°- 66°C (-40°- 150.8°F)	
Storage (60 days)	-40°- 66°C (-40°- 150.8°F)		-40°- 66°C (-40°- 150.8°F)		-40°- 66°C (-40°- 150.8°F)	
Rate of Change	11°- 19.8°C/hr (20°- 36°F/hr)		11°- 19.8°C/hr (20°- 36°F/hr)		11°- 19.8°C/hr (20°- 36°F/hr)	
Relative Humidity						
Operating	20-90% noncondensing		20-90% noncondensing		20-90% noncondensing	
Nonoperating	10-95%		10-95%		10-95%	
Storage (60 days)	10-95%		10-95%		10-95%	
4100 Max Heat Dissipation	1800[3] Watts, 6143 Btu/hr		4800 Watts, 16382 Btu/hr		1100 Watts, 3754 Btu/hr	
4000 Max Heat Dissipation	1450[3] Watts, 6143 Btu/hr		4800 Watts, 16382 Btu/hr		700 Watts, 3754 Btu/hr	
Airflow						
Quantity	200 cubic ft./min		300 cubic ft./min[4]		200 cubic ft./min	
Intake	Rear		Rear		Rear	
Exhaust	Front		Front and Top		Front	
Altitude						
Operating	3,050 m (10,000 ft)		3,050 m (10,000 ft)		3,050 m (10,000 ft)	
Nonoperating	12,200 m (40,000 ft)		12,200 m (40,000 ft)		12,200 m (40,000 ft)	
Mechanical Shock						
Operating	10 G, 10+/-3 ms		10 G, 10+/-3 ms		10 G, 10+/-3 ms	
Vibration (min/max)	5-16 16-200 200-500	.02in-da G 0.25 G 0.1 G	5-16 16-200 200-500	.02in-da G 0.25 G 0.1 G	5-16 16-200 200-500	.02in-da G 0.25 G 0.1 G
Acoustics	6.2 LNPEc (Bels)		6.7 LNPEc (Bels)		5.8 LNPEc (Bels)	
Electrical (min/max)	**U.S.**	**Europe**	**U.S.**	**Europe**		
Voltage	100-120Vac	200-240 Vac	200-240Vac	220-240 Vac	100-120/200-240Vac	
Phase	Single	Single	Single	Single	Single	
Nominal Frequency (Hz)	50-60	50-60	50-60	50/60	50-60	
Maximum rated current	12 Amps (multiple cord set)	10 Amps (multiple cord set)	24 Amps	24 Amps	8.4 Amps/4.2 Amps (single cord set) 8 Amps/4 Amps (multiple cord set)	
AlphaServer 4100 typical power	720	920	config-specific	config-specific	650	
AlphaServer 4000 typical power consumption, Watts	550	550	config-specific	config-specific	430	
Power Cord						
Length	450cm (177")	200-250cm	450cm (177")	450cm	250 cm (98.4 in)	
Plug	NEMA 5-15P	Country specific	NEMA L6-30P	IEC309, 32A	IEC 320	
Agency Approvals	CAN/CSA-C22.2 No. 950-M95 UL 1950, Ed.3 EN 60 950, Ed.2, A3		CAN/CSA-C22.2 No. 950-M95 UL 1950, Ed.3 EN 60 950, Ed.2, A3		CAN/CSA-C22.2 No. 950-M95 UL 1950, Ed.3 EN 60 950, Ed.2, A3	

1 Stabilizers will nest with other AlphaServer 4100/4000 cabinets so that cabinets can be installed with zero side clearance.
2 Maximum operating temperature at sea level. Reduce by 1C (1.8F) for every 600 m (2000 ft) above sea level.
3 Maximum power consumption for two line cords.
4 Cabinet fans only.

Recommended Power Protection/UPS Solutions for AlphaServer 4100/4000 Systems

Digital's UPS offerings feature robust on-line design and include EIA232 port for local or network monitoring. Prestige units feature a three-piece modular design which allows users to safely swap out components without disconnecting the critical load and "plug and play" battery and receptacle extensions. Prestige models include a three-year, 24-48 hour hot-swap warranty. All units include maintenance bypass.

Note: For complete protection all UPS products should be used with data line surge protectors—4N-GA249-AB (2 wire modem), 4N-GA249-CA* (10BaseT), 4N-GA510-BF (ThinWire), 4N-GAZ45-xx (din rail multiport).

*Additional plug-in data modules available (4N-GA240-xx).

Solutions for Pedestal Systems

4N-AEAAH-AM	Prestige 3 kVA (2 kW), single phase, 60Hz, 208V-120/208V, 6 ft. cord with L6-30P and (1) L5-30R, (4) 5-15R receptacles. and 7 minute battery at full UPS load, 240V-240/120V operation also available. 4N-AEACH-AA - AE receptacle extensions available.
4N-AEAAH-AS	Prestige 3 kVA (2.1 kW), single phase, 50Hz, 200-240V in/out selectable, 6 ft. input cord with VDE stripped pigtail connection for attachment of country specific plug (by customer). Unit includes (3) IEC320, 10A and (1) IEC320 20A output receptacle which can be optionally extended to choice of Schuko, French, British, or Australian (4N-AEACH-DA - DD) receptacle extensions, 7 minute battery at full UPS load.
4N-AEWAR-G2	Prestige 5 year on-site exchange warranty upgrade for 4N-AEAAH-AM, U.S. only.
4N-AEACH-HA	Optional mobile module stacker with seismic mount provisions for above UPS.

Solutions for Cabinet Systems

Number of Systems	UPS Model		Type	Receptacle Module for Plug-in Connection	
	60Hz	50Hz		60 Hz	50 Hz
1-3 Systems	**4N-AEAAJ-CL**[1]	**4N-AEAAJ-CU**	6 kVA Prestige[2]	Included	Hardwired
4 Systems or more	**4N-AEAAL-BA**	**4N-AEAAL-BA**	10 kVA PUPS Plus	**4N-AEACK-BN**	Hardwired

1208-120/208V shown; substitute -CT for 240-120/240V models.
2Optional mobile module stacker with seismic mounting provisions for 6 kVA Prestige—4N-AEACH-HD.

UPS Models

4N-AEAAJ-CL	Prestige 6 kVA (4 kW), single phase, 60Hz, 208-120/208V, 6 ft. cord with L6-30P and (2) L6-30R, (8) 5-15R receptacle. Modular hot-swap design with 7 minute battery at full UPS load, extendible plug and play batteries and receptacle provisions. Substitute -CT for 240V 240/120V operation.
4N-AEAAJ-CU	Prestige 6 kVA (4 kW) 50Hz package, single phase, 50Hz, 200-240V in/out selectable, hardwired input/output.
4N-AEAAL-BA	PUPS plus 10 kVA (7 kW), single-phase, 50/60Hz, 173-276V in, 9 minute battery at full UPS load. 200-240V selectable output, hardwired input/output with optional plug-in output receptacle modules.
4N-AEACK-BN	PUPS plus 10 kVA receptacle module (3)L6-30R, (3)5-20R, (2)L5-20R.
4N-AEWAR-G3/G4	Prestige 5 year on-site exchange warranty upgrade for 4N-AEAAH-CM/CT. G4 provides on-site remedial and start-up service.

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

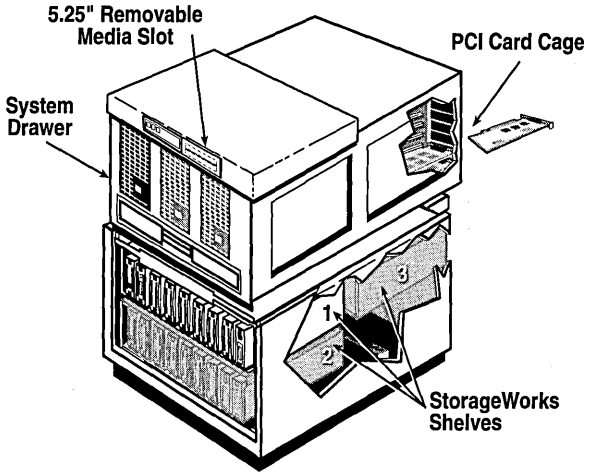
Includes cables, media and documentation; Digital UNIX and OpenVMS on CD-ROM, Windows NT on 3.5-in diskette.

UPS System	Windows NT	Digital UNIX	OpenVMS
Prestige UPS	**4N-AEAES-AA**	**4N-AEAES-AK**	**4N-AEAES-EM**
PUPS Plus UPS	**4N-AEAES-AA**	**4N-AEAES-AK**	**4N-AEAES-FM**
Network Management and multi system shutdown*	**4N-AEAES-BA**	**4N-AEAES-BK**	**Call for information**

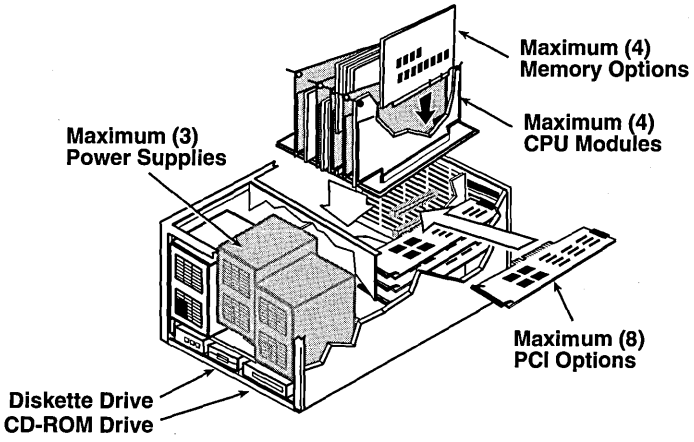
*Network Management and/or multi system shutdown for Windows NT and Digital UNIX requires the Connect-UPS Network Adapter (SNMP/ManageWorks compatible); see below.

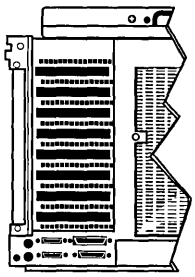
UPS System	60Hz Application	50Hz Application
Prestige 6 kVA and PUPS Plus UPS	**4N-AEAEO-DA/DC**	**4N-AEAEO-DB/DD**

DA/DB=Twisted pair; DC/DD=ThinWire



AlphaServer 4100 Pedestal System

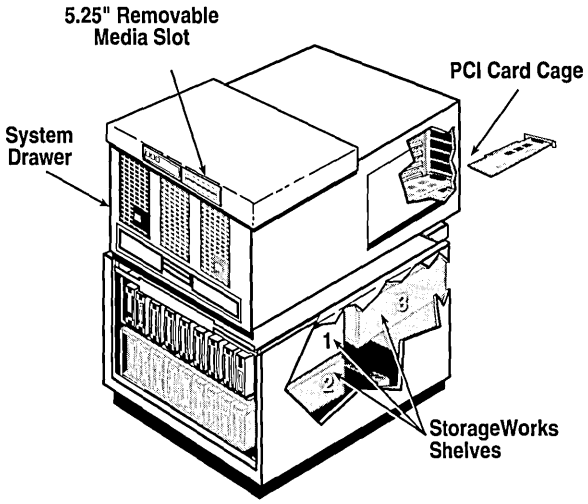




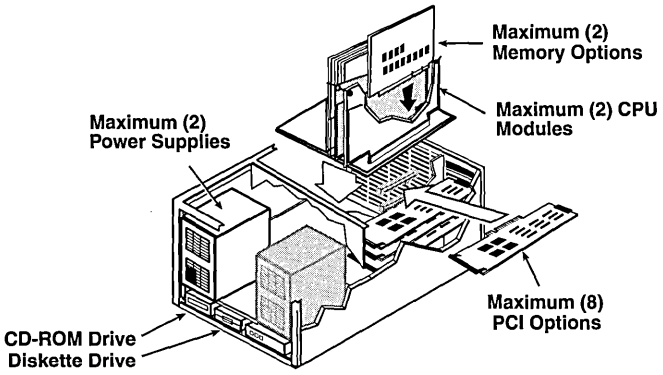
PCI Bulkhead

AlphaServer 4100 System Drawer

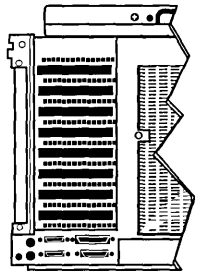
= Optional



AlphaServer 4000 Pedestal System

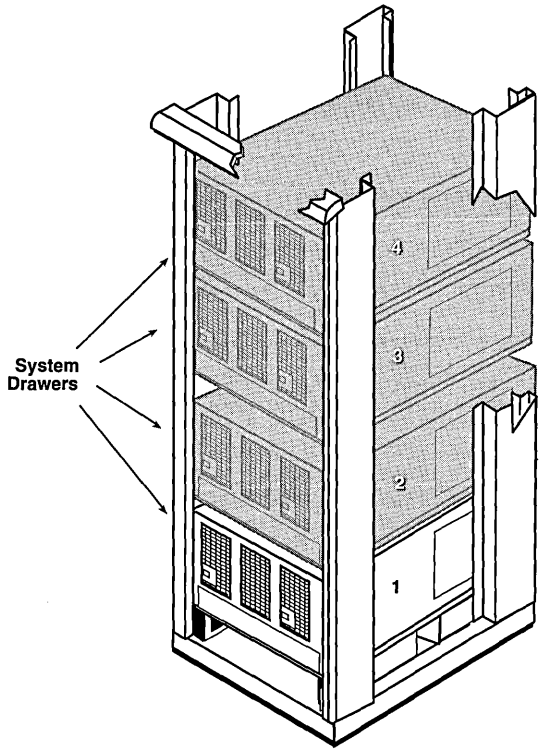


AlphaServer 4000 System Drawer

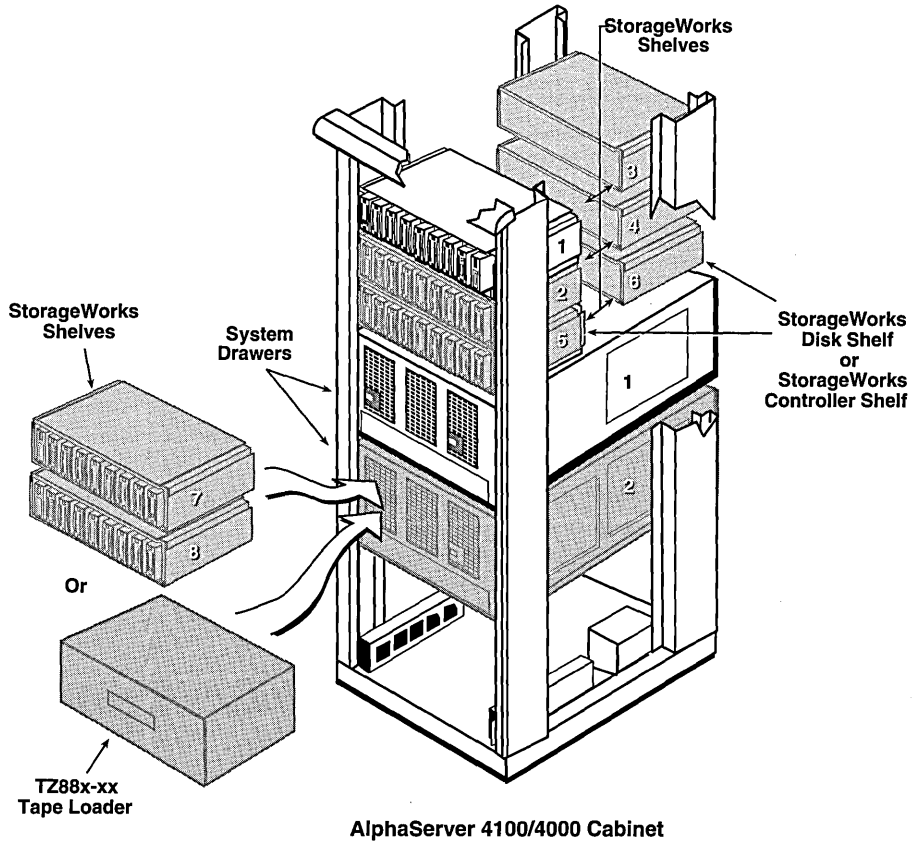


PCI Bulkhead

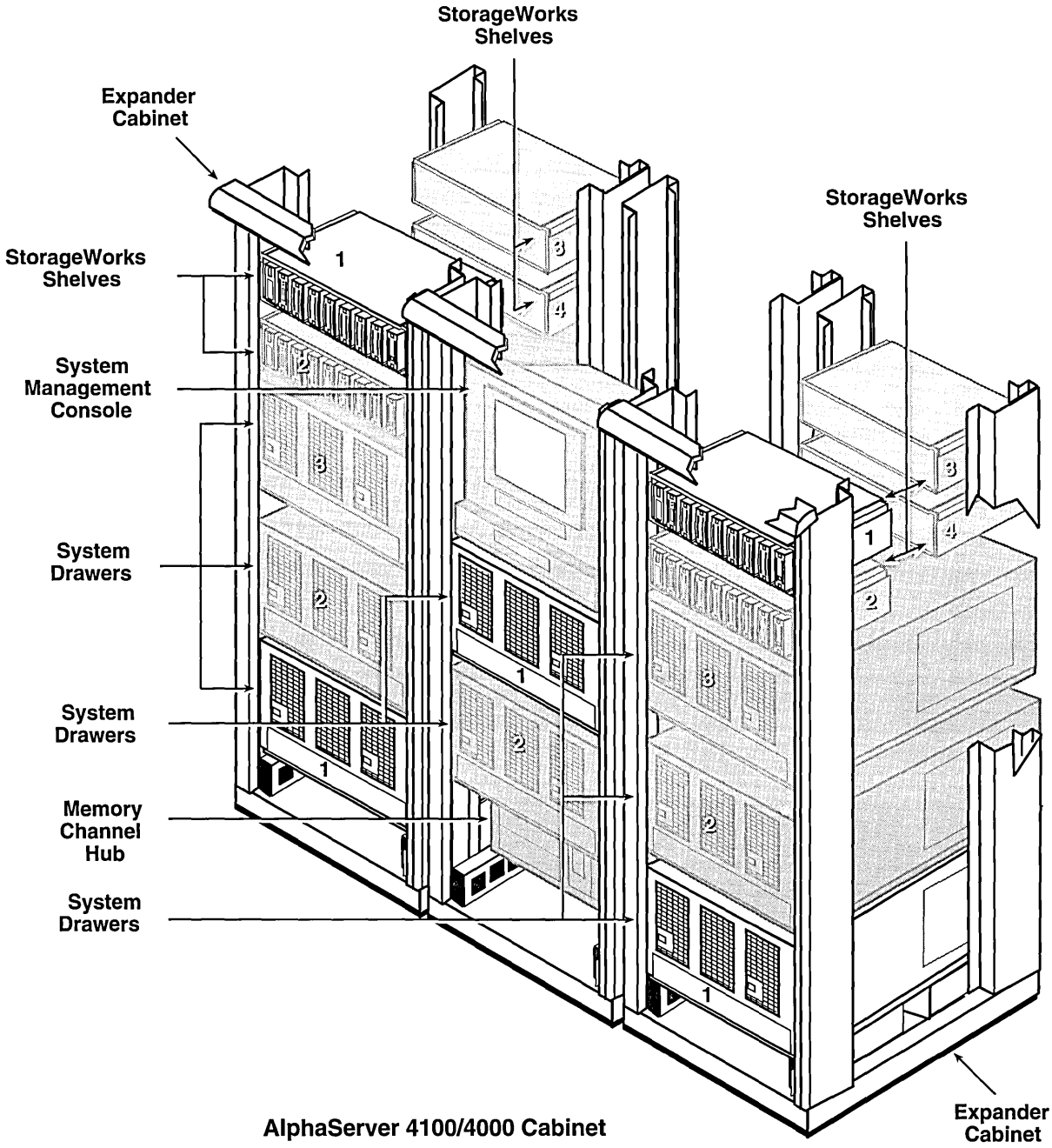
= Optional



AlphaServer 4100/4000 Cabinet

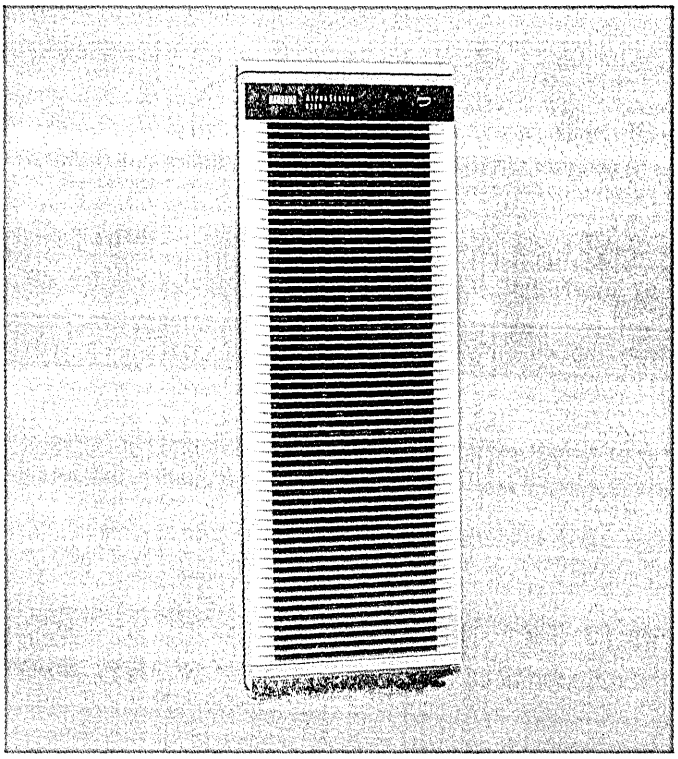


AlphaServer 4100/4000 Cabinet



AlphaServer 4100/4000 Cabinet

= Optional



AlphaServer 8200

Product Description

AlphaServer 8200 is the highest performance office system in the industry. It can be configured with up to six of the world's fastest microprocessors (Alpha microprocessor 21164) with 5/300 MHz, 5/350 MHz, or 5/440 MHz CPUs. With the enormous capacity of the Alpha 64-bit architecture—up to 6 GB of memory, and PCI I/O of up to 108 slots—this server offers room for growth for the largest and most complex applications.

AlphaServer 8200 runs Digital UNIX or OpenVMS operating systems and offers the reliability and availability features customers require for bet-your-business environments. Clusters, hot swap disks, RAID, redundant power, ECC memory and data paths, fault management, and uninterruptible power system are all available.

Small enterprises and large departments can have an office server with unprecedented performance, capacity, and reliability for those applications previously available on enterprise systems. Large databases, complex simulations, data warehousing, and decision support are a few examples of the kinds of applications the AlphaServer 8200 can support with ease. And, with up to 6 GB of memory, this office server can provide all the benefits that Very Large Memory/Very Large Database (VLM/VLDB) systems have provided in the past.

For technical/scientific users, the AlphaServer 8200 provides supercomputer performance in the office. The AlphaServer 8200 has single processor floating-point performance that dominates the competition in the generic benchmarks and wins at the application level as well.

Step 1—Base Servers

- AlphaServer 8200 5/300 and 5/350 Systems require
  - Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- AlphaServer 8200 5/440 Systems require
  - Digital UNIX V3.2G or Digital UNIX V4.0a, or OpenVMS V6.2-1H3, or later
- Software media and documentation required for first system on site. See Step 13 for ordering information.
- Console terminal required to install system. See Step 10 unless terminal is available on site.
- Base Servers include 5 slot backplane—three slots are used by CPU module, memory module, and KFTIA-AA system I/O module.
  - Two slots available for additional CPU, memory, or system I/O module(s).
- CD-ROM drive and RZ28D-VA SCSI disk drive included in BA656 Internal Storage Drawer are connected via single-ended SCSI-2 port on KFTIA-AA system I/O module.
  - Four additional narrow 3.5-inch StorageWorks devices can be added in BA656 Internal Storage Drawer.
- Universal Single-Phase power supply supplies necessary power for system; requires selection of power cord from Step 2.
- Redundant power supply (N+1) can be added if required.
- For recommended power protection, UPS products, see section following Specifications.

AlphaServer 8200 Base Servers include

- Processor module with
  - One or two Alpha microprocessor 21164 5/300 or 5/350 MHz CPU(s), each CPU includes 4 MB Backup cache, or
  - Two Alpha microprocessor 21164 5/440 MHz CPUs, each includes 4 MB Backup cache
- System I/O module (KFTIA-AA) includes
  - I/O channel
  - Two twisted-pair 802.3/Ethernet
  - Single-ended SCSI-2 port
  - Three Fast Wide Differential (FWD) SCSI-2 ports
- Three CK-KFTIA-AA Cabinet Kits
- 128, 256, 512 MB, or 2 GB of memory
- BA656 Internal Storage Drawer
- RZ28D-VA 2 GB 3.5-inch SCSI disk drive
- 600 MB CD-ROM drive
- Universal single phase power
- 48 VDC power supply
- Shielded console cable included for connection to console terminal (BC16E-25)
- Factory Installed Software
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90-day software product warranty
- Installation of the system cabinet is included with AlphaServer 8200 5/440 Base Servers only

5/300 Servers	5/350 Servers	5/440 Servers	Operating System	Memory
Single-CPU Systems				
DA-281AB-A9	**DA-281CB-A9**		Digital UNIX	128 MB
DA-281AD-A9	**DA-281CD-A9**		Digital UNIX	512 MB
DY-281AB-A9	**DY-281CB-A9**		OpenVMS	128 MB
DY-281AD-A9	**DY-281CD-A9**		OpenVMS	512 MB
Dual-CPU Systems				
DA-281BB-A9	**DA-281DB-A9**	**DA-282FB-A9**	Digital UNIX	128 MB
DA-281BC-A9	**DA-281DC-A9**		Digital UNIX	256 MB
DA-281BD-A9	**DA-281DD-A9**	**DA-282FD-A9**	Digital UNIX	512 MB
DA-281BF-A9	**DA-281DF-A9**	**DA-282FF-A9**	Digital UNIX	2 GB
DY-281BB-A9	**DY-281DB-A9**	**DY-282FB-A9**	OpenVMS	128 MB
DY-281BC-A9	**DY-281DC-A9**		OpenVMS	256 MB
DY-281BD-A9	**DY-281DD-A9**	**DY-282FD-A9**	OpenVMS	512 MB
DY-281BF-A9	**DY-281DF-A9**	**DY-282FF-A9**	OpenVMS	2 GB

Step 1—AlphaServer 8200 Systems *(continued)*

AlphaServer 8200 Expanded Base Server includes

- Processor module with two Alpha microprocessor 21164 5/350 MHz or 5/440 MHz CPUs; each CPU includes 4 MB Backup cache
- System I/O module with four I/O channels (KFTHA-AA)
- PCI Shelf Mount Box (DWLPB-CA)
- PCI Fast Wide Differential (FWD) SCSI Adapter (KZPSA-BB)
- Digital Etherworks 32-bit Network Interface Card (DE435-AA) or Fast Ethernet Card (DE500-XA)
- 512 MB or 2 GB of memory
- BA656 Internal Storage Drawer
- SCSI-2 16-bit wide StorageWorks shelf (BA356-JB)
- StorageWorks SCSI Signal Converter (DWZZB-VW)
- BN21K-01 Fast Wide Differential cable
- RZ28D-VW 2 GB 3.5-inch SCSI disk drive (located in BA356-JB)
- 600 MB CD-ROM drive
- PCI single-ended SCSI controller (KZPAA-AA) and BN21H-02 SCSI cable (connects to CD-ROM)
- Universal single phase power
- 48 VDC power supply
- Shielded console cable included for connection to console terminal
- Factory Installed Software
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90 day software product warranty
- System installation included with AlphaServer 8200 5/440 Expanded Base Servers only

5/350 Servers (Dual-CPU)	Operating System	Memory
DA-281DD-B9	Digital UNIX	512 MB
DY-281DD-B9	OpenVMS	512 MB
5/440 Servers (Dual-CPU)	**Operating System**	**Memory**
DA-282FD-B9	Digital UNIX	512 MB
DY-282FD-B9	OpenVMS	512 MB
DA-282FF-B9	Digital UNIX	2 GB
DY-282FF-B9	OpenVMS	2 GB

Step 1a—AlphaServer 8200 5/300 System Building Blocks

Note: System Building Blocks are an alternative to standard Base Servers or Expanded Base Servers; they provide flexibility in configuring the AlphaServer 8200 with a choice of memory and I/O options.

System Building Block Requirements

- **Minimum of one memory module**
- **Minimum of one system I/O module**
- **SCSI controller**
- Systems require Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- Console terminal required unless available on site
- System includes 5 slot backplane—three slots are used by CPU, memory and system I/O modules
  - Two slots available for additional CPU, memory, or system I/O module(s)
- CD-ROM drive included in BA656 Internal Storage Drawer—SCSI controller **must** be ordered separately
  - BA656 Internal Storage Drawer is restricted to CD-ROM drive only when KZPAA is selected
  - If KFTHA-AA I/O module is selected, the following items must be ordered to provide interface to CD-ROM in BA656 internal storage drawer. If KFTIA-AA I/O module is selected these items are **not** required

DWLPB-CA PCI shelf mount box; AlphaServer 8200 system cabinet only, maximum three per cabinet.

KZPAA-AA PCI single-ended SCSI controller for CD-ROM connection **only**—no other SCSI options can be installed in BA656 internal storage drawer if KZPAA is used as CD-ROM interface. KZPAA is restricted as CD-ROM connection only, no other disk of tape connections supported—maximum one per system. Requires BN21H-02 SCSI cable

- If Factory Installed Software is required, BA356-JB and appropriate disk drive and controller **must** be ordered separately.
- Universal single phase power supply will supply necessary power for system. Redundant power supply (N+1) can be added if required.

Step 1a—AlphaServer 8200 5/300 System Building Blocks *(continued)*

AlphaServer 8200 5/300 System Building Blocks include

- Processor module with one or two Alpha microprocessor 21164/300 MHz CPU(s); each includes 4 MB Backup cache
- BA656 Internal Storage Drawer
- 600 MB CD-ROM drive
- Universal single phase power
- 48 VDC power supply
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90 day software product warranty

Order Number	Operating System	CPU	Memory	I/O Module
DA-281AY-A9	Digital UNIX	Single-CPU Systems	Required	Required
DY-281AY-A9	OpenVMS	Single-CPU Systems	Required	Required
DA-281BY-A9	Digital UNIX	Dual-CPU Systems	Required	Required
DY-281BY-A9	OpenVMS	Dual-CPU Systems	Required	Required

Step 1b—AlphaServer Expansion Packages—Digital UNIX systems only

DECsafe packages contain all necessary hardware (excluding console terminal) and software to provide a complete and operational system in a DECsafe high availability environment. **Note:** This package is only orderable with a Digital UNIX system configuration. It is **not** orderable as a stand alone, upgrade, or spared on the order.

8YFEB-EX **DECsafe High Availability SCSI Package includes**:

Six RZ28D-VW 2.1 GB, 3.5-inch disk drives in BA356-JB shelf
TZ87 20 GB, 5.25-inch SCSI tape drive in second BA356-JB shelf
Two DWZZB-VWs to convert Fast Wide Differential (FWD) SCSI signals from KFTIA-AA and KZPSA-BB for use in BA356-JB shelf
PCI Plug-in unit (DWLPB-CA), with KZPSA-BB Fast Wide Differential (FWD) SCSI controller
BN21K cables and CK-KFTIA-AA cable kit
DECsafe Available Server software license kit

Step 2—Power Cord

BN23H-4E **60 Hz**—AC line cord for Single Phase Power, one per cabinet (4.5 meters in length)

BN20P-4E **50 Hz**—AC line cord for Single Phase Power, one per cabinet (4.5 meters in length)

Note: See Specifications for information on appropriate power cord to order. If redundant supply (H7266-AD/AE) is ordered, power cord is included and does not have to be ordered separately.

Step 3—Additional CPU Modules (SMP Upgrades)

- Up to two additional CPU modules can be added to Base Servers, Expanded Base Servers and System Building Blocks—system maximum of three CPU modules.
- Combining 5/300 MHz, 5/350 MHz, and 5/440 MHz CPU modules in the same system is **not** supported.
- For more than two processor modules in a system, a minimum of two memory modules are recommended for optimal system performance.
- All SMP upgrades include processor module with Alpha microprocessor(s), SMP extension license, and end-user product warranty.

5/300 Servers	5/350 Servers	5/440 Servers	Operating System	CPU Module Type
751P2-AX	**753P2-AX**		Digital UNIX	Single-CPU
752P2-AX	**754P2-AX**	**756P2-AX**	Digital UNIX	Dual-CPU
751P1-AX	**753P1-AX**		OpenVMS	Single-CPU
752P1-AX	**754P1-AX**	**756P1-AX**	OpenVMS	Dual-CPU

Step 4—Memory

Maximum of 6 GB per system. **Note:** A short term memory size restriction is currently in effect for **5/300** MHz systems **only**. Memory modules must be ordered in a quantity of one or two of the same size—add-on memory size must be the same as that included with Base Server or Expanded Base Server selected or the initial memory module selected for a System Building Block configuration. The maximum memory supported is temporarily two 2 GB memory modules, resulting in a system maximum of 4 GB.

- For Base Servers two additional memory modules can be added for a system maximum of three.
- System Building Blocks require the selection of one memory module—system maximum of three.
- The maximum of three memory modules is reduced by one for each additional CPU module selected from Step 3 and each system I/O module added from Step 6.
- Each memory module has built in two-way interleaving; additional interleaving is accomplished by adding more memory modules.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 4a—Memory Upgrades

Memory upgrades are field installed only (not configured in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs); upgrades 128 MB (-BA) module to 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs); upgrades 512 MB (-DA) module to 1 GB (-EA) module

Step 4b—Prestoserve Nonvolatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems only.
- Maximum one Prestoserve I/O performance enhancement option per system.
- Includes Prestoserve license and documentation kit.

DJ-ML200-BA	4 MB Prestoserve, PCI option—requires DWLPB-CA/CB
DJ-ML200-CA	8 MB Prestoserve, PCI option—requires DWLPB-CA/CB
DJ-ML300-BA	4 MB Prestoserve, KFTIA-AA daughter card mounting—requires KFTIA-AA

Step 5—I/O Expansion Buses

PCI I/O bus is available on AlphaServer 8200. Application and system configuration determine maximum configuration. Configuration limits exist at I/O bus level and controller level. Verify maximum number of allowable controllers listed in Controller Configuration Table.

- Each DWLPB-CA/CB (PCI shelf mount box) includes 12 PCI slots and required cable for connection to I/O channel.
- Each PCI shelf mount box requires one I/O channel connection to KFTHA-AA or KFTIA-AA, see Step 6.
- Maximum of nine I/O channels available (KFTIA plus two KFTHAs)

DWLPB-CA	**PCI shelf mount box for AlphaServer 8200 system cabinet** only—maximum three per cabinet.
DWLPB-CB	**PCI shelf mount box for AlphaServer 8200 expansion cabinet** only—maximum four per cabinet.
KFE70-BA	**EISA Bridge option;** PCI to EISA bridge module set—must reside in first DWLPB-CA in system cabinet only. Converts 12-slot PCI bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 diskette drive, mounting hardware, and cables to mount RX26 in processor system unit. Maximum one EISA Bridge option supported per system. This option is required to support KZPSC SCSI RAID controllers. It includes diskette drive required to run the RAID Configuration Utility (RCU).

Step 6—System I/O Modules

- KFTIA-AA system I/O module included with Base Server; KFTHA-AA included with Expanded Base Server—any combination of KFTIA or KFTHA modules can be added for a system maximum of three.
  - Maximum nine I/O channels available on AlphaServer 8200 (two KFTHA-AA modules, one KFTIA-AA module).
- System Building Block requires the selection of one I/O module.

KFTHA-AA	**System I/O module with four I/O channels** for DWLPB-CA/CB boxes.
KFTIA-AA	**System I/O module with one I/O channel** for DWLPB-CA/CB shelf mount box, includes - two 802.3 twisted-pair Ethernet ports—requires BN26M cable per port - one single-ended SCSI-2 port—requires BN21H cable - three FWD (Fast Wide Differential) SCSI-2 ports—requires CK-KFTIA-AA and BN21K cable per port (**Note**: Base Servers include KFTIA-AA with three CK-KFTIA-AA cabinet kits.) One of the following optional FDDI daughter cards can be added to KFTIA-AA—see Step 9 for cables. - Single attachment station multi-mode fiber card (DEFPZ-AA) **or** - Twisted-pair copper card (DEFPZ-UA) Prestoserve (DJ-ML300-BA) can be added to KFTIA-AA.
BN26M-xx	Ethernet twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN21H-xx	SCSI-2 single-ended cable; 50-pin male straight to 50-pin male straight. Connects KFTIA-AA single-ended SCSI-2 port to StorageWorks shelf.
CK-KFTIA-AA	Cabinet kit for Fast Wide Differential (FWD) SCSI-2 port. One kit required for each used port on KFTIA -AA—maximum three per KFTIA-AA. Cabinet kit includes Y-cable and FWD terminator.
BN21K-xx	SCSI-2 Fast Wide Differential cables; 68-pin male straight to 68-pin male right-angle. Connects KFTIA-AA FWD SCSI-2 ports to DWZZA-VA or DWZZB-VW (cable lengths in meters).
BN21K-02*	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in system cabinet (front)
BN21K-03*	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in system cabinet (rear)
BN21K-05/10	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in expansion cabinet (front or rear) Connects from KFTIA FWD port to DWZZB-VW in BA356-SB in SW500 and SW800 Cabinets

* Manufacturing may substitute correct cable length depending on configuration.

Step 7—Storage Controllers

- KFTIA-AA I/O module included with Base Server; KFTHA-AA I/O module included with Expanded Base Server; System Building Blocks require I/O module.
- DWZZA-AA requires minimum revision E02 for connecting any Fast Wide Differential SCSI-2 port from KFTIA-AA or KZPSA-BB to externally mounted TZ8xx tape loaders.
- DWZZB-VW Fast Wide Differential Single-ended SCSI Converter requires minimum revision A01 for connecting FWD SCSI-2 signals from KFTIA-AA or KZPSA-BB to BA356-JB StorageWorks Shelf.
- System maximum of two KZPSC-AA/BA SCSI RAID controllers.
- Tape and optical devices are not supported on KZPSC SCSI RAID controllers.

Storage Controllers—PCI-based	
KZPSA-BB	**PCI Fast Wide Differential SCSI Adapter.** OpenVMS supports eight per PCI, maximum 26 with OpenVMS V6.2-1H3 per system. Digital UNIX supports eight per PCI, maximum 32 per system (uses one PCI slot). Provides one SCSI-2 bus. The KZPSA supports DECsafe Available Server.
BN21K-xx	**SCSI-2 Fast Wide Differential cables**; 68-pin male straight to 68-pin male right-angle. Connects KZPSA-BB Fast Wide Differential SCSI-2 port to DWZZA-VA or DWZZB-VW.
BN21K-01*	Connects from KZPSA to DWZZB-VW in BA356-JB in system cabinet (front)

* Manufacturing may substitute correct cable length depending on configuration.

Step 7—Storage Controllers *(continued)*

Storage Controllers—PCI-based	
BN21K-02*	Connects from KZPSA to DWZZB-VW in BA356-JB in system cabinet (rear)
BN21K-03*	Connects from KZPSA to DWZZB-VW in BA356-JB in expansion cabinet (front or rear)
BN21K-05/10	Connects from KZPSA to DWZZB-VW in BA356-SB in SW500 and SW800 cabinets
KZPSC-AA	**PCI SCSI RAID Controller with 1 port.** OpenVMS and Digital UNIX support two per PCI, maximum two per system (uses one PCI slot, and KFE70-BA—EISA Bridge option). Provides one Fast/wide/single-ended connection. Allows RAID levels 0,1, and 5. Tape drives not supported.
BN31S-1E	1.5 meter wide SCSI cable. For connections from PCI RAID controller to BA356-JB Wide SCSI StorageWorks Shelf located in same cabinet.
KZPSC-BA	**PCI SCSI RAID Controller with 3 ports.** OpenVMS and Digital UNIX support two per PCI, maximum two per system (uses two PCI slots, and KFE70-BA—EISA Bridge option). Provides three Fast/wide/single-ended connections. Allows RAID levels 0,1, and 5. Tape drives not supported.
BN31K-0E	Required for KZPSC-BA to use third port on module. Connects internally from KZPSC-BA module to second PCI slot/bulkhead.
BN31S-1E	1.5 meter single-ended wide SCSI cable. For connections from PCI RAID controller to BA356-JB Wide SCSI StorageWorks Shelf located in same cabinet. One required for each used port on KZPSC-BA module.
MS100-AA†	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only
MS100-AB†	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only
KZPSC-UB	Battery back-up for Cache memory option
KFPSA-AA	**PCI DSSI Adapter (OpenVMS only)**—Requires OpenVMS V6.2-1H2 or later; minimum System Console Firmware Revision 3.09. Maximum twelve per PCI, twenty-four per system with OpenVMS V6.2-1H3. (End node only). **Note**: KFPSA and KFMSB are not supported on same DSSI bus.
BC21Q-xx	External shielded cable (MR/MR connectors) Select required length—09, 16, 25, 50 ft.
BC22Q-xx	External shielded cable (MR/PS connectors) Select required length—16, 25, 50 ft.
CIPCA-AA	**PCI-to-CI Adapter (OpenVMS only)**—Requires OpenVMS V6.2-1H2 or later, minimum System Console Firmware Revision 3.09. Maximum two per PCI, two per system; uses one PCI slot for adapter and one EISA slot for power only. Note: KFE70 option is **not** required.
BNCIA-xx	Computer interconnect cable sets—Connects CIPCA to Star Coupler. Select required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft)

* Manufacturing may substitute correct cable length depending on configuration.

† Requires AlphaServer 8200 minimum System Console Firmware Revision V3.2.2, OpenVMS V6.2-1H2 and Digital UNIX V3.2D or later operating system software.

Step 8—Storage

Note: When multiple storage devices are configured with the system, specify which devices should be installed inside the system cabinet, inside the system expansion cabinet, or installed in the external StorageWorks cabinet. Line item sequencing will allow Manufacturing to configure storage options in the appropriate cabinet.

- List storage options to be integrated in system cabinet immediately following system part number.
- List storage options to be integrated in StorageWorks cabinet immediately following StorageWorks cabinet part number.
- Order appropriate BN21x-xx SCSI cables for connecting controllers and storage options.

Step 8a—Internal Storage (System Cabinet)

Wide SCSI devices are supported in BA356-JB Wide SCSI StorageWorks shelves inside the System cabinet. They are also supported in external StorageWorks cabinets via BA356-SB rackmount options for the SW500 and SW800 cabinets. The BA356-JB includes BA35X-HG 48V/150W DC power supply and BA35X-RD metric mounting hardware.

System cabinet provides space for up to six BA356 StorageWorks shelves; each shelf holds a maximum of two 5.25-inch devices and one 3.5-inch device or seven 3.5-inch devices. Typical configurations require a signal converter, i.e., DWZZB-VW which counts as one 3.5-inch device.

- DWZZB-VW is a Fast Wide Differential to Fast Wide Single-Ended Converter.
- BA656 Internal Storage Drawer included in base systems; provides space for four additional narrow 5400 RPM and 7200 RPM SCSI 3.5-inch devices.
- BA356-JB StorageWorks shelves support narrow and wide SCSI 5400 RPM and 7200 RPM disk drives.

Wide SCSI Options	
BA356-JB	**Wide SCSI-2 StorageWorks Shelf**—includes 16-bit I/O personality module, 48V/150W DC power supply, DC fans, and rackmounting hardware. Supports 16-bit wide SCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum revision levels.
DWZZB-VW	**Wide SCSI-2 StorageWorks Signal Converter**—required to convert FWD signals from KFTIA-AA and KZPSA-BB for use in the BA356-JB StorageWorks shelves.
BA35X-MG	8-bit I/O Personality Module—can be used in place of 16-bit I/O personality module for direct connection to narrow single-ended controllers, field installable only.
16-bit Wide Drives	
RZ26N-VW	1.05 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28M-VW	2.1 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28D-VW	2.1 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ29B-VW	4.3 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
8-bit Narrow Drives	
RZ26N-VA	1.05 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28M-VA	2.1 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28D-VA	2.1 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ29B-VA	4.3 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier

Note: To ensure 16-bit wide SCSI operation, use wide SCSI drives with wide SCSI controllers in wide SCSI StorageWorks shelves with wide SCSI cables. See *Storage Devices*—StorageWorks Supported Devices for 8-bit and 16-bit Expansion Table for minimum hardware revision levels.

Tape Devices (Note: Tape and Optical Devices not supported on KZPSC SCSI RAID controller.)	
TLZ09-VA	8.0 GB DAT 3.5" SCSI tape drive in StorageWorks carrier. OpenVMS V6.2-1H3 and Digital UNIX V3.2C required along with System Console Firmware Revision 3.0-9.
TKZ15-VA	5/10 GB Helical Scan 8-mm, 5.25-inch SCSI tape drive in StorageWorks carrier
TZ87-VA	20.0 GB DLT 5.25-inch SCSI tape drive in StorageWorks carrier
TZ88N-VA	20/40 GB DLT 5.25-inch SCSI tape drive in StorageWorks carrier
Optical Disk	
RWZ52-VA	1.3 GB Optical Drive in StorageWorks carrier
Solid State Disks (Supported with KZPSC, KZPSA, KFTIA)—cannot be combined with RZxx disks/tapes on same SCSI bus	
EZ31-VW	134 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ32-VW	268 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ64-VA	475 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ69-VA	950 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later

Step 8b—External Storage (I/O Expansion Cabinet)

I/O expansion cabinet (H9B10-EA) provides space for a maximum of 16 BA356-JB SCSI StorageWorks shelves and a maximum of four DWLPB-CB PCI shelf mount boxes. Disk and tape drives supported are the same as Step 8a Internal Storage. See configuration limitations in Step 11b.

Step 8c—External Storage

The following list describes available disk storage devices, capacities, and shelf type, and available tape drives. These supported options can be added as required.

Storage Cabinets	Capacity	
SW5XX, SW8XX	6–227 GB	
SCSI Disk Drives		
RZ26N-VA	1.05 GB	Narrow
RZ28M-VA, RZ28D-VA	2.1 GB	Narrow
RZ29B-VA	4.3 GB	Narrow
RZ26N-VW	1.05 GB	Wide
RZ28M-VW, RZ28D-VW	2.1 GB	Wide
RZ29B-VW	4.3 GB	Wide
Tape Drives		
TZ87, TZ857*, TZ877, TZ88, TZ885, TZ887, TSZ07, TKZ15-VA, TLZ09, TKZ09, TKZ60, TKZ61, TKZ62, TL810, TL812, TL820, TL822, TL826	See *Storage Devices* for ordering information.	
Optical Libraries		
RW525-ZA	19 GB Optical Library, 1 drive	
RW531-ZC	38 GB Optical Library, 2 drives	
RW532-ZF	76 GB Optical Library, 4 drives	
RW536-ZF	170 GB Optical Library, 4 drives	
RWZ52-FA	1.3 GB Tabletop Optical Library	

* Loader support for Digital UNIX is available via DECnsr.

Step 9—Networks and Communications

Two twisted-pair 802.3/Ethernet controllers on KFTIA-AA system I/O module are included with each Base Server; DE435 or DE500 network interface card included with Expanded Base Server. See Step 6 for twisted-pair Ethernet cable part number. Optional DEFPZ-AA/UA (FDDI) daughter card can be installed on KFTIA-AA system I/O module. Select additional devices if required. **Note**: Connection of system to Ethernet requires twisted-pair cable. *See Network Products Guide* for details.

LAN Communications Controllers—KFTIA-AA daughter cards

- Maximum one FDDIcontroller daughter card per KFTIA-AA I/O module.
- System maximum of three FDDIcontroller daughter cards.

DEFPZ-AA	**FDDIcontroller Fiber - Single attachment station**—daughter card for mounting on KFTIA-AA. Requires BN24x cable.
BN24E-xx	Fiber-Optic Cable, Dual 2.5 mm Bayonet "ST" type connectors
BN24D-xx	Fiber-Optic Cable, Dual 2.5 mm Bayonet "ST" type connector to FDDI "MIC" connector
DEFPZ-UA	**FDDIcontroller Fiber - Twisted-pair copper**—daughter card for mounting on KFTIA-AA. Requires BN26x cable.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable

Step 9—Networks and Communications *(continued)*

LAN Communications Controllers—PCI based

- Requires DWLPB-CA/CB, PCI shelf mount box.
- System maximum of six DEFPA-AA/DA/UA/MA FDDI controllers

DE435-AA	**Digital Etherworks 32-bit High Performance Network Interface Card**—supports twisted-pair, thick wire, and ThinWire (uses one PCI slot). OpenVMS and Digital UNIX support eight per PCI, maximum eight per system. Requires appropriate cable.
DE450-CA	**PCI-to-Ethernet 3-port Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.
DE450-TA	**PCI-to-Ethernet 1-port Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.
DE500-XA	**Fast Ethernet (100 Mbit) PCI Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system.
DEFPA-AA	**FDDIcontroller Fiber - Single attachment station MultiMode Fiber**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN34x "SC" type connecting cable.
DEFPA -DA	**FDDIcontroller Fiber - Dual attachment station MultiMode Fiber**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN34x "SC" type connecting cable.
BN34A-xx	MultiMode Fiber Optic Duplex cable—"SC" connector to "ST" connector
BN34B-xx	MultiMode Fiber Optic Duplex cable—"SC" connector to "SC" connector
BN34D-xx	MultiMode Fiber Optic Duplex cable—"SC" connector to "MIC" connector
DEFPA-MA	**FDDIcontroller Copper - Dual attachment station DAS**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN26x or BN25H connecting cables.
DEFPA-UA	**FDDIcontroller Fiber - Single attachment station UTP**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN26x or BN25H connecting cables.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable
BN25H-03	3-meter Unshielded twisted pair RJ45 connectors
DGLPB-AB	**ATMworks 350 ATM PCI bus adapter** (uses one PCI slot). Digital UNIX V4.0a supports four per PCI, maximum four per system.

Step 9—Networks and Communications *(continued)*

LAN Communications Controllers—EISA based

- Requires DWLPB-CA and KFE70-BA, EISA bridge module set.
- See EISA Bus IRQ Address Table.

DNSES-AA	**Synchronous Communications Controller**—(uses one EISA slot). Digital UNIX and OpenVMS support one per EISA, maximum one per system. Requires BC19x cable.
BC19B-02	EIA-422-A/V.11 adapter cable; can be extended with BC55D-33
BC19D-02	EIA-232-D/V.24 adapter cable; can be extended with BC22F-xx
BC19E-02	EIA-423-A/V.10 adapter cable; can be extended with BC55D-33
BC19F-02	V.35 adapter cable; can be extended with BC19L-25
DW300-AA	**Token Ring Adapter**—(uses one EISA slot) Digital UNIX supports one per EISA, maximum one per system. Requires BN26M cable.
BN26M-xx	802.5/Token Ring twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
CXI01-AA	**Digiboard Asynchronous Xem/ISA Multiport Serial Card with 16 RJ45 PORTS/Xem Port**—(uses one EISA slot) supports one per EISA, maximum one CXI01-AA/AD per system. Supported on Digital UNIX systems only.
CXI01-AB	**Digiboard PORTS/Xem, 16 RJ45 Port Concentrator**—mounts separately from PCI bus. Maximum of three CXI01-AB can be attached to CXI01-AA; provides up to 48 additional ports. Supported on Digital UNIX systems only.
CXI01-AD	**Digiboard Asynchronous EPC/X Multiport Serial Card with 16 RJ45 Port EPC/CON-16 Concentrator**—(uses one EISA slot) supports one per EISA, maximum one CXI01-AA/AD per system. Supported on Digital UNIX systems only.
CXI01-AE	**Digiboard EPC/CON-16 Concentrator**—mounts separately from PCI bus. Maximum of three CXI01-AE can be attached to CXI01-AD; provides up to 48 additional ports. Supported on Digital UNIX systems only.
CXI01-AC	Digiboard RJ45 to DB25 Male Converter
CXI01-AF	Digiboard RJ45 to DECMJ11 Adapter—Eight per package

Local and Wide Area Communications Servers

Each communications server requires 802.3/Ethernet connection. Depending on server selected, either ThinWire BNC-type connection (e.g., BC16M cable) or thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Additional items also required—see the *Network Products Guide*.

Network Connectivity Products

See Network Products Guide for details.

Step 9a—MEMORY CHANNEL Controller

Digital UNIX Systems

- Requires Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.
- The following options are not currently supported with MEMORY CHANNEL: DJ-ML200, DNSES-AA, CIPCA CIXCD, DE500-XA

OpenVMS Systems

- Requires OpenVMS V7.1 and OpenVMS Cluster License
- The following options are not currently supported with MEMORY CHANNEL: DNSES-AA, DE500-XA

Step 9a—MEMORY CHANNEL Controller *(continued)*

MEMORY CHANNEL requirements for currently installed AlphaServer 8200 systems:

- Console firmware at revision V2.3 or higher.
- CCMAA-BA Adapter must be installed in slots 0-7 of a DWLPA-CA PCI; no restriction for DWLPB-CA PCI bus.

- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported.
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAQ-AA	TruCluster Software for Digital UNIX
QB-4ZCAQ-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAQ-AA	OpenVMS Cluster license for Alpha systems

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation. For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 10—Console Terminal

- Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- Shielded console cable is included for connection to the console terminal.

VT510-xx	VT510 terminal
LA30N-xx	LA30 printer
LK411-xx	Keyboard

Step 11—Expansion—System Cabinet and I/O Expansion Cabinet

Step 11a—System Cabinet

- System Cabinet includes one single-phase power supply.
- Provides space for additional redundant (N+1) power supply.
- BA656 Internal Storage Drawer included in system cabinet; provides space to accommodate four additional 3.5-inch narrow SCSI devices including one tape device.
- Provides space for six BA356-JB SCSI StorageWorks Shelves, three DWLPB-CA (PCI shelf mount boxes) or combination of StorageWorks and PCI shelves.
  - For each DWLPB-CA placed in system cabinet, subtract two BA356-JB shelves from maximum available. Example: One DWLPB-CA in system cabinet allows for a maximum of four BA356-JB shelves.

Shelf Mount Boxes	Quantity
StorageWorks shelves (BA356-JB)	6 maximum (see limits above)
PCI shelf mount box (DWLPB-CA)	3 maximum

Step 11b—I/O Expansion Cabinet

- I/O expansion cabinet includes one single-phase power supply.
- Provides space for additional redundant (N+1) power supply.
- Maximum four I/O channels supported in each I/O expansion cabinet.
- Space for 16 BA356-JB SCSI StorageWorks Shelves, four DWLPB-CB (PCI Rack mount boxes) or combination StorageWorks and PCI shelves.
  - For each DWLPB-CB placed in expansion cabinet, subtract two BA356-JB shelves from maximum available. Example: Three DWLPB-CB in expansion cabinet allows for a maximum of ten BA356-JB shelves.

Shelf Mount Boxes	Quantity
StorageWorks shelf (BA356-JB)	16 maximum (see limits above)
PCI shelf mount box (DWLPB-CB)	4 maximum

H9B10-EA **I/O Expansion Cabinet**—Single Phase power, maximum two per system

Note: See Step 2 for selection of appropriate power cord—one per I/O expansion cabinet. If redundant supply (H7266-AD/AE) is ordered, power cord is not required.

Step 12—Power Options

- Power options are available for AlphaServer 8200 system and expansion cabinets.
- System cabinet and expansion cabinet includes one power supply (H7266-AA)—200-240 VAC input voltage, 48VDC, 2400 watt, output supply.
- Power system supports N+1 power redundancy and battery backup capability.
- If redundant power supply is ordered, power cord in Step 2 no longer required.

H7266-AD Single Phase 48V DC redundant power supply—60 Hz power connector, maximum one per cabinet

H7266-AE Single Phase 48V DC redundant power supply—50 Hz power connector, maximum one per cabinet

Note: See Specifications for information on appropriate power supply to order.

Step 12a—Battery Backup Options

- Optional battery backup requires addition of H7267-AA to each power supply in system cabinet and expansion cabinets.
- Battery backup provides up to 5 minutes of capacity to power contents of system and expansion cabinets.

H7267-AA Battery Backup Option Kit—Includes batteries, charger board, installation manual for adding battery backup operation to one power supply (H7266-AA, H7266-AD, H7266-AE). Can be field installed.

H7239-AA Battery Pack replacement option—Includes two battery packs for replacement of batteries in power supply (H7266-AA, H7266-AD, H7266-AE). Field installed only.

Step 12b—Power Option for BA356 StorageWorks Shelves

- Provides N+1 power for BA356-JB StorageWorks shelves.
- Occupies one slot in StorageWorks shelf.

BA35X-HG 48V DC 150W Redundant Power Supply for StorageWorks shelf; includes 48VDC jumper cable for connecting to first power supply in StorageWorks shelf.

Step 13—Software

Select user licenses and additional software as required. **Note**: Media and documentation required for first system on site.

Software Processor Code = Q

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AM-3G	Digital UNIX Concurrent Use 32-user license
QL-MT7AM-3H	Digital UNIX Concurrent Use 64-user license
QL-MT7AQ-AA	Digital UNIX Traditional unlimited user license
QL-MT5AQ-AA	Digital UNIX developer's extension license
QL-MT6AQ-AA	Digital UNIX server extension license
QL-MTJAQ-AA	DECnet/OSI end-system license
QL-MTKAQ-AA	DECnet/OSI extended function license
QB-05SAQ-AA	DECsafe Available Server license and documentation (Digital UNIX only). Media available on layered product CD-ROM. KZMSA or KZPSA adapter required.

Digital UNIX Media and Documentation

QA-MT4AA-H8	Digital UNIX media and on-line documentation (base system, complementary products) on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation
QA-MT4AB-GZ	Digital UNIX end user hardcopy documentation subkit
QA-MT5AA-GZ	Digital UNIX developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	Digital UNIX server extension hardcopy documentation subkit

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AQ-AA	OpenVMS Traditional unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license

Step 13—Software (*continued*)

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-09SAA-GZ	OpenVMS base hardcopy documentation
QA-001AA-GZ	OpenVMS full hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX
QA-03XAA-H8	Layered products media and documentation for OpenVMS

Digital NAS Base Server 200 Software

Digital NAS Base Server 200 software included with base AlphaServer 8200 systems. Media available on layered product CD-ROM.

Step 14—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include one-year hardware warranty, on-site, same day, 4-hour response time.
- Select optional Hardware Supplemental Support Services if required.

AlphaServer 8200

One CPU less than 2 GB memory	Two CPUs less than 2 GB memory	Two CPUs 2 GB memory	
FM-8U4HR-36	**FM-8D4HR-36**	**FM-8G4HR-36**	Years 1-3, 5 x 9, 4-hour response time
FM-8U512-36	**FM-8D512-36**	**FM-8G512-36**	Years 1-3, 5 x 12, 4-hour response time
FM-8U616-36	**FM-8D616-36**	**FM-8G616-36**	Years 1-3, 6 x 16, 4-hour response time
FM-8U724-36	**FM-8D724-36**	**FM-8G724-36**	Years 1-3, 7 x 24, 4-hour response time
FM-8U4HR-60	**FM-8D4HR-60**	**FM-8G4HR-60**	Years 1-5, 5 x 9, 4-hour response time
FM-8U512-60	**FM-8D512-60**	**FM-8G512-60**	Years 1-5, 5 x 12, 4-hour response time
FM-8U616-60	**FM-8D616-60**	**FM-8G616-60**	Years 1-5, 6 x 16, 4-hour response time
FM-8U724-60	**FM-8D724-60**	**FM-8G724-60**	Years 1-5, 7 x 24, 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for Digital UNIX and OpenVMS include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 8200 One CPU Systems

FM-82UOS-12	12-month Software Supplemental Support for Digital UNIX one CPU systems
FM-82UOS-36	36-month Software Supplemental Support for Digital UNIX one CPU systems
FM-82UOS-60	60-month Software Supplemental Support for Digital UNIX one CPU systems

AlphaServer 8200 One CPU Systems

FM-82UVM-12	12-month Software Supplemental Support for OpenVMS one CPU systems
FM-82UVM-36	36-month Software Supplemental Support for OpenVMS one CPU systems
FM-82UVM-60	60-month Software Supplemental Support for OpenVMS one CPU systems

Step 14—Hardware and Software Supplemental Support Services *(continued)*

AlphaServer 8200 Two CPU Systems

FM-82DOS-12	12-month Software Supplemental Support for Digital UNIX two CPU systems
FM-82DOS-36	36-month Software Supplemental Support for Digital UNIX two CPU systems
FM-82DOS-60	60-month Software Supplemental Support for Digital UNIX two CPU systems
FM-82DVM-12	12-month Software Supplemental Support for OpenVMS two CPU systems
FM-82DVM-36	36-month Software Supplemental Support for OpenVMS two CPU systems
FM-82DVM-60	60-month Software Supplemental Support for OpenVMS two CPU systems

Step 14a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

Step 15—Environmental Power Products

See UPS Solutions for AlphaServer 8200 systems following Specifications.

Optional Controller Configuration Table

With multiple adapters that provide the same interface available on different I/O buses it is possible to exceed operating system limit on the number of ports supported for that interface. Follow these guidelines for maximum number of ports that each operating system supports. Fill in this table under the relevant area, add up number of controllers/ports available, and verify that operating system limits will not be exceeded. **Do not exceed these values.**

Option Name	A Number of Ports/Buses	B Number of Options	C Total Ports (A * B)	Digital UNIX Limit	OpenVMS Limit
SCSI Options					
Included **KFTIA-AA** I/O module, one single-ended and three FWD SCSI ports*	4	1	4		
Additional **KFTIA-AA** I/O module, one single-ended and three FWD SCSI ports	4				
KZPSA-BB PCI fast wide differential SCSI adapter	1				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**32**	**26**
802.3/Ethernet Options					
Included **KFTIA-AA** I/O module, two 802.3/Ethernet ports*	2	1	2		
Additional **KFTIA-AA** I/O module, two 802.3/Ethernet ports	2				
DE435-AA PCI 802.3/Ethernet controller, DE450 and DE500	1				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**8**	**8**
FDDI Options					
Included **KFTIA-AA** I/O module, optional FDDI daughter card installed (**DEFPZ-AA/UA**)*	1				
Additional **KFTIA-AA** I/O module, optional FDDI daughter card installed (**DEFPZ-AA/UA**)	1				
DEFPA-AA/DA/UA/MA PCI FDDIcontroller, one port each	1				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**8**	**8**

*Applies to Base Servers only.

EISA Bus IRQ Address Table

Configuration Rules and Information

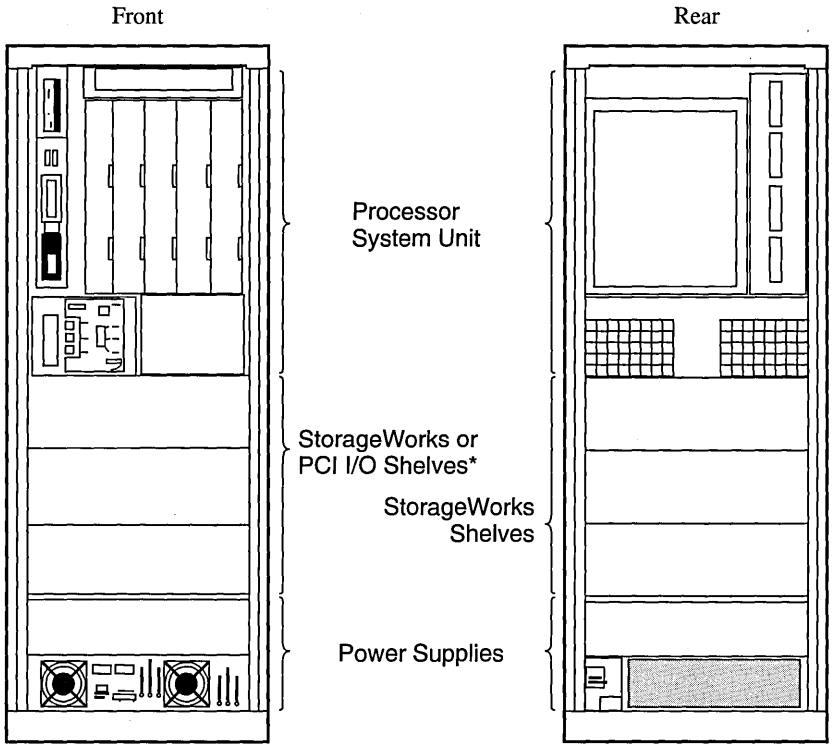
- EISA Bus IRQ address assignments are for Digital UNIX and OpenVMS systems only.
- In some cases, the maximum number of each supported device is less than number of EISA bus addresses available; this is due to other limitations.
- Only one device can occupy any given IRQ address; if multiples of a device are configured, each device occupies a separate address.
- Match each device to one available address. (Note: With the table as a worksheet, fill in "0" for each device; fill in only one "0" per column).
- Actual IRQ address assignment will be made by EISA Configuration Utility (ECU), which is run during system manufacture, or in the installed system if EISA bus is reconfigured.

	EISA Bus IRQ Addresses									Maximum of Each Supported	
Option	5	7	8	9	10	11	12	14	15	OpenVMS	Digital UNIX
DNSES-AA	–	–	0	0	0	0	0	0	0	1	1
DW300-AA	0	–	–	0	0	0	–	–	0	0	1
CXI01-AA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1
CXI01-AD	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1

Table Codes:
0 = address is available for device
– = address not available for device
NA = Not Applicable

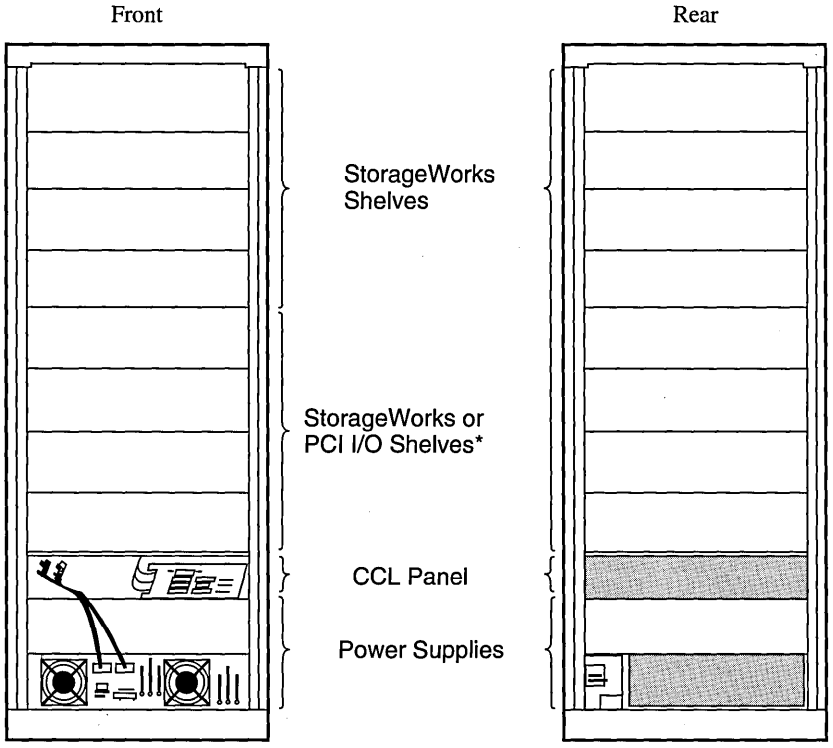
AlphaServer 8200

System Cabinet



BU-3480

Expansion Cabinet



* A PCI I/O shelf extends into the rear of the cabinet.
A StorageWorks shelf cannot be located behind a PCI shelf.

BU-3481

Specifications

Physical Characteristics	Operating	Shipping
Height	170.0 cm (67.0 in.)	194.0 cm (76.25 in.)
Width	60.0 cm (23.6 in.)	91.5 cm (36.0 in.)
Depth	92.5 cm (36.4 in.)	121.5 cm (47.9 in.)
Weight		
Minimum configuration	318 kg (700 lb.)	363 kg (800 lb)
Maximum configuration	591 kg ((1300 lb.)	636 kg (1400 lb.)
Clearances	**Operating**	**Service**
Front	1.0 m (40 in.)	1.5 m (59 in.)
Rear	.75 m (29.5 in.)	1.0 m (40 in.)
Sides	0	0
Environmental	**Operating**	**Non-Operating**
Temperature	10° to 35°C (50° to 95°F)	–40° to 66°C (–40° to 151°F)
Humidity	10% to 90%	10% to 95%
Altitude	0–2.4 km (0–8200 ft)	9,100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g max.
Heat dissipation[1]	**Minimally configured system**[1] (system cabinet) 3200 Btu/hr, 930 W **Fully configured system**[2] (system cabinet) 9100 Btu/hr, 2647 W **Fully configured system**[3] (system cabinet with two I/O expansion cabinets) 21,300 Btu/hr, 6234 W	
Regulatory		
Agency approvals	UL Listed to UL1950 CSA Certified to CAN/C22.2 No. 950-M89 FCC Part 15 (Class A) CE Declaration #1259	
Reviewed to	EN 60950/A1, Jan. 1993, European Norm AS/NZS 3260:1993, Australian/New Zealand Standard EMKO-TSE{74-SEC}Summary of Nordic Deviations IEC950, 2nd Ed., 2nd Amend.	
Power Requirements[4]	US/Canada/Japan	Europe/AP
Nominal AC input line voltage	202-240 (208) V Japan (202) V	202-240 (240) V
Frequency range	50–60 Hz	50–60 Hz
Phases	Single-phase line-to-line or line-to-neutral	Single-phase line-to-line or line-to-neutral
Maximum input current	16 A rms	16 A rms
Surge current	80 A peak	80 A peak
Rating	16 A	16 A
Power cord part number	BN23H-4E	BN20P-4E
Power cord length	4.5 meters (15 feet)	4.5 meters (15 feet)
Power cap (system)	DEC 12-16886-00 NEMA L6-30P	DEC 12-30333-03
Receptacle	NEMA L6-30R	IEC 309 (32A)[5] 2 Pole/3-Wire (220-240V)
PCS/PDS/PDU/UPS cable	BC26E	

1 Minimally configured system contains one power supply, one CPU module, one memory module, one System I/O module, one CD-ROM, and one RZ28 disk drive.

2 Fully configured system contains two power supplies, one CPU module, two memory modules, two System I/O modules, one CD-ROM, 16 RZ28 drives, two PCI shelves, and two StorageWorks shelves.

3 Fully configured system and two expansion cabinets consists of the above "fully configured system" and two expansion cabinets which each contain one PCI shelf , 14 StorageWorks shelves, and 84 RZ28 disk drives.

4 Power system provides unity power factor which allows full utilization of the input line current (Watts = VA).

5 Receptacle type is Hubbell 332R6 or equivalent.

Recommended On-Line Power Protection/UPS Solutions for AlphaServer 8200 systems

For complete protection, UPS products should be used with data line surge protectors—4N-GA249-AB (2 wire modem), 4N-GA249-CA (10BaseT), 4N-GA510-BF (ThinWire). See TVSS section of Environmental Products Chapter.

System	Storage	UPS Model	Receptacle Module for Plug-in Connection	
			60 Hz	**50 Hz**
AlphaServer 8200 (Single phase)	None	**4N-AEAAJ-CL (60 Hz)** **4N-AEAAJ-CU (50 Hz)**	Included	Hardwired
	SW500 or Expansion Cabinet	**4N-AEAAL-BA**	**4N-AEACK-BN**	Hardwired
	SW800	**4N-AEAAN-BA (60 Hz)** **4N-AEAAN-BE (50 Hz)**	**4N-AEACM-BN**	Hardwired

UPS Models	
4N-AEAAJ-CL	Prestige 6kVA (4kW), single phase, 60 Hz, 208V-120/208V, 6 ft. cord with L6-30P and (2) L6-30R, (8) 5-15R receptacles. Modular hot-swap design with 7 minutes battery at full load, extendible plug and play batteries and receptacle provisions. Unit includes 3 year hot swap warranty. Substitute -CT for 240V-240/120V operation.
4N-AEAAJ-CU	Prestige 6kVA (4kW) 50 Hz package, single phase, 50/60 Hz, 200-240V in and out, selectable; hardwired input/output.
4N-AEAAL-BA	PUPS plus 10kVA (7kW), single-phase, 50/60Hz, 176-276V in, 200-240V out, 9 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BA	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, 176-256V in, 200-240V out, 10 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BE	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, International model rated 380/415V in, 380/415/220V out; hardwired input/output.
Options	
4N-AEACM-BN	PUPS plus 15kVA receptacle module (3) L6-30R, (3) 5-20R, (2) L5-20R
4N-AEACM-BK	PUPS plus 15kVA receptacle module (2) L21-30R, (3) 5-20R
4N-AEACH-HD	Mobile module stacker for Prestige 6kVA models (includes siesmic supports)

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Includes cables, media and documentation.

UPS System	Digital UNIX	OpenVMS
Prestige UPS	**4N-AEAES-AK**	**4N-AEAES-EM**
PUPS plus UPS	**4N-AEAES-AK**	**4N-AEAES-FM**
Network Management or multi shutdown*	**4N-AEAES-BK**	**Call for information**

* Requires Connect-UPS Network Adapter (SNMP compatible) - for Digital UNIX systems, suffixes denote twisted pair/ThinWire
4N-AEAEO-DA/DC for 60Hz applications
4N-AEAEO-DE/DD for 50Hz applications

AlphaServer 8200 Rackmount

Product Description

The AlphaServer 8200 5/300, 5/350 and 5/440 Rackmount Systems are based on a rackmounted drawer that provides the environment for the five slot card cage and modules for the AlphaServer 8200 5/300, 5/350 and 5/440 departmental server. The Rackmount provides the same functionality plus support for XMI and VME in the tall 81" cabinet or any other 19" RETMA cabinet with the proper depth. It is the highest performance departmental server in the industry. It can be configured with up to six of the world's fastest microprocessors (Alpha microprocessor 21164). With the enormous capacity of the Alpha 64-bit architecture, up to 6 GB of memory, PCI, XMI and VME of up to a combination of more than 100 slots, this server offers room for growth for the largest and most complex applications.

The AlphaServer 8200 Rackmount runs OpenVMS or Digital UNIX operating systems and offers the reliability and availability features customers require for bet-your-business environments. Clusters, hot swap disks, RAID, ECC, memory and data paths, fault management along with space for many supported options including third party 19" RETMA compatible options are available.

All system building blocks and options stand alone as 19" rackmount assemblies and plug directly into 240V AC power strips provided with the system cabinet, all air flow is front to rear in order to allow ultimate flexibility in the final configuration of unique systems, and all cable egress is from the rear which helps in the management of high interface cable situations.

The AlphaServer 8200 provides supercomputer performance for the department. The AlphaServer 8200 has single processor floating point performance that dominates the competition in the generic benchmarks and wins at the application level as well. And, with up to 6 GB of memory, this server can provide all the benefits that Very Large Memory/Very Large Database (VLM/VLDB)systems have provided in the past.

Note: This Configuration menu for the Rackmount AlphaServer 8200 is intended to be a supplement to the non Rackmount Standard 8200. Only the unique Rackmount Features and Options will be listed here. Refer to AlphaServer 8200 configuration menu for: SMP Expansion, Memory, Supported Options, Storage Devices, and Software.

Step 1—Base Server System

- AlphaServer 8200 5/300 and 5/350 Systems require
  - Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- AlphaServer 8200 5/440 Systems require
  - Digital UNIX V3.2G or later, and OpenVMS V6.2-1H3 or later
- Software media and documentation required for first system on site.
- Console terminal required unless available on site.
- Base Servers include 5 slot backplane—three slots are used by CPU module, memory module, and KFTIA-AA system I/O module.
  - Two slots available for additional CPU, memory, or system I/O module(s).
- CD-ROM and RZ28-VA disk included in BA36R StorageWorks shelf, are connected via single ended SCSI-2 port on KFTIA-AA system I/O module.
  - Three additional 3.5-inch Storage Works devices can be added to the BA36R Storage shelf.
- 240V Universal single phase power is required for system, see Step 2.

AlphaServer 8200 Rackmount Base Systems include

- Processor module with
  - One or two Alpha microprocessor 21164 5/300 or 5/350 MHz CPU(s), each CPU includes 4 MB Backup cache, or
  - Two Alpha microprocessor 21164 5/440 MHz CPUs, each includes 4 MB Backup cache
- AlphaServer 8200 5/440 Systems require
  - Digital UNIX V3.2G or Digital UNIX V4.0a, or OpenVMS V6.2-1H3, or later
- System I/O module (KFTIA-AA) includes I/O channel for DWLPR-A9 or DWLMR-BA, two twisted-pair 802.3/Ethernet, single-ended SCSI-2 port, and three Fast Wide Differential (FWD) SCSI-2 ports
- 128 MB, 256 MB, 512 MB, or 2 GB of memory
- BA36R-AF StorageWorks Storage Shelf
- RZ28-VA 2 GB 3.5-inch SCSI disk
- 600 MB CD-ROM drive
- Universal 240V single phase power
- H9A15-CB 80" cabinet with rear door, side panels, and vented top
- Factory installed software
- Digital UNIX base license or Open VMS base license
- NAS 200 Software
- One year hardware product warranty
- 90 days software product warranty
- Requires 31.5 inches of vertical rackmounting space
- System installation included with AlphaServer 8200 5/440 Base Servers only

5/300 Servers	5/350 Servers	5/440 Servers	Operating System	Memory
Single-CPU Systems				
DA-AM1AB-A9	**DA-AM1CB-A9**	**N/A**	Digital UNIX	128 MB
DA-AM1AD-A9	**DA-AM1CD-A9**	**N/A**	Digital UNIX	512 MB
DY-AM1AB-A9	**DY-AM1CB-A9**	**N/A**	OpenVMS	128 MB
DY-AM1AD-A9	**DY-AM1CD-A9**	**N/A**	OpenVMS	512 MB
Dual-CPU Systems				
DA-AM1BB-A9	**DA-AM1DB-A9**	**DA-AM2FB-A9**	Digital UNIX	128 MB
DA-AM1BC-A9	**DA-AM1DC-A9**	**N/A**	Digital UNIX	256 MB
DA-AM1BD-A9	**DA-AM1DD-A9**	**DA-AM2FD-A9**	Digital UNIX	512 MB
DA-AM1BF-A9	**DA-AM1DF-A9**	**DA-AM2FF-A9**	Digital UNIX	2 GB
DY-AM1BC-A9	**DY-AM1DC-A9**	**N/A**	OpenVMS	256 MB
DY-AM1BD-A9	**DY-AM1DD-A9**	**DY-AM2FD-A9**	OpenVMS	512 MB
DY-AM1BF-A9	**DY-AM1DF-A9**	**DY-AM2FF-A9**	OpenVMS	2 GB

Step 1a—AlphaServer 8200 5/300 Rackmount System Building Blocks

Note: System Building Blocks are an alternative to standard Base Servers listed in Step 1. They provide flexibility in configuring the AlphaServer 8200 with a choice of memory and I/O options.

System Building Block Requirements

- **Minimum of one Memory module**
- **Minimum of one System I/O module**
- **SCSI controller**
- Systems require Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- Console terminal required unless available on site
- System includes 5 slot backplane—three slots are used by CPU, memory, and system I/O modules
  - Two slots available for additional CPU, memory, or system I/O module(s)
- The SBB is the 5 slot Rackmount 8200 drawer with either a single or dual CPU.
- If factory installed Software is required, a BA36R-AF StorageWorks Shelf, CD-ROM and system disk are required.
- If required a cabinet and appropriate controller can be ordered separately.

Ordering Information

300 MHz Rackmount SBB	
751XR-A9	A ready to mount AlphaServer 8200 Rackmount Drawer 240V with single CPU. No memory. No I/O. No operating system. Requires 24.5 inches of vertical rackmounting space.
752XR-A9	A ready to mount AlphaServer 8200 Rackmount Drawer 240V with dual CPU. No memory. No I/O. No operating system. Requires 24.5 inches of vertical rackmounting space.
350 MHz Rackmount SBB	
753XR-A9	A ready to mount AlphaServer 8200 Rackmount Drawer 240V with single CPU. No memory. No I/O. No operating system. Requires 24.5 inches of vertical rackmounting space.
754XR-A9	A ready to mount AlphaServer 8200 Rackmount Drawer 240V with dual CPU. No memory. No I/O. No operating system. Requires 24.5 inches of vertical rackmounting space.
440 MHz Rackmount SBB	
756XR-A9	A ready to mount AlphaServer 8200 Rackmount Drawer 240V with dual CPU. No memory. No I/O. No operating system. Requires 24.5 inches of vertical rackmounting space.

- If KFTHA-AA I/O module is selected the following PCI or XMI components must be ordered to provide the interface to CD-ROM drive in the BA35R-SF or BA36R-AF.
- If KFTIA-AA I/O module is selected these components are **not** required.

Required for PCI systems:

DWLPR-A9	Rackmount PCI unit
KZPAA-AA*	PCI single-ended SCSI controller
BN21H-02	SCSI cable

* KZPAA is restricted as CD-ROM controller only. Maximum one per system.

Required for XMI systems:

DWLMR-BA	Rackmount XMI unit
KZMSA-AB	XMI single-ended SCSI controller
CK-KZMSA-RB	KZMSA internal cabinet kit. One required for each KZMSA.
BN21H-02	SCSI cable

Note: Complete system configuration beginning with Step 2.

Step 2—Power Controllers

Two required for each system cabinet. Cabinets are equipped with two (2) H7600-AB power controllers. Each H7600 requires 1.75 inches of vertical mounting space.

H7600-AB	North America 220/240V 24 Amp Twist-Lock
H7600-BB	Elsewhere 220/240 16 Amp Pin-and-Sleeve

Step 3—CPU Symmetric MultiProcessing (SMP) Expansion

- See Step 3 AlphaServer 8200 configuration menu

Step 4—AlphaServer Expansion Packages

- Consult CSS

Step 5—Memory

- See Step 4 of AlphaServer 8200 configuration menu

Step 6—I/O Expansion Buses

The PCI, EMI and VME I/O buses are available on AlphaServer 8200 Rackmount systems. Application and system configuration constraints will determine maximum configuration. Configuration limits exist at the I/O bus level and controller level. Verify maximum number of allowed controllers as listed in Controller Configuration Table.

- Each DWLPR-A9/B9 (PCI or PCI with EISA Drawer) contains 12 PCI slots
- Each DWLMR-A9 (XMI Rackmount Drawer) contains 14 XMI slots
- Each 2T-DWLVR-A9 (VME Rackmount Chassis) contain 6 VME slots
- The PCI and XMI shelves connect directly to system via a HOSE cable to either the KFTIA-AA or KFTHA-AA. Maximum nine HOSE connections supported per system.
- VME Chassis is connected to system via a PCI with a PCI to VME bridge Kit. Maximum of one supported per PCI.
- Both EISA and VME cannot be supported in the same PCI chassis.

DWLPR-A9	**PCI Rackmount Chassis** contains 12 PCI slots. Each DWLPR-A9 requires 7 inches of vertical rackmounting space.
KFE70-CA[1]	**PCI to EISA Bridge**; Converts 12-slot PCI bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 diskette drive, mounting hardware, and cables to mount RX26. Maximum one EISA Bridge option supported per system.) Each KFE70-CA/DWLPR-A9 requires 8.75 inches of vertical rackmounting space.
DWLPR-B9[2]	**12 Slot PCI Drawer with KFE70-CA embedded**. Contains 2 EISA, 6 PCI/EISA, and 2 PCI slots. Maximum one DWLPR-B9 unit is supported per system.) Each DWLPR-B9 requires 8.75 inches of vertical rackmounting space.
2T-DWLVR-A9[2,3]	**6 VME Slot Rackmount Chassis;** connects to system via PCI with a PCI to VME Bridge Kit. (Maximum one VME supported per PCI). Each 2T-DWLVR-A9 requires 14 inches of vertical rackmounting space, a line card kit, and **both** signal cables listed below.
DWPVC-AA	PCI to VME line card kit for OpenVMS systems, **or**
DWPVC-BA	PCI to VME line card kit for Digital UNIX
	and
BC32D-08	Signal cable from PCI to VME I/O panel, **and**
BC32E-03	Signal cable from VME I/O panel to VME module

1 Maximum of one EISA bus per system.
2 The EISA option and the VME option **cannot be** supported together on the same PCI Chassis.
3. Selection of either PCI to VME line card kit for OpenVMS **or** Digital UNIX is required for 6 VME Slot Rackmount chassis (2T-DWLVR-A9). Either line card kit requires **both** signal cables (BC32D-08 **and** BC32E-03).

Step 7—System I/O Modules

- See Step 6 AlphaServer 8200 configuration menu.

Step 8—Storage Controllers

- See Step 7 AlphaServer 8200 configuration menu
- BA36R-AF/AR (Wide) StorageWorks shelves and BA35R-AF/AR (Narrow) StorageWorks shelves are recommended for use with Rackmount systems. Select appropriate SCSI cables to connect from controller to these shelves.

Step 9—Storage

- See Step 8 AlphaServer 8200 configuration menu
- BA36R-AF and BA36R-AR **wide** StorageWorks shelves, and BA35R-AF and BA35R-AR **narrow** StorageWorks shelves are supported on Rackmount systems.
- 8-bit narrow and 16-bit wide devices are supported on Rackmount systems
- Base system includes one StorageWorks shelf, a CD-ROM drive and one hard disk drive leaving 4 slots for 3.5" devices.

Note: BA655 or BA658 are **not** supported on Rackmount systems

Step 10—Networks and Communications

- See Step 9 Digital AlphaServer 8200 configuration menu
  - DWLPR-A9 required for PCI based options
  - DWLPR-B9 required for EISA based options
  - KFE70-CA (EISA/PCI bridge)

Step 11—Console Terminal

- Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- Shielded console cable is included for connection to console terminal.

VT510-xx VT510 terminal.

Step 12—Expansion (Storage Expansion Cabinet and I/O Expansion Cabinet)

If expansion is required, disks, tapes, I/O chassis or other, select same cabinet and power controllers as used in system cabinet and stack. 71.75" rack space available. Use only devices with 240V AC or 120V/240V AC front ends.

Step 13—Power Expansion Components

- Base system cabinet includes two H7600-AB power controllers and one power supply.
- Redundant (N+1) power supply option is **not** supported on the Rackmount AlphaServer 8200 system.
- Battery backup capability is not supported on the Rackmount AlphaServer 8200 system. The use of UPS system is recommended.

Step 14—Software

- See Step 13 AlphaServer 8200 configuration menu.

Step 15—Environmental Power Products

See AlphaServer 8200 UPS Solutions following Specifications in AlphaServer 8200 configuration menu..

Configuring system in H9A15 Cabinet

The H9A15 cabinet is 80" tall and has 79.75" of standard 19" vertical rack space.

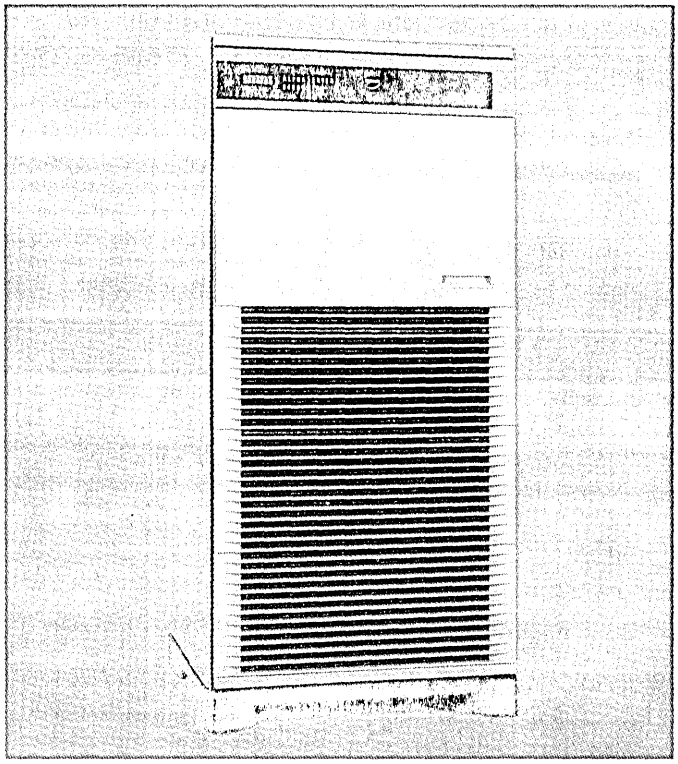
- AlphaServer 8200 Rackmount SBB is 24.75" and can be mounted no lower than 7" from the bottom of cabinet to provide bottom access to clock module replacement.
- BA36R-AF is usually above the SBB with system disk and CD-ROM.
- PCI drawer is recommended for bottom of cabinet with System Building Block above.
- Two H7600 power strips can be mounted on rear in back of system storage shelf. One power strip should be used solely for SBB with second supporting other cabinet options.
- All other empty spaces can filled with options as required, or blank dress bezels will be installed.
- The items usually configured in cabinet with SBB are all standard 19" RETMA compatible and occupy different heights and depths. See chart below.

Options	Rack Height	Depth[1]
System Building Block	24.75"	32.00"
PCI drawer (no EISA)	7.00"	25.00"
PCI drawer with EISA	8.75"	25.00"
XMI drawer	15.75"	34.50"
6 slot VME drawer	7.00"	23.50"
BA36R-AF/AR shelves	7.00"	10.00"

1. Does not include cable egress allowance.

Specifications

Physical Characteristics	**Operating**	**Shipping**
Height	202.0 cm (79.5 inches)	225.4 cm (88.8 inches)
Width	60.0 cm (23.6 inches	91.5 cm (36.0 inches)
Depth	103.6 cm (40.8 inches)	121.5 cm (47.9 inches)
Weight	318 kg (700 lb)	352 kg (775 lb)
Clearance	**Operating**	**Service**
Front	1.0 m 40 inches	1.5 m 59 inches
Rear	.75 m 29.5 inches	1.0 m 40 inches
Side	0	0
Environmental	**Operating**	**Non-operating**
Temperature	10° to 35°C (50 to 95°F)	-40° to 66°C (-40° to 151°F)
Humidity	10% to 90%	10% - 95%
Altitude	0 to 2.4M (0 to 8200 ft)	9,100m (30,000 ft)
Vibration	2-22Hz @ 0.01"da min.	22-500Hz @ 0.25 g max.
Heat Dissipation		
Minimum Configuration	3200 Btu/hr, 930W	
Max Single Cabinet Configuration	9100 Btu/hr, 2647W	
Power Requirements		
Nominal AC input voltage	200-240V AC	
Frequency range	47-63 Hz	
Phases	Single-Phase	
Max input current (Max Config)	13.3 A rms	
Plugs from Cabinet	NEMA L6-20P (QTY=2)	
Receptacle	NEMA L6-20R (QTY=2)	
Regulatory Approvals	UL,CSA,IEC,FCC,CE	



AlphaServer 8400

Product Description

The AlphaServer 8400—using the world's fastest microprocessors, the Alpha 21164 300 MHz, 350 MHz, or 440 MHz CPUs—is the world's fastest and highest capacity enterprise server. It is the solution for the most demanding business problems, at the best price.

The AlphaServer 8400 supports up to 12 processors with 4 GB memory, two processors with 14 GB of memory, and any combination between these maximums, with 1.2 GB/sec (peak) of I/O. The balanced system design and fast processors allow the AlphaServer 8400 to hold the industry record for the tpc-c open systems benchmark with the best price/performance. Based on the Linpack 1000 x 1000 benchmark, the AlphaServer 8400 delivers more than 3 GFLOPS in a single platform. This makes the AlphaServer 8400 the industry's best commercial and technical server at the best price/performance.

The AlphaServer 8400 supports the Digital UNIX and OpenVMS operating systems. For investment protection, the DEC and VAX 7000 products can be upgraded to the AlphaServer 8400 in a few hours, giving them unsurpassed performance today and the room to grow into the future. The AlphaServer 8400 platform has been designed to take full advantage of future generations of Alpha microprocessors, with scaleable performance.

The AlphaServer 8400 enterprise servers join the AlphaServer line, with low cost, high performance PCI I/O, providing up to 144 PCI slots on 12 different physical PCI buses. With over 1.2 GB/sec of I/O, customers can build the largest database servers with commodity components and have the reliability and availability of expensive mainframes.

The AlphaServer 8400 includes a one year hardware warranty, on-site, 4 hour response, five days per week. System installation is included with the new AlphaServer 8400 5/440 system.

Step 1—Base Servers

- AlphaServer 8400 5/300 and 5/350 Systems require
  - Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- AlphaServer 8400 5/440 Systems require
  - Digital UNIX V3.2G or Digital UNIX V4.0a, or OpenVMS V6.2-1H3, or later
- Software media and documentation required for first system on site. See Step 13 for ordering information.
- Console terminal required to install system. See Step 11 unless terminal is available on site.
- System includes 9 slot centerplane—three slots used by the CPU module, memory module, and system I/O module.
  - Six slots available for additional CPU, memory, or system I/O module(s).
- CD-ROM connected via single-ended SCSI-2 port on KFTIA-AA system I/O module.
- RZ28D-VW SCSI disk drive and DWZZB-VW are located in BA660-AB StorageWorks shelf and connected via Fast Wide Differential (FWD) port on KFTIA-AA system I/O module, using one CK-KFTIA-AA.
- For recommended power protection/UPS products, see section following Specifications.

AlphaServer 8400 Base Servers include

- Processor module with
  - One or two Alpha microprocessor 21164 5/300 or 5/350 MHz CPU(s), each CPU includes 4-MB Backup cache, or
  - Two Alpha microprocessor 21164 5/440 MHz CPUs, each CPU includes 4-MB Backup cache
- System I/O module (KFTIA-AA) includes
  - I/O channel
  - Two twisted-pair 802.3/Ethernets
  - Single-ended SCSI-2 port
  - Three Fast Wide Differential (FWD) SCSI-2 ports
- Three CK-KFTIA-AA cabinet kits
- 256 MB, 512 MB, or 2 GB of memory
- BA660-AB StorageWorks Plug-in-unit (PIU)
- RZ28D-VW 2 GB 3.5-inch SCSI disk
- 600 MB CD-ROM drive
- DWZZB-VW SCSI signal converter
- Three-Phase Power Subsystem with power cord
- 48 VDC power regulator
- Shielded console cable is included for connection to the console terminal
- Factory Installed Software
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90 day software product warranty
- Installation of the system cabinet is included with AlphaServer 8400 5/440 Base Servers only

Order Number	Power	Operating System	Memory
5/300 Single-CPU Systems			
DA-291AC-BA/BB/BC	Three Phase	Digital UNIX	256 MB
DA-291AD-BA/BB/BC	Three Phase	Digital UNIX	512 MB
DA-291AF-BA/BB/BC	Three Phase	Digital UNIX	2 GB
DY-291AC-BA/BB/BC	Three Phase	OpenVMS	256 MB
DY-291AD-BA/BB/BC	Three Phase	OpenVMS	512 MB
DY-291AF-BA/BB/BC	Three Phase	OpenVMS	2 GB
5/300 Dual-CPU Systems			
DA-291BC-BA/BB/BC	Three Phase	Digital UNIX	256 MB
DA-291BD-BA/BB/BC	Three Phase	Digital UNIX	512 MB
DA-291BF-DA/DB/DC	Three Phase	Digital UNIX	2 GB
DY-291BC-BA/BB/BC	Three Phase	OpenVMS	256 MB
DY-291BD-BA/BB/BC	Three Phase	OpenVMS	512 MB
DY-291BF-DA/DB/DC	Three Phase	OpenVMS	2 GB
5/350 Dual-CPU Systems			
DA-291DD-AA/AB/AC	Three Phase	Digital UNIX	512 MB
DA-291DF-AA/AB/AC	Three Phase	Digital UNIX	2 GB
DY-291DD-AA/AB/AC	Three Phase	OpenVMS	512 MB
DY-291DF-AA/AB/AC	Three Phase	OpenVMS	2 GB

Note: x**A** = 60 Hz, 208 V, x**B** = 50 Hz, 380/416 V, x**C** = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1—Base Servers *(continued)*

5/440 Dual-CPU Systems			
DA-292FC-AA/AB/AC	Three Phase	Digital UNIX	256 MB
DA-292FD-AA/AB/AC	Three Phase	Digital UNIX	512 MB
DA-292FF-AA/AB/AC	Three Phase	Digital UNIX	2 GB
DY-292FC-AA/AB/AC	Three Phase	OpenVMS	256 MB
DY-292FD-AA/AB/AC	Three Phase	OpenVMS	512 MB
DY-292FF-AA/AB/AC	Three Phase	OpenVMS	2 GB

Note: x**A** = 60 Hz, 208 V, x**B** = 50 Hz, 380/416 V, x**C** = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

AlphaServer 8400 Expanded Base Servers include:

- Processor module with two Alpha microprocessor 21164 5/300 MHz, 5/350 MHz, or 5/440 MHz CPUs; each CPU includes 4-MB Backup cache
- System I/O module (KFTHA-AA) with four I/O channels
- 512 MB or 2 GB of memory
- BA660-AB StorageWorks Plug-in-unit
- RZ28D-VW 2 GB 3.5-inch SCSI disk
- BN21K-02 2-meter SCSI cable(s)
  - Two with 5/300 and 5/350 systems
  - One with 5/440 systems
- DWZZB-VW SCSI signal converter(s)
  - Two with 5/300 and 5/350 systems
  - One with 5/440 systems
- 600 MB CD-ROM drive
- PCI 12 slot Plug-in-unit(s)
  - One DWLPB-AA and one DWLPB-BA with 5/300 and 5/350 systems
  - One DWLPB-AA with 5/440 systems
- PCI Fast Wide Differential SCSI controller(s)
  - Eight KZPSA-BBs with 5/300 and 5/350 Digital UNIX systems
  - Seven KZPSA-BBs with 5/300 and 5/350 OpenVMS systems
  - One KZPSA-BB with 5/440 systems
- PCI Fast Narrow Single-Ended SCSI controller KZPAA-AA for CD-ROM connection only
- Digital Etherworks 32-bit Network Interface Card
  - DE435-AA with 5/300 and 5/350 systems
  - DE500-XA with 5/440 systems
- BN21H-02 2-meter SCSI cable
- Two 48 VDC power regulators
  - Three-Phase power subsystem **includes** power cord
- Shielded console cable for connection to console terminal
- Factory Installed Software
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90 day software product warranty
- Installation of the system cabinet is included with AlphaServer 8400 5/440 Expanded Base Servers only

Order Number	Dual-CPU	Power	Operating System	Memory
DA-291BD-CA/CB/CC	**5/300**	Three Phase	Digital UNIX	512 MB
DA-291BF-HA/HB/HC	**5/300**	Three Phase	Digital UNIX	2 GB
DY-291BD-CA/CB/CC	**5/300**	Three Phase	OpenVMS	512 MB
DY-291BF-HA/HB/HC	**5/300**	Three Phase	OpenVMS	2 GB
DA-291DD-BA/BB/BC	**5/350**	Three Phase	Digital UNIX	512 MB
DA-291DF-BA/BB/BC	**5/350**	Three Phase	Digital UNIX	2 GB
DY-291DD-BA/BB/BC	**5/350**	Three Phase	OpenVMS	512 MB
DY-291DF-BA/BB/BC	**5/350**	Three Phase	OpenVMS	2 GB
DA-292FD-BA/BB/BC	**5/440**	Three Phase	Digital UNIX	512 MB
DA-292FF-BA/BB/BC	**5/440**	Three Phase	Digital UNIX	2 GB
DY-292FD-BA/BB/BC	**5/440**	Three Phase	OpenVMS	512 MB
DY-292FF-BA/BB/BC	**5/440**	Three Phase	OpenVMS	2 GB

Note: x**A** = 60 Hz, 208 V, x**B** = 50 Hz, 380/416 V, x**C** = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1a—AlphaServer 8400 5/300 System Building Blocks

System Building Blocks are an alternative to standard Base Servers, or Expanded Base Servers. They provide flexibility in configuring the AlphaServer 8400 5/300 with a choice of memory and I/O options.

System Building Block Requirements:

- **Minimum of one Memory module**
- **Minimum of one I/O module**
- **CD-ROM Drive**

- Systems require Digital UNIX V3.2B or later, and OpenVMS V6.2 or later.
- Console terminal required unless available on site.
- System consists of 9 slot backplane—three slots used by CPU, memory, and system I/O modules.
  - Six slots available for additional CPU, memory, or system I/O module(s).
- If KFTHA-AA I/O module is selected the following PCI or XMI options must be ordered to provide the interface to CD-ROM drive.

Required for PCI systems	
DWLPB-AA	PCI plug-in unit. See Step 5 for details.
KZPAA-AA	PCI single-ended SCSI controller for CD-ROM connection only; KZPAA is restricted as CD-ROM connection only, no other disk or tape connections are supported—maximum one per system.
BN21H-02	SCSI cable
Required for XMI systems	
DWLMA-AA	XMI plug-in unit. See Step 6 for details.
KZMSA-AB	XMI single-ended SCSI controller
BN21H-02	SCSI cable

- CD-ROM, 600 MB 5.25-inch in cabinet drive (**RRDCD-CA**) is required and **must** be ordered separately.
- If Factory Installed Software is required, BA660-AB, appropriate disk drive, and controller **must** be ordered separately.
- Redundant power supply (N+1) can be added if required.

AlphaServer 8400 5/300 System Building Blocks

- Processor module with one or two Alpha microprocessor 21164/300 MHz CPU(s); each includes 4 MB Backup cache
- Three-Phase Power Subsystem with power cord
- 48 VDC power regulator
- Digital UNIX base license **or**
- OpenVMS base license
- Digital NAS Base Server 200 software
- One year hardware product warranty
- 90 day software product warranty

Order Number	Power	Operating System	Memory	I/O Module
Single-CPU Systems				
DA-291AY-AA/AB/AC	Three Phase	Digital UNIX	Required	Required
DY-291AY-AA/AB/AC	Three Phase	OpenVMS	Required	Required
Dual-CPU Systems				
DA-291BY-AA/AB/AC	Three Phase	Digital UNIX	Required	Required
DY-291BY-AA/AB/AC	Three Phase	OpenVMS	Required	Required

Note: x**A** = 60 Hz, 208 V, x**B** = 50 Hz, 380/416 V, x**C** = 50/60 Hz, 202 V Japan
All Three Phase power variations include attached power cord.

Step 1b—AlphaServer Expansion Packages

AlphaServer Expansion Packages are designed to be added to Base AlphaServers, Expanded Base Servers, and System Building Blocks to create fully functional DECsafe high availability and CI cluster systems. They include all the necessary hardware (excluding console terminal) and software to provide complete and operational systems.

Note: These packages are only orderable with a system configuration. They are not orderable as stand alone, upgrade options or spared on the order.

Digital UNIX AlphaServer Expansion Package	
8YFKC-EA/EB	**DECsafe High Availability SCSI Package** includes: SW800-FA/FB StorageWorks cabinet HSZ40-CD StorageWorks array controller in BA350-MB Six RZ28D-VW 2.1 GB 3.5-inch disk drives in BA356-SB shelf DWZZB-VW SCSI Signal Converter TZ87-VA 20 GB, 5.25-inch SCSI tape drive in BA356-SB shelf PCI Plug-in unit (DWLPB-AA) with two KZPSA-BB Fast Wide Differential SCSI adapters Two BN21K 10-meter cables for connecting HSZ40 to KZPSAs in system cabinet BN21H 1-meter cable from HSZ40 to shelf DECsafe Available Server software license kit
OpenVMS AlphaServer Expansion Package	
8YCAA-AX	**Cluster Add-on Package** includes: DWLMA-AA XMI plug-in unit CIXCD-AC XMI CI controller One BNCIA 10-meter cable OpenVMS cluster License (QL-MUZAQ-AA)

Note: AA/EA = 60 Hz, 120/208 V; AB/EB = 50 Hz, 220-240/380-415V.

Step 2—Additional CPU Modules (SMP Upgrades)

- System maximum of six processor modules (total of 12 CPUs).
- Combining 5/300 MHz, 5/350 MHz, and 5/440 MHz CPU modules in the same system is **not** supported.
- For more than three processor modules in a system, a minimum of two separate memory modules are recommended for optimal system performance.
- All SMP upgrades include processor module with Alpha microprocessor(s) SMP license, and end-user product warranty.

5/300 Servers	5/350 Servers	5/440 Servers	CPU Module Type	Operating System
751P2-AX	**753P2-AX**	**N/A**	Single-CPU	Digital UNIX
752P2-AX	**754P2-AX**	**756P2-AX**	Dual-CPU	Digital UNIX
751P1-AX	**753P1-AX**	**N/A**	Single-CPU	OpenVMS
752P1-AX	**754P1-AX**	**756P1-AX**	Dual-CPU	OpenVMS

Step 3—Memory

Maximum 14 GB per system. **Note**: A short term memory size restriction is currently in effect for **5/300** MHz systems **only**. Memory modules must be ordered in a quantity of one, two, or four of the same size; add-on memory size must be the same as that included with Base Server or Expanded Base Server selected or the initial memory module selected for a System Building Block configuration. The maximum memory supported is temporarily four 2 GB memory modules, resulting in a system maximum of 8 GB.

- For Base Servers or Expanded Base Servers order up to six additional memory modules—system maximum seven.
- System Building Blocks require the selection of one memory module—system maximum seven.
- Maximum of seven memory modules is reduced by one for each additional CPU module added from Step 3 and each additional System I/O module added from Step 5.
- Each memory module has built in two-way interleaving; additional interleaving is accomplished by adding more memory modules.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3a—Memory Upgrades

- Memory upgrades are field installed only (not configured in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs); upgrades 128 MB (-BA) module to 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs); upgrades 512 MB (-DA) module to 1 GB (-EA) module

Step 3b—Prestoserve Non-Volatile Random Access Memory (NVRAM)

- Supported on Digital UNIX systems only.
- Maximum one Prestoserve I/O performance enhancement option per system.
- Includes Prestoserve license and documentation kit.

DJ-ML200-BA	4 MB Prestoserve; PCI option—requires DWLPB-AA/BA
DJ-ML200-CA	8 MB Prestoserve; PCI option—requires DWLPB-AA/BA
DJ-ML300-BA	4 MB Prestoserve; KFTIA-AA daughter card mounting, requires KFTIA-AA

Step 4—I/O Expansion Buses

PCI and XMI I/O expansion buses are available on AlphaServer 8400 systems. Application and system configuration determines maximum I/O configuration. Configuration limits exist at I/O bus level and controller level. With different I/O buses present in the system, verify maximum number of allowed controllers listed in the Controller Configuration Table.

- Each DWLPB-AA/AB (PCI plug-in unit) includes a 12-slot PCI bus and uses one rear expansion bay. SCSI disks in BA660-AB plug-in units can occupy the corresponding front expansion bay.
- Each DWLPB-AA/AB (PCI plug-in unit) has one open space for addition of DWLPB-BA/BB (second PCI expansion box) or BA661-AA (Wide SCSI StorageWorks shelf)
- Each DWLMA-AA/BA (XMI plug-in unit) includes one 12-slot XMI channel—uses two expansion bays, front and back.
- Each PCI and XMI plug-in unit requires one I/O channel connection to either KFTHA-AA or KFTIA-AA, see Step 6.
- Maximum of twelve I/O channels supported (three KFTHAs).

Step 4—I/O Expansion Buses *(continued)*

DWLPB-AA	**PCI plug-in unit with one PCI box** for AlphaServer 8400 **system cabinet** only, maximum two per system cabinet, two per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-AB	**PCI plug-in unit with one PCI box** for AlphaServer 8400 **expansion cabinet** only, maximum two per expansion cabinet, four per system. Maximum of six DWLPB-AA and DWLPB-AB (PCI plug-in units) per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-BA	**Second PCI expansion box for mounting in DWLPB-AA**—maximum one per DWLPB-AA. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLPB-BB	**Second PCI expansion box for mounting in DWLPB-AB**—maximum one per DWLPB-AB. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
BA661-AA	**Wide SCSI StorageWorks Shelf** (BA356-LB) can be added to DWLPB-AA/AB in place of second PCI expansion box (DWLPB-BA/BB). Maximum one BA661-AA per DWLPB-AA/AB, and maximum of six BA661-AA per system. Supports 16-bit (Wide) SCSI and some 8-bit (Narrow) SCSI devices.
KFE70-AA	**EISA Bridge option**—PCI to EISA bridge module set—must reside in first DWLPB-AA in system cabinet only. Converts PCI bus from 12-slot bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 floppy drive, mounting hardware, and cables to mount RX26 below CD-ROM in the system cabinet. Maximum of one EISA Bridge option per system. This option is required to support KZPSC SCSI RAID controllers. It includes the floppy disk drive required to run the RAID Configuration Utility (RCU).
DWLMA-AA	**XMI plug-in unit for system cabinet**—maximum two per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.
DWLMA-BA	**XMI plug-in unit for I/O expansion cabinet**—maximum two per cabinet, four per system. Total maximum six DWLMA-AA and DWLMA-BA (XMI plug-in units) per system. Requires one I/O channel connection on either KFTIA-AA or KFTHA-AA.

Step 5—System I/O Modules

- KFTIA-AA system I/O module included with Base Server; KFTHA-AA included with Expanded Base Server—any combination of KFTIA or KFTHA modules can be added for a maximum of three.
  - Maximum twelve I/O channels available on AlphaServer 8400.
- System Building Block requires the selection of one I/O module.

KFTHA-AA	**System I/O module with four I/O channels** for PCI or XMI plug-in units
KFTIA-AA	**System I/O module with one I/O channel** for PCI or XMI plug-in units. Includes - two 802.3 twisted-pair Ethernet ports—requires BN26M cable per port - single-ended SCSI-2 port—requires BN21H cable - three FWD (Fast Wide Differential) SCSI-2 ports—requires CK-KFTIA-AA and BN21K cable per port One of the following optional FDDI daughter cards can be added to KFTIA-AA—see Step 8 for cables. - Single attachment station multi-mode fiber card (DEFPZ-AA) **or** - Twisted-pair copper card (DEFPZ-UA) - Prestoserve (DJ-ML300-BA) can be added to KFTIA-AA.
BN26M-xx	Ethernet twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable.
BN21H-xx	SCSI-2 Single-ended cable; 50-pin male straight to 50-pin male straight. Connects KFTIA-AA single-ended SCSI-2 port to StorageWorks shelf.

Step 5—System I/O Modules *(continued)*

CK-KFTIA-AA	**Cabinet kit for FWD (Fast Wide Differential) SCSI-2 port.** One kit required for each used port on KFTIA-AA, maximum three per KFTIA-AA. Cabinet kit includes Y-cable and FWD terminator.
BN21K-xx	SCSI-2 Fast Wide Differential cables; 68-pin male straight to 68-pin male right-angle. Connects KFTIA-AA Fast Wide Differential SCSI-2 ports to DWZZA-VA or DWZZB-VW.
BN21K-02*	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB System cabinet (rear) Connects from KFTIA FWD port to DWZZB-VW in BA661-AA in DWLPB-xx PIU
BN21K-03*	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB System cabinet (front)
BN21K-05/10	Connects from KFTIA FWD port to DWZZB-VW in BA660-AB Expansion cabinet (front or rear) Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in SW500 and SW800 Cabinets

* Manufacturing may substitute correct cable length depending on configuration.

Step 6—Storage Controllers

- KFTIA-AA included with each Base Server; KFTHA-AA included with Expanded Base Server—PCI, EISA, and XMI storage controllers can be added.
  - Requires corresponding PCI plug-in unit (DWLPB-AA/AB/BA/BB) or XMI plug-in unit (DWLMA-AA/BA).
- DWZZA-AA requires minimum revision E02 for connecting any Fast Wide Differential SCSI-2 port from KFTIA-AA or KZPSA-BB to TZ8xx tape loaders.
- DWZZB-VW Fast Wide Differential Single-ended SCSI Converter requires minimum revision A01 for connecting FWD SCSI-2 signals from KFTIA-AA or KZPSA-BB to BA356-JB StorageWorks Shelf.
- System maximum of two KZPSC-AA/BA SCSI RAID controllers.
- Tape and optical devices are not supported on KZPSC SCSI RAID controllers.

PCI-based Storage Controllers	
KZPSA-BB	**PCI Fast Wide Differential SCSI Adapter**—OpenVMS V6.2-1H3 supports eight per PCI, maximum 26 per system. Digital UNIX supports eight per PCI, maximum 32 per system (uses one PCI slot). Provides one SCSI-2 bus. KZPSA supports DECsafe Available Server.
BN21K-xx	**SCSI-2 Fast Wide Differential cables**—68-pin male straight to 68-pin male right-angle. Connects KZPSA-BB Fast Wide Differential SCSI-2 port to DWZZA-VA or DWZZB-VW.
BN21K-01*	Connects from KZPSA to DWZZB-VW in BA660-AB System cabinet (rear) Connects from KZPSA to DWZZB-VW in BA661-AA in DWLPB-xx PIU
BN21K-02*	Connects from KZPSA to DWZZB-VW in BA660-AB System cabinet (front)
BN21K-05/10	Connects from KZPSA to DWZZB-VW in BA660-AB Expansion cabinet (front or rear)
KZPSC-AA	**PCI SCSI RAID Controller with 1 port**—OpenVMS and Digital UNIX support two per PCI, maximum two per system (uses one PCI slot and KFE70-AA EISA Bridge option). Provides one Fast/wide/single-ended connection. Allows RAID levels 0,1, and 5. Tape drives not supported.
BN31S-1E	1.5 meter single-ended wide SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet (rear only) and BA661-AA.

Step 6—Storage Controllers *(continued)*

PCI-based Storage Controllers	
KZPSC-BA	**PCI SCSI RAID Controller with 3 ports**—OpenVMS and Digital UNIX support two per PCI, maximum two per system (uses two PCI slots and KFE70-AA EISA Bridge option). Provides three Fast Wide/single-ended connections. Allows RAID levels 0,1, and 5. Tape drives not supported.
BN31K-0E	Required for KZPSC-BA to use third port on module connects internally from KZPSC-BA module to second PCI slot/bulkhead.
BN31S-1E	1.5 meter single-ended wide SCSI cable for connections from PCI RAID controller to BA660-AB system cabinet (in front and rear locations) and BA661-AA. One required for each used port on KZPSC-BA module.
MS100-AA†	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.
MS100-AB†	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.
KZPSC-UB	Battery back-up for Cache memory option.
KFPSA-AA	**PCI DSSI Adapter (OpenVMS only)**—Requires OpenVMS V6.2-1H2 or later; minimum System Console Firmware Revision 3.09. Maximum twelve per PCI, 24 per system with OpenVMS V6.2-1H3. (End node only) Note: KFPSA and KFMSB not supported on the same bus.
BC21Q-xx	External shielded cable (MR/MR connectors) Select required length—09, 16, 25, 50 ft
BC22Q-xx	External shielded cable (MR/PS connectors) Select required length—16, 25, 50 ft
CIPCA-AA	**PCI-to-CI Adapter (OpenVMS only)**—Requires OpenVMS V6.2-1H2 or later, minimum System Console Firmware Revision 3.09. Maximum two per PCI, two per system; uses one PCI slot for adapter and one EISA slot for power only. Note: KFE70 option is **not** required.
BNCIA-xx	Computer interconnect cable sets—Connects CIPCA to Star Coupler. Select required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft)
XMI-based Storage Controllers	
KZMSA-AB	**Fast single-ended SCSI-2 Disk/Tape Adapter**—OpenVMS supports six per XMI, maximum 12 per system. Digital UNIX supports 10 per XMI, maximum 16 per system (uses one XMI slot). Provides two single-ended SCSI-2 buses. KZMSA supports DECsafe Available Server.
CK-KZMSA-LA	Two 30-inch internal cabinet cables—One kit per KZMSA required.
KFMSB-AA	**DSSI Adapter (OpenVMS only)**—Supports six per XMI, maximum 12 per system (uses one XMI slot) Provides two DSSI buses; each bus provides seven ports for DSSI Integrated Storage Element (ISE) devices; no more than two tapes per bus. Maximum three DSSI cluster nodes supported.
CK-KFMSB-LC	Two 8-foot internal cabinet cables and two DSSI terminators. One kit per KFMSB required.
KFMSB-UA	**DSSI Controller Upgrade**—Upgrades KFMSA-xx to KFMSB-AA. Includes KFMSB-AA, CK-KFMSB-LC, and requires return of KFMSA-xx.
CIXCD-AC	**XMI CI Controller**—OpenVMS supports four per XMI, maximum 10 per system. Digital UNIX supports one per XMI, maximum one per system (uses one XMI slot). The CIXCD requires one BNCIA cable set to connect system to Star Coupler. OpenVMS Cluster software license required for each system when multiple OpenVMS systems are used in cluster environment. **Note:** One CIXCD is supported on Digital UNIX systems for expanded disk interconnect capability only.
BNCIA-xx	Computer interconnect cable sets—Connects Star Coupler to system and SW800. Select required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).

† Requires AlphaServer 8400 minimum System Console Firmware Revision V3.2.2, OpenVMS V6.2-1H2 and Digital UNIX V3.2D or later operating system software.

Step 7—Storage

Note: When multiple storage devices are configured with the system, specify which devices should be installed inside the system cabinet, inside the system expansion cabinet, or installed in the external StorageWorks cabinet. Line item sequencing allows Manufacturing to configure storage options in the appropriate cabinet.

- List storage options to be integrated in system cabinet immediately following the system part number.
- List storage options to be integrated in StorageWorks cabinet immediately following StorageWorks cabinet part number.
- Order the appropriate BN21*-** SCSI cables for connecting controllers and SCSI storage options.

- Wide SCSI devices are supported in BA660-AB/BA661-AA StorageWorks PIUs, or external StorageWorks cabinets. BA660-AB/BA661-AA support both wide and narrow SCSI 5400 RPM and 7200 RPM disk drives.
- System cabinet provides space for four disk plug-in units (PIU) if no PCI or XMI plug-in units are installed. Each of the two pairs of expansion bays (front to back) in bottom of system cabinet can hold one Battery PIU, one XMI PIU, one PCI PIU, one PCI PIU plus one SCSI disk PIU, one SCSI disk PIU, or two SCSI disk PIUs.
- System cabinet provides space for up to seven StorageWorks shelves—three BA660-AB plug-in-units (each includes two StorageWorks shelves) and one BA661-AA StorageWorks shelf. Each shelf holds a maximum of two 5.25-inch devices and one 3.5-inch device or seven 3.5-inch devices. Typical configurations will require a signal converter, i.e., DWZZB-VW which counts as one 3.5-inch device.

Wide SCSI Options	
BA660-AB	**Wide SCSI-2 StorageWorks plug-in-unit**—includes two BA356-LB modular expansion shelves, 16-bit I/O personality module, 48V/150W DC power supply, DC fans, and AlphaServer 8400 mounting hardware. Supports 16-bit wide SCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum hardware revision levels.
BA661-AA	**Wide SCSI-2 StorageWorks Shelf**—includes 16-bit I/O personality module, 48V/150W DC power supply, DC fans, mounting hardware and BA356-LB.Can be added to DWLPB-AA/AB in place of second PCI expansion box (DWLPB-BA/BB). Maximum one BA661-AA per DWLPB-AA/AB; maximum six BA661-AA per system. Supports 16-bit (wide) SCSI and some 8-bit (narrow) SCSI devices.
DWZZB-VW	**Wide SCSI-2 StorageWorks Signal Converter**—required to convert FWD signals from KFTIA-AA and KZPSA-BB for use in BA660-AB and BA661-AA/BA.
BA35X-MG	**8-bit I/O Personality Module**—can be used in place of 16-bit I/O personality module for direct connection to narrow single-ended controllers, field installable only.
16-bit Disk Drives	
RZ26N-VW	1.05 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28M-VW	2.1 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28D-VW	2.1 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ29B-VW	4.3 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
8-bit Disk Drives	
RZ26N-VA	1.05 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28M-VA	2.1 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ28D-VA	2.1 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier
RZ29B-VA	4.3 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier

Note: To ensure 16-bit wide SCSI operation, use wide SCSI drives with wide SCSI controllers in wide SCSI StorageWorks shelves with wide SCSI cables. See *Storage Devices*—StorageWorks Supported Devices for 8-bit and 16-bit Expansion Table for minimum hardware revision levels.

Step 7—Storage *(continued)*

Tape Devices	
TLZ09-VA	8.0 GB DAT 3.5" SCSI tape drive in StorageWorks carrier. OpenVMS V6.2-1H3 and Digital UNIX V3.2C required along with System Console Firmware Revision 3.0-9.
TKZ15-VA	5/10 GB Helical Scan 8-mm, 5.25-inch SCSI tape drive in StorageWorks carrier
TZ87-VA	20.0 GB DLT 5.25-inch SCSI tape drive in StorageWorks carrier; must be mounted in BA660-AB located in rear of cabinet or BA661-AA located in DWLPB-xx.
TZ88N-VA	20/40 GB DLT 5.25-inch SCSI tape drive in StorageWorks carrier
Optical Disk	
RWZ52-VA	1.3 GB Optical Drive in StorageWorks carrier
Solid State Disks (Supported with KZMSA, KZPSC, KZPSA, KFTIA)—cannot be combined with RZxx disks/tapes on same SCSI bus.	
EZ31-VW	134 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ32-VW	268 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ64-VA	475 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later
EZ69-VA	950 MB Solid State Disk; requires OpenVMS V6.2 or later and Digital UNIX V3.2C or later

Step 7a—StorageWorks Expansion Packages

StorageWorks Expansion Packages have been created to simplify ordering StorageWorks options. They are intended to be used with Expanded Base Servers.

- Order the correct number of HSZ40-TL packages to fill the BA350-MB RAID controller shelves in the SW82x StorageWorks Cabinet package.
- Order disk drives separately.
- SW820/SW821 StorageWorks Expansion Packages—all BA356 shelves operate in split-bus mode.
- All SW82x StorageWorks Expansion Packages include redundant power supplies (BA35X-HF)—this reduces the number of available slots in each BA356 shelf to six in the SW822 and three on each split-bus of the SW820/SW821.

StorageWorks Expansion Packages	
SW820-LA/LB	SW800 StorageWorks Cabinet with five BA350-MB RAID controller shelves, 15 BA356-JC device shelves, 15 BA35X-MG 8-bit I/O personality modules for BA356, 30 BN21H-02 SCSI-2 single-ended cables, 20 BA35X-HF redundant power supplies, 15 BA35X-ME terminator boards—**split-bus mode**
SW821-LA/LB	SW800 StorageWorks Cabinet with seven BA350-MB RAID controller shelves, 14 BA356-JC device shelves, 14 BA35X-MG 8-bit I/O personality modules for BA356, 28 BN21H-02 SCSI-2 single-ended cables, 21 BA35X-HF redundant power supplies, 14 BA35X-ME terminators boards—**split-bus mode**
SW822-LA/LB	SW800 StorageWorks Cabinet with three BA350-MB RAID controller shelves, 18 BA356-JC device shelves, 18 BA35X-MG 8-bit I/O personality modules for BA356, 18 BN21H-02 SCSI-2 single-ended cables, 21 BA35X-HF redundant power supplies
HSZ40-TL	Two HSZ40B SCSI RAID array controllers each with 32 MB cache, HSZ Traditional License (QL-2YJA9-AA), RAID HSZ40 Firmware License (QL-3J0A9-AA), Mirror Firmware HSZ40 Traditional License (QL-4DTA9-AA), BN21K-20 20-meter cable, BN21L-0B .15-meter cable

Step 7b—External Storage (I/O Expansion Cabinet)

I/O expansion cabinet (H9F00-BA/BB/BC/BD) provides space for up to six SCSI disk plug-in units (PIU) if no other PCI/XMI plug-in unit (PIU) is configured in the expansion cabinet. Each of the two pairs of expansion bays in the bottom of the cabinet can hold one Battery PIU, one PCI PIU, one XMI PIU, or two SCSI disk PIUs. Two expansion bays in the top of the expansion cabinet can hold up to two SCSI disk PIUs. Disk and tape drives supported are the same as Step 7 Internal Storage.

Step 7c—External Storage

Following list describes available disk storage devices and capacities. These supported options can be added as required.

Storage Cabinets	Capacity	
SW5XX, SW8XX	6–227 GB	
SCSI Disk Drives	**Capacity**	
RZ26N-VA	1.05 GB	Narrow
RZ28M-VA, RZ28D-VA	2.1 GB	Narrow
RZ29B-VA	4.3 GB	Narrow
RZ26N-VW	1.05 GB	Wide
RZ28M-VW, RZ28D-VW	2.1 GB	Wide
RZ29B-VW	4.3 GB	Wide
Tape Drives		
TZ87, TZ857*, TZ877, TZ88, TZ885, TZ887, TSZ07, TKZ15-VA, TKZ09, TKZ60, TKZ61, TKZ62, TL810, TL812,TL820, TL822, TL826	See *Storage Devices* for ordering information.	
Optical Libraries		
RW525-ZA	19 GB Optical Library, 1 drive	
RW531-ZC	38 GB Optical Library, 2 drives	
RW532-ZF	76 GB Optical Library, 4 drives	
RW536-ZF	170 GB Optical Library, 4 drives	
RWZ52-FA	1.3 GB Tabletop Optical Library	

* Loader support for Digital UNIX is available via DECnsr.

Step 8—Networks and Communications

Two twisted-pair 802.3/Ethernet controllers on KFTIA-AA system I/O module included with Base Server; DE435 or DE500 network interface card included with Expanded Base Server. See Step 5 for twisted-pair Ethernet cable part number. Optional DEFPZ-AA/UA (FDDI) daughter card can be installed on KFTIA-AA system I/O module. Select additional devices if required. **Note**: Connection of system to Ethernet requires twisted-pair cable. *See Network Products Guide* for details.

LAN Communications Controllers—KFTIA-AA Daughter Cards	
• Maximum one FDDIcontroller fiber daughter card per KFTIA-AA I/O module	
DEFPZ-AA	**FDDIcontroller Fiber - Single Attachment Station—daughter card** for mounting on KFTIA-AA. Requires BN24x cable.
BN24E-xx	Fiber-Optic Cable, Dual 2.5mm Bayonet "ST" type connectors
BN24D-xx	Fiber-Optic Cable, Dual 2.5mm Bayonet "ST" type connector to FDDI "MIC" connector
DEFPZ-UA	**FDDIcontroller Fiber - Twisted-pair Copper—daughter card** for mounting on KFTIA-AA. Requires BN26x cable.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable

LAN Communications Controllers—PCI based	
• Requires DWLPB-AA/AB/BA/BB	
• System maximum of six DEFPA-AA/DA/UA/MA FDDIcontrollers.	
DE435-AA	**Digital Etherworks 32-bit High Performance Network Interface Card**—supports twisted-pair, thick wire and ThinWire (uses one PCI slot). OpenVMS and Digital UNIX support eight per PCI, maximum eight per system. Requires appropriate cable.
DE450-CA	**PCI-to-Ethernet 3-port Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.
DE450-TA	**PCI-to-Ethernet 1-port Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.

Step 8—Networks and Communications *(continued)*

LAN Communications Controllers—PCI based *(continued)*

DE500-XA	**Fast Ethernet (100 Mbit) PCI Adapter**—(uses one PCI slot). OpenVMS (V6.2) and Digital UNIX (V3.2C) support eight per PCI, maximum eight per system.
DEFPA-AA	**FDDIcontroller Fiber - Single attachment station MultiMode Fiber**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN34x "SC" type connecting cable.
DEFPA -DA	**FDDIcontroller Fiber - Dual attachment station MultiMode Fiber**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. Requires BN34x "SC" type connecting cable.
BN34A-xx	MultiMode Fiber-Optic Duplex cable—"SC" connector to "ST" connector
BN34B-xx	MultiMode Fiber-Optic Duplex cable—"SC" connector to "SC" connector
BN34D-xx	MultiMode Fiber-Optic Duplex cable—"SC" connector to "MIC" connector
DEFPA-MA	**FDDIcontroller Copper - Dual attachment station DAS**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. . Requires BN26x or BN25H connecting cables.
DEFPA-UA	**FDDIcontroller Fiber - Single attachment station UTP**—(uses one PCI slot). OpenVMS and Digital UNIX support six per DWLPB, maximum six per system with Digital UNIX V3.2G and OpenVMS V6.2, V6.2-1H2, V6.2-1H3 operating system releases. . Requires BN26x or BN25H connecting cables.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable
BN25H-03	3-meter Unshielded twisted pair RJ45 connectors
DGLPB-AB	**ATMworks 350 ATM PCI bus adapter** (uses one PCI slot). Digital UNIX V4.0a supports four per PCI, maximum four per system.

LAN Communications Controllers—EISA based

- Requires DWLPB-AA and KFE70-AA, EISA bridge module set.
- See EISA Bus IRQ Address Table.

DNSES-AA	**Synchronous Communications Controller**—(uses one EISA slot). Digital UNIX and OpenVMS. support one per EISA, maximum one per system. Requires BC19x cable
BC19B-02	EIA-422-A/V.11 adapter cable, can be extended with BC55D-33
BC19D-02	EIA-232-D/V.24 adapter cable, can be extended with BC22F-xx
BC19E-02	EIA-423-A/V.10 adapter cable, can be extended with BC55D-33
BC19F-02	V.35 adapter cable, can be extended with BC19L-25
DW300-AA	**Token Ring Adapter**—(uses one EISA slot). Digital UNIX supports one per EISA, maximum one per system. Requires BN26M cable.
BN26M-xx	802.5/Token Ring twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable.
CXI01-AA	**Digiboard Asynchronous Xem/ISA Multiport Serial Card with 16 RJ45 PORTS/Xem Port**—(uses one EISA slot). Digital UNIX only, supports one per EISA, maximum one CXI01-AA/AD per system.
CXI01-AB	**Digiboard PORTS/Xem, 16 RJ45 Port Concentrator**—mounts separately from PCI bus. Maximum of three CXI01-AB can be attached to CXI01-AA, provides up to 48 additional ports. Digital UNIX only.
CXI01-AD	**Digiboard Asynchronous EPC/X Multiport Serial Card with 16 RJ45 Port EPC/CON-16 Concentrator**—(uses one EISA slot). Digital UNIX one per EISA, maximum one CXI01-AA/AD per system. Digital UNIX only.
CXI01-AE	**Digiboard EPC/CON-16 Concentrator**—mounts separate from PCI bus. Maximum three CXI01-AE can be attached to the CXI01-AD provides up to 48 additional ports. Digital UNIX only.
CXI01-AC	Digiboard RJ45 to DB25 Male Converter
CXI01-AF	Digiboard RJ45 to DECMJ11 Adapter—8 per package

Step 8—Networks and Communications *(continued)*

LAN Communications Controllers—XMI based	
DEMNA-M	**802.3/Ethernet controller**—XMI-to-Ethernet adapter, (uses one XMI slot). OpenVMS supports four per XMI, maximum six per system. Digital UNIX supports six per XMI, maximum eight per system.
CK-DEMNA-KN	DEMNA cabinet kit—required with DEMNA-M
DEMFA-AA	**DEC FDDIcontroller 400**—XMI-to-FDDI adapter, Single attachment station with fiber MIC connector; (uses one XMI slot). OpenVMS supports four per XMI, maximum four per system. Digital UNIX supports seven per XMI, maximum eight per system.

Local and Wide Area Communications Servers

Each communications server requires 802.3/Ethernet connection. Depending on the server selected, either ThinWire BNC-type connection (e.g., BC16M cable) or thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Additional items also required—see *Network Products Guide* for ordering information.

Network Connectivity Products

See *Network Products Guide* for details.

Step 8a—MEMORY CHANNEL Controller

Digital UNIX Systems

- Require Digital UNIX V3.2E (Digital UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX.
- The following options are not currently supported with MEMORY CHANNEL: DJ-ML200, DNSES-AA, CIPCA CIXCD, DE500-XA

OpenVMS Systems

- Require OpenVMS V7.1 and OpenVMS Cluster License
- The following options are not currently supported with MEMORY CHANNEL: DNSES-AA, DE500-XA

MEMORY CHANNEL requirements for currently installed AlphaServer 8400 systems:

  - Console firmware at revision V2.3 or higher.
  - CCMAA-BA Adapter must be installed in slots 0-7 of a DWLPA-CA PCI; no restriction for DWLPB-CA PCI bus.
- For two-system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards.

CCMAA-BA	PCI to MEMORY CHANNEL controller—Maximum two supported.
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAQ-AA	TruCluster Software for Digital UNIX
QB-4ZCAQ-AA	Digital UNIX Driver for MEMORY CHANNEL license
QL-MUZAQ-AA	OpenVMS Cluster license for Alpha systems

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation. For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 9—Console Terminal

- Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- Shielded console cable is included for connection to the console terminal.

VT510-xx VT510 terminal

LA30N-xx LA30 printer

LK411-xx Keyboard

Step 10—Expansion (System Cabinet and I/O Expansion Cabinet)

Step 10a—System Cabinet Expansion

- System Cabinet includes one three-phase power regulator
  - provides space for two additional three-phase power regulators.
- Maximum four I/O channels per cabinet allowed. PCI and XMI plug-in units each require one I/O channel connection.
- Four lower expansion bays are available for plug-in units. The lower bays accommodate plug-in units as follows.

AlphaServer 8400 System Cabinet

Expansion Bay Location	Plug-In Unit (PIU)		Quantity	Expansion Bays Occupied
Lower	Disk plug-in unit	(BA660-AB)	Four maximum	Front or Rear
Lower	XMI plug-in unit	(DWLMA-AA)	Two maximum	Front and Rear
Lower	Battery plug-in unit	(H7237-AA/AC/CA/CB)	One maximum	Front and Rear
Lower	PCI plug-in unit	(DWLPB-AA)	Two maximum	Rear only

Step 10b—I/O Expansion Cabinet

- I/O Expansion Cabinet includes one three-phase power regulator
  - Provides space for two additional three-phase power regulators

H9F00-BA/BB/BC I/O expansion cabinet—Three phase power, maximum two per system.
Note: -BA = 60 Hz, 208V, -BB = 50 Hz, 380/416V, -BC = 50/60 Hz, 202V.

- Expansion cabinet can be configured to hold all disk plug-in units or combination of disk plug-in units and PCI or XMI plug-in units.
  - Six expansion bays—two upper and four lower—are available for plug-in units. The two upper bays accommodate maximum of two disk plug-in units. The four lower bays accommodate plug-in units as follows:

Expansion Bay Location	Plug-In Unit (PIU)		Quantity	Expansion Bays Occupied
Upper	Disk plug-in unit	(BA660-AB)	Two maximum	Front or Rear
Lower	Disk plug-in unit	(BA660-AB)	Four maximum	Front or Rear
Lower	PCI plug-in unit	(DWLPB-AB)	Two maximum	Rear only
Lower	XMI plug-in unit	(DWLMA-BA)	Two maximum	Front and Rear
Lower	Battery plug-in unit	(H7237-AA/AC/CA/CB)	One maximum	Front and Rear

Step 11—Power Expansion Components

- System Cabinet and Expansion Cabinets must be same type; either three-phase or single-phase. Mixing of three-phase and single-phase cabinets in same system configuration is not allowed.
- Three-phase power provides optional N+1 redundant power regulator and optional battery backup/UPS capability.
- Determine the need for adding second power regulator by filling in the EPU- Power Configuration Table. **Note:** The Power Configuration Table provides a manual method for determining the need of second power regulator. Equivalent power unit (EPU) is an equivalent value of power used (48 VDC) by each option.

Step 11a—Three-Phase Expansion Components

H9B00-AF	Battery option for I/O Expansion Cabinet—fully loaded battery cabinet supports three power regulators, provides for 60 minutes uninterruptible power (UPS). Maximum one per H9F00-BA/BB/BC expansion cabinet.
H7237-AA	Battery plug-in unit with batteries for battery backup/UPS capability—maximum one per cabinet. Use in system cabinet and/or H9F00-BA/BB/BC expansion cabinet. Includes four batteries to support 48 V power regulator and cabling for additional H7238-AA battery options.
H7238-AA	4-pack battery option—one required per optional 48 V power regulator to support battery backup/UPS capability. For use only with the H7237-AA.
H7237-CA/CB	Battery plug-in unit, includes one H7263-AA/AB (BBU capable power regulator) and batteries for battery backup/UPS capability. Must be ordered at time of system purchase if BBU functionality is required.
H7238-BA/BB	Additional battery UPS. Includes H7263-AA/AB (BBU capable power regulator and H7238-AA 4-pack battery option). Required with H7237-CA/CB for second and third regulator support.
H7263-AA/AB	Three-Phase 48 VDC power regulator with BBU capability—maximum three per cabinet. Second regulator may be required to supply adequate power depending on configuration. Third regulator assures N+1 power redundancy and higher availability in the event of power regulator failure. See Power Configuration Table.
H7263-AC/AD	Same as above regulator without BBU capability. One include with system.

Step 11b—Single-Phase to Three-Phase Power Upgrade

- Includes new AC distribution box with attached line cord, DC subrack, one three-phase 48VDC power regulator.
- If single phase power system has two power regulators, an additional three-phase 48VDC power regulator is required.

H7268-AA/AB/AC	Single-Phase to Three-Phase Upgrade Kit, Converts system to three-phase power subsystem. -AA= 60 Hz, 208V, -AB = 50 Hz, 380/416V, -AC = 50/60 Hz, 202V

Step 11c—Power Option for StorageWorks Shelves in StorageWorks Plug-in-Units

- Provides N+1 power for BA660-AB, BA661-AA StorageWorks PIUs/shelves.
- Occupies one slot in StorageWorks shelf.

BA35X-HG	48V DC 150W Redundant Power Supply for BA660-AB, BA661-AA—includes 48VDC jumper cable for connecting to first power supply in StorageWorks shelf.

Step 12—Software

Select user licenses and additional software as required. Media and documentation recommended for first system on site.

Software Processor Code = Q

Digital UNIX Concurrent Use Licenses

Digital UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

QL-MT7AM-3B	Digital UNIX Concurrent Use 1-user license
QL-MT7AM-3C	Digital UNIX Concurrent Use 2-user license
QL-MT7AM-3D	Digital UNIX Concurrent Use 4-user license
QL-MT7AM-3E	Digital UNIX Concurrent Use 8-user license
QL-MT7AM-3F	Digital UNIX Concurrent Use 16-user license
QL-MT7AM-3G	Digital UNIX Concurrent Use 32-user license
QL-MT7AM-3H	Digital UNIX Concurrent Use 64-user license
QL-MT7AQ-AA	Digital UNIX Traditional unlimited user license
QL-MT5AQ-AA	Digital UNIX developer's extension license
QL-MT6AQ-AA	Digital UNIX server extension license

Step 12—Software *(continued)*

QL-MTJAQ-AA	DECnet/OSI end-system license
QL-MTKAQ-AA	DECnet/OSI extended function license
QB-05SAQ-AA	DECsafe Available Server license and documentation (Digital UNIX only). Media available on layered product CD-ROM. KZMSA or KZPSA adapter required.

Digital UNIX Media and Documentation

QA-MT4AA-H8	Digital UNIX media and on-line documentation (base system, complementary products) on CD-ROM
QA-MT4AA-GZ	Digital UNIX full hardcopy documentation
QA-MT4AB-GZ	Digital UNIX end user hardcopy documentation subkit
QA-MT5AA-GZ	Digital UNIX developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	Digital UNIX server extension hardcopy documentation subkit

OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AQ-AA	OpenVMS Traditional unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license
QL-MUZAQ-AA	OpenVMS cluster software license. Required with each system that connects to an OpenVMS cluster.

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-09SAA-GZ	OpenVMS base hardcopy documentation
QA-001AA-GZ	OpenVMS full hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for Digital UNIX
QA-03XAA-H8	Layered products media and documentation for OpenVMS

Digital NAS Base Server 200 Software

Digital NAS 200 Base Server software included with base AlphaServer 8400 systems. Media available on layered product CD-ROM.

Step 13—Hardware and Software Supplemental Support Services

Hardware—Americas and Asia Pacific only

- Systems include one-year hardware warranty, on-site, same day, 4-hour response time.
- Select optional Hardware Supplemental Support Services if required.

AlphaServer 8400

Two CPUs less than 2 GB memory	Two CPUs 2 GB memory	
FM-4Y4HR-36	**FM-4Z4HR-36**	Years 1-3, 5 x 9, 4-hour response time
FM-4Y512-36	**FM-4Z512-36**	Years 1-3, 5 x 12, 4-hour response time
FM-4Y616-36	**FM-4Z616-36**	Years 1-3, 6 x 16, 4-hour response time
FM-4Y724-36	**FM-4Z724-36**	Years 1-3, 7 x 24, 4-hour response time
FM-4Y4HR-60	**FM-4Z4HR-60**	Years 1-5, 5 x 9, 4-hour response time
FM-4Y512-60	**FM-4Z512-60**	Years 1-5, 5 x 12, 4-hour response time
FM-4Y616-60	**FM-4Z616-60**	Years 1-5, 6 x 16, 4-hour response time
FM-4Y724-60	**FM-4Z724-60**	Years 1-5, 7 x 24, 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for Digital UNIX and OpenVMS include advisory and remedial software support with new version license rights for operating system and Digital NAS Base Server 200 for the time period indicated.

AlphaServer 8400 Two CPU Systems	
FM-84DOS-12	12-month Software Supplemental Support for Digital UNIX two CPU systems
FM-84DOS-36	36-month Software Supplemental Support for Digital UNIX two CPU systems
FM-84DOS-60	60-month Software Supplemental Support for Digital UNIX two CPU systems
FM-84DVM-12	12-month Software Supplemental Support for OpenVMS two CPU systems
FM-84DVM-36	36-month Software Supplemental Support for OpenVMS two CPU systems
FM-84DVM-60	60-month Software Supplemental Support for OpenVMS two CPU systems

Step 13a—Hardware and Software Supplemental Support Services (Europe only)

Europe does **not** have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelerator tool; contact MCS Sales in your country for information on Hardware and Software Supplemental Support Services.

Step 14—Environmental Power Products

See UPS Solutions for AlphaServer 8400 systems following Specifications.

AlphaServer 8400 EPU (Equivalent Power Units)—Power Configuration Table

- Second power regulator may be needed to supply additional 48V power to the system.
- Mixing of three-phase and single-phase power regulators in system configuration is not allowed.
- Use chart to determine need for second power regulator.
- If EPU is greater than 80, order second power regulator (three-phase regulator—H7263-AC/AD) or H7263-AA/AB if BBU is required).
- EPU must not exceed 180.

Options	EPU Values System Cabinet Options	Quantity	Total EPU (Qty times EPU)	EPU Values Expansion Cabinet Options	Quantity	Total EPU (Qty times EPU)
Base system includes power regulator, CPU module, system I/O module, memory module	30	1	30			
I/O expansion cabinet (H9F00-BA/BB/BC) includes one power regulator					1	0
Additional 5/300 CPU modules—751P1-AX, 751P2-AX	11					
Additional 5/300 CPU modules—752P1-AX, 752P2-AX	13					
Additional 5/350 CPU modules—753P1-AX, 753P2-AX	12					
Additional 5/350 CPU modules—754P1-AX, 754P2-AX	14					
Additional dual 5/440 CPU modules—756P1-AX, 756P2-AX	8					
KFTIA-AA System I/O module	4					
KFTHA-AA System I/O module	3					
MS7CC-BA 128 MB memory	5					
MS7CC-CA 256 MB memory	5					
MS7CC-DA 512 MB memory	5					
MS7CC-EA 1 GB memory	5					
MS7CC-FA 2 GB memory	5					
Add PCI options						
DWLPB-AA/AB/BA/BB	1					
KZPSA-BB	1					
KZPSC-AA/BA	1					
DE435-AA, DE450-AA, DE500-XA	1					
DEFPA-AA/DA/UA/MA	1					
KFE70-AA	1					
Add EISA options						
DNSES-AA	1					
DW300-AA	1					
CXI01-AA/AD	1					
Add XMI options						
DWLMA XMI plug-in unit	4					
KZMSA-AB XMI SCSI controller	3					
KFMSB-AA DSSI disk/tape adapter	3					
CIXCD-AC XMI CI controller	4					
DEMNA-M XMI Ethernet controller	3					
DEMFA-AA XMI FDDI adapter	5					
Disk and Tape options						
RZ26, RZ28, RZ29 -VA SCSI disk drive	1					
RZ26, RZ28, RZ29 -VW SCSI disk drive	1					
TLZ07, TLZ09, TLZ15-VA SCSI tape drive	1					
TL810, TL820, TZ86, TZ87, TZ88 -VA SCSI tape drive	3					
DWZZA-VA/DWZZB-VW SCSI signal converter	0					
Total						

Note: Depending on configuration, system offers integral UPS capability that supports all in-cabinet components for at least 11 minutes. If UPS support is required for external devices, e.g., console terminals, terminal servers, printers, and modems, a universal UPS can be ordered separately.

Optional Controller Configuration Table

With multiple adapters that provide the same interface available on different I/O buses (PCI or XMI), it is possible to exceed operating system limit on number of ports supported for that interface. Follow these guidelines for maximum number of ports that each operating system will support. Fill in table under the relevant area, add up the number of controllers/ports available, and verify the operating system limits will not be exceeded. **Do not exceed these values.**

Option Name	A Number of Ports/Buses	B Number of Options	C Total Ports (A * B)	Digital UNIX Limit	OpenVMS Limit
SCSI Options					
Included **KFTIA-AA** I/O module, one single-ended and three FWD SCSI ports*	4	1	4		
Additional **KFTIA-AA** I/O module, one single-ended and three FWD SCSI ports	4				
KZPSA-BB PCI fast wide differential SCSI adapter	1				
KZMSA-AB XMI fast single-ended SCSI adapter	2				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**32**	**26**
802.3/Ethernet Options					
Included **KFTIA-AA** I/O module, two 802.3/Ethernet ports*	2	1	2		
Additional **KFTIA-AA** I/O module, two 802.3/Ethernet ports	2				
DE435-AA PCI 802.3/Ethernet controller, **DE450, DE500**	1				
DEMNA-M XMI 802.3/Ethernet controller	1				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**8**	**8**
FDDI Options					
Included **KFTIA-AA** I/O module, optional FDDI daughter card installed **(DEFPZ-AA/UA)***	1				
Additional **KFTIA-AA** I/O module, optional FDDI daughter card installed **(DEFPZ-AA/UA)**	1				
DEFPA-AA/-DA/-UA/MA PCI FDDIcontroller, one port each	1				
DEMFA-AA XMI FDDIcontroller	1				
Add column "C"—must be less than or equal to value listed under operating system to be used.				**8**	**8**

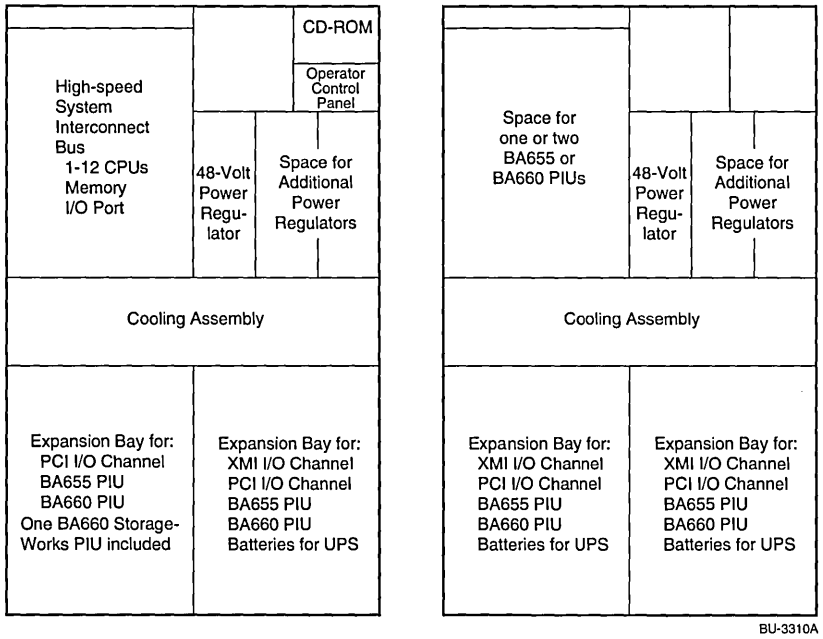
EISA Bus IRQ Address Table

Configuration Rules and Information

- EISA Bus IRQ address assignments are for Digital UNIX and OpenVMS systems only.
- In some cases, the maximum number of each supported device is less than the number of EISA bus addresses available; this is due to other limitations.
- Only one device can occupy any given IRQ address; if multiples of a device are configured, each device occupies separate address.
- Match each device to one available address. (Note: With the table as a worksheet, fill in "0" for each device; fill in only one "0" per column.)
- Actual IRQ address assignment will be made by the EISA Configuration Utility (ECU), which is run during system manufacture, or in the installed system if the EISA bus is reconfigured.

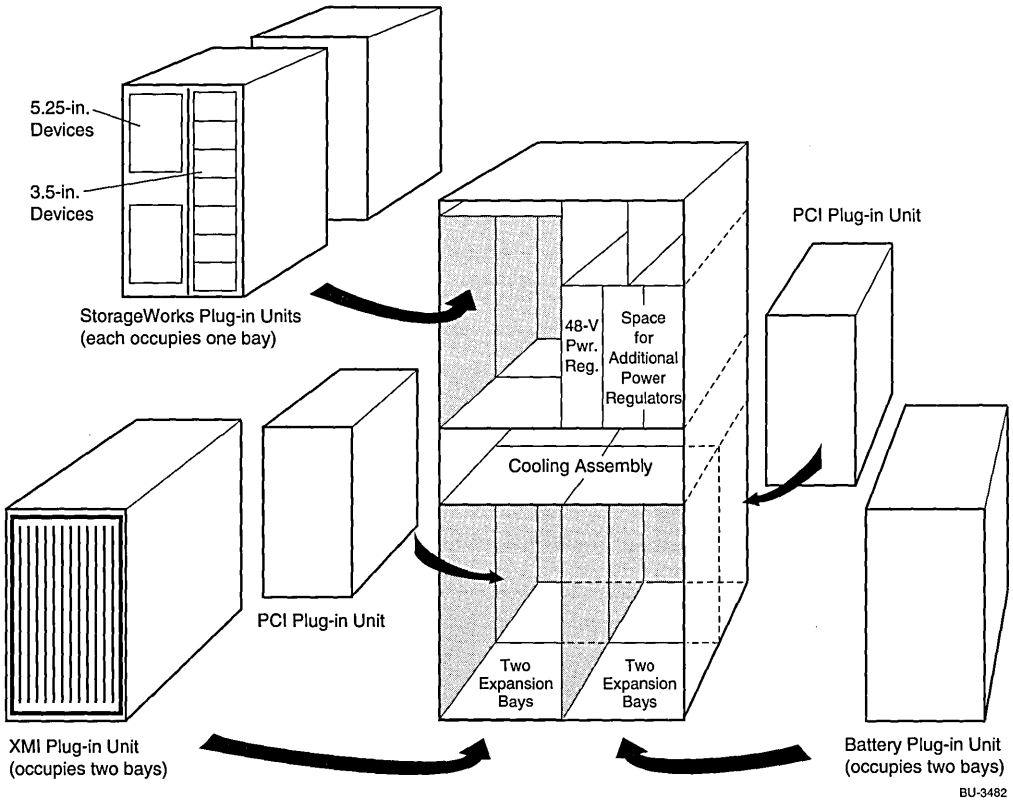
	EISA Bus IRQ Addresses									Maximum of Each Supported	
Option	5	7	8	9	10	11	12	14	15	OpenVMS	Digital UNIX
DNSES-AA	–	–	0	0	0	0	0	0	0	1	1
DW300-AA	0	–	–	0	0	0	–	–	0	0	1
CXI01-AA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1
CXI01-AD	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1

Table Codes:
0 = address is available for device, **–** = address not available for device **NA** = Not Applicable



System Cabinet I/O Expansion Cabinet

Note: Three-Phase Power Systems support up to three Power Regulators.



Specifications

Physical Characteristics	Operating	Shipping
Height	170.0 cm (67.0 in.)	195.0 cm (76.7 in.)
Width	80.0 cm (31.5 in.)	109.5 cm (43.1 in.)
Depth	87.5 cm (34.4 in.)	121.0 cm (47.5 in.)
Weight, full configuration		
Without batteries	408 kg (900 lb.)	448 kg (1000 lb.)
With batteries	545 kg (1200 lb.)	585 kg (1300 lb.)
Clearances	**Operating**	**Service**
Front	1.0 m (40 in.)	1.5 m (59 in.)
Rear	1.0 m (40 in.)	1.0 m (40 in.)
Sides	0	0
Environmental	**Operating**	**Non-Operating**
Temperature	15° to 28°C (59° to 82°F)	–40° to 66°C (–40° to 151°F)
Humidity	20% to 80%	10% to 95%
Altitude	0–2.4 km (0–8000 ft)	9,100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g max.
Heat dissipation[1]	**Minimally configured system**[1] (system cabinet) 3,400 Btu/hr, 1,000 W **Fully configured system**[2] (system cabinet) 15,700 Btu/hr, 4,600 W **Fully configured system**[3] (system cabinet with two I/O expansion cabinets) 30,600 Btu/hr, 9,000 W	
Regulatory		
Agency approvals	UL Listed to UL1950 UL Classified to IEC950 CSA Certified to CAN/CSA-C22.2, No. 950-M89 FCC Part 15 (Class A) CE Declaration #1171	
Reviewed to	AS 3260, Australian Standard EN 60950, European Norm	

Power Requirements[1] Three-Phase Power Subsystem[2]	US/Canada	Europe/AP	Japan
Nominal voltage	120/208 V	380–415 V	202 V
Frequency range	50–60 Hz	50–60 Hz	50–60 Hz
Phases	3-phase star 4-wire N-GND	3-phase star 4-wire N-GND	3-phase delta 4-wire mid-GND or 3-wire junction GND
Maximum input current/phase	24 A rms	12.8 A rms	24 A rms
Surge current	50 A peak	50 A peak	50 A peak
Rating	30 A	16 A	30 A
Power cap (system)	DEC 12-12314-00	DEC 12-30333-02	DEC 12-12314-00
Receptacle (site)	DEC 12-12315-01	See footnote 4	DEC 12-12315-01
(Industry equivalent)	NEMA L21-30R	IEC 309	NEMA L21-30R
PCS/PDS/PDU/UPS cable	BC24W	BN29X	BC24W

1 Minimally configured system contains one regulator, one CPU module, one memory module, one KFTIA-AA module, CD-ROM, and RZ28 disk drive.

2 Fully configured system contains two power regulators, four CPU modules, three memory modules, two System I/O modules, one DWLPB-AA, one DWLPB-BA, three BA655-AB, CD-ROM, 36 RZ28 drives.

3 Fully configured system and expansion cabinets consist of the above "fully configured system" and two expansion cabinets which each contain one DWLPB-AB, one DWLPB-BB, six KZPSA-BB, five BA655-AB, and 60 RZ28 drives.

4 Receptacle type is Hubbell 516R6 or equivalent

UPS Solutions

For complete protection, UPS products should be used with data line surge protectors—4N-GA249-AB (2 wire modem), 4N-GA249-CA (10BaseT), 4N-GA510-BF (ThinWire). See TVSS section of Environmental Products Chapter.

System	Storage	UPS Model	Receptacle Module for Plug-in Connection	
			60 Hz	50 Hz
AlphaServer 8400 (Single phase)	None, SW500, or Expansion Cabinet	**4N-AEAAL-BA**	**4N-AEACK-BN**	Hardwired
	SW800	**4N-AEAAN-BA (60 Hz)** **4N-AEAAN-BE (50 Hz)**	**4N-AEACM-BN**	Hardwired
AlphaServer 8400 (Three-phase)	None	**4N-AEAAN-BA (60 Hz)** **4N-AEAAN-BE (50 Hz)**	**4N-AEACM-BK**	Hardwired
	SW800 or Expansion Cabinet	**4N-AEAAN-BA (60 Hz)** **4N-AEAAN-BE (50 Hz)**	**4N-AEACM-PA**	Hardwired

UPS Models	
4N-AEAAL-BA	PUPS plus 10kVA (7kW), single-phase, 50/60Hz, 176-276V in, 200-240V out, 9 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BA	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, 176-256V in, 200-240V out, 10 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAN-BE	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, International model rated 380/415V in, 380/415/220V out; hardwired input/output.

Options	
4N-AEACK-BN	PUPS plus 10kVA receptacle module (3) L6-30R, (3) 5-20R, (2) L5-20R
4N-AEACM-BK	PUPS plus 15kVA receptacle module (2) L21-30R, (3) 5-20R2
4N-AEACM-BN	PUPS plus 15kVA receptacle module (2) L6-30R, (2) L21-30R, (1) 5-20R2
4N-AEACM-PA	PUPS plus 15kVA dual receptacle module: Module 1: (2) L21-30R and conduit kit for connecting Module 1 to Module 2 Module 2: (2) L21-30R, (3) 5-20R2

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Includes cables, media and documentation.

UPS System	OpenVMS	Digital UNIX
Prestige UPS	**4N-AEAES-EM**	**4N-AEAES-AK**
PUPS plus UPS	**4N-AEAES-FM**	**4N-AEAES-AK**
Network Management or mult shutdown*	Call for information	**4N-AEAES-BK**

* Requires Connect-UPS Network Adapter (SNMP compatible) - for Digital UNIX systems, suffixes denote twisted pair/ThinWire
4N-AEAEO-DA/DC for 60Hz applications
4N-AEAEO-DE/DD for 50Hz applications

AlphaServer 8400 Rackmount

Product Description

The AlphaServer 8400 5/300, 5/350, and 5/440 Rackmount systems are 23.5-inch wide versions of the nine-slot AlphaServer 8400 enterprise server. The Rackmount provides the same functionality and supports VME as well as XMI and PCI in the tall 80" H9A15 cabinet with extended depth. It is the highest performance enterprise server in the industry. It can be configured with up to twelve of the world's fastest microprocessors (Alpha microprocessor 21164). With the enormous capacity of the Alpha 64-bit architecture, up to 14 GB of memory, PCI, XMI and VME of up to a combination of more than 100 slots, this server offers room for growth for the largest and most complex applications.

The AlphaServer 8400 Rackmount runs OpenVMS or Digital UNIX operating systems and offers the reliability and availability features customers require for bet-your-business environments. Clusters, hot swap disks, RAID, ECC, memory and data paths, fault management along with space for any supported option including third party 19" RETMA compatible options are available.

All System Building Blocks and options stand alone as 19" rackmount assemblies and plug directly into 240V AC. All cable egress is from the rear which helps in manage high interface cable situations.

The AlphaServer 8400 provides supercomputer performance for the business. The AlphaServer 8400 has single processor floating point performance that dominates the competition in the generic benchmarks and wins at the application level as well. And, with up to 14 GB of memory, this server can provide all the benefits that Very Large Memory/Very Large Database (VLM/VLDB) systems have provided in the past.

Note: This Configuration menu for the Rackmount AlphaServer 8400 is intended to be a supplement to the non Rackmount Standard 8400. Only the unique Rackmount features and options are listed. Refer to the AlphaServer 8400 configuration menu for SMP Expansion, memory, storage devices and software.

Step 1—Base Server System

- AlphaServer 8400 5/300 and 5/350 Systems require
  - Digital UNIX V3.2B or later, and OpenVMS V6.2 or later
- AlphaServer 8400 5/440 Systems require
  - Digital UNIX V3.2G or later, and OpenVMS V6.2-1H3 or later
- Software media and documentation required for first system on site.
- Console terminal required unless available on site.
- System includes 9 slot centerplane—three slots used by the CPU module, memory module, and system I/O module.
  - Six slots available for additional CPU, memory, or system I/O module(s).
- CD-ROM and RZ28-VA disk included in BA36R StorageWorks shelf, are connected via single ended SCSI-2 port on KFTIA-AA system I/O module, or from KFTHA-AA I/O module with PCI single ended SCSI controller.
  - Three additional 3.5-inch Storage Works devices can be added to the BA36R Storage shelf.
- 240V Universal single phase power is required for system, see Step 2.

AlphaServer 8400 Rackmount Base Servers include

- Processor module with
  - One or two Alpha microprocessor 21164 5/300 or 5/350 MHz CPU(s), each CPU includes 4 MB Backup cache, or
  - Two Alpha microprocessor 21164 5/437 MHz CPUs, each CPU includes 4 MB Backup cache
- AlphaServer 8400 5/440 Systems require
  - Digital UNIX V3.2G or Digital UNIX V4.0a, or OpenVMS V6.2-1H3, or later
- System I/O module (KFTIA-AA) includes
  - I/O channel
  - Two twisted-pair 802.3/Ethernets
  - Single-ended SCSI-2 port
  - Three Fast Wide Differential (FWD) SCSI-2 ports
- 128 MB, 256 MB, 512 MB, or 2 GB of memory
- BA36R-AF StorageWorks Storage Shelf
- RZ28-VA 2 GB 3.5-inch SCSI disk
- 600 MB CD-ROM drive
- Universal 240V single phase power
- Factory installed software
- Digital UNIX base license or Open VMS base license
- NAS 200 Software
- One year hardware product warranty
- 90 days software product warranty
- System installation included with AlphaServer 8400 5/440 Base Servers only

Dual-CPU Systems

300 MHz	350 MHz	440 MHz	Operating System	Memory
CT-AN1BC-A9	**N/A**	**N/A**	Digital UNIX	256 MB
CT-AN1BD-A9	**CT-AN1DD-A9**	**DA-AN2FD-A9**	Digital UNIX	512 MB
CT-AN1BF-A9	**CT-AN1DF-A9**	**DA-AN2FF-A9**	Digital UNIX	2.0 GB
CT-AN1BC-V9	**N/A**	**N/A**	OpenVMS	256 MB
CT-AN1BD-V9	**CT-AN1DD-V9**	**DY-AN2FD-A9**	OpenVMS	512 MB
DY-AN1BF-V9	**CT-AN1DF-V9**	**DY-AN2FF-A9**	OpenVMS	2.0 GB

Step 1a—AlphaServer 8400 5/300 Rackmount System Building Blocks

System Building Blocks are an alternative to standard Base Servers listed in Step 1. They provide flexibility in configuring the AlphaServer 8400 with a choice of memory and I/O options.

System Building Block Requirements

- **Minimum of one Memory module**
- **Minimum of one System I/O module**
- **CD-ROM drive**
- Systems require Digital UNIX V3.2B or later, and OpenVMS V6.2 or later.
- Console terminal required unless available on site.
- System includes 9 slot backplane—three slots are used by CPU, memory, and system I/O modules.
  - Six slots available for additional CPU, memory, or system I/O module(s).
- SBB is a 9 slot Rackmount card cage in a chassis and H9A15 cabinet with power and cooling.
- If factory installed Software is required, a BA36R-AF StorageWorks Shelf, CD-ROM and system disk are required.
- If required a cabinet and appropriate controller can be ordered separately.

Ordering Information

440 MHz Cabinet SBB	
756XS-A9	One dual 440 MHz CPU module in H9A15 cabinet with one power strip and packaging. No operating system, no I/O module, no memory.

- If KFTHA-AA I/O module is selected the following PCI or XMI components must be ordered to provide the interface to CD-ROM drive in the BA35R-SF or BA36R-AF.
- If KFTIA-AA I/O module is selected these components are **not** required.

Required for PCI systems:

DWLPR-A9	Rackmount PCI unit
KZPAA-AA*	PCI single-ended SCSI controller
BN21H-02	SCSI cable

* KZPAA is restricted as CD-ROM controller only. Maximum one per system.

Required for XMI systems:

DWLMR-BA	Rackmount XMI unit
KZMSA-AB	XMI single-ended SCSI controller
CK-KZMSA-RB	KZMSA internal cabinet kit. One required for each KZMSA.
BN21H-02	SCSI cable

Note: Complete system configuration beginning with Step 2.

Step 2—Power Controllers

AlphaServer 8400 Rackmount systems include two power cords, one from system box and one from H7600-AA power controller. Both power cords are 20 Amp Twist-Lock for use in Americas.

Other geographies may request H7600-BB power controller (ships with international Pin-and-Sleeve and appropriate power cord for system).

H7600-AB	North America 220/240V 24 Amp Twist-Lock
H7600-BB	Elsewhere 220/240 16 Amp Pin-and-Sleeve

Step 3—CPU Symmetric MultiProcessing (SMP) Expansion

- See Step 2 AlphaServer 8400 configuration menu

Step 4—AlphaServer Expansion Packages

- Consult CSS

Step 5—Memory

- See Step 3 of AlphaServer 8400 configuration menu

Step 6—I/O Expansion Buses

The PCI, EMI and VME I/O buses are available on AlphaServer 8400 Rackmount systems. Application and system configuration constraints will determine maximum configuration. Configuration limits exist at the I/O bus level and controller level. Verify maximum number of allowed controllers as listed in Controller Configuration Table.

- Each DWLPR-A9/B9 (PCI or PCI with EISA Drawer) contains 12 PCI slots
- Each DWLMR-A9 (XMI Rackmount Drawer) contains 14 XMI slots
- Each 2T-DWLVR-A9 (VME Rackmount Chassis) contain 6 VME slots
  - VME chassis with 12 and 21 VME slots are available; requires PCI to VME Bridge Kit and cables. Consult CSS.
- PCI and XMI shelves connect directly to system via a HOSE cable to either the KFTIA-AA or KFTHA-AA. Maximum nine Hose connections supported per system.
- VME Chassis is connected to system via PCI with a PCI to VME bridge Kit. Maximum of one supported per PCI.
- Both EISA and VME cannot be supported in the same PCI chassis.

DWLPR-A9	**PCI Rackmount Chassis** contains 12 PCI slots. Each DWLPR-A9 requires 7 inches of vertical rackmounting space..
KFE70-CA[1]	**PCI to EISA Bridge**; Converts 12-slot PCI bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 diskette drive, mounting hardware, and cables to mount RX26. Maximum one EISA Bridge option supported per system.) Each KFE70-CA/DWLPR-A9 requires 8.75 inches of vertical rackmounting space.
DWLPR-B9[2]	**12 Slot PCI Drawer with KFE70-CA embedded**. Contains 2 EISA, 6 PCI/EISA, and 2 PCI slots. Maximum one DWLPR-B9 unit is supported per system.) Each DWLPR-B9 requires 8.75 inches of vertical rackmounting space.
2T-DWLVR-A9[2,3]	**6 VME Slot Rackmount Chassis;** connects to system via PCI with a PCI to VME Bridge Kit. (Maximum one VME supported per PCI.) Each 2T-DWLVR-A9 requires 14 inches of vertical rackmounting space, a line card kit, and **both** signal cables listed below.
DWPVC-AA **DWPVC-BA**	PCI to VME line card kit for OpenVMS systems, **or** PCI to VME line card kit for Digital UNIX systems
	and
BC32D-08	Signal cable from PCI to VME I/O panel, **and**
BC32E-03	Signal cable from VME I/O panel to VME module

1 Maximum of one EISA bus per system.
2 The EISA option and the VME option **cannot be** supported together on the same PCI Chassis.
3. Selection of either PCI to VME line card kit for OpenVMS **or** Digital UNIX is required for 6 VME Slot Rackmount chassis. (2T-DWLVR-A9). Either line card kit requires **both** signal cables (BC32D-08 **and** BC32E-03).

Step 7—System I/O Modules

- See Step 5 AlphaServer 8400 configuration menu.

Step 8—Storage Controllers

- See Step 6 AlphaServer 8400 configuration menu.
- BA36R-AF/AR (Wide) StorageWorks shelves and BA35R-AF/AR (Narrow) StorageWorks selves are recommended for use with Rackmount systems. Select appropriate SCSI cables to connect from controller to these shelves.

Step 9—Storage

- See Step 8 AlphaServer 8400 configuration menu.
- BA36R-AF and BA36R-AR **wide** StorageWorks shelves, and BA35R-AF and BA35R-AR **narrow** StorageWorks shelves are supported on Rackmount systems.
- 8-bit narrow and 16-bit wide devices are supported on Rackmount systems.
- Base system includes one StorageWorks shelf, a CD-ROM drive and one hard disk drive leaving 4 slots for 3.5" devices.

Note: BA655 or BA658 are **not** supported on Rackmount systems.

Step 10—Networks and Communications

- See Step 8 Digital AlphaServer 8400 configuration menu.
  - DWLPR-A9 required for PCI based options
  - DWLPR-B9 required for EISA based options
  - KFE70-CA (EISA/PCI bridge)

Step 11—Console Terminal

- Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- Shielded console cable is included for connection to console terminal.

VT510-xx VT510 terminal.

Step 12—Expansion (Storage Expansion Cabinet and I/O Expansion Cabinet)

If expansion is required, disks, tapes, I/O chassis or other, select same cabinet and power controllers as used in system cabinet and stack. 71.75" rack space available. Use only devices with 240V AC or 120V/240V AC front ends.

Step 13—Power Expansion Components

- Base system cabinet includes two H7600-AB power controllers and one power supply.
- Redundant (N+1) power supply option is **not** supported on the Rackmount AlphaServer 8400 system.
- Battery backup capability is not supported on the Rackmount AlphaServer 8400 system. The use of UPS system is recommended.

Step 14—Software

- See Step 12 AlphaServer 8400 configuration menu.

Step 15—Environmental Power Products

See AlphaServer 8400 UPS Solutions following Specifications in AlphaServer 8400 configuration menu.

Configuring system in H9A15 Cabinet

The H9A15 cabinet is 80" tall and has 71.75" of standard 19" vertical rack space.

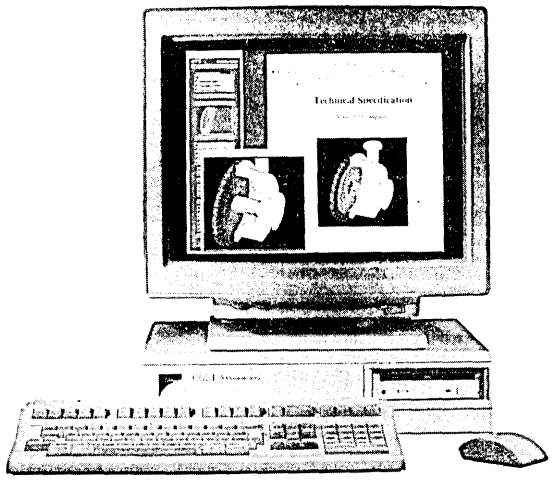
- AlphaServer 8400 Rackmount SBB is 36.75" and is mounted 14 inches from top of cabinet.
- BA36R-AF is mounted directly above the SBB with system disk and CD-ROM.
- To preserve air flow the only options supported above SBB are: front and rear mounted BA36R-xx shelves, PCI drawer (no EISA), and VME drawer.
- PCI drawer with EISA, and XMI drawer are recommended for bottom of cabinet, below SBB.
- One H7600 power strips can be mounted in bottom of cabinet.
- Remaining 21-inches of available space in bottom of cabinet can be filled with options as required.
- The items usually configured in cabinet with SBB are all standard 19" RETMA compatible and occupy different heights and depths. See chart below.

Cabinet Configuration Table	Rack Height	Depth[1]
System Building Block	36.75"	23.5"
PCI drawer (no EISA)	7.00"	25.00"
PCI drawer with EISA	8.75"	25.00"
XMI drawer	15.75"	34.50"
6 slot VME drawer	7.00"	23.50"
BA36R-AF/AR shelves	7.00"	10.00"

1. Does not include cable egress

Specifications

Physical Characteristics	Operating	Shipping
Height	202.0 cm (79.5 inches)	225.4 cm (88.8 inches)
Width	60.0 cm (23.6 inches	91.5 cm (36.0 inches)
Depth	103.6 cm (40.8 inches)	121.5 cm (47.9 inches)
Weight	363 kg (800 lb)	397 kg (875 lb)
Clearance	**Operating**	**Service**
Front	1.0 m 40 inches	1.5 m 59 inches
Rear	.75 m 29.5 inches	1.0 m 40 inches
Side	0	0
Environmental	**Operating**	**Non-operating**
Temperature	10° to 35°C (50 to 90°F)	-40° to 66°C (-40° to 151°F)
Humidity	10% to 90%	10% - 95%
Altitude	0 to 2.4M (0 to 8200 ft)	9,100m (30,000 ft)
Vibration	2-22 Hz @ 0.01" da min.	22-500 Hz @ 0.25 g max.
Heat Dissipation		
Minimum Configuration	3200 Btu/hr, 930 W	
Maximum Configuration	14400 Btu/hr, 4200 W	
Power Requirements		
Nominal AC input voltage	200-240V AC	
Frequency range	47-63 Hz	
Phases	Single-Phase	
Max input current (Max Config)	20.3 A rms	
Plugs from Cabinet	NEMA L6-20P (QTY=2)	
Receptacle	NEMA L6-20R (QTY=2)	
Regulatory Approvals	UL, CSA, IEC, FCC, CE	



VAXstation 4000 Model 96

Product Description

The VAXstation 4000 Model 96 system is a high-performance, OpenVMS VAX workstation. The Model 96 system supports three graphic options: LCSPX (accelerated 2D); SPXg (8-plane 3D with 16-bit Z-Buffer); and SPXgt (24-plane 3D with 24-bit Z-Buffer). SPXg graphics provide hardware acceleration for 2D and 3D vectors and solid fill. SPXgt is most useful in accelerating the performance of applications that make extensive use of smooth-shaded graphics and true-color imaging.

Main memory can be configured at 16, 32, 64, 80, or 128 Mbytes, and the system includes 256 Kbytes of writeback cache. A TURBOchannel adapter option provides direct connectivity to Digital-supported TURBOchannel options, including thick wire Ethernet, additional SCSI, or FDDI controllers.

VAXstation 4000 Model 96 memory modules, internal storage devices, and graphics option upgrades are customer installable. Internal storage permits a maximum of two 3.5-inch hard disks and one removable media device (diskette, compact disc, or tape drive). External expansion is supported in StorageWorks BA353 modular storage units.

VAXstation 4000 Model 96 Base System software licenses include the OpenVMS operating system and Network Application Support (NAS 150) for VAXstations. Systems ordered with a factory-installed disk will have OpenVMS and DECwindows Motif factory installed.

The VAXstation 4000 Model 96 system is ideal for applications such as CAD/CAM/CAE, medical and other forms of imaging, econometrics, process control/CIM, mapping, geophysical analysis, scientific visualization, and is suitable as a trader workstation. It provides a level of VAXstation performance that enables users to run the most computationally demanding applications.

To allow VAXstation 3100 and VAXstation 4000 Model 60 users to take full advantage of the processing performance of the VAXstation 4000 Model 96 system, upgrade kits are available. To provide investment protection, SPXg and SPXgt color graphics cards and monitors can be transferred from a VAXstation 4000 Model 60 system to an upgraded VAXstation 4000 Model 96 system.

Step 1—Systems

120-V Base Systems include a U.S. keyboard and all required power cords. If a 240 V system is selected, the appropriate country kit or keyboard and power cord are required from Step 14.

- Graphics, TURBOchannel, and synchronous communication options are customer installable and will ship as SPARES.
- Other options ordered with Base Systems will be factory installed unless specified as SPARES.

VAXstation 4000 Model 96 Base Systems include

- Base module
- Memory—eight SIMM connectors
- Cache memory: 256 Kbytes
- ThinWire/thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- 2D color/grayscale graphics board (LCSPX)
- U.S. keyboard (120 V only)
- Three-button mouse
- One DEC-423 serial line
- One EIA-232D serial line with modem control
- 2.7-meter (9-foot) color/monochrome video cable
- 1.8-meter (6-foot) power cord (120-V systems only)
- 0.9-meter (3-foot) monitor power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Software licenses: OpenVMS VAX and Digital NAS Client 150 for VAXstations DECwindows Motif, DECmessageQ RT, ObjectBroker RT, DECnet End Node, DECnet/OSI End System, DEC TCP/IP Client, VMScluster Client
- English-language user documentation

Note: Base Systems ordered with a factory-installed disk include factory-installed software (FIS).

Order Number	Memory	Monitor	Hz	Hard Disk Drive: 1.0 Gbyte	CD-ROM: 600 MB
PV71A-BA/BB	16 MB	Required	72		
PV71A-BC/BD	64 MB	Required	72	Included	Included

Note: BA, BC = 120/240 V Northern Hemisphere; BB,BD = 240 V Southern Hemisphere

Step 2—Monitor (Required for Base Systems)

Note: VAXstation 4000 Model 96 does not support dual-and quad-monitor configurations.

VRT17-PA/P4 17" (16.0" viewable image size) high-resolution color monitor with Light Gray enclosure. Trinitron aperture grille CRT with 0.26mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1280 x 1024 at 75Hz NI refresh rates. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -PA for Northern Hemisphere or -P4 for Southern Hemisphere operation. If purchased in North American, -PA includes 120V power cord, otherwise power cords for -PA and -P4 not included, order separately.

VRC21-LA/L4 21" (19.6" viewable image size) ultra high-resolution color monitor with Ligh Gray enclosure. Diamondtron aperture grille CRT with 0.30 mm stripe pitch and anti-reflection, anti-glare, anti static coating. Auto-scanning from VGA to 1600 x 1200 at 75Hz NI refresh rates. On Screen display (OSD). Stereo viewing compatible. MPR-II, Energy Star, DPMS and NUTEK compliant. 120/240V universal power supply. Includes 3.0 meter HD15 male to BNC video cable. Select -LA for Northern Hemisphere, or -L4 for Southern Hemisphere operation. If purchased in North America, -LA includes 120V power cord, otherwise power cords for -LA and -L4 not included, order separately.

Note: xA = 120/240 V Northern Hemisphere; x4 = 240V Southern Hemisphere

Step 3—Storage

Select storage devices if required. Factory-installed variants (-EM) include factory-installed software (FIS) which includes OpenVMS and DECwindows MOTIF.

- System disk must be ordered if the system is not being booted over the network by a server.
- Maximum of seven SCSI devices, not to exceed two internal hard drives, one removable media device, and four external devices; or up to six external SCSI devices (with only one internal drive).

Note: FIS is not a substitute for a software load device; media and documentation are required for first system on site.

Step 3a—Internal Storage (Factory/Field Installed)

Systems have three internal storage cavities.

Slot 1—Removable media (RX26, RRD45, TLZ09, TZK11)
Slot 2—3.5-inch disk RZ26N or RZ28M
Slot 3—3.5-inch disk RZ26N, or RZ28M
Select up to one half-height removable media device.

RX26 -ES/UL	2.8 MB 3.5-inch internal diskette drive
RRD45-EN	600 MB internal, dual speed compact disk drive
TLZ09-HF	8.0 Gbyte 4-mm DAT tape drive
TZK20-HG	2.3 GB QIC tape drive

Select up to two 3.5-inch half-height disk drives. Factory-installed variants (-EM) include factory-installed software (FIS).

RZ26N-EN	1.05-Gbyte internal disk drive
RZ28M-EN	2.1-Gbyte internal disk drive

Step 3b—External Storage (Expansion Box)

TLZ09-TA	8 GB 4-mm DAT tabletop tape drive
TZK20-DB	2.3 GB QIC tabletop tape drive
TZ88N-TA*	40 GB SCSI tabletop tape drive

For StorageWorks BA353 modular storage expansion box information, see *Storage Devices.*

Step 3c—Workstands

BA46X-AA	Vertical floor stand for one VAXstation 4000 system.
H9855-AA	Horizontal workstand for one VAXstation 4000 system.

Step 4—Memory

Systems include 16 MB (4 x 4-MB SIMMs) or 32* MB (8 x 4-MB SIMMs). Additional memory may be added in 16-or 64-MB increments if four memory slots are available. Eight SIMM memory slots total; 16-and 64-MB modules may be combined.

MS44L-AA	4 MB parity (1 x 4-MB, 100-ns SIMMs)
MS44-DC	64 MB parity (4 x 16-MB, 100-ns SIMMs)

* Increasing memory in 32-MB systems requires removal of 4 x 4-MB SIMMs.

Step 5—TURBOchannel Adapter (Customer Installable)

- TURBOchannel adapter provides one single-width bus slot for Digital or third-party options.
- Adapter requires OpenVMS VAX V5.5-2HW or higher.
- Required for TURBOchannel options (Step 5a).

DWCTX-BX	TURBOchannel adapter module

Step 5a—TURBOchannel Options (Customer Installable)

- Requires a TURBOchannel adapter.
- Each option requires one TURBOchannel slot.
- The following TURBOchannel options have OpenVMS VAX/driver support.

PMAD-AB	Thick wire Ethernet TURBOchannel option card
PMAZ-AB	Additional SCSI TURBOchannel option card
DEFTA-AA	DEC FDDIcontroller 700 (fiber optic) option card. Requires DEC LAN device driver kit V1.0 (QA-0PAAA-H5/H8) with OpenVMS VAX V5.5-2.

Step 6—Synchronous Communication Options

Select synchronous communication option if TURBOchannel adapter was not selected from Step 5.

VAX Wide Area Network (WAN) device driver license is required before adding asynchronous communication controller. Order license, media (TK50 or magtape), and documentation.

QL-VAWA9-AA	VAX WAN V1.2 device driver license
QA-VAWAA-H5	VAX WAN V1.2 device driver media (TK50)and documentation
QA-VAWAA-HM	VAX WAN V1.2 device driver media (magtape)and documentation
QA-VAWAA-GZ	VAX WAN V1.2 device driver documentation

Step 6a—Synchronous Communication Controller (Customer Installable)

DSW21-AA	One-line synchronous communication controller and EIA-232 V.24 synchronous modem cable
DSW21-AB	One-line synchronous communication controller and EIA-423 V.10 synchronous modem cable
DSW21-AC	One-line synchronous communication controller and EIA-422 V.36 synchronous modem cable
DSW21-AD	One-line synchronous communication controller and V.35 synchronous modem cable
DSW21-AE	One-line synchronous communication controller and EIA-530 synchronous modem cable
DSW21-AF	One-line synchronous communication controller and X.21 synchronous modem cable

Step 7—Networking Cables

BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30 feet in length)
BNE3H-xx	Thick wire transceiver cable with straight connector (PVC)(xx = 05/10/20/40 meters in length)
BNE3L-xx	Thick wire transceiver cable with straight connector (Teflon)(xx = 05/10/20/40 meters in length)

Note: Right-angle Ethernet cables are not supported.

Step 8—Printers

Order printers if required.

Step 9—Hardware Documentation

Information kits ship with every system. Information kits include the following documents: *VAXstation 4000 Model 90 Quick Installation Card, Owners and System Installation Guide*, and *Options Installation Guide*.

Step 10—Graphics Options (Customer Installable)

- Graphics options are listed with compatible monitors.
- Upgrades include video cables.
- Recommended configurations for SPXg/gt are 24—32 MB of memory and 1-Gbyte internal disk.

Note: Model 96 will not support dual-or quad-monitor configurations.

VAXstation 4000 Model 96 Graphics

Order Number	Description	Compatible Monitor	Hz
PV71G-AA	LCSPX 8-plane 2D color/grayscale graphics 1280 x 1024 resolution, 72 Hz	17-inch C VRT17-HA/H4 21-inch C VRC21-LA/H4	66/72 66/72
PV71G-BA[1]	SPXg 8-plane 3D color graphics with 16-bit Z-Buffer, 1280 x 1024 resolution, 72 Hz		
PV71G-CA[1]	SPXgt 24-plane 3D color graphics with 24-bit Z-Buffer, 1280 x 1024 resolution, 72 Hz		

1. SPXg and SPXgt options include DEC PHIGS Runtime license and require DECwindows Motif V1.1 media.

Step 11—Software Media and Documentation

VAXstation 4000 Model 96 systems require OpenVMS VAX V5.5-2HW or higher; a media and documentation kit is recommended for the first system on site.

- VAXstation 4000 Model 96 systems include the following Base System license PAKs: OpenVMS VAX operating system and Digital NAS Client 150 for VAXstations (DECwindows Motif, DECmessageQ RT, ObjectBroker RT, DECnet End Node, DECnet/OSI End System, DEC TCP/IP Client, VMScluster Client)

OpenVMS VAX and DECwindows Media and Documentation

QA-09SAA-H5 OpenVMS VAX and DECwindows media (TK50) and documentation

QA-09SAA-H8 OpenVMS VAX and DECwindows media (CD-ROM) and documentation

QA-09SAA-GZ OpenVMS VAX and DECwindows documentation

Digital NAS Client 150 Software

QA-36PAA-H5 Digital NAS Client 150 for VAXstations media (TK50) and documentation (CD-ROM)

QA-36PAA-H8 Digital NAS Client 150 for VAXstations media and documentation on CD-ROM

DEC PHIGS Runtime License

Included with SPXg and SPXgt options. Order media and documentation separately.

QA-VK1AA-H5 DEC PHIGS Runtime for OpenVMS VAX media (TK50) and documentation

QA-VK1AA-HM DEC PHIGS Runtime for OpenVMS VAX media (magtape) and documentation NAS 150 for VAXstations media (magtape) and documentation (CD-ROM)

DEC SoftPC

DEC SoftPC, an optional layered product, allows a VAXstation 4000 system to run MS-DOS programs with no added hardware. Order license, media, and documentation.

QL-YNWAA-3B DEC SoftPC for OpenVMS VAX single-user license

QA-YNWAA-H5 DEC SoftPC for OpenVMS VAX media (TK50)

QA-YNWAA-HM DEC SoftPC for OpenVMS VAX media (magtape)

QA-YNWAA-GZ DEC SoftPC for OpenVMS VAX documentation

Step 12—Country Kits, Power Cords, Keyboards (Not Required for 120 V Systems)

Country Kit	Power Cord	Keyboard	Country	Language
FCP01-AG	**BN19C-2E**	**LK401-AG**	Austria	German/Austrian
FCP01-AB	**BN19C-2E**	**LK401-AB**	Belgium	Flemish
FCP01-AD	**BN19K-2E**	**LK401-AD**	Denmark	Danish
FCP01-AF	**BN19C-2E**	**LK401-AF**	Finland	Suomi
FCP01-AP	**BN19C-2E**	**LK401-AP**	France	French
FCP01-AG	**BN19C-2E**	**LK401-AG**	Germany	German
FCP01-AH	**BN19C-2E**	**LK401-AH**	Holland	Dutch
FCP01-AT	**BN18L-2E**	**LK401-AT**	Israel	Hebrew
FCP01-AI	**BN19Z-2E**	**LK401-AI**	Italy	Italian
FCP01-AN	**BN19C-2E**	**LK401-AN**	Norway	Norwegian
FCP01-AV	**BN19C-2E**	**LK401-AV**	Portugal	Portuguese
FCP01-AS	**BN19C-2E**	**LK401-AS**	Spain	Spanish
FCP01-AM	**BN19C-2E**	**LK401-AM**	Sweden	Swedish
FCP01-AK	**BN19E-2E**	**LK401-AK**	Switzerland	French
FCP01-AL	**BN19E-2E**	**LK401-AL**	Switzerland	German
FCP01-AE	**BN19A-2E**	**LK401-AA**	U.K./Ireland	English
	BN19H-2E	**LK401-AA**	Australia/NZ	English
	BN19P-1K	**LK401-AA**	U.S./Canada	English
	BN19P-1K	**LK401-AC**	Canada	French
	BN19S-2E	**LK401-AA**	India	English
	BN19P-1K	**LK401-CA**	China	Chinese
		LK401-AJ	Japan	Katakana

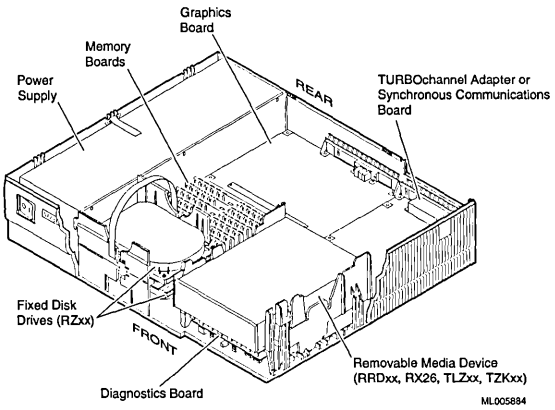
Step 13—VAXstation 4000 Upgrades

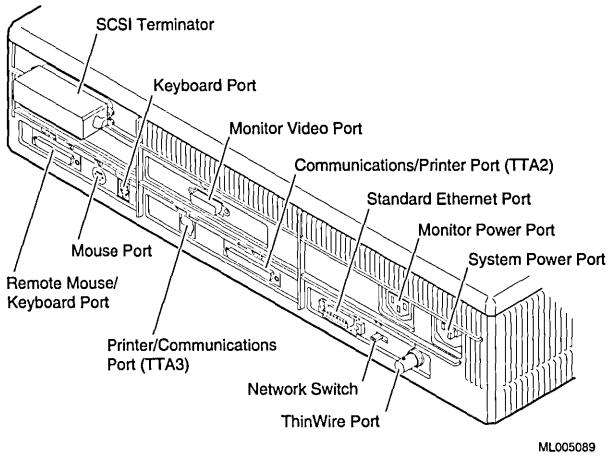
Upgrade kits must be installed by Digital Services.

Order Number	From	To	Includes
PV71U-BF†	VAXstation 4000 Model 60 2D LCG graphics (66/72 Hz)	VAXstation 4000 Model 96 2D LCSPX graphics (66/72 Hz)	VAXstation 4000 Model 96 CPU System enclosure and power supply 8-plane color/grayscale graphics board 2.7-m (9-ft) color/monochrome video cable Brackets for three internal SCSI devices (one removable, two fixed disks) ThinWire/thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS** base license Digital NAS 150 license **Note:** Mandatory return of Model 60 CPU board and LCG graphics card
PV71U-BH	VAXstation 4000 Model 90/90A 2D LCSPX graphics - 66/72Hz	VAXstation 4000 Model 96 2D LCSPX graphics (66/72 Hz)	VAXstation 4000 Model 96 CPU Digital NAS 150 license **Note:** Mandatory return of Model 90/90A CPU board

† VAXstation Model 96 systems require minimum of 16 MB of memory. See Model 96 memory configurations. 4-MB and 16-MB SIMMs from Model 60 may be transferred to Model 96 in sets of four **only** (e.g., two MS44L-BA = 4 x 4-MB SIMMs). Model 96 memory modules must be installed in sets of four matching value SIMMs.

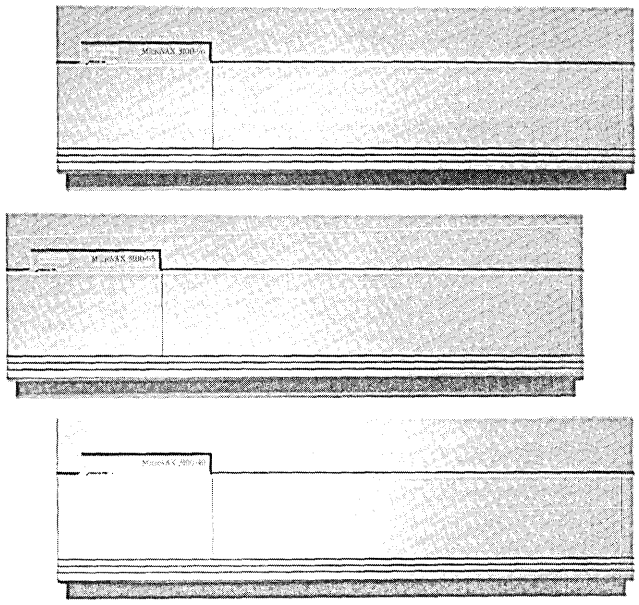
System Diagram





Specifications

Power Requirements	Model 96
SPECmark89	12.0/45.6
Line voltage	120/240 VAC
Voltage tolerance—RMS	88-132/176-264 VAC
Frequency/single phase	50/60 Hz
Frequency tolerance	47-65 Hz
Maximum running current	6.2 A/3.1 A
Maximum power consumption	465 W
Operating Environment	
Temperature	10 °–40 °C (50 °–104 ° F) or 15 °–32 ° C (59 °–90 ° F) with tape or diskette in system box
Relative humidity	20%–80% noncondensing
Maximum operating altitude	2.4 km (8,000 feet)
Physical Characteristics	
Height	11.3 cm (4.4 in.)
Width	48.2 cm (19.0 in.)
Depth	40.0 cm (15.5 in.)
Weight (diskless)	4.5 kg (10 lb)



MicroVAX 3100

Product Description

MicroVAX 3100 systems offer enhanced distributed computing capabilities and flexibility. They support more than 10,000 commercial and technical applications across local or wide area networks.

MicroVAX 3100 systems support add-on synchronous options for wide area communications and asynchronous options, including modem options for terminal and printer connections. Networking allows communications in a variety of environments, including DECnet, TCP/IP, OSI, SNA, and X.25.

PC clients based on MS-DOS, OS/2, and Macintosh can be connected to the MicroVAX 3100 system, enabling the entire business to share information. Digital's advanced client/server computing, based on NAS (Network Application Support), delivers a wide range of solutions to help integrate desktop workstations and PCs.

MicroVAX 3100 Model 40 system supports a broad range of computing needs and a large number of users. Additional internal SCSI storage can be added to meet future application needs. The MicroVAX 3100 Model 40 system is board upgradable to MicroVAX 3100 Model 85 and 96 systems.

MicroVAX 3100 Model 85 and 96 systems offer enhanced Ethernet performance, and twice the storage capacity of the Model 40 on optional SCSI-2 card for external SCSI devices. ECC memory can be expanded to 128 MB.

MicroVAX 3100 Model 88 and 98 systems offer identical functionality to the Model 85 and 96 in a new desktop mini-tower platform. In addition these systems offer enhancements in memory, support for up to 256 MB, and six internal storage devices are supported in system enclosure.

MicroVAX 3100 systems are designed for sustained reliability and ease of serviceability. Their compact size provides mid-range systems performance at entry-level system prices.

MicroVAX 3100 Comparison Chart

	Model 40	Model 85	Model 96	Model 88	Model 98
Performance (TPS)	39e	110e	200e	110e	200e
Enclosures	BA42-B	BA42-B	BA42-B	MiniTower	MiniTower
Mbytes of memory: Included	8	64	64	64	128
Mbytes of memory: Maximum	32	128	128	256	256
Storage Devices (internal maximum)	5	5	5	6	6
Storage Devices (total internal and external)	7	14[1]	14[1]	14	14
Storage Capacity	27.3 GB	56.7 GB	56.7 GB	19.2 GB/ 60.2 GB	19.2 GB/ 60.2 GB

1 SCSI controller option (KZDDA-xx) supports seven additional external SCSI devices.

MicroVAX 3100 Models 40, 85 and 96

Step 1—Systems

Select user licenses are required.

MicroVAX 3100 Model 40, 85, and 96 Systems include

- BA42 large enclosure with CPU/FPU
- **Model 40**
  - 8 MB base memory on CPU, maximum 32 MB parity memory Digital NAS Base Server 200
- **Models 85 and 96**
  - 64 MB memory in DSIM slot, maximum 128 MB ECC memory Digital NAS Base Server 200
- 802.3/Ethernet interface (ThinWire/Thick wire) with terminators
- Ethernet kit; includes ThinWire T-connector with BNC terminators and 15-pin thick wire terminator
- Synchronous SCSI-2 interface for connecting internal and external SCSI devices; external connection via a 50-pin external SCSI-2 connector
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- EIA-232 asynchronous serial line with modem control (25-pin D-subminiature connector)
- H8575-A 25-pin-to-MMJ DEC-423 to EIA-232 adapter
- 7.6-meter (25-foot) console terminal cable
- 120 V power cord (country-specific power cord required for 240 V use; see Step 9)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264Vac
- Hardware documentation (QZ-K44AB-GZ for Model 40; QZ-A05AA-GZ for Model 85; QZ-001AA-GZ for Model 96)
- OpenVMS base license (with POSIX)
- Factory-installed software[1]
- Three-year hardware product warranty
- 90-day software warranty

1. Delivery of software on a system disk is not warrantied. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation kits that include complete installation instructions. See Step 8 for details.

MicroVAX 3100 Model 40, 85, and 96 Advantage Servers

Order Number	MicroVAX 3100	Memory	Digital NAS	Disk Drive	CD-ROM
DV-31GCB-CA	Model 40	16 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)
DV-31JCB-EA	Model 85	64 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)
DV-31SCA-CA	Model 96	64 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)

* Disk drive in Advantage Server systems include Factory Installed Software (FIS)

MicroVAX 3100 Model 40 Base Server

Order Number	MicroVAX 3100	Memory	Digital NAS	Disk Drive	CD-ROM
DV-31GAB-B9	Model 40	8 MB	Base Server 200	Required	Required

Note: Hard disk, CD-ROM, and tape drive are not included with Model 40 Base Server, they must be ordered separately.

Step 2—Storage

Select storage devices as required. See *Storage Devices* for further details.

Step 2a—Internal Storage

- System supports maximum of five internal drives in any of the following combinations:
  - Five RZ2x half-height disk drives, or
  - Four RZ2x half-height disk drives and one removable media device
  - Maximum of two RZ29B disk drives
  - Three RZ2x half-height disk drives and two removable media devices (RX26, RRD45, TLZ09, TZK11, or TZK20)
- RZ26N disk drive in Advantage Server systems include Factory Installed Software (FIS)
- Base Systems ordered with one hard disk drive include FIS
- Order a load device (TLZ09) if necessary
- OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- Field-installed options require Customer Services installation.

Removable Media Devices for Models 40, 85, and 96 systems

RRD45-EN	600 MB CD-ROM drive
RX26 -EN/EL	2.8 MB diskette drive; factory/field installed
TLZ09-HF	8.0 GB 4-mm 3.5-inch DAT drive
TZK11-HF	2.1 GB cartridge (QIC) tape drive
TZK20-HF	2.3 GB 300 Kbs SCSI (QIC) tape drive

Fixed Disk Drives for Models 40, 85, and 96 systems

RZ26N-EN	1.0 GB 3.5-inch SCSI disk drive 5400 RPM
RZ28M-EN	2.1 GB 3.5-inch SCSI disk drive 5400 RPM
RZ28D-EN	2.1 GB 3.5-inch SCSI disk drive 7200 RPM
RZ29B-EN	4.3 GB 3.5-inch SCSI disk drive 7200 RPM

Step 2b—External Storage

- Model 40:
  - Maximum seven SCSI-2 devices
  - Maximum two BA353 expansion boxes or one BA350 StorageWorks expansion shelf
- Models 85 and 96:
  - Maximum 14 SCSI devices with additional SCSI card option.

Use the following table to calculate external SCSI bus length.

Maximum SCSI Bus Length	Model 40	Models 85 and 96
Internal	2 m (78.7 inches)	2.25 m (88.6 inches)
External	4 m (157.4 inches)	3.75 m (148.0 inches)
KZDDA internal	N/A	0.73 m (29.0 inches)
KZDDA external	N/A	5.27 m (207.5 inches)
External Enclosure	**External Cable Length**	
RRD45	0.45 m (18 inches)	
TLZ09	0.91 m (36 inches)	
TZ88N	0.28 m (11 inches)	
TLZ7L	0.91 m (36 inches) or 1.82 m (72 inches)	
BA353	1.82 m (72 inches)	
BA350	1.82 m (72 inches)	

Step 2b—External Storage *(continued)*

SCSI Controller and Tabletop Storage

KZDDA-AA/AF	SCSI controller card supports seven additional external SCSI devices, factory/field installed (Models 85 and 96 only)
RRD45-FA/DG*	600 MB tabletop CD-ROM drive; 120 V/240 V, requires 1.8 meter (6 foot) SCSI cable BC06P-06
TLZ09-DD*	8.0 GB tabletop DAT drive with universal power supply; includes 120 V power cord
TZ88N-TA*	40 GB SCSI tabletop tape drive
TZ887-NT	280 GB SCSI tape subsystem, 7 cartridge loader in tabletop enclosure
BC06P-2F	TZ8x cable, 2.5 ft (0.8 m)
BC06P-06	TZ8x cable, 6 ft (1.8 m)
BC06P-09	TZ8x cable, 9 ft (2.7 m)

* Country-specific power cord required for 240 V use.

StorageWorks Expansion Units

BA353-AA[1]	StorageWorks desktop expansion box supports three 3.5-inch half-height, or two 3.5-inch half-height and one 5.25-inch half height drive. 120 V power cord included, Requires SCSI cable BC09D-xx.
BA356-SC[2]	StorageWorks 16-bit shelf includes dual speed blowers. Supports maximum of seven 3.5-inch devices 8 or 16- bit), requires BA35X-MG 8-bit I/O module
BA362-AA/AB	Office expansion unit, supports up to two 3.5-inch modular storage devices
BA364-AA/AB	Office expansion unit, supports up to four 3.5-inch modular storage devices and one fixed CD-ROM

1. Country-specific power cord required for 240 V use.
2. One BA356 expansion unit is supported per single ended SCSI bus; no other external device can be connected to system with BA356 unit.

SCSI devices supported in StorageWorks Expansion Units

RZ26N-VA/VW	1.05 GB, 3.5-inch, half-height disk drive, 5400 RPM
RZ28M-VA/VW	2.1 GB, 3.5-inch, half-height disk drive, 5400 RPM
RZ28D-VA/VW	2.1 GB, 3.5-inch, half-height disk drive, 7200 RPM
RZ29B-VA/VW	4.3 GB, 3.5-inch, half-height disk drive, 7200 RPM
TLZ09-VA	8.0 GB, 3.5-inch, half-height 4-mm DAT drive
TZ88N-VA	20/40 GB SCSI tape drive in StorageWorks carrier
TZK11-VA	2.0 GB 5.25-inch QIC tape in StorageWorks carrier

Step 3—Memory

Model 40

Systems include 8 MB of base memory on CPU; systems support maximum 32 MB parity memory.

MS44L-AA	4 MB parity memory modules for Model 40

Model 85 and 96

Systems include 64 MB base memory in first DSIM slot; systems support maximum 128 MB of ECC memory.

MS44L-BC	16 MB ECC memory modules for Models 85 and 96
MS44-DC	64 MB ECC memory modules for Models 85 and 96

Step 3—Memory (*continued*)

Memory Configuration Chart for Models 40, 85, and 96

Required Memory	Model 40 (8 MB systems)	Models 85 and 96 (64 MB systems)
16 MB	1 x MS44L-BA	N/A
24 MB	2 x MS44L-BA	N/A
32 MB	3 x MS44L-BA	N/A
40 MB	N/A	N/A
48 MB	N/A	N/A
72 MB	N/A	N/A
80 MB	N/A	1 x MS44L-BC
128 MB	N/A	1 x MS44-DC

Step 4—Networks and Communications

- Systems support one asynchronous and one synchronous communication option
- An 8-line DEC-423 to 16-line DEC-423 upgrade option is available for the MicroVAX 3100 Models 40/85/96, see *Network Products Guide* for more information.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.

Asynchronous Multiplexer Options

Select **one** asynchronous multiplexer for communications expansion

DHW42-AA Provides eight DEC-423 lines for a system total of 12 asynchronous lines (11 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, external 36-pin BC16C-10 3-m (10-ft) cable, and H3104-00 eight-line distribution harmonica; factory or field installed.

DHW42-CA Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two external 50-pin to 4-way 25-pin BC29J-06 1.8-m (6-ft) cables; factory or field installed.

DHW42-BA Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, two external 36-pin BC16C-10 3-m (10-ft) cables, and two H3104-00 eight-line distribution harmonica; factory or field installed.

DHW42-UP Upgrades DHW42-AA to DHW42-BA; field installed only.

Note: Addition of DHW4x options increases number of users; an OpenVMS license upgrade may be required.

Synchronous Communications Options

- Select **one** synchronous option
- EIA-232/V.24 cable (BC19D-02) is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection
- Synchronous communication option requires VAX WAN Device Driver V1.2 or higher required. VAX WAN Device Driver media included in OpenVMS Consolidated Software Disk CD-ROM media. See Step 8 for details.

DSW42-AA EIA-232 synchronous controller provides two lines). Includes synchronous logic module, I/O assembly, and external EIA-232 0.6-m (2-ft) adapter cable

BC19B-02 EIA-422/V.11 0.6-m (2-ft) adapter cable

BC19E-02 EIA-423/V.10 0.6-m (2-ft) adapter cable

Step 4—Networks and Communications *(continued)*

LAN Communications Controller

802.3/Ethernet Interface (ThinWire/Thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x).

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M cable)or a thick wire 15-pin AUI transceiver cable is required (e.g., BNE3x). Software media and documentation and cables are also required. See Network Products Guide.

DECserver 90M, 90TL, 900TM, 90L+, 700, and MUXserver 90, 320, 380 Communications and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 90, 250, DECbrouter 90; and DECnis 500, 600 MultiProtocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

InfoServer 1000 Network Storage Server

To provide initial system load (ISL) capabilities order InfoServer Local Area Compact Disk. Other configurations are offered for tape/backup and for serving more CD-ROMs. InfoServer systems support CD-ROM, hard drives, magneto-optical and tape drives. InfoServer 1000 systems can serve up to seven SCSI devices. See *Storage Devices* for ordering information.

Network Connectivity Products

See the *Network Products Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT420) for each system unless otherwise available. If logging is required, a combination of video terminal and LA75 is recommended.

Step 6—Terminals and Printers

Select terminals and serial printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided.

Step 7—CPU Upgrades

Note: A non-return charge will be assessed if old CPU board is not returned to Digital

Order Number	From	To	Includes
31JXR-AA	MicroVAX 3100 Model 40 MicroVAX 3100 Model 80	MicroVAX 3100 Model 85 Server	MicroVAX 3100 Model 85 Server CPU 64 MB of memory **OpenVMS** base license
49GAX-E9	MicroVAX 3100 Model 40 MicroVAX 3100 Model 80	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU 64 MB of memory **OpenVMS** base license
49JAX-E9	MicroVAX 3100 Model 85 MicroVAX 3100 Model 90 MicroVAX 3100 Model 95	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU 64 MB of memory **OpenVMS** base license
49XR-AA	MicroVAX 3100 Model 90 MicroVAX 3100 Model 95	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU **OpenVMS** base license

Step 8—Software

Licenses required to support additional users beyond those included in base systems.

Operating System support for Model 40 requires V5.5 or higher; Model 85 and 96 require V5.5-2H4 or higher

Software Processor Code = B
Clusterwide License Rating = 20 (C)

OpenVMS VAX Concurrent Use Licenses

OpenVMS VAX Concurrent Use licenses are for customers running **OpenVMS VAX V6.2 or greater.**

OpenVMS VAX Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one OpenVMS system to another OpenVMS system at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-XULA5-AA	OpenVMS VAX Traditional unlimited user license

OpenVMS VAX Interactive User Licenses

OpenVMS VAX Interactive User licenses are for customers running **OpenVMS VAX V5.5 or greater.** OpenVMS VAX Interactive User licenses **are** specific to a single system and **cannot** be shared across an OpenVMS Cluster.

QL-XULA9-BB	OpenVMS VAX Interactive 1-user license
QL-XULA9-BC	OpenVMS VAX Interactive 2-user license
QL-XULA9-BD	OpenVMS VAX Interactive 4-user license
QL-XULA9-BE	OpenVMS VAX Interactive 8-user license
QL-XULA9-BF	OpenVMS VAX Interactive 16-user license
QL-XULA9-BG	OpenVMS VAX Interactive 32-user license

Step 8—Software *(continued)*

OpenVMS VAX Interactive User Licenses

QL-XULA9-BH OpenVMS VAX Interactive 64-user license
QL-XULAA-BR OpenVMS VAX Interactive 128-user license
QL-XULAB-BR OpenVMS VAX Interactive 256-user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User licenses are for customers running **OpenVMS VAX Version 6.0 or greater.** OpenVMS VAX Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS VAX Distributed Interactive User licenses can also be shared across an entire OpenVMS Cluster running OpenVMS VAX V6.0 or greater.

Note: OpenVMS VAX Distributed Interactive User licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS VAX and OpenVMS Alpha systems).

QL-09SA9-BB OpenVMS VAX Distributed Interactive 1-user license
QL-09SA9-BC OpenVMS VAX Distributed Interactive 2-user license
QL-09SA9-BD OpenVMS VAX Distributed Interactive 4-user license
QL-09SA9-BE OpenVMS VAX Distributed Interactive 8-user license

OpenVMS VAX Distributed Interactive User Licenses

QL-09SA9-BF OpenVMS VAX Distributed Interactive 16-user license
QL-09SA9-BG OpenVMS VAX Distributed Interactive 32-user license
QL-09SA9-BH OpenVMS VAX Distributed Interactive 64-user license
QL-09SAA-BR OpenVMS VAX Distributed Interactive 128-user license
QL-09SAB-BR OpenVMS VAX Distributed Interactive 256-user license

QL-VBRAP-AA VAXcluster license for multiuser systems

OpenVMS VAX Media and Documentation

Choose operating system media and documentation. Recommended for first system on site. Operating System support for Model 40 requires V5.5 or higher; Model 85 and 96 require V5.5-2H4 or higher.

QA-001AA-Hx OpenVMS media with extended documentation.
QA-09SAA-Hx OpenVMS media with base documentation.

Note: x denotes the media type: 5 = TK50, 8 = CD-ROM

OpenVMS Consolidated Software Media and Documentation

Choose as an alternative to the above OpenVMS kits. Requires RRD43 CD-ROM.

QA-VWJ8A-A8 OpenVMS and layered product binaries on CD-ROM without hardcopy documentation.
QA-VYR8A-G8 OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader.

QA-GXXAB-Hx POSIX media and documentation (without IEEE documentation

Digital NAS Base Server 200

Digital NAS packaged products do not include hardcopy documentation, (documentation is CD-ROM only).

QL-MC1AB-AA Digital NAS Base Server 200 license for OpenVMS VAX systems
QA-MC1AA-Hx Digital NAS Base Server 200 media and documentation kit

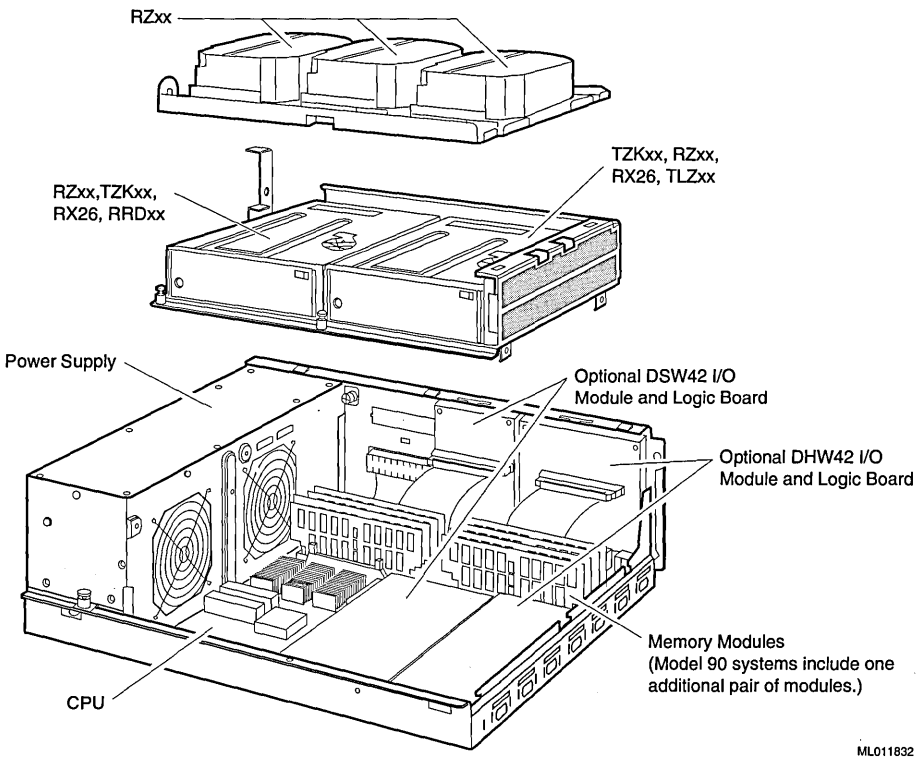
Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 9—Power Cords

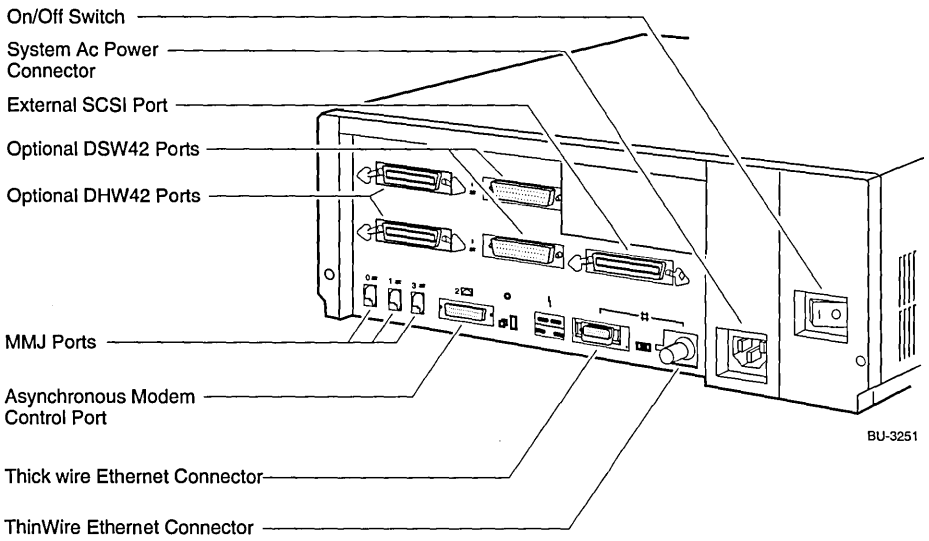
Select for 220/240 V systems.

BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain, and Chile
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19U-2E	Israel
BN19S-2E	India
BN19H-2E	Australia, New Zealand

MicroVAX 3100 System Diagram



MicroVAX 3100 System Diagram



Specifications

Physical Characteristics	Models 40, 85, 96	
Height	14.99 cm (5.90 inches)	
Width	46.38 cm (18.26 inches)	
Depth	40.00 cm (15.75 inches)	
Weight	16.0 kg (36.85 lb)	
Power Requirements	**Model 40**	**Models 85/96**
Nominal voltage	120/240 Vrms	120/240 Vrms
Power source phasing	Single	Single
Nominal frequency	50–60 Hz	50–60 Hz
Voltage range	88–132 Vrms 176–264 Vrms	88–132 Vrms 176–264 Vrms
Line frequency tolerance	47–63 Hz	47–63 Hz
Typical running current	1.1/0.6 A	1.5/0.75 A
Typical power consumption (Watts)	132/144	180/40
Standard Communication		
Minimum MMJ lines	3 DEC-423	3 DEC-423
Modem lines	1 EIA-232	1 EIA-232
Ethernet	Thick wire and ThinWire supported on all models	
Communications Options[1]		
MMJ lines	8 DEC-423	8 DEC-423
MMJ lines	16 DEC-423	16 DEC-423
Modem lines	8 EIA-232	8 EIA-232
Synchronous lines	2 synchronous	2 synchronous
Operating Environment	Temperature (sea level) 10-40°C (50-90°F) Relative humidity 10%–80% noncondensing; 20% to 80% if tape drive is present. Maximum operating altitude 2.4 km (8,000 ft)	

1 DEC-423, EIA-232 and synchronous lines can be ordered separately. The DEC-423 and EIA-232 options cannot be configured together in the same system. An 8-line DEC-423 to 16-line DEC-423 upgrade option is available for the MicroVAX 3100 Model 40.

MicroVAX 3100 Model 88 and 98

Step 1—Systems

MicroVAX 3100 Model 88 and 98 Systems include

- Minitower enclosure with CPU/FPU
- 64 MB or 128 MB SIMM memory
- Digital NAS Base Server 200
- 802.3/Ethernet interface (ThinWire/Thick wire) with terminators
- Ethernet kit; includes ThinWire T-connector with BNC terminators and 15-pin thick wire terminator
- Synchronous SCSI-2 interface for connecting internal and external SCSI devices; external connection via a 50-pin external SCSI-2 connector
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- EIA-232 asynchronous serial line with modem control (25-pin D-subminiature connector)
- H8575-A 25-pin-to-MMJ DEC-423 to EIA-232 adapter
- 7.6-meter (25-foot) console terminal cable
- 120 V power cord (country-specific power cord required for 240 V use; see Step 9)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264Vac
- Hardware documentation (EK-MV489-UI for Model 88 and 98
- 1.05 GB RZ26N disk (Uses one 3.5" half-height SCSI bay)
- 600 MB CD-ROM (Uses one 5.25" removable media bay)
- OpenVMS base license (with POSIX)
- Factory-installed software[1]
- Three-year hardware product warranty
- 90-day software warranty

1. Delivery of software on a system disk is not warrantied. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation kits that include complete installation instructions. See Step 8 for details.

MicroVAX 3100 Model 88 and 98 Advantage Servers

Order Number	MicroVAX 3100	Memory	Digital NAS	Disk Drive	CD-ROM
DV-31JCC-EA	Model 88	64 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)
DV-31SCC-EA	Model 98	64 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)
DV-31SCC-FA	Model 98	128 MB	Base Server 200	1.05 GB FIS*	RRD45 (600 MB)

* Disk drive in Advantage Server systems include Factory Installed Software (FIS)

Step 2—Storage

Select storage devices as required. See *Storage Devices* for further details.

Step 2a—Internal Storage

- System supports maximum of six internal devices in any of the following combinations:
  - Six RZ26 or RZ28 half-height disk drives, or
  - Five RZ26 or RZ28 disk drives and one removable media device
  - Three RZ26 or RZ28 half-height disk drives and three removable media devices
  - Maximum of three RZ29B disk drives supported, must be installed in removable media device bays
- RZ26N disk drive in Advantage Server systems include Factory Installed Software (FIS)
- Order a load device (TLZ09) if necessary
- OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- Field-installed options require Customer Services installation.

Removable Media Devices for Models 88 and 98

RRD45-AB	600 MB CD-ROM drive
TLZ09-LK	8.0 GB 4-mm DAT drive
TZK11-LG	2.1 GB cartridge QIC tape drive
TZK20-LK	2.3 GB 300 Kbs SCSI QIC tape drive

Step 2a—Internal Storage *(continued)*

Fixed Disk Drives

RZ26N-EB	1.0 GB 3.5-inch SCSI disk drive 5400 RPM
RZ28M-EB	2.1 GB 3.5-inch SCSI disk drive 5400 RPM
RZ28D-EB	2.1 GB 3.5-inch SCSI disk drive 7200 RPM
RZ29B-EB	4.3 GB 3.5-inch SCSI disk drive 7200 RPM

Step 2b—External Storage

- Model 88 and 98:
  - Maximum 14 SCSI devices with additional SCSI card option.

Use the following table to calculate external SCSI bus length.

Maximum SCSI Bus Length	Model 40
Internal	1.2 m (47.2 inches)
External	4.8 m (189.0 inches)
KZDDA internal	0.1 m (3.9 inches)
KZDDA external	5.9 m (232.0 inches)

SCSI Controller and Tabletop Storage

KZDDA-AB	SCSI controller card supports seven additional external SCSI devices for Models 85 and 96 only (one per system supported)
RRD45-FA/DG*	600 MB tabletop CD-ROM drive; 120 V/240 V, requires 1.8 meter (6 foot) SCSI cable BC06P-06
TLZ09-DD*	8.0 GB tabletop DAT drive with universal power supply; includes 120 V power cord
TZ88N-TA*	40 GB SCSI tabletop tape drive
TZ887-NT	280 GB SCSI tape subsystem, 7 cartridge loader in tabletop enclosure
BC09D-03	TZ8x cable, 3 foot (0.9 m)
BC09D-06	TZ8x cable, 6 ft (1.8 m)
BC09D-09	TZ8x cable, 9 ft (2.7 m)

* Country-specific power cord required for 240 V use.

StorageWorks Expansion Units

BA356-SC[1]	StorageWorks 16-bit shelf includes dual speed blowers. Supports maximum of seven 3.5-inch devices 8 or 16- bit), requires BA35X-MG 8-bit I/O module, requires SCSI cable BN21H-xx
BA362-AA/AB	Office expansion unit, supports up to two 3.5-inch modular storage devices, requires BN31V-01 3.2 feet (1.0 m) SCSI cable
BA364-AA/AB	Office expansion unit, supports up to four 3.5-inch modular storage devices and one fixed CD-ROM, requires 3.2 feet (1.0 m) SCSI cable

1. One BA356 expansion unit is supported per single ended SCSI bus; no other external device can be connected to system with BA356 unit.

SCSI devices supported in StorageWorks Expansion Units

RZ26N-VA/VW	1.0 GB, 3.5-inch, half-height disk drive, 5400 RPM
RZ28M-VA/VW	2.1 GB, 3.5-inch, half-height disk drive, 5400 RPM
RZ28D-VA/VW	2.1 GB, 3.5-inch, half-height disk drive, 7200 RPM
RZ29B-VA/VW	2.1 GB, 3.5-inch, half-height disk drive, 7200 RPM
TLZ09-VA	8.0 GB, 3.5-inch, half-height 4-mm DAT drive
TLZ7L-VA	32 GB 5.25-inch full-height 4 mm DAT tape loader in StorageWorks carrier
TZK11-VA	2.0 GB 5.25-inch QIC tape in StorageWorks carrier
TZ88N-VA	20/40 GB SCSI tape drive in StorageWorks carrier

Step 3—Memory

- Model 88 and 98 with 64 MB memory include one PB7MA-CC memory option, select one additional 64 MB memory option (PB7MA-CC) for system total of 128 MB.
- Model 98 with 128 MB memory include one PB7MA-CD memory option, adding an additional memory option is not currently supported

PB7MA-CC 64 MB SIMM memory for Models 88 and 98

PB7MA-CD* 128 MB SIMM memory for Models 88 and 98

1. Support for adding a PB7MA-CD is not currently supported

Memory Configuration Chart

Required Memory	Model 88 and 96 (64 MB systems)	Models 96 (128 MB systems)
64 MB	1 x PB7MA-CC	N/A
128 MB	2 x PB7MA-CC	1 x PB7MA-CD
192 MB	1 x PB7MA-CC and 1 x PB7MA-CD[1]	1 x PB7MA-CC and 1 x PB7MA-CD[1]
256 MB	2 x PB7MA-CD[2]	2 x PB7MA-CD[1]

1. Support for 192 MB and 256 MB memory is not currently supported
2. Systems with 64 MB memory can only be expanded to 256 by removing installed 64 MB memory option and installing two 128 MB memory options

Step 4—Networks and Communications

- Systems support one asynchronous and one synchronous communication option
- An 8-line DEC-423 to 16-line DEC-423 upgrade option is available for the MicroVAX 3100 Models 40/85/96, see *Network Products Guide* for more information.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.

Asynchronous Multiplexer Options

Select **one** asynchronous multiplexer for communications expansion

DHW42-CB Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two external 50-pin to 4-way 25-pin BC29J-06 1.8-m (6-ft) cables; factory or field installed.

DHW42-BB Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, two external 36-pin BC16C-10 3-m (10-ft) cables, and two H3104-00 eight-line distribution harmonica; factory or field installed.

Note: Addition of DHW42 xB options increases number of users; an OpenVMS license upgrade may be required.

Synchronous Communications Options

- Select **one** synchronous option
- EIA-232/V.24 cable (BC19D-02) is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection
- Synchronous communication option requires VAX WAN Device Driver V1.2 or higher required. VAX WAN Device Driver media included in OpenVMS Consolidated Software Disk CD-ROM media. See Step 8 for details.

DSW43-AA EIA-232 synchronous controller provides two lines). Includes synchronous logic module, I/O assembly, and external EIA-232 0.6-m (2-ft) adapter cable

BC19B-02 EIA-422/V.11 0.6-m (2-ft) adapter cable

BC19E-02 EIA-423/V.10 0.6-m (2-ft) adapter cable

Step 4—Networks and Communications *(continued)*

LAN Communications Controller

802.3/Ethernet Interface (ThinWire/Thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x).

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M cable)or a thick wire 15-pin AUI transceiver cable is required (e.g., BNE3x). Software media and documentation and cables are also required. See Network Products Guide.

DECserver 90M, 90TL, 900TM, 90L+, 700, and MUXserver 90, 320, 380 Communications and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 90, 250, DECbrouter 90; and DECnis 500, 600 MultiProtocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

InfoServer 1000 Network Storage Server

To provide initial system load (ISL) capabilities order InfoServer Local Area Compact Disk. Other configurations are offered for tape/backup and for serving more CD-ROMs. InfoServer systems support CD-ROM, hard drives, magneto-optical and tape drives. InfoServer 1000 systems can serve up to seven SCSI devices. See *Storage Devices* for ordering information.

Network Connectivity Products

See the *Network Products Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT520) for each system unless otherwise available. If logging is required, a combination of video terminal and LAxx is recommended.

Step 6—Terminals and Printers

Select terminals and serial printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided.

Step 7—CPU Upgrades

Note: A non-return charge will be assessed if old CPU board is not returned to Digital

Order Number	From	To	Includes
49JAC-AA	MicroVAX 3100 Model 88	MicroVAX 3100 Model 98	MicroVAX 3100 Model 98 Server CPU **OpenVMS** base license

Step 8—Software

Licenses required to support additional users beyond those included in base systems.

Operating System support requires V5.5-2H4, V6.2 or higher

Software Processor Code = B
Clusterwide License Rating = 20 (C)

OpenVMS VAX Concurrent Use Licenses

OpenVMS VAX Concurrent Use licenses are for customers running **OpenVMS VAX V6.2 or greater.**

OpenVMS VAX Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one OpenVMS system to another OpenVMS system at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-XULA5-AA	OpenVMS VAX Traditional unlimited user license

OpenVMS VAX Interactive User Licenses

OpenVMS VAX Interactive User licenses are for customers running **OpenVMS VAX V5.5 or greater**. OpenVMS VAX Interactive User licenses **are** specific to a single system and **cannot** be shared across an OpenVMS Cluster.

QL-XULA9-BB	OpenVMS VAX Interactive 1-user license
QL-XULA9-BC	OpenVMS VAX Interactive 2-user license
QL-XULA9-BD	OpenVMS VAX Interactive 4-user license
QL-XULA9-BE	OpenVMS VAX Interactive 8-user license
QL-XULA9-BF	OpenVMS VAX Interactive 16-user license
QL-XULA9-BG	OpenVMS VAX Interactive 32-user license
QL-XULA9-BH	OpenVMS VAX Interactive 64-user license
QL-XULAA-BR	OpenVMS VAX Interactive 128-user license
QL-XULAB-BR	OpenVMS VAX Interactive 256-user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User licenses are for customers running **OpenVMS VAX Version 6.0 or greater.** OpenVMS VAX Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS VAX Distributed Interactive User licenses can also be shared across an entire OpenVMS Cluster running OpenVMS VAX V6.0 or greater.

Note: OpenVMS VAX Distributed Interactive User licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS VAX and OpenVMS Alpha systems).

QL-09SA9-BB	OpenVMS VAX Distributed Interactive 1-user license
QL-09SA9-BC	OpenVMS VAX Distributed Interactive 2-user license
QL-09SA9-BD	OpenVMS VAX Distributed Interactive 4-user license
QL-09SA9-BE	OpenVMS VAX Distributed Interactive 8-user license

Step 8—Software *(continued)*

OpenVMS VAX Distributed Interactive User Licenses

QL-09SA9-BF OpenVMS VAX Distributed Interactive 16-user license
QL-09SA9-BG OpenVMS VAX Distributed Interactive 32-user license
QL-09SA9-BH OpenVMS VAX Distributed Interactive 64-user license
QL-09SAA-BR OpenVMS VAX Distributed Interactive 128-user license
QL-09SAB-BR OpenVMS VAX Distributed Interactive 256-user license

QL-VBRAP-AA VAXcluster license for multiuser systems

OpenVMS VAX Media and Documentation

Choose operating system media and documentation. Recommended for first system on site. Operating System support for Model 40 requires V5.5 or higher; Model 85 and 96 require V5.5-2H4 or higher.

QA-001AA-Hx OpenVMS media with extended documentation.
QA-09SAA-Hx OpenVMS media with base documentation.

Note: x denotes the media type: 5 = TK50, 8 = CD-ROM

OpenVMS Consolidated Software Media and Documentation

Choose as an alternative to the above OpenVMS kits. Requires RRD43 CD-ROM.

QA-VWJ8A-A8 OpenVMS and layered product binaries on CD-ROM without hardcopy documentation.
QA-VYR8A-G8 OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader.

QA-GXXAB-Hx POSIX media and documentation (without IEEE documentation)

Digital NAS Base Server 200

Digital NAS packaged products do not include hardcopy documentation, (documentation is CD-ROM only).

QL-MC1AB-AA Digital NAS Base Server 200 license for OpenVMS VAX systems
QA-MC1AA-Hx Digital NAS Base Server 200 media and documentation kit

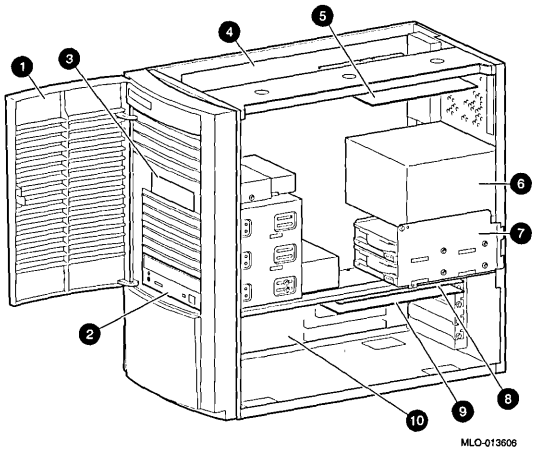
Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 9—Power Cords

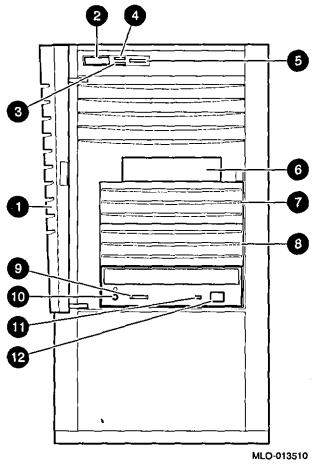
BN19P-2E power cord is included with North American systems. Select country specific power cord for 240 V use.

Order Number	Country/Voltage	Amps	Plug	Meters (Feet)
BN19P-2E	U.S./Japan 125 V	10	NEMA 5-15	1.9 (6.2)
BN19H-2E	Australia/New Zealand 125 V	10	AS 3112-1981	2.5 (8.2)
BN19C-2E	Central Europe, 250 V	10	CEE 7/7 (Schuko)	2.5 (8.2)
BN19A-2E	U.K./Ireland, 250 V	10	BS 1363	2.5 (8.2)
BN19E-2E	Switzerland, 250 V	10	SEV 1011	2.5 (8.2)
BN19K-2E	Denmark, 250 V	10	Afsnit 107	2.5 (8.2)
BN24X-2E	Italy, 250 V	10	CEI 23-16 / VII	2.5 (8.2)
BN19S-2E	India/South Africa, 250 V	10	BS 546	2.5 (8.2)
BN18L-2E	Israel, 250 V	10	SI 32	2.5 (8.2)

Model 88 and 98 System Diagram

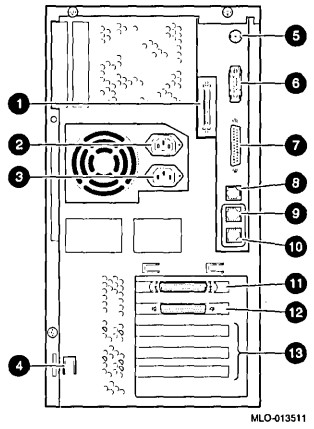


1 Front Door
2 CD-ROM
3 System Disk Drive
4 System board
5 SIMM board (required)
6 SIMM board (optional)
7 Power Supply
8 Rear drive bay
9 DHW42 Asynchronous option
10 DSW43 synchronous option



1 Front door
2 Power switch
3 Disk drive LED
4 Power LED
5 Halt switch; halts system and returns it from operating system to console mode
6 RZ2x SCSI disk (non-accessible)
7 Accessible/non-accessible bay for 3.5" or 5.25" device
8 Accessible/non-accessible bay for 3.5" or 5.25" device
9 CD-ROM volume switch
10 CD-ROM headphone jack
11 CD-ROM activity light
12 CD-ROM eject button

Model 88 and 98 System Diagram

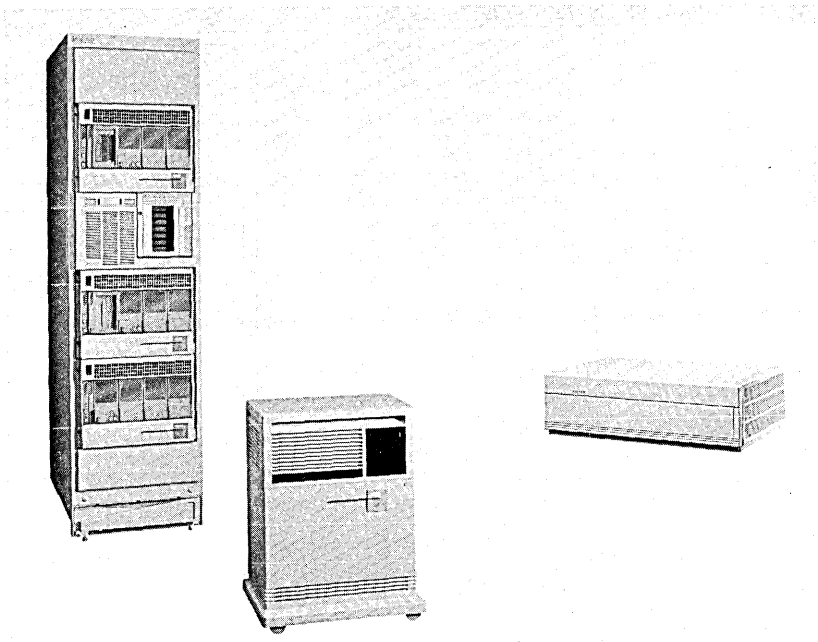


1 SCSI port (terminated required)
2 2A AC power outlet connection
3 AC power input connector
4 Pre-installed software label
5 System identification label
6 Lockdown hasp
7 ThinWire Ethernet
8 ThinWire Ethernet LED
9 Tick wire Ethernet
10 Tick wire Ethernet LED
11 Modem port (with adapter)
12 MMJ port (for console only)
13 MMJ port
14 MMJ port
15 DHW42 Asynchronous communication (optional)
16 DSW43 Synchronous communication (optional)
17 KZDDA SCSI port (optional)

Specifications

Physical Characteristics	**Models 88, 89**
Height	40.64 cm (16.0 inches)
Width	22.1 cm (8.7 inches)
Depth	47.5 cm (18.7 inches)
Weight	16.0 kg (35.0 lb)
Power Requirements	
Nominal voltage	120/240 Vrms
Power source phasing	Single
Nominal frequency	50–60 Hz
Voltage range	88–132 Vrms 176–264 Vrms
Line frequency tolerance	47–63 Hz
Typical running current	2.3/1.3 A
Typical power consumption (Watts)	170W
Standard Communication	
Minimum MMJ lines	3 DEC-423
Modem lines	1 EIA-232
Synchronous lines	Thick wire and ThinWire supported on all models
Communications Options[1]	
MMJ lines	16 DEC-423
Modem lines	8 EIA-232
Synchronous lines	2 synchronous
Operating Environment	Temperature (sea level) 10-40°C (50-90°F) Relative humidity 10%–80% noncondensing; 20% to 80% if tape drive is present. Maximum operating altitude 3.5 km (10,000 ft)

1 DEC-423, EIA-232 and synchronous lines can be ordered separately. The DEC-423 and EIA-232 options cannot be configured together in the same system.



VAX 4000

Product Description

VAX 4000 systems provide commercial systems performance, high availability, and a compact footprint. They support a wide range of applications and options, including FDDI networks and Q-bus peripherals. System enclosure supports internal storage and Q-bus expansion through a B400X expansion cabinet. VAX 4000 systems come in three packages: Desktop Model 106A, Desktop/Deskside Model 108, and Pedestal/Deskside Model 505A/705A

DSSI and Ethernet adapter chips—each driven by a 10-MIP on-chip RISC processor—are tightly integrated on the CPU module with direct access to memory. Digital's DSSI to SCSI HSD10 storage solutions replace DSSI RF36 disk technology in all VAX 4000 systems. Digital's HSD10 DSSI-to-SCSI controller. mounted internally in system cabinet, supports standard RZxx SCSI storage on VAX 4000 systems while still supporting DSSI clustering. External StorageWorks HSD10 controllers are supported.

VAX 4000 Model 106A offers performance of 10-ns NVAX chip. Systems achieve 215 transactions per second (TPS). With internal support for the HSD10, DSSI-to-SCSI controller, VAX 4000 customers can take advantage of low-cost, more flexible and open StorageWorks solutions.

VAX 4000 Model 108 offers identical functionality to the Model 106A in a new Desktop/Deskside minitower platform. In addition, these systems offer enchancements in the memory and storage capacity, supporting up to 256 MB of standard SIMM memory and six storage devices in the system enclosure

VAX 4000 Model 505A and 705A offer 12 ns and 9 ns performance, respectively in a Q-bus Pedestal package. Systems achieve 200 and 280 transactions per second (TPS) with the NVAX CPU chip.

A DSSI OpenVMS cluster system provides high data and system availability by joining Q-bus VAX 4000, VAX 6000, and VAX 7000 systems via DSSI. Each system can access and share all disks attached to the DSSI buses; this provides multiple paths to the data. Should one system in a DSSI OpenVMS cluster configuration fail, data is available to serve systems via the other paths, and all I/O operations can resume immediately. No application rewrite is required across high-availability options, and systems can be expanded without disruption to existing operations.

VAX 4000 Comparison Chart

	Model 106A (BA42B)	Model 108 (MiniTower)	Model 505A (BA440)	Model 705A (BA440)
Minimum version of OpenVMS	5.5-2H4	5.5-2H4	5.5-2H4	5.5-2H4
Performance (TPS)	215e	215e	200e	280e
Maximum memory	128 MB	256 MB[1]	512 MB	512 MB
Maximum Internal Storage	8.4 GB	19.2 GB	25.2 GB	25.2 GB
Maximum External Storage	327.6 GB	335.4 GB	680.5 GB	680.5 GB
Maximum disk I/O throughput per embedded DSSI bus	1200 I/Os per second 2 standard	1200 I/Os per second 2 standard	1200 I/Os per second 2 standard 2 optional	1200 I/Os per second 2 standard 2 optional
Q-bus slots available	In separate cabinet/enclosure (B400X-B9)	In separate cabinet/enclosure (B400X-B9)	5 HSD10-Jx controller takes up slots 6 & 7-power only)	5 HSD10-Jx controller takes up slots 6 & 7-power only)
Maximum possible Q-bus slots (with B400X expansion cabinet)	11	11	15	15
Maximum Tape Configurations	**Internal/External**	**Internal/External**	**Internal/External**	**Internal/External**
TLZ09	1 / 2[2]	2 / 2[2]	1 / 2[2]	1 / 2[2]
TZK11	1 / 2[2]	2 / 2[2]	1 / 2[2]	1 / 2[2]
TZK20	1 / 2[2]	2 / 2[2]	0 / 2[2]	0 / 2[2]
TZ88N-TA	0 / 2[2]	0 / 2[2]	0 / 2[2]	0 / 2[2]

1 256 and 192 MB not currently available

2 Tabletop maximum of two tapes per SCSI bus

Tape and CD-ROM drives that can be used as bood[1] and load[2] devices

Device	Model 106A	Model 108	Model 505A	Model 705A
InfoServer 150[3]	Load	Load	Load	Load
RRD45	Boot/load	Boot/load	Boot/load	Boot/load
TLZ09	Boot	Boot	Boot	Boot
TZK11	Boot	Boot	N/A	N/A
TZK20	Boot	Boot	Boot	Boot
TZ88	Boot	Boot	Boot	Boot

1. A "boot" device is defined as a device that is supported by both the hardware system's VMB bootstrap facility (console level "BOOT" command) and the OpenVMS operating system STABACKIT utility.
2. A "load" device is defined as a device that supports the media on which Digital distributes software.
3. Attaches directly to the network for simultaneous shared access. OpenVMS V5.5-2H4 supports Initial System Software Load (ISL) for MicroVAX 3xxx, VAX 4000, and VAX 6000 systems.

VAX 4000 Model 108 Systems

Step 1—Model 108 Systems

- VAX 4000 Model 108 systems require OpenVMS V5.5-2H4, V6.1, or higher. To operate systems in an existing cluster environment, the cluster system disk must be updated.
- Systems include factory-installed software* (OpenVMS V6.2). Media and documentation is recommended for the first system on site. Media and documentation for OpenVMS V 5.5-2H4 is included with each system for customers who need to load and run OpenVMS V5.5-2H4.
- Systems include HSD10-EN DSSI-SCSI controller with RZ28 2.1 GB SCSI disk, and RRD45 CD-ROM drive.
- Systems include 120 V power cord (220 V/240 V devices require a country-specific power cord; see Step 8)
- Select OpenVMS user licenses if required from Step 8.

* FIS is not a substitute for software media and documentation; see Step 7

ADVANTAGE SERVERS include

- Minitower enclosure with CPU/FPU
- DSSI-SCSI controller (HSD10-EB)
- DSSI single to Dual Attach Tri-Link
- Synchronous SCSI inteface for connecting internal and external SCSI devices; external connection via 50-pin high density external SCSI connector
- Six Storage bays
- Two Memory slots
- Q-bus port
- 802.3 Ethernet Interface (ThinWire/Thick wire) with terminators
- Ethernet kit includes ThinWire T-connector with BNC terminators and 15-pin Thick wire
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- EIA-232 asynchronous serial line with modem control (25-pin D-subminiature connector)
- H8575-A 25-pin-to-MMJ DEC-423-to-EIA-232 adapter
- 7.6-meter (25-foot) console terminal cable
- 120 V power cord (country specific power cord required for 240 V use)
- 64 MB or 128 MB SIMM memory
- One 2.1 GB disk (uses one 3.5" SCSI bay)
- One 600 MB CD-ROM drive (uses one 5.25" removable media bay)
- OpenVMS base license
- Digital NAS Base Server 200 software license
- Hardware Documentation EK-VX108-UI
- Three-year hardware product warranty
- 90-day software warranty

VAX 4000 Model 108 Advantage Servers

Order Number	Memory	Controllers	Digital NAS	Disk Drive	CD-ROM
DV-418CC-E9	64 MB	Single-DSSI DSSI-SCSI Controller	Base Server 200	2.1 GB FIS*	RRD45 (600 MB)
DV-418CC-F9	129 MB	Single-DSSI DSSI-SCSI Controller	Base Server 200	2.1 GB FIS*	RRD45 (600 MB)

Step 2—Memory

- Systems with 64 MB memory include one PB7MA-CC memory option, select one additional 64 MB memory option (PB7MA-CC) for system total of 128 MB.
- Systems with 128 MB memory include one PB7MA-CD memory option, adding an additional memory option is not currently supported

PB7MA-CC 64 MB SIMM memory for Model 108

PB7MA-CD* 128 MB SIMM memory for Model 108

1. Support for adding a PB7MA-CD is not currently supported

Step 2—Memory *(continued)*

Memory Configuration Chart

Required Memory	Model 108 (64 MB systems)	Models 108 (128 MB systems)
64 MB	1 x PB7MA-CC	N/A
128 MB	2 x PB7MA-CC	1 x PB7MA-CD
192 MB	1 x PB7MA-CC and 1 x PB7MA-CD[1]	1 x PB7MA-CC and 1 x PB7MA-CD[1]
256 MB	2 x PB7MA-CD[2]	2 x PB7MA-CD[1]

1. Support for 192 MB and 256 MB memory is not currently supported
2. Systems with 64 MB memory can only be expanded to 256 MB by removing installed 64 MB memory option and installing two 128 MB memory options.

Step 3—Storage

- Single systems support:
  - Seven DSSI device IDs per DSSI node (controller), when the embedded HSD10 controller uses one device ID on the first DSSI bus.
  - Two-system DSSI VMScluster configurations that support six DSSI nodes (controllers), where each node uses one of the eight available nodes, and can be connected between any pair of DSSI adapters (one controller in each system).

Step 3a—Storage Controller

- One KFDDA-BB Single DSSI-SCSI controller included in system, one additional KFDDA-BB supported per system.
- Four Q-bus storage adapters (two KZQSA and two KFQSA) are supported per system in B400X Q-bus enclosure.
- One HSD10-JA/JF supported per B400X Q-bus enclosure.

KFDDA-BB Single-DSSI-SCSI controller for VAX 4000 Model 108

KZQSA-SA/SF Q-bus-to-SCSI adapter. Uses one Q-bus slot in BA400x enclosure. Supports two SCSI devices (tape and CD-ROM) in tabletop enclosure. Factory/Field installed.

KFQSA-SE/SG Q-bus-to-DSSI adapter. Uses one Q-bus slot in BA400x enclosure, includes 25-foot BC21M-25 cable. Factory/Field installed.

Step 3b—Internal Storage

- System supports maximum of six internal devices in any of the following combinations:
  - Six RZ26 or RZ28 half-height disk drives, or
  - Five RZ26 or RZ28 disk drives and one removable media device
  - Three RZ26 or RZ28 half-height disk drives and three removable media devices
  - Maximum of three RZ29B disk drives supported, must be installed in removable media device bays
- RZ28B drive in Advantage Servers include Factory Installed Software (FIS)
- Order a load device (TLZ09) if necessary
- OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- HSD10-EB is configured on KFDDA-BB DSSI bus 0 and supports up to 6 RZ2x internal disks and up to seven RZ2x disks when the external HSD10 SCSI port is used. SCSI bus is terminated on the HSD10 controller side and requires a terminator on the far end of the SCSI bus. One HSD10 supported per system enclosure.
- Internal removable media devices are configured on the internal on-board SCSI bus.

Removable Media Devices for Model 108

RRD45-AB 600 MB 4X CD-ROM drive

TLZ09-LK 8.0 GB 4 mm DAT drive

TZK11-LG 2.1 GB cartridge QIC tape drive

TZK20-LK 2.3 GB 300 Kbs SCSI QIC tape drive

Step 3b—Internal Storage

SCSI Disk Drives

RZ26N-EB	1.0 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28M-EB	2.1 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28D-EB	2.1 GB 3.5" x 1" SCSI disk drive 7200 RPM
RZ29B-EB	4.3 GB 3.5" x 1.6" SCSI disk drive 7200 RPM

Step 3c—External Storage

Use the following table to calculate external SCSI bus length.

Maximum SCSI Bus Length	Model 108
On-board internal	1.2 m (47.2 inches)
On-board external	4.8 m (189.0 inches)
HSD10 SCSI internal	1.2 m (47.2 inches)
HSD10 SCSI external	4.8 m (189.0 inches)

DSSI External Expansion

- StorageWorks Deskside Expansion Units (BA356) support HSD10-AA for DSSI expansion
- One Q-bus expansion cabinet (B400X) supported per system
- One TKxx tape drive supported in B400X expansion cabinet
- Two TZxx/TLZxx tape drives supported per DSSI bus
- One HSD10-Jx DSSI-SCSI controller per BA400X expansion cabinet

StorageWorks HSD10 Array Controller

- StorageWorks BA356 supports HSD10 DSSI-SCSI array controller and up to seven SCSI devices

HSD10-AA	StorageWorks HSD10 DSSI-SCSI Array controller with 8 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.
HSD10-AD	StorageWorks HSD10 DSSI-SCSI Array controller with 16 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.
HSD10-AF	StorageWorks HSD10 DSSI-SCSI Array controller with 32 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.

B400X Expansion Cabinet

- B400X includes Q-bus extender modules and two 9-foot (2.7 m) cables
- 9-foot (2.7 m) BC21M-09 DSSI cable
- 6-foot (1.8 m) BC06P-06 KZQSA cable
- 10-foot (3.0 m) BC09F-10 power control cable, Universal power supply, and 120 V power cord

B400X-B9	Q-bus Expansion Cabinet provides eleven additional Q-bus slots and supports: One TKxx, TLZxx, or TZxx tape drive One HSD10-Jx controller and four RZ28x-AA/RZ29B-AA disk drives One HSD10-Jx controller and three RZ282-AA/RZ292-AA disk drives and one RZ28M-xx/RZ29B-AA disk drive in any combination of RZ28M-AA and RZ282-AA, not to exceed 7 drives per HSD10-JA.

SCSI Storage Devices for B400X

RRD45-JA	600 MB 4X CD-ROM drive, requires KZQSA Q-bus-to-SCSI controller or HSD10-JA DSSI-SCSI controller

Step 3c—External Storage *(continued)*

SCSI External Storage

- System supports seven SCSI devices per system on HSD10 DSSI-SCSI controller, up to 6 internal, and up to 7 on external HSD10 SCSI port.
- System supports seven SCSI devices per system on the on-board SCSI controller, up to 5 internal, and up to 7 on external SCSI port.
- Maximum SCSI bus length, internal and external, is 236-inches (6 meters), see SCSI cable chart

StorageWorks Expansion Units

- StorageWorks BA356 supports HSD10 DSSI-SCSI array controller and up to seven SCSI devices

BA356-SC[1]	StorageWorks 16-bit shelf includes dual speed blowers. Supports maximum of seven 3.5" devices 8 or 16-bit), requires BA35X-MG 8-bit I/O module, and BN21H-xx SCSI cable
BA362-AA/AB	Office expansion unit, supports up to two 3.5" modular storage devices, requires BN31V-01 3.2 feet (1.0 m) SCSI cable
BA364-AA/AB	Office expansion unit, supports up to four 3.5" modular storage devices and one fixed CD-ROM, requires BN31V-01 3.2 feet (1.0 m) SCSI cable

1. One BA356 expansion unit is supported per single ended SCSI bus; no other external device can be connected to system with BA356 unit.

SCSI devices supported in StorageWorks Expansion Units

RZ26N-VA/VW	1.0 GB 3.5" x 1" half-height disk drive, 5400 RPM
RZ28M-VA/VW	2.1 GB 3.5" x 1" half-height disk drive, 5400 RPM
RZ28D-VA/VW	2.1 GB 3.5" x 1" half-height disk drive, 7200 RPM
RZ29B-VA/VW	2.1 GB 3.5" x 1.6" half-height disk drive, 7200 RPM
TLZ09-VA	8.0 GB 3.5" half-height 4-mm DAT drive
TZ88N-VA	20/40 GB SCSI tape drive in StorageWorks carrier

External SCSI devices

RRD45-FA/DG*	600 MB 4X CD-ROM tabletop drive, requires BC06P-06 1.8 meter (6 foot) SCSI cable, 120 V/240 V
TZ88N-TA	20/40 GB SCSI tabletop tape drive
TZ887-NT	280 GB SCSI tabletop 7 cartridge loader tape subsystem
BC09D-03	TZ8x cable, 3 foot (0.9 m)
BC09D-06	TZ8x cable, 6 ft (1.8 m)
BC09D-09	TZ8x cable, 9 ft (2.7 m)

* -FA variant includes 120 V power cord, order country specific power cord for DG variant

Step 4—Networks and Communications

Systems support one asynchronous and one synchronous communication option. Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.

Asynchronous Multiplexer Options

Select **one** asynchronous multiplexer for communications expansion

DHW42-CB	Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two external 50-pin to 4-way 25-pin BC29J-06 1.8-m (6-ft) cables; factory or field installed.
DHW42-BB	Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, two external 36-pin BC16C-10 3-m (10-ft) cables, and two H3104-00 eight-line distribution harmonica; factory or field installed.

Note: Addition of DHW42 xB options increases number of users; an OpenVMS license upgrade may be required.

Step 4—Networks and Communications *(continued)*

Synchronous Communications Options

- Select **one** synchronous option
- EIA-232/V.24 cable (BC19D-02) is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection
- VAX WAN Device Driver included in OpenVMS layered products CD-ROM media. VAX WAN Device Drive V1.2 or higher is required.

DSW43-AA	EIA-232 synchronous controller provides two lines). Includes synchronous logic module, I/O assembly, and external EIA-232 0.6-m (2-foot) adapter cable
BC19B-02	EIA-422/V.11 0.6-m (2-foot) adapter cable
BC19E-02	EIA-423/V.10 0.6-m (2-foot) adapter cable

802.3/Ethernet Communications Controller

802.3/Ethernet Interface (ThinWire/Thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x).

VAX 4000 Model 108 systems require a B400X Q-bus expansion cabinet before adding any of the following options

FDDI Communications Controller

DEFQA-SA/SF	DEC FDDIcontroller/Q-bus SAS (single attachment station) FDDI Controller. Uses one Q-bus slot. Model 105A systems running OpenVMS V5.5-2H4 require DEC LAN Device drive kit for OpenVMS VAX V.1.0. DEC LAN device driver included in OpenVMS V6.1. Factory/field installed.
DEFQA-DA/DF	DEC FDDIcontroller/Q-bus DAS (dual attachment station) FDDI Controller. Uses one Q-bus slot. Model 105A systems running OpenVMS V5.5-2H4 require DEC LAN device driver kit for OpenVMS VAX V1.0. DEC LAN device driver included in OpenVMS V6.1. Factory/field installed.

Both options use the ANSI standard MIC (media interface connector) and support multimode fiber (MMF) up to distances of 2 kilometers between stations. Options require one Q-bus slot (maximum two per system) and a DEC LAN device driver kit.

QA-0PAAA-H5	DEC LAN device driver kit for DEFQA on TK50
QA-0PAAA-HM	DEC LAN device driver kit for DEFQA on 9-track 1600-bit/inch magtape

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M cable)or a thick wire 15-pin AUI transceiver cable is required (e.g., BNE3x). Software media and documentation and cables are also required. See Network Products Guide.

InfoServer 1000 Network Storage Server

To provide initial system load (ISL) capabilities order InfoServer Local Area Compact Disk. Other configurations are offered for tape/backup and for serving more CD-ROMs. InfoServer systems support CD-ROM, hard drives, magneto-optical and tape drives. InfoServer 1000 systems can serve up to seven SCSI devices. See *Storage Devices* for ordering information.

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT520) for each system unless otherwise available. Note: One console terminal required per configuration. VT330, VT340, VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and serial printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided.

Step 7—Software

Licenses required to support additional users beyond those included in base systems.

Operating System support requires V5.5-2H4, V6.2 or higher

Software Processor Code = S
Clusterwide License Rating = 100 (E)

OpenVMS VAX Interactive User Licenses

OpenVMS VAX Interactive User licenses are for customers running **OpenVMS VAX V5.5 or greater**. OpenVMS VAX Interactive User licenses **are** specific to a single system and **cannot** be shared across an OpenVMS Cluster.

QL-XULA9-BB	OpenVMS VAX Interactive 1-user license
QL-XULA9-BC	OpenVMS VAX Interactive 2-user license
QL-XULA9-BD	OpenVMS VAX Interactive 4-user license
QL-XULA9-BE	OpenVMS VAX Interactive 8-user license
QL-XULA9-BF	OpenVMS VAX Interactive 16-user license
QL-XULA9-BG	OpenVMS VAX Interactive 32-user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User licenses are for customers running **OpenVMS VAX Version 6.0 or greater.** OpenVMS VAX Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS VAX Distributed Interactive User licenses can also be shared across an entire OpenVMS Cluster running OpenVMS VAX V6.0 or greater.

Note: OpenVMS VAX Distributed Interactive User licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS VAX and OpenVMS Alpha systems).

QL-09SA9-BB	OpenVMS VAX Distributed Interactive 1-user license
QL-09SA9-BC	OpenVMS VAX Distributed Interactive 2-user license
QL-09SA9-BD	OpenVMS VAX Distributed Interactive 4-user license
QL-09SA9-BE	OpenVMS VAX Distributed Interactive 8-user license
QL-09SA9-BF	OpenVMS VAX Distributed Interactive 16-user license
QL-09SA9-BG	OpenVMS VAX Distributed Interactive 32-user license
QL-09SA9-BH	OpenVMS VAX Distributed Interactive 64-user license
QL-09SAA-BR	OpenVMS VAX Distributed Interactive 128-user license
QL-09SAB-BR	OpenVMS VAX Distributed Interactive 256-user license

OpenVMS Consolidated Software Media (CD-ROM) and Documentation—requires CD-ROM reader

Systems include OpenVMS V6.2 base license; order media and documentation separately for OpenVMS V6.2. Systems also include OpenVMS V5.5-2H4 media and documentation

QA-VWJ8A-A8	OpenVMS layered product binaries on CD-ROM without hardcopy documentation.
QA-VYR8A-G8	OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader.
QA-A93AA-Hx*	PATHWORKS for OpenVMS media and documentation
QA-GXXAB-Hx*	POSIX media and documentation (without IEEE documentation)

* x denotes media type: 8=CD0ROM, 5=TK50, M=magtape

Step 7—Software *(continued)*

Digital NAS Base Server 200

Advantage Servers include Digital NAS Base Server 200 license, order media and documentation separately.

QA-MC1AA-Hx* Digital NAS Base Server 200 media and documentation kit

* x denotes media type: 8=CD-ROM, 5=TK50, M=magtape

Step 7—Power Cords

- Select power cord for 220/240 V use
- BN19P-2E power cord is included with North American systems. Select country specific power cord for 240 V use

Power Cords for VAX 4000 Model 108 systems

Order Number	Country/Voltage	Amps	Plug	Meters (Feet)
BN19P-2E	U.S./Japan 125 V	10	NEMA 5-15	1.9 (6.2)
BN19H-2E	Australia/New Zealand 125 V	10	AS 3112-1981	2.5 (8.2)
BN19C-2E	Central Europe, 250 V	10	CEE 7/7 (Schuko)	2.5 (8.2)
BN19A-2E	U.K./Ireland, 250 V	10	BS 1363	2.5 (8.2)
BN19E-2E	Switzerland, 250 V	10	SEV 1011	2.5 (8.2)
BN19K-2E	Denmark, 250 V	10	Afsnit 107	2.5 (8.2)
BN24X-2E	Italy, 250 V	10	CEI 23-16 / VII	2.5 (8.2)
BN19S-2E	India/South Africa, 250 V	10	BS 546	2.5 (8.2)
BN18L-2E	Israel, 250 V	10	SI 32	2.5 (8.2)

Power Cords for B400X and R400X Expansion Pedestals

BN20B-2E	U.S., Canada, Japan
BN22C-2E	Australia, New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K., Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 8—Diagnostics and Documentation

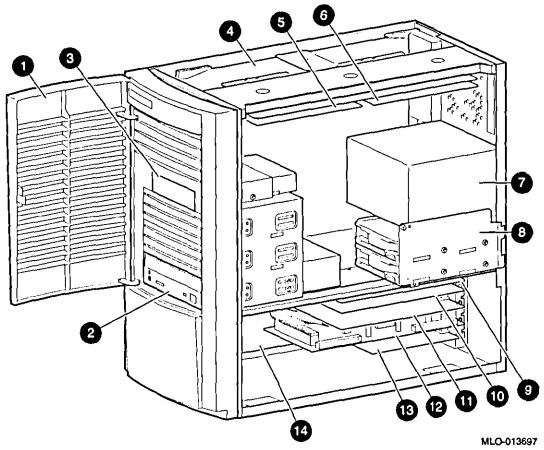
Select optional diagnostics and documentation.

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

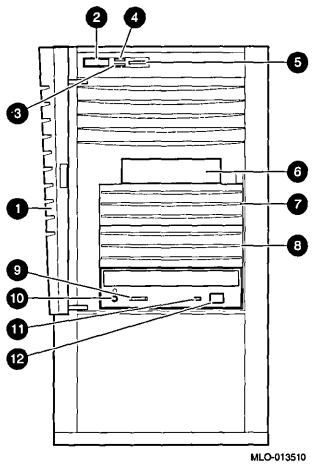
Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation

VAX 4000 Model 108 System Diagram

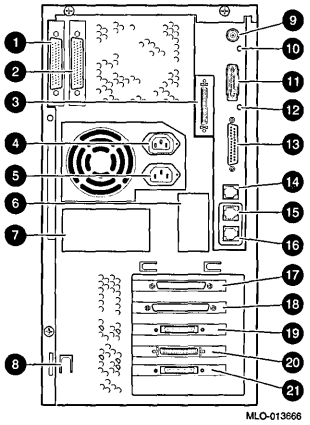


1 Front Door
2 CD-ROM
3 System Disk Drive
4 System board
5 SIMM board (required)
6 Power Supply
7 Rear drive bay
8 DHW42 Asynchronous option
9 DSW43 Synchronous option
10 KFDDA (optional)
11 HSD10 DSSI-SCSI adapter
12 KFDDA
13 CDAL I/O board
14 SIMM carrier



1 Front door
2 Power switch
3 Disk drive LED
4 Power LED
5 Halt switch; halts system and returns it from operating system to console mode
6 RZ2x SCSI disk (non-accessible)
7 Accessible/non-accessible bay for 3.5" or 5.25" device
8 Accessible/non-accessible bay for 3.5" or 5.25" device
9 CD-ROM volume switch
10 CD-ROM headphone jack
11 CD-ROM activity light
12 CD-ROM eject button

VAX 4000 Model 108 System Diagram



1 Qbus port
2 Qbus port
3 SCSI port (terminated when not in use)
4 Aux 2A AC power outlet
5 AC power input connector
6 Pre-installed software label
7 System identification label
8 Lockdown hasp
9 ThinWire Ethernet
10 ThinWire Ethernet LED
11 Tick wire Ethernet
12 Tick wire Ethernet LED
13 Modem port (MMJ adapter provided)
14 MMJ port (for console only)
15 MMJ port
16 MMJ port
17 DHW42 Asynchronous communication (optional)
18 DSW43 Synchronous communication (optional)
19 KFDDA DSSI port (optional)
20 HSD10 SCSI port
21 KFDDA port (TriLink adapter provided)

VAX 4000 Model 106A Systems

Step 1—Model 106A Systems

- VAX 4000 Model 106A systems require OpenVMS V5.5-2H4 or V6.2. To operate systems in an existing cluster environment, the cluster system disk must be updated.
- Systems include factory-installed software* (OpenVMS V6.2). Media and documentation is recommended for the first system on site. Media and documentation for OpenVMS V 5.5-2H4 is included with each system for customers who need to load and run OpenVMS V5.5-2H4.
- Systems includes HSD10-EN DSSI-SCSI Controller with RZ28 2.1 GB SCSI disk, and RRD45 CD-ROM drive.
- Systems include 120 V power cord (220 V/240 V devices require a country-specific power cord; see Step 9)
- Select OpenVMS user licenses if required from Step 8

*FIS is not a substitute for software media and documentation; see Step 8

ADVANTAGE SERVERS include

- CPU with dual DSSI controller, 802.3/Ethernet (ThinWire/thick wire) controller
- BA42B tabletop enclosure with:
  - Mounting slots for 1 HSD10 adapter and 2 SCSI disks
  - Synchronous SCSI controller
  - Two SCSI slots for removable media devices
  - Q-bus port
  - Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
  - Three DEC-423 asynchronous serial lines (MMJ data leads only)
  - H8575-A 25-pin-to-MMJ DEC-423-to-EIA-232 adapter
- 7.6-meter (25-foot) console terminal cable
- 64 MB memory (MS44-DC)
- HSD10-EN Adapter
- RZ28M-EN SCSI disk drive
- CD-ROM RRD45 drive
- OpenVMS base license
- Digital NAS Base Server 200 software license
- *DSSI VMScluster Installation and Troubleshooting Guide* (EK-410AB-MG), hardware documentation
- Three-year hardware warranty
- 90 day software warranty

VAX 4000 Model 106A Advantage Servers

Order Number	Memory	Controllers	Digital NAS	Disk Drive	CD-ROM
DV-416CC-E9	64 MB	Dual-DSSI DSSI-SCSI Controller	Base Server 200	2.1 GB FIS*	RRD45 (600 MB)

Step 2—Memory

Systems include 64 MB of memory. Select additional memory if required; 64 MB systems can be expanded to 80 or 128 MB.

MS44L-BC	16 MB of memory (4 x 4 MB DSIM modules)
MS44-DC	64 MB of memory (4 x 16 MB DSIM modules)

Step 3—Storage

Select storage devices if required. Field-installed options require Customer Services installation.

- Single systems support:
  - Seven ISEs per DSSI adapter, where the embedded HSD10 controller uses one of the ISEs on the first DSSI bus.
  - Two-system DSSI VMScluster configurations that support six DSSI nodes, where each node uses one of the eight available nodes, and can be connected between any pair of DSSI adapters (one adapter in each system).

Step 3a—Storage Controllers/Adapters

- Four Q-bus storage adapters (two KZQSA and two KFQSA) are supported per system in B400X enclosure
- One HSD10-JA/JF is supported per B400X enclosure
- HSD10 Field Upgrade Kit (HSD10-EK) includes controller and internal cabling

KFQSA-SE/SG	Q-bus-to-DSSI adapter. Uses one Q-bus slot (in B400X expansion pedestal); factory/field installed.
KZQSA-SA/SF	Q-bus-to-SCSI adapter. Uses one Q-bus slot (in B400X expansion pedestal). Supports two SCSI devices (tape and CD-ROM) in tabletop enclosure.
HSD10-EN/EK	DSSI-SCSI-2 controller embedded in BA42B enclosure, supports up to two SCSI devices; factory/field installed.
HSD10-JA/JF	DSSI-SCSI-2 controller embedded in BA440/BA430/B400X enclosure, supports up to seven SCSI devices; factory/field installed. Requires 2 Q-bus slots for power; no Q-bus load. One per enclosure.
HSD10-AA	DSSI-SCSI-2 controller for StorageWorks BA350 form factor, supports up to seven SCSI devices.

Step 3b—Internal Storage

- System enclosure supports up to two 3.5" disk devices on top tray and two 5.25-inch SCSI removable media devices on bottom tray.
- Two SCSI hard disk drives are supported in bottom native mode SCSI trays. A maximum of 3 hard SCSI disk drives are supported in BA42B enclosure due to power constraints; Note: A maximum of two hard SCSI disk drives are supported if RZ29B (3.5" x 1.6") disks are selected.
- HSD10-EN configured on DSSI bus 0 and will support up to 2 RZ28M-EN/EK on DSSI adapter internal to BA42B; one per system box. HSD10-EN/EK SCSI bus is terminated internal to the BA42B.

SCSI Removable Media Devices

RX26-EN	2.8 MB diskette drive
RRD45-EN	600 MB 4x CD-ROM drive
TLZ09-HF	8.0 GB DAT drive; factory/field installed
TZK11-HF	2.0 GB quarter-inch cartridge (QIC) tape drive; factory/field installed
TZK20-HF	2.3 GB 300 Kbs SCSI QIC tape drive

SCSI Disk Devices

RZ26N-EN	1.05 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28M-EN	2.1 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28D-EN	2.1 GB 3.5" x 1" SCSI disk drive 7200 RPM
RZ29B-EN	4.3 GB 3.5" x 1.6" SCSI disk drive 7200 RPM

Step 3c—DSSI External Expansion

- One Q-bus expansion pedestal (B400X) supported per CPU
- One TKxx tape drive supported in a B400X expansion pedestal
- Two TZxx/TLZxx/TZxx tape drives supported per DSSI bus
- One HSD10-Jx controller per B400X-B9 expansion box

B400X Expansion Pedestals include

- Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X only)
- 2.7-meter (9-foot) DSSI cable (BC21M-09)
- 1.8-meter (6-foot) KZQSA cable (BC06P-06)
- 3.0-meter (10-foot) power control cable (BC09F-10), Universal power supply, 120 V power cord

B400X-B9	Provides eleven additional Q-bus slots and supports: One TKxx, TLZXX, or, TZxx tape drive One HSD10-Jx controller and four RZ28x-AA/RZ29B-AA One HSD10-Jx controller and three RZ282-AA/RZ29B-aa disk drives and one RZ28M-xx/RZ29B-AA disk drive or any combination of RZ28M-AA and RZ282-AA, not to exceed 7 drives per HSD10-Jx.

Step 3c—DSSI External Expansion *(continued)*

SCSI Storage Devices for B400X

RRD45-JA 600 MB quad-speed CD-ROM drive. Requires Q-bus-to-SCSI controller (KZQSA-SA/SF) or DSSI-SCSI controller HSD05-JA

OpenVMS V6.2 supports standalone backup. Standalone backup is not supported on OpenVMS V5.5-2H4.

Step 3d—SCSI External Storage

Configuration Rules

- System supports seven SCSI devices per CPU on synchronous SCSI controller, 2 internal and 5 external in a BA356 StorageWorks enclosure. Maximum one BA356 per CPU due to cable restrictions.
- Select storage controller if additional external SCSI storage is required.
- Maximum SCSI bus length (internal and external) is 6 meters (236 inches). See SCSI cable chart for cable length information.
- BA3560 deskside expansion unit supports HSD10 DSSI-SCSI controller controllers and up to seven SCSI-2 devices
- See StorageWorks Section for qualified list of SCSI devices.

StorageWorks HSD10 Array Controller

- StorageWorks BA356 supports HSD10 DSSI-SCSI array controller and up to seven SCSI devices

HSD10-AA StorageWorks HSD10 DSSI-SCSI Array controller with 8 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.

HSD10-AD StorageWorks HSD10 DSSI-SCSI Array controller with 16 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.

HSD10-AF StorageWorks HSD10 DSSI-SCSI Array controller with 32 MB cache buffer, supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires BC29R-xx DSSI cable for VAX 4000 to HSD10 connection.

StorageWorks Expansion Units

- StorageWorks BA356 supports HSD10 DSSI-SCSI array controller and up to seven SCSI devices

BA356-SC[1] StorageWorks 16-bit shelf includes dual speed blowers. Supports maximum of seven 3.5" devices 8 or 16- bit), requires BA35X-MG 8-bit I/O module, and BN21H-xx SCSI cable

BA362-AA/AB Office expansion unit, supports up to two 3.5" modular storage devices, requires BN31V-01 3.2 feet (1.0 m) SCSI cable

BA364-AA/AB Office expansion unit, supports up to four 3.5" modular storage devices and one fixed CD-ROM, requires BN31V-01 3.2 feet (1.0 m) SCSI cable

1. One BA356 expansion unit is supported per single ended SCSI bus; no other external device can be connected to system with BA356 unit.

SCSI devices supported in StorageWorks Expansion Units

RZ26N-VA/VW 1.0 GB 3.5" x 1" disk drive 5400 RPM in StorageWorks carrier

RZ28M-VA/VW 2.1 GB 3.5" x 1" disk drive 5400 RPM in StorageWorks carrier

RZ28D-VA/VW 2.1 GB 3.5" x 1" disk drive 7200 RPM in StorageWorks carrier

RZ29B-VA/VW 2.1 GB 3.5" x 1.6" disk drive 7200 RPM in StorageWorks carrier

TLZ09-VA 8.0 GB 3.5" half-height 4-mm DAT drive in StorageWorks carrier

TZ88N-VA 20/40 GB SCSI tape drive in StorageWorks carrier

Step 3d—SCSI External Storage *(continued)*

External SCSI devices

RRD45-FA/DG*	600 MB 4X CD-ROM tabletop drive, requires BC06P-06 1.8 meter (6 foot) SCSI cable, 120 V/240 V
TZ88N-TA	20/40 GB SCSI tabletop tape drive
TZ887-NT	280 GB SCSI tabletop 7 cartridge loader tape subsystem
BC09D-03	TZ8x cable, 3 foot (0.9 m)
BC09D-06	TZ8x cable, 6 ft (1.8 m)
BC09D-09	TZ8x cable, 9 ft (2.7 m)

* -FA variant includes 120 V power cord, order country specific power cord for DG variant

SCSI Cable Chart

SCSI cabling recommendations. Maximum cable length must not exceed 4.3 m (174.4 in.) outside of system enclosure. The following devices include cables except TZ8x, which requires BC06P-xx cable.

Tabletop Enclosure	Internal Cable Length	External Cable Length
RRD45	0.35 m (14 in.)	1.0 m (36 in.)
TLZ09	0.32 m (12.6 in.)	0.91 m (36 in.)
TZ8x	0.32 m (12.6 in.)	0.91 m (36 in.)

Step 4—Networks and Communications

Select communications options as required. See *Network Products Guide* for more information.

- Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.
- Select one asynchronous multiplexer for communications expansion.

DHW42-AA	Provides eight DEC-423 lines for a system total of 12 asynchronous lines (11 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, external 36-pin 3-meter (10-foot) cable (BC16C-10), and H3104-00 eight-line distribution harmonica; factory or field installed.
DHW42-CA	Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two 1.8-meter (6-foot) external 50-pin to 4-way 25-pin (BC29J-06) cables; factory or field installed.
DHW42-BA	Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, two external 36-pin 3-meter (10-foot) cables (BC16C-10), and two H3104-00 eight-line distribution harmonica; factory or field installed.
DHW42-UP	Upgrades DHW42-AA to DHW42-BA; field installed only.

Synchronous Communications Option

- Select one synchronous option
- EIA-232 synchronous cable (BC19D-02 is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection)

DSW42-AA	EIA-232 synchronous controller—provides two lines. Includes synchronous logic module, I/O assembly, and external 0.6-meter (2-foot) EIA-232 adapter cable.
BC19B-02	EIA-422/V.11 0.6-meter (2-foot) adapter cable
BC19E-02	EIA-423/V.10 0.6-meter (2-foot) adapter cable

Note: VAX WAN Device Driver included in OpenVMS Layered Products CD-ROM media; see Step 8 for details. VAX WAN Device Driver V1.2 or higher required.

Step 4—Networks and Communications *(continued)*

802.3/Ethernet Communications Controller

802.3/Ethernet interface (ThinWire/thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g.; BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g.; BNE3x). Select one additional controller (maximum two per system)

DESQA-SA/SF 802.3/Ethernet/Q-bus controller, ThinWire / thick wire Uses one Q-bus slot; factory/field installed.

VAX 4000 Model 106A systems require a B400X Q-bus expansion cabinet before adding any of the following options

FDDI Communications Controller

DEFQA-SA/SF DEC FDDIcontroller/Q-bus SAS (single attachment station) FDDI Controller. Uses one Q-bus slot. Model 105A systems running OpenVMS V5.5-2H4 require DEC LAN Device drive kit for OpenVMS VAX V.1.0. DEC LAN device driver included in OpenVMS V6.1. Factory/field installed.

DEFQA-DA/DF DEC FDDIcontroller/Q-bus DAS (dual attachment station) FDDI Controller. Uses one Q-bus slot. Model 105A systems running OpenVMS V5.5-2H4 require DEC LAN device driver kit for OpenVMS VAX V1.0. DEC LAN device driver included in OpenVMS V6.1. Factory/field installed.

Both options use the ANSI standard MIC (media interface connector) and support multimode fiber (MMF) up to distances of 2 kilometers between stations. Options require one Q-bus slot (maximum two per system) and a DEC LAN device driver kit.

QA-0PAAA-H5 DEC LAN device driver kit for DEFQA on TK50

QA-0PAAA-HM DEC LAN device driver kit for DEFQA on 9-track 1600-bit/inch magtape

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media, documentation, and cables are also required. See *Network Products Guide* for ordering information.

Infoserver 1000 Network Storage Server

To provide initial system load (ISL) capabilities to VAX systems, order the InfoServer Local Area compact disk. Other configurations are offered for tape/backup and serving more CD-ROMs. InfoServer systems support CD-ROM, hard drives, magneto-optical and tape drives. InfoServer 1000 systems can serve up to seven SCSI devices. See *Storage Devices*, for ordering information.

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT520, VT420) for each system unless otherwise available. **Note**: One console terminal required per configuration. A VT330, VT340, VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered unless otherwise available. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each.

Step 7—CPU Upgrades

In cabinet CPU upgrade for VAX 4000 Models 100/100A/105A and 106A systems.

Order Number	From	To	Includes
53XR-BA	VAX 4000 Models 100, 100A, 105A	VAX 4000 Model 106A	OpenVMS VAX base license

Step 7a–Dual-DSSI Adapter Module (field installed)

Select dual-DSSI storage adapter module upgrade for **installed** VAX 4000 Model 100, 100A, 105A or 106A systems. Both options require one additional 9-foot DSSI cable (BC21M-09).

Order Number	From	To	Includes
KFDDA-AF[1]	Model 100A and 105A systems with one high-speed DSSI adapter module	Model 100A/105A systems	High-speed dual-DSSI adapter module, cable assembly, and user documentation
KFDDA-CF[2]	Model 100 systems with one high-speed DSSI adapter module	Model 100A system	High-speed dual-DSSI adapter module, DSSI in/out cable, I/O cover panel, OpenVMS and CPU firmware upgrade media kits, and user documentation

1 For VAX 4000 Model 100A systems with serial numbers KA332ABJ46 and higher, or AY33328925 and higher and all Model 105A systems
2 For VAX 4000 Model 100 systems with serial numbers KA332ABJ45 and lower, or AY33328924 and lower

Step 8—Software

Software Processor Code = S
Clusterwide License Rating = 100 (E)

OpenVMS VAX Interactive User Licenses

OpenVMS VAX Interactive User licenses are for customers running **OpenVMS VAX V5.5 or greater**. OpenVMS VAX Interactive User licenses **are** specific to a single system and **cannot** be shared across a VMScluster.

QL-XULA9-BB OpenVMS VAX Interactive 1-user license
QL-XULA9-BC OpenVMS VAX Interactive 2-user license
QL-XULA9-BD OpenVMS VAX Interactive 4-user license
QL-XULA9-BE OpenVMS VAX Interactive 8-user license
QL-XULA9-BF OpenVMS VAX Interactive 16-user license
QL-XULA9-BG OpenVMS VAX Interactive 32-user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User licenses are for customers running **OpenVMS VAX Version 6.0 or greater.** OpenVMS VAX Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS VAX Distributed Interactive User licenses can also be shared across an entire VMScluster running OpenVMS VAX V6.0 or greater.

Note: OpenVMS VAX Distributed Interactive User licenses are architecture specific and **cannot** be shared across a **mixed** VMScluster (OpenVMS VAX and OpenVMS AXP systems).

QL-09SA9-BB OpenVMS VAX Distributed Interactive 1-user license
QL-09SA9-BC OpenVMS VAX Distributed Interactive 2-user license
QL-09SA9-BD OpenVMS VAX Distributed Interactive 4-user license
QL-09SA9-BE OpenVMS VAX Distributed Interactive 8-user license
QL-09SA9-BF OpenVMS VAX Distributed Interactive 16-user license
QL-09SA9-BG OpenVMS VAX Distributed Interactive 32-user license
QL-09SA9-BH OpenVMS VAX Distributed Interactive 64-user license
QL-09SAA-BR OpenVMS VAX Distributed Interactive 128-user license
QL-09SAB-BR OpenVMS VAX Distributed Interactive 256-user license

Step 8—Software *(continued)*

OpenVMS Consolidated Software Media (CD-ROM) and documentation—requires CD-ROM reader

Systems include OpenVMS V6.1 base license; order media and documentation separately for OpenVMS V6.1.
Systems also include OpenVMS V5.5-2H4 media and documentation

QA-VWJ8A-A8	OpenVMS layered product binaries on CD-ROM without hardcopy documentation
QA-VYR8A-G8	OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader
QA-A93AA-Hx	PATHWORKS for OpenVMS media and documentation
QA-GXXAB-Hx	POSIX media without IEEE documentation

x denotes media type: 5 = TK50; M = Magtape

Digital NAS Base Server Licenses

ADVANTAGE-SERVERS include Digital NAS Base Server 200 license, order media and documentation separately

QA-MC1AA-Hx	Digital NAS Base Server 200 media and documentation kit (CD-ROM)

* denotes processor code
x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 9—Power Cords

Select for 220/240 V use.

Power Cords for VAX 4000 Model 105A System Enclosure

BN19A-2E	U.K., Ireland
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19U-2E	Israel
BN19H-2E	Australia, New Zealand
BN19S-2E	India

Power Cords for B400X and R400X Expansion Pedestals

BN20B-2E	U.S., Canada, Japan
BN22C-2E	Australia, New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K., Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 10—Diagnostics and Documentation

Select optional diagnostics and documentation.

QZ-K14AA-U5 On TK50 media
QZ-K32AA-U8 On CD-ROM media

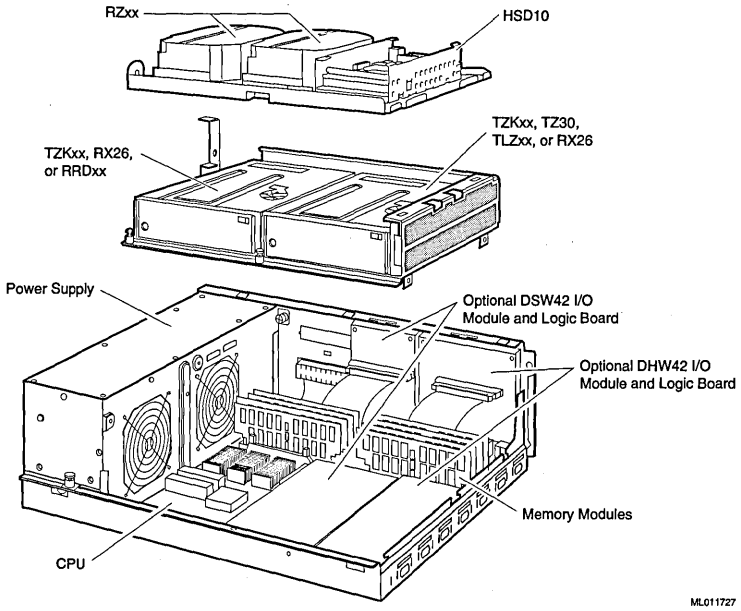
Extended Diagnostics and Documentation

QX-K19AC-AA Single-use TK50 license
QZ-K19AA-H5 Media on TK50
QX-K32AA-AA Single-use CD-ROM license
QZ-K32AA-H8 Media on CD-ROM
QZ-K19AA-GZ Hardcopy extended maintenance documentation

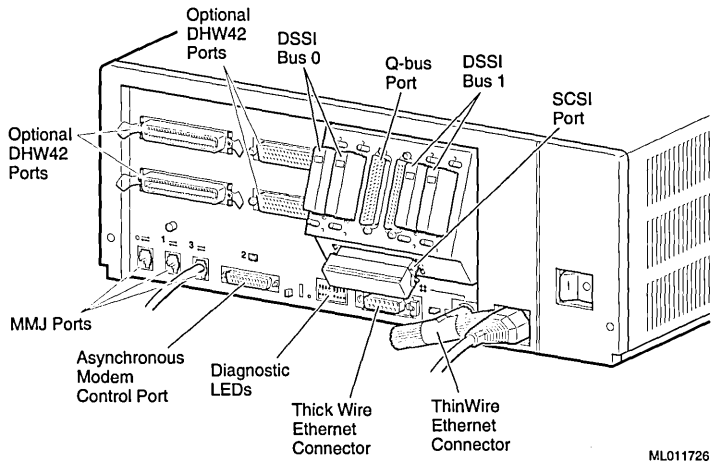
Hardware Documentation

QZ-K04AB-GZ English language (included with system)

VAX 4000 106A System Diagram



VAX 4000 Model 106A System Diagram



Specifications

Physical Characteristics	
Height	14.99 cm (5.90 in.)
Width	46.38 cm (18.26 in.)
Depth	40.00 cm (15.75 in.)
Weight	18.40 kg (40.00 lb)*
Power Requirements	
Nominal voltage	120/240 Vrms
Power source phasing	Single
Nominal frequency	50–60 Hz
Voltage range	88–132 Vrms
	176–264 Vrms
Line frequency tolerance	47–63 Hz
Typical running current	2.0/1.0 A
Typical power consumption	240 W
Standard Communication	
Minimum MMJ lines	Three DEC-423
Modem lines	One EIA-232
Ethernet	Thick wire and ThinWire supported on all models
Communications Options	
MMJ lines	Eight DEC-423
MMJ lines	16 DEC-423
Modem lines	Eight EIA-232
Synchronous lines	Two synchronous
Operating Environment	
Temperature (sea level)	10°–40° C (50°–90° F)
Relative humidity	10%–90% noncondensing
Maximum operating altitude	2.4 km (8,000 ft)

* Approximate weight with HSD10-EN and two disks

Step 1—VAX 4000 Model 505A and 705A Systems

- VAX 4000 Model 505A and 705A systems require OpenVMS V5.5-2H4 or V6.2. To operate systems in an existing cluster environment, the cluster system disk must be updated.
- Systems ordered with one disk include factory-installed software* (OpenVMS V6.2). Media and documentation for factory -installed software is recommended for the first system on site. Media and documentation for OpenVMS V5.5-2H4 is included with each system to allow customers to run OpenVMS V5.5.2H4 in place of V6.2.
- Systems include 120 V power cord (220/240 V devices require a country-specific power cord; see Step 10). Select OpenVMS user licenses if required from Step 8

* FIS is not a substitute for software media and documentation; see Step 8

ADVANTAGE SERVER Systems include

- CPU with two embedded DSSI adapters, 802.3/Ethernet (ThinWire/thick wire) controller
- 128-Mbyte memory
- DSSI-SCSI controller (HSD10-EB)
- 2.1 Gbyte 3.5-inch disk drive, factory installed
- BA440 system pedestal enclosure with
  - Three RZxx disk drive slots and one TKxx, TZ8x, TLZxx tape drive slot for or a fourth RZxx disk
  - Seven Q-bus slots, 5 available (HSD10-JA takes up 2 Q-bus slots)
  - Vac7.6-meter (25-foot) console terminal cable
  - Universal power supply that automatically adjusts to 90–128 Vac or 190–256
- RRD45 4X 600 Mbyte CD-ROM drive
- OpenVMS base license
- NAS Base Server 200 software license
- Hardware documentation
- *DSSI VMScluster Installation and Troubleshooting Guide* (EK-410AB-MG)
- Three full-year standard hardware warranty and 90 days software warranty

VAX 4000 Model 505A and 705A Advantage Servers

Order Number	Model CPU Speed	Memory	Digital NAS	Disk Drive	CD-ROM
DV-45AFC-EA	505A / 83 MHz	128 MB	Base Server 200	2.1 GB FIS*	RRD45 (600 MB)
DV-47AFC-FA	705A / 110 MHz	128 MB	Base Server 200	2.1 GB FIS*	RRD45 (600 MB)

Step 2—Memory

Systems support four memory modules. Select a maximum of three additional memory modules. Systems can be expanded to 512 Mbytes.

MS690-CA	64-Mbyte memory module, factory/field installed
MS690-DA	128-Mbyte memory module, factory/field installed

Step 3—Storage

- System come with one embedded HSD10-JA DSSI-SCSI Adapter with one RZ28M-AA disk (RZ28M-AA is configured on HSD10-JA SCSI bus). Additional RZ2xx storage can be added to the HSD10-JA SCSI bus.
- RRD4x CD ROM is connected to embedded HSD10-JA SCSI bus. TLZ09 and TZ87 SCSI tape drives are also configured on HSD10-JA SCSI bus.
- Single systems support seven ISEs per DSSI adapter; two-system DSSI OpenVMS Cluster configurations support six ISEs per DSSI adapter and can be connected between any pair of DSSI adapters (one adapter in each system); three-system DSSI OpenVMS Cluster configurations support five ISEs per DSSI adapter and can be connected between any three DSSI adapters (one adapter in each system). HSD10 DSSI-SCSI adapter supports seven disks, space permitting.
- Order load device other than CD ROM if necessary. OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- Systems with one SCSI disk include factory installed software.
- DSSI adapters support two tape drives; one per system enclosure (BA440) and one per expansion cabinet (B400X).

Step 3a—Storage Controllers

Four Q-bus storage adapters are supported per CPU; two DSSI and two SCSI controllers.

KFDDB-AA/AF	Dual-DSSI adapter daughter card, mounts directly on CPU board for high performance (maximum of one daughter card supported per CPU). I/O bulkhead assembly mounts in two Q-bus slots, requires two 9-foot BC21M-09 cables. Factory/field installed..
KFQSA-SE/SG	Q-bus-to-DSSI adapter, uses one Q-bus slot; factory/field installed. Includes 25-foot BC21M-25 cable.
KZQSA-SA/SF	Q-bus-to-SCSI controller, users one Q-bus slot; required for TLZxx, RRD4x, RWZ01, TSZxx, or TZ85/86/87 tabletop devices. Provides connections for two storage devices (four devices per CPU); factory/field installed.
HSD10-JA/JF	DSSI-SCSI-2 controller embedded in BA440/BA430/B400X enclosure, supports up to seven SCSI devices; factory/field installed. Requires 2 Q-bus slots for power; no Q-bus load. One per enclosure.
HSD10-AA	DSSI-SCSI-2 controller for StorageWorks BA356 form factor, supports up to seven SCSI devices.

Step 3b—Internal Storage

- System CPU enclosure supports up to three RZ2x/dual-RZ2x2 SCSI drives and one removable media drive (tape drive or CD-ROM), or a fourth RZ2x/dual-RZ2x2 SCSI disk drive.
- Internal storage devices are connected to embedded HSD10-JA/JF SCSI bus.
- Advantage Servers include HSD10-JA controller with one RRD45 CD-ROM disk drive and one RZ2x disk installed.

Note: Existing RF36 DSSI disks can be configured with systems that contain RZ2x/RZ2x2 disks.

DSSI Integrated Storage Elements (ISEs)

RF36 DSSI storage is no longer available. RZ2x and dual-RZ2x2 SCSI storage connected to the embedded HSD10-JA/JF is a replacement for RF36 DSSI storage.

SCSI Disk Drives

RZ26N-AA	1.05 GB 3.5" x 1" SCSI disk drive
RZ28M-AA	2.1 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28M-AA	2.1 GB 3.5" x 1" SCSI disk drive 5400 RPM
RZ28D-AA	2.1 GB 3.5" x 1" SCSI disk drive 7200 RPM
RZ29B-AA	4.3 GB 3.5" x 1.6" SCSI disk drive 7200 RPM
RZ262-AA	Two 1.05 GB SCSI disk drives in one storage bay
RZ282-AA	Two 2.1 GB SCSI disk drives in one storage bay
RZ282-AB	Dual RZ28D disk drive BA430/BA440
RZ292-AA	Dual RZ29B disk drive BA430/BA440

CD-ROM and Tape Drives

RRD45-JA	600 MB 4X CD-ROM drive, requires KZQSA Q-bus-to-SCSI controller or HSD10-JA DSSI-SCSI controller

Step 3c—DSSI External Storage

Expansion Pedestals

- B400X-B9 Expansion Pedestal
- B400X-B9 uses the same ISEs, DAT drive, and tape drives as listed in Step 3b. A HSD10-JA/JF is required to connect RZxx SCSI devices to the DSSI bus. A KZQSA Q-bus SCSI controller maybe used as an alternative but the SCSI devices in the B400X-B9 will not be connected to the DSSI bus.

B400X-B9	Provides ten additional Q-bus slots and supports up to seven RF/RZ-series disk drives, or three RF/RZ-series disk drives and one TKxx, TLZxx, or TZ8x tape drive, one RRD4x CD ROM drive or DL-TLZ07-JA/JF combination tape/CD ROM unit. Factory/field installed.

Step 3d—SCSI External Storage

StorageWorks HSD10 Array Controller

HSD10-AA StorageWorks HSD10 DSSI-SCSI Array Controller with 8 MB Cache buffer supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires DSSI cable (BC29R-xx) for VAX 4000 to HSD10 connection. Maximum DSSI cable length supported is 60 feet.

HSD10-AD StorageWorks HSD10 DSSI-SCSI Array Controller with 16 MB Cache buffer supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires DSSI cable (BC29R-xx) for VAX 4000 to HSD10 connection

HSD10-AF StorageWorks HSD10 DSSI-SCSI Array Controller with 32 MB Cache buffer supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires DSSI cable (BC29R-xx) for VAX 4000 to HSD10 connection

StorageWorks Expansion Units

- StorageWorks BA356 supports HSD10 DSSI-SCSI array controller and up to seven SCSI devices

BA356-SC StorageWorks 16-bit shelf includes dual speed blowers. Supports maximum of seven 3.5" devices 8 or 16-bit), requires BA35X-MG 8-bit I/O module, and BN21H-xx SCSI cable

SCSI devices supported in StorageWorks Expansion Units

RZ26N-VA/VW 1.0 GB 3.5" x 1" half-height disk drive, 5400 RPM

RZ28M-VA/VW 2.1 GB 3.5" x 1" half-height disk drive, 5400 RPM

RZ28D-VA/VW 2.1 GB 3.5" x 1" half-height disk drive, 7200 RPM

RZ29B-VA/VW 2.1 GB 3.5" x 1.6" half-height disk drive, 7200 RPM

TLZ09-VA 8.0 GB 3.5" half-height 4-mm DAT drive

TZ88N-VA 20/40 GB SCSI tape drive in StorageWorks carrier

SCSI Tabletop Storage

RRD45-FA/DG* 600 MB 4X CD-ROM tabletop drive, requires BC06P-06 1.8 meter (6 foot) SCSI cable, 120 V/240 V

TLZ09-DD 8 GB 4 mm DAT tabletop drive, requires 1 meter single ended SCSI cable for 50 low density connector

TZ88N-TA 20/40 GB SCSI tabletop tape drive

TZ887-NT 280 GB SCSI tabletop 7 cartridge loader tape subsystem

* 120 V power cord included. 220/240 V devices require a country-specific power cord; see Step 10.

Step 4—Networks and Communications

Select devices as required. See *Network Products Guide* for more information.

FDDI Communications Controller

Both DEFQA-xx options use ANSI standard MIC (Media Interface Connector) and support multimode fiber (MMF) up to distances of 2 kilometers between stations. Options require one Q-bus slot (maximum one per system) and DEC LAN device driver kit.

DEFQA-SA/SF DEC FDDIcontroller/Q-bus SAS (single attachment station) FDDI Controller. Uses one Q-bus slot. Models 400, 500, and 600 require OpenVMS V5.5-2 and DEC LAN device driver kit for OpenVMS VAX V1.0; Models 500A/600A/700A and 505A/705A require OpenVMS V5.5-2H4 and DEC LAN device driver kit for OpenVMS VAX V1.0. DEC LAN device driver included in OpenVMS V6.2. Factory/field installed.

DEFQA-DA/DF DEC FDDIcontroller/Q-bus DAS (dual attachment station) FDDI Controller. Uses one Q-bus slot. Models 400, 500, and 600 require OpenVMS V5.5-2 and DEC LAN device driver kit for OpenVMS VAX V1.0; Models 500A/600A/700A and 505A/705A require OpenVMS V5.5-2H4 and DEC LAN device driver kit for OpenVMS VAX V1.0. DEC LAN device driver included in OpenVMS V6.2. Factory/field installed.

QA-0PAAA-H5 DEC LAN device driver kit for DEFQA on TK50

QA-0PAAA-HM DEC LAN device driver kit for DEFQA on 9-track 1600-bit/inch magtape

Step 4—Networks and Communications *(continued)*

802.3/Ethernet Communications Controller

802.3/Ethernet interface (ThinWire/thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g.; BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g.; BNE3x). Select one additional controller (maximum two per system)

DESQA-SA/SF 802.3/Ethernet/Q-bus controller, ThinWire / thick wire Uses one Q-bus slot; factory/field installed.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 7, *Networks, Communications, and Cables*, for ordering information.

DECserver 90M, 90L+, 90TL, 900TM, 700, and MUXserver 90, 320, 380 Communications and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

Infoserver 1000 Network Storage Server

To provide initial system load (ISL) capabilities to VAX systems, order the InfoServer Local Area compact disk. Other configurations are offered for tape/backup and serving more CD-ROMs. InfoServer systems support CD-ROM, hard drives, magneto-optical and tape drives. InfoServer 1000 systems can serve up to seven SCSI devices. See descriptions in, Chapter 8, *Storage Devices,* for ordering information.

DEC WANrouter 90, 250, DECbrouter 90; DECnis 500, 600 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See *Network Products Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT520, VT420) for each system unless otherwise available. **Note**: One console terminal required per configuration. A VT330, VT340, VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each.

Step 7—CPU Board Upgrades

- Memory must be upgraded to new style memory. Refer to part number MS690-UC (64-Mbyte memory upgrade) or MS690-UD (128-Mbyte memory upgrade).
- A non-return charge will be assessed if old CPU board is not returned to Digital.

Order Number	From	To	Includes
CPU Board Upgrades for systems with serial numbers WF04899999 or lower, and AY04700100 or lower			
691XU-CS	VAX 4000 Model 300	VAX 4000 Model 505A	CPU Module, BA440 backplane OpenVMS VAX base license
694XU-CS	VAX 4000 Model 300	VAX 4000 Model 705A	CPU Module, BA440 backplane OpenVMS VAX base license
CPU Board Upgrades for systems serial numbers WF04900000 or higher and AY04700101 or higher			
691XU-DS	VAX 4000 Model 300	VAX 4000 Model 505A	CPU Module OpenVMS VAX base license
694XU-DS	VAX 4000 Model 300	VAX 4000 Model 705A	CPU Module OpenVMS VAX base license
CPU Board Upgrades for VAX 4000 Model 400, 500, 500A			
691XU-DB	VAX 4000 Model 400,500,500A	VAX 4000 Model 505A	CPU Module OpenVMS VAX base license
694XR-DB	VAX 4000 Model 400,500,500A	VAX 4000 Model 705A	CPU Module OpenVMS VAX base license
694XR-JB	VAX 4000 Model 505A, 600, 600A, 700A	VAX 4000 Model 705A	CPU Module OpenVMS VAX base license

Step 8—Software

Licenses required to support additional users beyond those included in Base Systems.

Software Processor Code	VAX 4000 Model 105A = **S**
Clusterwide License Rating	VAX 4000 Model 105A = **100 (E)**

OpenVMS VAX Interactive User Licenses

OpenVMS VAX Interactive User licenses are for customers running **OpenVMS VAX V5.5 or greater**. OpenVMS VAX Interactive User licenses **are** specific to a single system and **cannot** be shared across an OpenVMS Cluster.

QL-XULA9-BB	OpenVMS VAX Interactive 1-user license
QL-XULA9-BC	OpenVMS VAX Interactive 2-user license
QL-XULA9-BD	OpenVMS VAX Interactive 4-user license
QL-XULA9-BE	OpenVMS VAX Interactive 8-user license
QL-XULA9-BF	OpenVMS VAX Interactive 16-user license
QL-XULA9-BG	OpenVMS VAX Interactive 32-user license
QL-XULA9-BH	OpenVMS VAX Interactive 64-user license
QL-XULAA-BR	OpenVMS VAX Interactive 128-user license
QL-XULAB-BR	OpenVMS VAX Interactive 256 user license
QL-XULA2-AA	Model 505A and 705A OpenVMS VAX Interactive unlimited user license

Step 8—Software *(continued)*

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User licenses are for customers running **OpenVMS VAX V6.0 or greater.** OpenVMS VAX Distributed Interactive User licenses are **not** specific to a single system and **can** be moved between systems at users discretion. OpenVMS VAX Distributed Interactive User licenses can also be shared across an entire OpenVMS Cluster running OpenVMS VAX V6.0 or greater.

Note: OpenVMS VAX Distributed Interactive User licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS VAX and OpenVMS Alpha systems).

QL-09SA9-BB	OpenVMS VAX Distributed Interactive 1-user license
QL-09SA9-BC	OpenVMS VAX Distributed Interactive 2-user license
QL-09SA9-BD	OpenVMS VAX Distributed Interactive 4-user license
QL-09SA9-BE	OpenVMS VAX Distributed Interactive 8-user license
QL-09SA9-BF	OpenVMS VAX Distributed Interactive 16-user license
QL-09SA9-BG	OpenVMS VAX Distributed Interactive 32-user license
QL-09SA9-BH	OpenVMS VAX Distributed Interactive 64-user license
QL-09SAA-BR	OpenVMS VAX Distributed Interactive 128-user license
QL-09SAB-BR	OpenVMS VAX Distributed Interactive 256-user license

Software Media and Documentation

Systems include OpenVMS base license; order media and documentation separately for OpenVMS V6.1. Systems include OpenVMS V5.5-2H4 media and documentation for customers who have not migrated to OpenVMS V6.1.

QA-VWJ8A-A8	OpenVMS and layered product binaries (CD-ROM) without hardcopy documentation.
QA-VYR8A-G8	OpenVMS extended and layered product online documentation (CD-ROM); requires DECwindows Bookreader
QA-A93AA-Hx	PATHWORKS for OpenVMS media and documentation
QA-GXXAB-Hx	POSIX media and documentation without IEEE documentation

NAS Licenses

Advantage Servers include NAS Base Server 200 license; order media and documentation separately.

Select the appropriate NAS software level. **Note:** NAS packaged products do not include hardcopy documentation; documentation is CD-ROM only. See description of NAS packages and NAS component hard copy documentation order numbers in Chapter 11, *Software and Services.*

QL-MC1A2-AA	NAS Base Server 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit

x denotes media type: 8 = CD-ROM, 5 = TK50

Step 9—Diagnostics and Documentation

Select optional diagnostics and hardware documentation.

Basic Diagnostics

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

Step 9—Diagnostics and Documentation *(continued)*

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation

Step 10—Power Cords

Select one for each 220/240 V system or expansion enclosure.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 11—Configuring Information

SLOT	MODULE	Current (Amps) +5 Vdc	+12 Vdc	–12 Vdc	Power (Watts)	Bus Loads ac	dc
5*							
4*							
3*							
2*	MS690	**	0.0	0.0	**	0.0	0.0
1	CPU	***	***	0.0	***	***	***
1†							
2†							
3†							
4†							
5†							
6†							
7†							
Mass-storage Shelf Device							
1							
2							
3							
4							
Total these columns:							
Must not exceed:		60.0	18.0	3.0	584	35.0	20.0

BU-3075

*Reserved for memory only

**MS690-BA: +5 Vdc = 5.3 Amps; Watts = 26.5
MS690-CA: +5 Vdc = 4.2 Amps; Watts = 21.0
MS690-DA: +5 Vdc = 6.4 Amps; Watts = 32.0

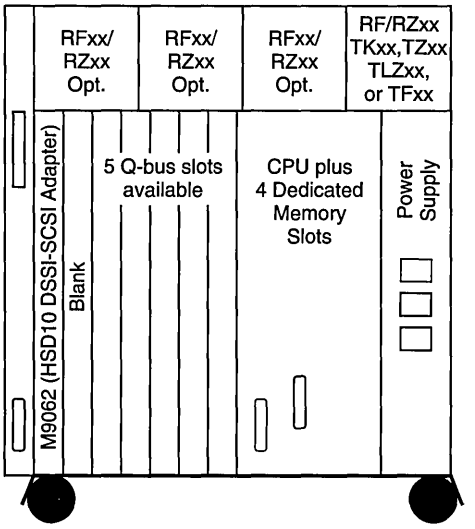
***KA675 (Model 400): +5 Vdc = 3.6; +12 Vdc = 1.6; Watts = 46.0;
ac Bus Loads = 4; dc Bus Loads = 1.

KA680 (Model 500): +5 Vdc = 4.8; + 12 Vdc = 1.6; Watts = 53.8;
ac Bus Loads = 4; dc Bus Loads = 1.

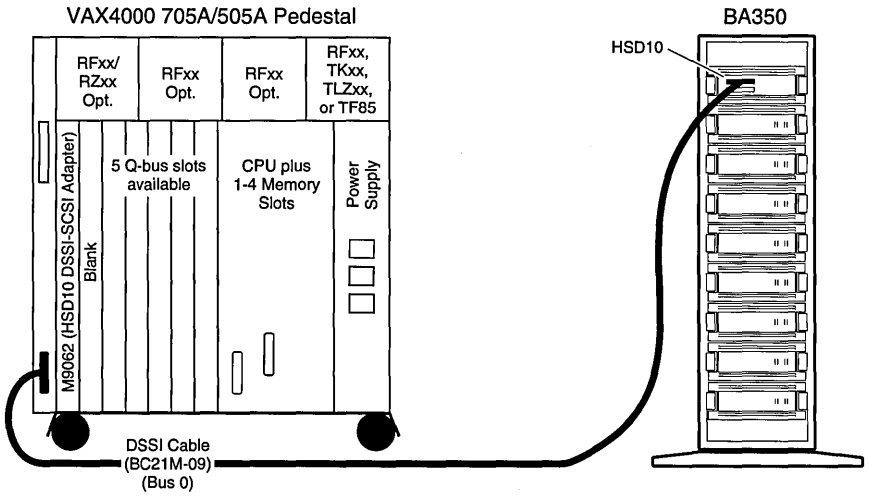
KA690 (Model 600): +5 Vdc = 5.8; +12 Vdc = 1.6; Watts = 59.8;
ac Bus Loads = 4; dc Bus Loads = 1.

†Q-bus slots

Use the following template in conjunction with the configuring information that follows to validate the configuration.



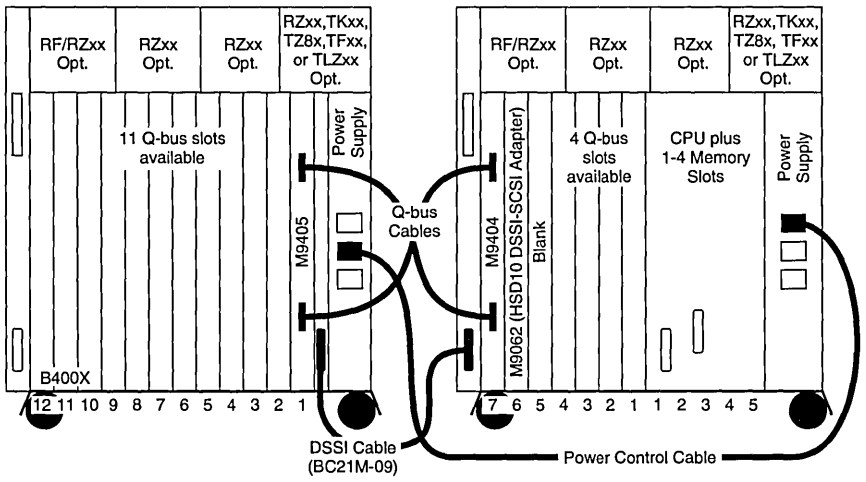
ML011833



Notes:

- The M9062 only derives power from the Q-bus slot.
- M9062 requires 2 Q-bus slots to accommodate module height - leave adjacent slot blank.

ML011731



Notes:

- A power control bus cable connects the system to the B400X expander. This power control bus cable permits the power to be turned on and off for the entire expanded system with the on/off switch on the system power supply.
- B400X expander includes a 9-foot (2.7-meter) DSSI cable and a 6-foot (1.8-meter) KZQSA cable for connecting the system to the TLZxx DAT drive in the B400X.
- To allow for expansion, mount M9062 module in slot 6.
- M9062 only derives power from the Q-bus.
- M9062 requires 2 Q-bus slots to accommodate module height - leave adjacent slot blank.

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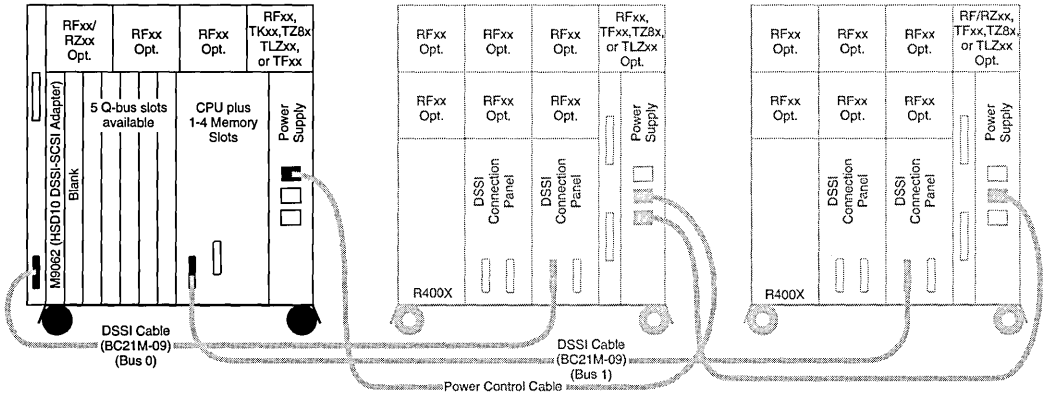

Notes:

- Two power control bus cables connect the system to the two R400X expanders. These power control bus cables permit the power to be turned on and off for the entire expanded system with the on/off switch on the system power supply.
- The R400X expander includes a 9-foot (2.7-meter) DSSI cable and a 6-foot (1.8-meter) KZQSA cable for connecting the system to the TLZxx DAT drive in the R400X.
- The M9062 only derives power from the Q-bus slot.

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VAX 4000 Expansion Pedestals (B400X)

Q-Bus and Storage Expansion Pedestal

B400X-B9	Q-bus and storage expansion pedestal

B400-B9 Q-bus and storage expansion pedestal; provides four storage cavities and 10 additional Q-bus slots. B400X has 12 slots, one slot in the system and one slot in B400X are used to make the connection between the enclosures—modules and cables required for the connection are included. Each storage cavity can house one 3.5-inch RZ2x disk or one dual RZ2x disk assembly RZ2x2). RF3x DSSI drives, no longer available, can be mixed with RZxx disks. The right cavity can house one 5.25-inch tape (TF8xE-Jx/TKxx/TLZ0x), one RRD4x CD-ROM drive, or a fourth RZ2x disk. A HSD10-Jx DSSI-SCSI adapter or KZQSA-Sx Q-bus SCSI controller is required for the SCSI devices. The HSD10-Jx will take up 2 Q-bus slot and is normally located at the end of the Q-bus. Included with the enclosure are Q-bus extender modules, 9-foot (2.7-m) Q-bus cables, one 9-foot (2.7-m) DSSI cable (BC21M-09), one 3.0-meter (0.9-foot) power control cable (BC09F-10), and one 6-foot (1.8-m) KZQSA cable (BC06P-06), universal power supply, and 120 V power cord (for non-120 V, a country-specific power cord is required). **Note**: See VAX 4000 Expansion Diagrams for supported storage configurations in B400X pedestals.

Cable Kit

H4010-AA	Required to connect B400X-B9 to BA2xx series enclosures

Power Cords

Select one for each 220/240 V expansion pedestal; 120 V power cord is included

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Specifications

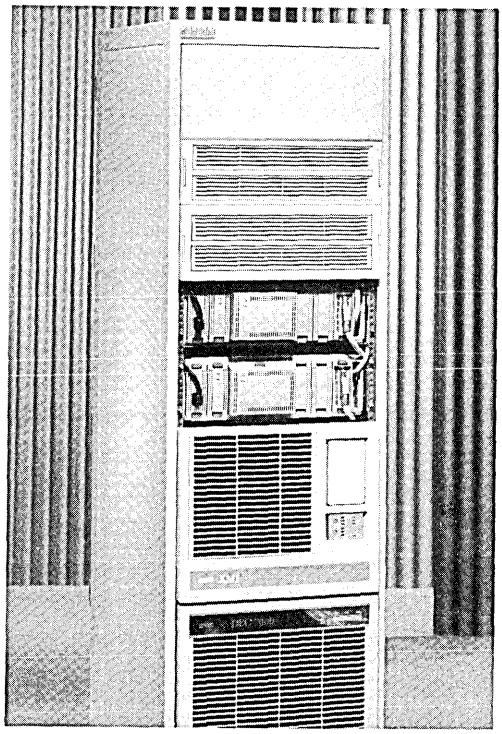
Height	53 cm (21.0 in.)
Width	69 cm (27.0 in.)
Depth	45 cm (17.8 in.)
Weight*	68 kg (150 lb), fully configured

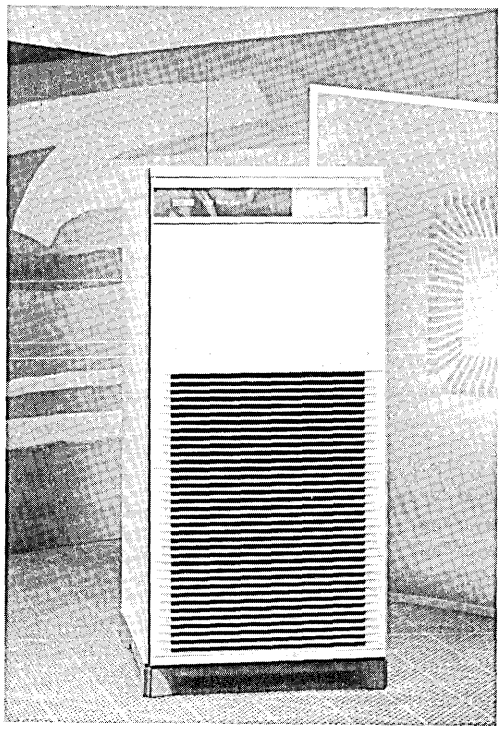
Specifications

Mounting Type: Pedestal				
Physical Characteristics	**Operating**		**Shipping**	
Height	69.0 cm (27.0 in.)		117 cm (45.6 in.)	
Width	53.0 cm (21.0 in.)		78 cm (30.5 in.)	
Depth	45.0 cm (17.8 in.)		61 cm (23.9 in.)	
Weight	66 kg (145 lb)		84.1 kg (185 lb)	
Clearances	**Operating**		**Service**	
Front	5.1 cm (2.0 in.)		100.0 cm (39.4 in.)	
Rear	5.1 cm (2.0 in.)		None	
Sides	5.1 cm (2.0 in.)		None	
Environmental				
Temperature	Operating		10° to 40° C (50° to 104° F)	
	Nonoperating		-40° to 66° C (-40° to 151°F)	
	Storage (60 days)		-40° to 60° C (-40° to 151°F)	
	Rate of change		11° C per hour (20° F)	
Relative Humidity	Operating		20% to 80% noncondensing	
	Nonoperating		10% to 95% noncondensing	
	Storage		10% to 95% noncondensing	
	Storage (60 days)		10% to 95% noncondensing	
	Rate of change		25% per hour	
Maximum Wet Bulb Temperature	Operating		25° C (77° F)	
	Storage		28° C (82° F)	
Minimum Dew Point Temperature	Operating		2° C (36° F)	
Maximum Heat Dissipation	Operating		2,903 Btu/hr	
Air Flow and Quality	Operating		306 m(3)/hr (180 ft(3)/min)	
	Intake location		Front top	
	Exhaust location		All sides, bottom	
	Particle size		N/A	
	Concentration		N/A	
Altitude	Operating		2438 meters (8,000 feet)	
	Nonoperating		4877 meters (16,000 feet)	
Mechanical Shock	Operating		10 g pk for 10 +-3 m/s	
	Nonoperating		40 g pk for 30 +-3 m/s	
Vibration	Operating		5-22 Hz @ .01" da minimum	
			22–500 Hz @ .25 g maximum	
Acoustics	Operating		5.5 bels, 40 dBA (typical)	
	Idle		5.2 bels, 37 dBA (typical)	
	Nominal AC Voltage			
Electrical	**101**	**120**	**220**	**240**
Voltage range (Vac)	90–110	104–128	176–242	186–264
Power source phase	Single	Single	Single	Single
Nominal frequency (Hz)	50–60	50–60	50–60	50–60
Frequency range (Hz)	47–63	47–63	47–63	47–63
RMS current (steady state) at nominal voltage (amps)	11.9	11.2	6.1	5.8
Startup current (amps)	12.6	11.6	6.2	5.8
Maximum inrush current (amps)	100	100	83	83
Maximum power consumption (Watts)	850	850	850	850
Power cord	Type	IEC 320 C16		
	Length	190 cm (75 in.)		
	U.S. plug	NEMA 5-15, Socket IEC 320 Sheet, C-15		

*Built-in universal power supply automatically selects the correct voltage range for either 120 V or 240 V operation.

Agency Approvals	UL 114 (office equipment)	VDE 0875 (RFI suppression)
	UL 478 (EDP units)	Australian AS C 100
	CSA C22.2 no.134 (office equipment)	IEC Publication 950
	CSA C22.2 no.154 (data processing)	FCC Part 15 Docket 20780





VAX 7000 and VAX 7000 Rackmount

Product Description

VAX 7000 Enterprise Servers are part of a family of OpenVMS-based systems designed for the rigorous demands of data center computing. They have a modular platform which enables users to improve performance in a number of different dimensions— symmetric multiprocessing, larger memory, more I/O bandwidth, greater disk capacity, and OpenVMS Cluster systems. VAX 7000 servers support additional I/O controllers, storage, user licenses, database software.

With up to 6 CPUs in a symmetric multiprocessing (SMP) configuration and up to 400 Mbytes/second of I/O, a single VAX 7000 system offers the powerful features needed in data center systems. VAX 7000 systems in OpenVMS Cluster configurations provide support for as much as 10 terabytes of data.

An optional N+1 redundant power system allows for higher system availability in the event of a power regulator failure. Systems can be configured with up to three power regulators. Optional system-level UPS (Uninterruptible Power System) capability is available to support CPU and I/O expansion cabinets.

The VAX 7000 Enterprise Server provides substantial I/O capacity, one 12-slot XMI I/O channel is standard, with the ability to add up to three additional 12-slot XMI I/O channels. These XMI I/O channels offer a bandwidth of 100 Mbytes/second each, making this system capable of providing very high I/O bandwidth performance—up to 400 Mbytes/second.

XMI devices supported include adapters for Ethernet, CI, FDDI, and DSSI interconnects. Support for up to 16 Ethernet adapters, 10 CI adapters, 12 DSSI adapters, and eight FDDI adapters demonstrates the large expansion potential of these systems. StorageWorks controllers enable SCSI-2 devices to provide reliable high-end storage on the CI bus.

Enterprise Expansion Packages may be ordered with a single part number to provide the hardware and licensing necessary to start an OpenVMS Cluster or add another node to an existing cluster.

Rackmount VAX 7000 servers maintain the same system level functionality as the larger pedestal systems, with four CPU/memory slots. Each rackmount system consists of two 19-inch rackmountable building block components, and is designed to be mounted in a H9702-FB cabinet.

Step 1—Systems

The following items are required.

Note: Second power regulator required when configuring five-and six-processor systems. OpenVMS user licenses may be ordered as needed.

- OpenVMS V5.5-2*, V6.1, or V6.2
- InfoServer 1000 Local Area CD for initial booting of system console
- CIXCD (CI) controller, KFMSA (DSSI) disk/tape adapter
- System disk device
- Console terminal
- VAXcluster Software license for each system when multiple systems are used in an OpenVMS Cluster environment

Additional items may be added as required.

* Requires console firmware V4.2.

OpenVMS Base Enterprise Servers include

- Model 810 CPU, system interconnect bus and 12-slot XMI I/O channel
- 256, 512 MBs, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- 48 V power regulator
- OpenVMS base license
- Digital NAS Base Server 200 V5.0 software
- One year hardware product warranty
- 90 day software product warranty

Order Number	Memory
7MAMD-KA/KB/KC	256 MBs (one 256 MB module)
7MAME-KA/KB/KC	512 MBs (one 512 MB module)
7MAMH-KA/KB/KC	2 Gbytes (one 2 GB module)

Note: xA = 60 Hz, 208 V; xB = 50 Hz, 380/416 V; xC = 50/60 Hz, Japan

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

7MATA-LE SMP Upgrade. Contains one CPU processor, OpenVMS VAX base license upgrade, and one full-year product warranty. Add up to 5 additional CPU processors.

Step 3—Enterprise Expansion Packages

Enterprise Expansion Packages are designed to be added to Base Enterprise Servers to create fully functional systems. They contain all necessary hardware (excluding console terminal) and software to make complete and operational systems.

7YCHA-BA/BB* Cluster Starter Package, includes:
SW800 StorageWorks cabinet with
HSJ40 StorageWorks array controller in BA350-MB
Six RZ28, 2.1 GB 3.5-inch disk drives in BA350 shelf
TZ87 20 GB, 5.25-inch SCSI tape drive in BA350 shelf
CIXCD-AC XMI CI controller (resides in XMI slot in system cabinet and connects to HSJ40 in SW800 via BNCIA 10-meter cable to SC008 to second BNCIA 10-meter cable to HSJ40)
Two BNCIA 10-meter cables
SC008-AC Star Coupler
BN21H-01 controller to shelf
BN21H-02 controller to TZ87
VAXcluster License
DECnet/OSI extended function license

7YCAA-BX Cluster Add-on Package, includes:
CIXCD-AC XMI CI controller
BNCIA 10-meter cable
VAXcluster License

* When adding storage devices to SW800, BA356 shelves must be order separately.

Step 4—Memory

Select additional memory if required; maximum 3.5 Gbytes per system. New systems can be expanded in any combination of arrays listed below. Systems running OpenVMS V5.5-2 are restricted to 512 MB maximum memory.

MS7AA-BA	128 MB memory array
MS7AA-CA	256 MB memory array
MS7AA-DA	512 MB memory array
MS7AA-FA*	2 GB memory array

* Systems with 2 x MS7AA-FA will only utilize the maximum 3.5 Gbytes of memory.

Step 5—Console Load Device

InfoServer required for initial booting of system console unless already available on-site on local area network.

SEADx-BA/BE	Infoserver Local Area CD. Includes InfoServer 1000 controller and RRD43 CD-ROM drive

Note: x = B for ThinWire or C for AUI connector; -BA includes 120-V power cord; -BE requires country-specific power cord; see *Storage Devices*.

Step 6—Storage Controller(s)/CI Controller

Base systems require selection of storage controller or CI controller (KFMSA included with preconfigured systems).

KFMSA-BA	DSSI disk/tape adapter. Total five per XMI; up to a maximum of 12 per system. Maximum number of KFMSAs is derived as follows: (25 minus the number of CIXCDs) divided by two. Requires one XMI slot; supports 14 DSSI devices. VAXcluster Software license (QL-VBRA*-AA) required for all OpenVMS systems that will connect to a DSSI-based OpenVMS Cluster. Note: One CK-KFMSA-LN required with each KFMSA-BA.
CK-KFMSA-LN	Two pairs of 1.2-m (4-ft) cables in cabinet kit. Supports mixed hosting with VAX 4000, quad-hosting of VAX 7000, and warm-swap.
CIXCD-AC	XMI CI controller. Total four per XMI; maximum 10 per system. Requires one XMI slot. Each CIXCD requires one BNCIA cable set to connect system to Star Coupler. VAXcluster Software license (QL-VBRAx-AA) required for each system when multiple systems are used in an OpenVMS Cluster environment.
BNCIA-xx	Computer interconnect cable sets. Connect Star Coupler to system and SW800 or HSCxx. Choose required length 10, 20 or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).

Step 7—Storage

Select storage devices as required. See *Storage Devices* for ordering information.

Step 7a—Internal Storage (System Cabinet)

The system cabinet provides space for two disk plug-in units. Disk plug-in unit has two BA356 modular expansion shelves; each shelf holds a maximum of two 5.25-inch devices or seven 3.5-inch devices.

BA660-AB	16-bit Wide SCSI plug-in-unit—includes 16-bit personality module, 48V 150W DC power supply, DC fans, and mounting hardware. Supports 16-bit wide SCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum hardware revision levels. Includes two BA356-LB modular expansion shelves.
HSD10-AA	StorageWorks array controller. Supports up to six SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 , V6.1 and V6.2
BC29S-06	Required to connect KFMSA-BA to internal HSD10-AA/BA655-AB.
BC29U-02	Required if daisy chaining HSD10-AA within BA655-AB.
RZ29B-VA	4.3 GB, 3.5-inch SCSI disk drive

Step 7a—Internal Storage (System Cabinet) *(continued)*

RZ26N-VA	1.05 GB 3.5" x 1" SCSI disk drive
RZ28M-VA	2.1 GB 3.5" x 1" SCSI disk drive
RZ29B-VA	4.3 GB 3.5" x 1.6" SCSI disk drive
TLZ09-VA	8.0 GB 3.5-inch SCSI tape drive
TL88N-VA	40 GB 5.25-inch SCSI tape drive

Step 7b—External Storage

The following list describes available storage devices, capacities, and components included with **initial** offerings; supported options can be added as required. See *Storage Devices* for ordering information.

Storage Arrays	Capacity	Storage Array Disk Drive Components
SW5xx, SW8xx	6–227 Gbytes	RZ26N, RZ28 SCSI disk drives
Disk Drives	**Capacity**	
RZ26N SCSI	1.05-GB	
RZ28 SCSI	2.1-GB	
RZ29B SCSI	4.3-GB	
Tape Drives		
TZ88	20/40 GB 5.25-inch SCSI tape drive	
TZ887	280 GB SCSI-2 cartridge tape subsystem	

Note: For additional ordering information, see Storage Devices.

Step 8—OpenVMS Cluster Options

For OpenVMS Cluster configurations, select appropriate OpenVMS Cluster options. CI controller, BNCIA cables, and VAXcluster Software license required.

HSJ40-AD/AF	StorageWorks array controller; supports up to 42 SCSI-2 devices. Includes 16-or 32 MB Read-Cache and controller-based disk striping. Supported by OpenVMS VAX V5.5-1 and later, OpenVMS Alpha V1.5.
HSD10-AA	StorageWorks array controller; supports up to seven SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 , V6.1, and V6.2
HSD30-AA	StorageWorks array controller; supports up to 18 SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 and V6.0, OpenVMS Alpha 1.5.
SW5xx/SW8xx	StorageWorks arrays. See *Storage Devices* for details
BNCIA-xx	Computer interconnect cable sets; connects Star Coupler to system and SW800 or HSCxx. Choose required length of 10, 20 or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
SC008-AC	8-port Star Coupler; Maximum five Star Couplers per system.
SC008-AD	Star Coupler; Upgrades SC008-AC to 16 ports; maximum one per SC008-AC
QL-VBRA5-AA	VAXcluster license; Required with each system that will connect to an OpenVMS Cluster.

Step 9—Networks and Communications

DEMNA 802.3/Ethernet controller included with each system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable. See the *Network Products Guide* for details.

LAN Communications Controllers

DEMNA-M	802.3/Ethernet controller; one included; total four per XMI; maximum 16 per system. Requires one XMI slot.
CK-DEMNA-KN	DEMNA cabinet kit, required with DEMNA-M.
DEMFA-AA	DEC FDDIcontroller 400, XMI-to-FDDI adapter; requires one XMI slot. Total four per XMI; maximum seven per system. Includes cabinet kit.

Step 9—Networks and Communications *(continued)*

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC-type connection, e.g., BC16M cable or thick wire 15-pin AUI transceiver cable, e.g., BNE3x is required. Additional items are also required—see the *Network Products Guide*.

DECserver 90M, 90L+, 90TL, 900TM, 700, and MUXserver 90, 320, 380 Communications and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 90, 250; DECBrouter 90; and DECnis 500, 600 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See the *Network Products Guide* for details.

Step 10—Console Terminal

A console terminal with EIA-232 25-pin D-subminiature connector and printer required unless otherwise available.

VT510-xx	VT510 terminal
LA75S-xx	LA75 Plus printer
LAXXS-AD	VT510/LA75 table for both VT510 and LA75

Step 11—Terminals and Printers

Order printers and terminals if required.

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet)

The **system cabinet** includes one 12-slot XMI-plug-in-unit and one power regulator, two additional power regulators, and two lower expansion bays for plug-in units. The lower bays accommodate plug-in units as follows.

System Cabinet

Expansion Bay Location	Plug-In Unit	Quantity	Expansion Bays Occupied
Lower	Disk plug-in unit	Two maximum	One each
Lower	XMI plug-in unit	Two maximum (included)	Two each
Lower	Battery plug-in unit	One maximum	Two
Lower	VAXBI plug-in unit	One maximum	Two

The **I/O expansion cabinet** includes one power regulator and provides space for two additional power regulators and six expansion bays—two upper and four lower—for plug-in units. The two upper bays accommodate a maximum of two disk plug-in units. The four lower bays accommodate plug-in units as follows.

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet) *(continued)*

I/O Expansion Cabinet

Expansion Bay Location	Plug-In Unit	Quantity	Expansion Bays Occupied
Upper	Disk plug-in unit	Two maximum	One each
Lower	Disk plug-in unit	Four maximum	One each
Lower	XMI plug-in unit	Two maximum	Two each
Lower	Battery plug-in unit	One maximum	Two
Lower	VAXBI plug-in unit	One maximum	Two

H9F00-BA/BB/BC I/O expansion cabinet, maximum two per system.

H9B00-AF Battery option for I/O expansion option; fully loaded battery cabinet with capability for 60 minutes uninterruptible power (UPS).

H7237-AA Battery plug-in unit with batteries for battery backup/UPS capability—maximum one per cabinet. Includes four batteries to support one 48 V power regulator and cabling for second and third H7238-AA battery option. Note: Not available in same cabinet with DWMBB VAXBI option.

H7237-CA/CB Battery plug-in unit, includes one H7263-AA/AAB (BBU capable power regulator) and batteries for battery backup/UPS capability. Must be ordered at time of system purchase if BBU functionality is required.

H7263-AA/AB 48 V power regulator, 60/50 Hz; maximum three per cabinet (one included). Second regulator may be required to supply adequate power depending on configuration. See power configuration table that follows. Third regulator assures redundancy and higher availability in the event of power regulator failure. Note: The power configuration table provides manual method of determining the need for second power regulator. Second power regulator is required when configuring five-or six-processor systems. Equivalent power unit (EPU) is equivalent value of power used at 48 Vdc by each option.

H7263-AC/AD Same regulator as above, without battery backup capability

H7238-AA 4-pack battery option; one required per optional 48 V power regulator (H7263-AA/AB) to support battery backup/UPS capability

H7238-BB/BC Additional batter UPS, includes H7263-AA/AB (BBU capable power regulator and H7238-AA 4-pack battery option.

Note: Maximum four XMI plug-in units per system; total two per cabinet (one included in system cabinet)

DWLMA-AA XMI plug-in unit with 12-slot XMI I/O channel for system cabinet

DWLMA-BA XMI plug-in unit with 12-slot XMI I/O channel for I/O expansion cabinet; maximum three per system.

DWMBB-LA VAXBI plug-in unit with five-slot I/O channel and interfaces. Must be located in same cabinet and adjacent to XMI I/O channel. Maximum one per cabinet, three per system. Note: Not available in same cabinet with H7237 battery option. Requires OpenVMS V6.1 or later.

Supported VAXBI Options

DMB32-M Multifunction controller—printer port, synchronous and asynchronous line support. Maximum three per VAXBI I/O channel plug-in unit, total nine per system. Requires CK-DMB32-LJ.

CK-DMB32-LJ DMB32 cabinet kit; occupies four panel units in VAXBI plug-in unit

Step 13—Software

Note: An OpenVMS Group Table Patch is available that enables OpenVMS Concurrent Use License PAKs and Distributed Interactive User License PAKs; it can be duplicated and used with each valid license. Customers are allowed to install and use the patch under their existing license agreement. The kit is available on the Internet at the following address: http://www.service.digital.com/html/patch_service.html. It can also be obtained by ordering the following:

QA-MT3AC-AA OpenVMS VAX and Alpha Group Table Patch on CD-ROM

Step 13—Software *(continued)*

OpenVMS VAX Concurrent Use Licenses

OpenVMS VAX Concurrent Use licenses are for customers running OpenVMS VAX V6.2 or greater. (See above note.)

OpenVMS VAX Concurrent Use license provides the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one OpenVMS system to another OpenVMS system at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license

OpenVMS VAX Concurrent Use Licenses

QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-XULA5-AA	OpenVMS VAX Traditional unlimited user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User Licenses are for customers running **OpenVMS VAX V6.0 to V 6.1.** (See above note.)

OpenVMS VAX Distributed Interactive User licenses provide the right to interactively use the operating system by the specified number of Interactive Users on a designated OpenVMS VAX system. OpenVMS VAX Distributed Interactive User licenses can be moved from one OpenVMS VAX system to another OpenVMS VAX system at the user's discretion and can be shared in an OpenVMS VAX Cluster but **NOT** in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-09SA9-BB	OpenVMS VAX Distributed Interactive 1 User License
QL-09SA9-BC	OpenVMS VAX Distributed Interactive 2 User License
QL-09SA9-BD	OpenVMS VAX Distributed Interactive 4 User License
QL-09sA9-BE	OpenVMS VAX Distributed Interactive 8 User License
QL-09SA9-BF	OpenVMS VAX Distributed Interactive 16 User License
QL-09SA9-BG	OpenVMS VAX Distributed Interactive 32 User License
QL-09SA9-BH	OpenVMS VAX Distributed Interactive 64 User License
QL-09SAA-BR	OpenVMS VAX Distributed Interactive 128 User License
QL-09SAB-BR	OpenVMS VAX Distributed Interactive 256 User License
QL-XULA5-AA	OpenVMS VAX Traditional unlimited user license

VAXcluster Software License

QL-VBRA5-AA	VAXcluster Software license. Required with each system that will connect to an OpenVMS Cluster.

Media and Documentation

QA-001AA-Hx	OpenVMS media and extended documentation, including OpenVMS Cluster and DECnet documentation
QA-09SAA-Hx	OpenVMS media and base documentation
QA-GXXAB-Hx	POSIX media and documentation (without IEEE documentation)

Note: x denotes media type: 5 = TK50; 8 = CD-ROM

Step 13—Software *(continued)*

Digital NAS Software Packages

Select the appropriate Digital NAS software package. The Digital NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only).

QL-MC2A5-AA	Digital NAS Server 300
QA-MC2AA-Hx	Digital NAS Server 300 media and documentation kit
QL-MC5A5-AA	Digital NAS Production Server 400
QA-MC5AA-Hx	Digital NAS Production Server 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 14—Environmental Power Products

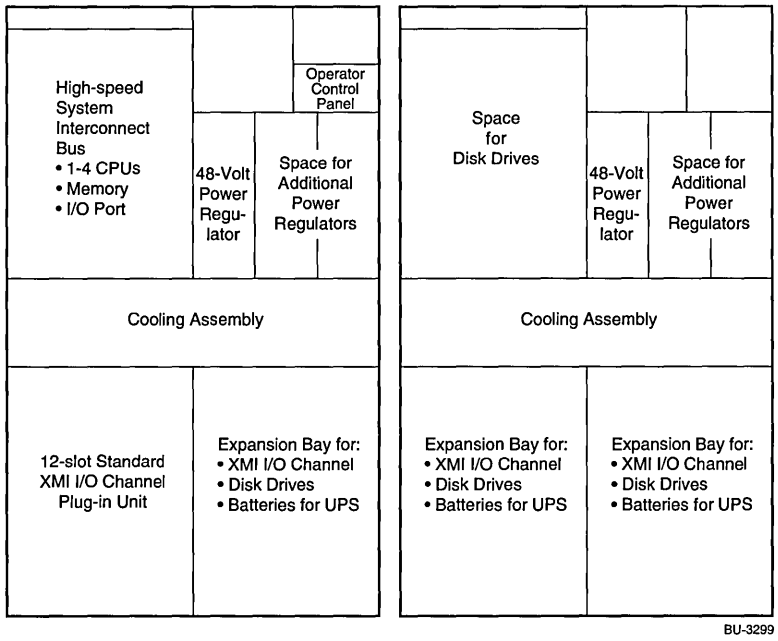
Select environmental power products if required.

Power Configuration Table

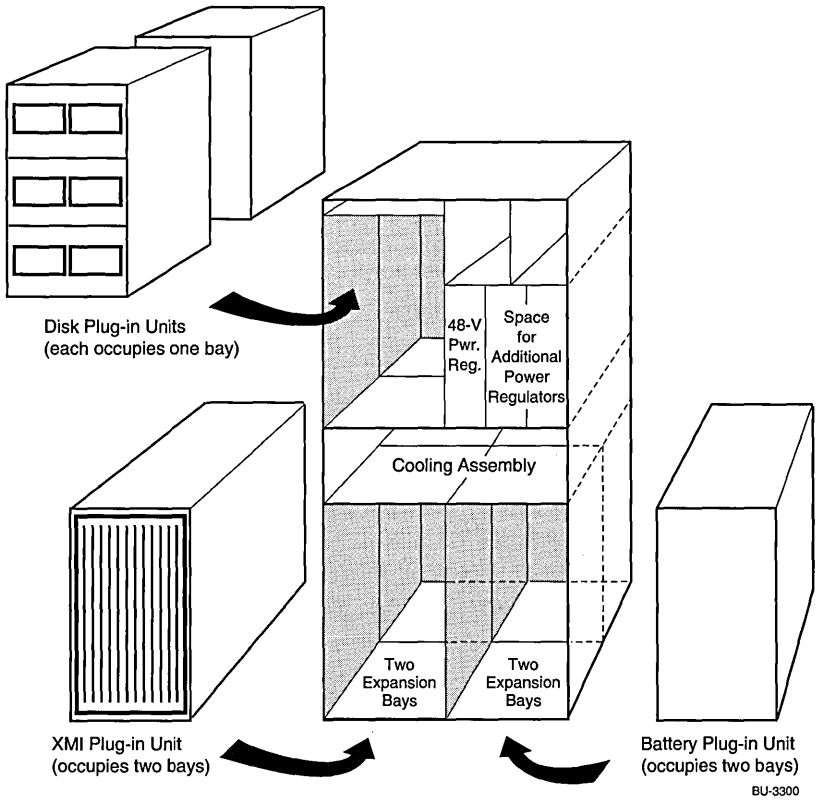
Options	EPU Values System Cabinet Options	Quantity	Total EPU (Qty times EPU)	EPU Values Expansion Cabinet Options	Quantity	Total EPU (Qty times EPU)
Base System includes power regulator, I/O port module, CPU module, memory module, XMI I/O channel, DEMNA	30	1	30	–		
I/O expansion cabinet (H9F00-BA/BB/BC) includes power regulator	–			0	1	0
Additional CPU modules	7			–		
MS7AA-BA 128 MBs of memory	10			–		
MS7AA-CA 256 MBs of memory	10			–		
MS7AA-DA 512 MBs of memory	10			–		
MS7AA-FA 2 Gbytes of memory	10			–		
CIXCD-AC XMI CI controller	4			4		
DEMFA-AA XMI FDDI adapter	5			5		
DEMNA-M XMI Ethernet controller	3			3		
DWLMA-AA XMI plug-in unit	4			–		
DWLMA-BA XMI plug-in unit	–			4		
KFMSA-BA XMI DSSI adapter	3			3		
DMB32-M VAXBI multifunction controller	3			3		
DWMBB-LA VAXBI plug-in unit	4			4		
RZ26, RZ28, RZ29 SCSI disk drives	1			1		
TLZ09 SCSI DAT tape drive	1			1		
TZ87-VA SCSI tape drive	3			3		
Total the Last Column*						

* If EPU is greater then 80, order second power regulator (H7263-AA/AB); EPU must not exceed a system total of 180. Five-and six-processor systems include two power regulators, providing a total of 180 EPUs.

Note: Depending on the configuration, the system offers integral UPS capability that supports all in-cabinet components for up to 11 minutes. If UPS support is required for external devices, e.g., console terminals, terminal servers, printers, modems, etc., a universal UPS can be ordered separately.



System Cabinet I/O Expansion Cabinet



Specifications

Physical Characteristics	Operating	Shipping
Height	170.0 cm (67.0 in.)	195.0 cm (76.7 in.)
Width	80.0 cm (31.5 in.)	109.5 cm (43.1 in.)
Depth	87.5 cm (34.4 in.)	121.0 cm (47.5 in.)
Weight, full configuration		
Without batteries	408 kg (900 lb)	448 kg (1000 lb)
With batteries	545 kg (1200 lb)	585 kg (1300 lb)

Clearances	Operating	Service
Front	1.0 m (40 in.)	1.5 m (59 in.)
Rear	1.0 m (40 in.)	1.0 m (40 in.)
Sides	0	0

Environmental	Operating	Nonoperating
Temperature	15° to 28° C (59° to 82°F)	-40° to 66° C (-40° to 151°F)
Humidity	20% to 80%	10% to 95%
Altitude	0–2.4 km (0–8000 ft)	9,100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g maximum
Heat dissipation[1]	Fully Configured System (System Cabinet) 17,700 Btu/hr, 5,200 W	Fully Configured System (System Cabinet with Two I/O Expansion Cabinets) 47,000 Btu/hr, 13,800 W
	Minimally Configured System[2] (System Cabinet) 3,400 Btu/hr, 1,000 W	

Power requirements[3]	U.S./Canada	Europe/APA	Japan
Nominal voltage	120/208 V	380–415 V	202 V
Frequency range	50–60 Hz	50–60 Hz	50–60 Hz
Phases	3-phase star 4-wire N-GND	3-phase star 4-wire N-GND	3-phase delta 4-wire mid-GND or 3-wire junction-GND
Maximum input current/phase	24 A rms	12.8 A rms	24 A rms
Surge current	50 A peak	50 A peak	50 A peak
Rating	30 A	16 A	30 A
Power cap (system)	DEC 12-12314-00	DEC 12-30333-02	DEC 12-12314-00
Receptacle (site)	DEC 12-12315-01	See footnote 4	DEC 12-12315-01
Receptacle	NEMA L21-30R	IEC309	NEMA L21-30R
PCS/PDS/PDU/UPS cable	BC24W	BN29X	BC24W

1 The power system provides unity power factor which allows full utilization of the input line current (watts = VA). Approximate Btu's for a given system configuration can be calculated by multiplying the "EPU" value per cabinet by 85.4.
2 Minimally configured system contains one regulator, one CPU module, one memory module, one IOP module, and one Ethernet controller.
3 Power cord is required for system cabinet and each I/O expansion cabinet.
4 Receptacle type is Hubbell 516R6 or equivalent.

Step 1—Rackmount Systems

The following items are required. OpenVMS user licenses may be ordered as needed.

- InfoServer 1000 Local Area CD for initial booting of system console
- CIXCD (CI) controller, KFMSA (DSSI) disk/tape adapter, or KDM70 (SDI/STI) disk/tape controller
- System disk device
- Console terminal
- VAXcluster Software license for each system when multiple systems are used in an OpenVMS Cluster environment

Additional items may be added as required.

Base Enterprise Server Systems include

- Model 810 CPU and high-speed system interconnect bus
- 12-slot XMI I/O channel
- DEC LANcontroller 400 (DEMNA)
- 802.3 Ethernet controller
- 256, 512 MBs, or 2 Gbytes of memory
- Console cable
- OpenVMS base license
- Digital NAS Base Server 200 V5.0 license
- One full-year product warranty (standard warranty recommended)

Order Number	Memory
7MARD-KA	256 MBs of memory (one 256 MB module)
7MARE-KA	512 MBs of memory (one 512 MB module)
7MARH-KA	2 Gbytes of memory (one 2 GB module)

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

Maximum of three CPU modules supported on Rackmount VAX 7000 systems.

7MATA-LE	SMP Upgrade. Contains one CPU processor, OpenVMS VAX base license upgrade, and one full-year product warranty. Add up to 2 more CPU processors.

Step 3—Memory

Select additional memory if required; maximum 3.5 Gbytes per system. **Note:** Rackmount VAX 7000 systems have a total of four CPU/memory slots.

MS7AA-BA	128 MB memory module
MS7AA-CA	256 MB memory module
MS7AA-DA	512 MB memory module
MS7AA-FA*	2 GB memory module

* Systems with 2 x MS7AA-FA will only utilize the maximum 3.5 Gbytes of memory.

Step 4—XMI I/O Channel

Select additional XMI I/O chassis if required.

DWLMR-BA	Rackmount XMI I/O expansion chassis
DWLMR-DA	Rackmount XMI I/O chassis, includes: DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller

Step 5—Cabinet

Select cabinet.

H9702-FB	Rackmount cabinet. One or two chassis pairs (system box plus XMI chassis) can be mounted in this cabinet.

Note: For other cabinets or integrated cabinet systems, contact a Digital Sales Representative.

Step 6—Storage Controllers

Select storage controller or CI controller.

KFMSA-BA	DSSI disk/tape adapter. Supports maximum of five per XMI and up to a maximum of 12 per system. Requires one XMI slot. Note: CK-KFMSA-RB required with each KFMSA-BA
CK-KFMSA-RB	Two 48-inch internal cabinet cables. One kit per KFMSA required
KDM70-AA	XMI disk/tape controller. Total three per XMI, maximum of 12 per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes
CK-KDM60-RA	Cabinet kit is required with each KDM70-AA
2T-CIXCD-RA	XMI CI controller. Total four per XMI. Maximum of ten per system. Requires one XMI slot. Cabinet kit included. Each 2T-CIXCD-RA requires BNCIA cable set to connect system to Star Coupler. VAXcluster software license (QL-VBRAx-AA) required for each system when multiple systems are used in an OpenVMS Cluster environment
BNCIA-xx	Computer interconnect cable sets. Choose required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft)

Step 7—Storage

There is *no* storage provided in the rackmount system order numbers. A variety of rackmount storage is available. A controller and one bootable disk are required for any operating system. Contact a Digital Sales Representative for assistance.

Step 8—Networks and Communications

DEMNA 802.3/Ethernet controller included with each DWLMR-DA chassis. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable. See the *Network Products Guide* for details.

LAN Communications Controllers

DEMNA-M	802.3/Ethernet controller—requires one XMI slot. OpenVMS Alpha supports four per XMI, maximum 16 per system.
CK-DEMNA-RA	DEMNA cabinet kit—required with DEMNA-M.
2T-DEMFA-RA	DEC FDDIcontroller 400, XMI-to-FDDI Adapter—requires one XMI slot. Total four per XMI. cabinet kit is included.

Step 9—Console Terminal

Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.

VT510-xx	VT510 terminal.
LA75S-xx	LA75 Plus printer.
LAXXS-AD	VT510/LA75 table for both VT510 and LA75.

Step 10—Software

Note: An OpenVMS Group Table Patch is available that enables OpenVMS Concurrent Use License PAKs and Distributed Interactive User License PAKs; it can be duplicated and used with each valid license. Customers are allowed to install and use the patch under their existing license agreement. The kit is available on the Internet at the following address: http://www.service.digital.com/html/patch_service.html. It can also be obtained by ordering the following:

QA-MT3AC-AA OpenVMS VAX and Alpha Group Table Patch on CD-ROM

OpenVMS VAX Concurrent Use Licenses

OpenVMS VAX Concurrent Use licenses are for customers running **OpenVMS VAX V6.2 or greater**. (See above note.)

OpenVMS VAX Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one OpenVMS system to another OpenVMS system at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-MT3AA-3B OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K OpenVMS Concurrent Use 256-user license
QL-XULA5-AA OpenVMS VAX Traditional unlimited user license

OpenVMS VAX Distributed Interactive User Licenses

OpenVMS VAX Distributed Interactive User Licenses are for customers running **OpenVMS VAX V6.0 to V 6.1.** (See above note.)

OpenVMS VAX Distributed Interactive User licenses provide the right to interactively use the operating system by the specified number of Interactive Users on a designated OpenVMS VAX system. OpenVMS VAX Distributed Interactive User licenses can be moved from one OpenVMS VAX system to another OpenVMS VAX system at the user's discretion and can be shared in an OpenVMS VAX Cluster but **NOT** in a mixed OpenVMS VAX and OpenVMS Alpha Cluster.

QL-09SA9-BB OpenVMS VAX Distributed Interactive 1 User License
QL-09SA9-BC OpenVMS VAX Distributed Interactive 2 User License
QL-09SA9-BD OpenVMS VAX Distributed Interactive 4 User License
QL-09sA9-BE OpenVMS VAX Distributed Interactive 8 User License
QL-09SA9-BF OpenVMS VAX Distributed Interactive 16 User License
QL-09SA9-BG OpenVMS VAX Distributed Interactive 32 User License
QL-09SA9-BH OpenVMS VAX Distributed Interactive 64 User License
QL-09SAA-BR OpenVMS VAX Distributed Interactive 128 User License
QL-09SAB-BR OpenVMS VAX Distributed Interactive 256 User License
QL-XULA5-AA OpenVMS VAX Traditional unlimited user license

Step 10—Software *(continued)*

VAXcluster Software License

QL-VBRA5-AA VAXcluster Software license. Required with each system that will connect to an OpenVMS Cluster.

Media and Documentation

QA-001AA-Hx OpenVMS media and extended documentation, including OpenVMS Cluster and DECnet documentation

QA-09SAA-Hx OpenVMS media and base documentation

QA-358AA-Hx Rdb Runtime media and documentation

QA-GXXAA-Hx POSIX media and documentation (with IEEE documentation)

QA-GXXAB-Hx POSIX media and documentation (without IEEE documentation)

Note: x denotes media type: 5 = TK50; 8 = CD-ROM

Digital NAS Software Packages

Select the appropriate Digital NAS software package. **Note:** The Digital NAS packaged products do not include hardcopy documentation for the components (documentation is CD-ROM only).

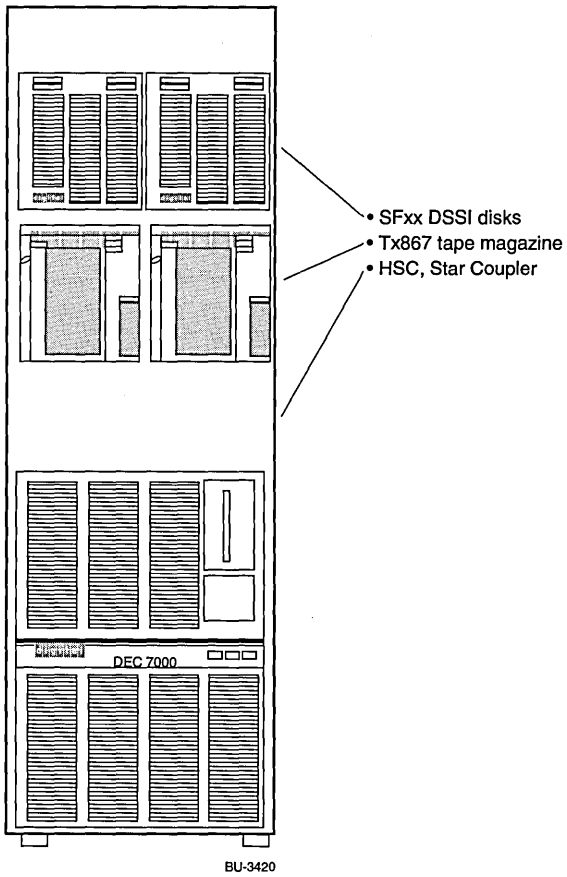
QL-MC2A5-AA Digital NAS Server 300

QA-MC2AA-Hx Digital NAS Server 300 media and documentation kit

QL-MC5A5-AA Digital NAS Production Server 400

QA-MC5AA-Hx Digital NAS Production Server 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape



Specifications

Power Requirement	System Box	XMI I/O Box	H9702-FB Cabinet
AC input voltage	200–240 V	200–240 V	200–240 V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Maximum input current	10A rms	6A rms	24A rms each power controller
Phases	One	One	One
Receptacle	NEMA 6-15	NEMA L6-15	L6-30R (2 required)
Physical characteristics			
Height	48.9 cm (19.3 in.)	39.4 cm (15.5 in.)	206.5 cm (81.3 in.)
Width	48.3 cm (19.0 in.)	48.3 cm (19.0 in.)	57.2 cm (22.5 in.)
Depth	75.2 cm (29.6 in.)	91.7 cm (36.1 in.)	91.4 cm (36.0 in.)
Weight	~90 lb (41 kg)	~130 lb (59 kg)	~300 lb (136 kg)

Clearances	Operating	Service
Front	1.0 m (40 in.)	1.5 m (60 in.)
Rear	1.0 m (40 in.)	1.0 m (40 in.)
Sides	0	Left 0.4 m (15 in.)

Environmental	Operating	Nonoperating
Temperature	15°–28° C (59°–82° F)	40°–66° C (40°–151° F)
Humidity	20%–80%	10%–95%
Heat dissipation	Fully configured system (system cabinet) 6850 Btu/hr, 2000 W per system	

TradeIn '96

Overview

Digital Equipment Corporation has replaced its ADVANTAGE-UPGRADE Program Offerings with the TradeIn '96 Business Practices. TradeIn '96, a simple, uniform, world-wide set of business practices eliminates the fixed upgrade paths of the past. Based on a table of trade-in values, the customer can now upgrade Digital and non-Digital systems to the exact system and configuration that meets their computing needs.

Digital's TradeIn '96 Business Practices help to reduce cost of ownership especially when used in conjunction with Digital's aggressive leasing programs. Digital also offers migration assistance in moving business applications to the Alpha platform.

Highlights

- Customer is able to upgrade to the exact system and configuration that meets their computing needs.
- Generous trade-in value for the existing installed system; includes credit for operating system licenses.
- Customer is allowed to keep existing installed system (or board) for 60 days to allow a smooth transition to the new system.
- Unless otherwise noted, for system upgrades, customer must return CPU, CPU enclosure, minimum memory configuration and base operating system license. For in-cabinet upgrades, customer must return CPU board and base operating system license.

TradeIn '96 Business Practices

- For system level upgrades, the customer selects the exact system and configuration that meets their needs. For in-cabinet upgrades, select the appropriate configuration and part number in this chapter. As part of the overall purchase of the new system, the customer will receive a trade-in value to be applied to the purchase price of the new system. After the new system is delivered, the customer has up to 60 days to keep the existing installed system. This is to allow for a smooth transition to the new installation.

Contact your Digital Sales Representative or Business Partner for more details and current trade-in values in your area.

Digital protects customers' software investments. Standard Software License Trade-in policy applies to the TradeIn '96 Business Practices.

Standard Software License Trade-in Policy

Customers receive credit for the software licenses being traded in. This credit is applied towards purchase of a new software license for the same product. Contact your local Digital Sales Representative or Business Partner for specific terms and conditions in your area.

- Layered Product Capacity Licenses move freely within the same Operating System/Hardware System Class or to a lower System Class within the same Operating System/Hardware Platform.
- Layered Product Capacity License upgrades are required when moving to any new Operating System/Hardware System Class. Standard Software License Trade-in Policy applies.
- Concurrent Use and Personal Use software licenses move freely within the same Operating System regardless of hardware platform. For upgrades to new Operating System, Standard Software License Trade-in policy applies.
- The TradeIn '96 trade-in value includes credit for the base Operating System license.
- For MIPS license upgrades, Standard Software License Trade-in Policy applies.

For more information, contact your local Software Business Practices Specialist, Digital Sales Representative, or Digital Authorized Distributor/Reseller.

AlphaStation 200 4/166 and 4/233 CPU Upgrades

Order Number	From	To	Includes
PB41U-AA	AlphaStation 200 4/100	AlphaStation 200 4/166	166 MHz CPU, Digital UNIX Base license **Note:** Mandatory Return of 100 MHz CPU and Digital UNIX Base license
PB41U-BA	AlphaStation 200 4/100	AlphaStation 200 4/166	166 MHz CPU, OpenVMS Base license **Note:** Mandatory Return of 100 MHz CPU and OpenVMS Base license
PB41U-CA	AlphaStation 200 4/100	AlphaStation 200 4/166	166 MHz CPU, Windows NT license **Note:** Mandatory Return of 100 MHz CPU and Windows NT license
PB43U-AA	AlphaStation 200 4/100	AlphaStation 200 4/233	233 MHz CPU, Digital UNIX Base license **Note:** Mandatory Return of 100 MHz CPU and Digital UNIX Base license
PB43U-BA	AlphaStation 200 4/100	AlphaStation 200 4/233	233 MHz CPU, OpenVMS Base license **Note:** Mandatory Return of 100 MHz CPU and OpenVMS Base license
PB43U-CA	AlphaStation 200 4/100	AlphaStation 200 4/233	233 MHz CPU, Windows NT license **Note:** Mandatory Return of 100 MHz CPU and Windows NT license

AlphaStation 200 4/233 CPU Upgrades

Order Number	From	To	Includes
PB42U-AA	AlphaStation 200 4/166	AlphaStation 200 4/233	233 MHz CPU Digital UNIX Base license **Note:** Mandatory Return of 166 MHz CPU and Digital UNIX Base license
PB42U-BA	AlphaStation 200 4/166	AlphaStation 200 4/233	233 MHz CPU OpenVMS Base license **Note:** Mandatory Return of 166 MHz CPU and OpenVMS Base license
PB42U-CA	AlphaStation 200 4/166	AlphaStation 200 4/233	233 MHz CPU Windows NT license **Note:** Mandatory Return of 166 MHz CPU and Windows NT license

AlphaStation 500/400 MHz CPU Upgrades

Order Number	From	To	Includes
PB56U-AA*	AlphaStation 500/266	AlphaStation 500/400	400 MHz CPU **Note:** Mandatory Return of 266 MHz CPU
PB56U-AB*	AlphaStation 500/333	AlphaStation 500/400	400 MHz CPU **Note:** Mandatory Return of 333 MHz CPU

Note: Installation and Travel are not included with CPU Board Upgrade. Order FM-WSDTP-IN and FM-TRAVL-IN separately.

AlphaStation 600 5/333 CPU Upgrade

Order Number	From	To	Includes
PB62U-BA	AlphaStation 600 5/266	AlphaStation 600 5/333	333 MHz CPU, 4 MB Fast cache for Digital UNIX, OpenVMS and Windows NT **Note:** Mandatory Return of 266 MHz CPU

AlphaServer 400 4/233 CPU Upgrades

Order Number	From	To	Includes
PB51U-CA	AlphaServer 400 4/166	AlphaServer 400 4/233	233 MHz, 512-Kbyte cache CPU **Digital UNIX** Server **Note:** Mandatory return of 166 MHz CPU
PB51U-BA	AlphaServer 400 4/166	AlphaServer 400 4/233	233 MHz, 512-Kbyte cache CPU **OpenVMS** Server **Note:** Mandatory return of 166 MHz CPU
PB51U-AA	AlphaServer 400 4/166	AlphaServer 400 4/233	233 MHz, 512-Kbyte cache CPU **Windows NT** Server **Note:** Mandatory return of 166 MHz CPU

AlphaServer 1000 5/300 CPU Upgrades

Order Number	From	To	Includes
PB75U-FZ	AlphaServer 1000 4/2xx	AlphaServer 1000 5/300	300 MHz CPU **Digital UNIX** Server **Note:** Mandatory return of 200, 233 or 266 MHz CPU
PB75U-MZ	AlphaServer 1000 4/2xx	AlphaServer 1000 5/300	300 MHz CPU **OpenVMS** Server **Note:** Mandatory return of 200, 233 or 266 MHz CPU
PB75U-AZ	AlphaServer 1000 4/2xx	AlphaServer 1000 5/300	300 MHz CPU **Windows NT** Server **Note:** Mandatory return of 200, 233 or 266 MHz CPU

AlphaServer 1000 to AlphaServer 1000A Upgrades

Order Number	From	To	Includes
PB77U-FX	AlphaServer 1000 4/2xx	AlphaServer 1000A 5/300	300 MHz CPU and enclosure **Digital UNIX** license **Note:** Mandatory return of 200, 233, or 266 MHz CPU and enclosure
PB77U-MX	AlphaServer 1000 4/2xx	AlphaServer 1000A 5/300	300 MHz CPU and enclosure **OpenVMS** license **Note:** Mandatory return of 200, 233, or 266 MHz CPU and enclosure
PB77U-AX	AlphaServer 1000 4/2xx	AlphaServer 1000A 5/300	300 MHz CPU and enclosure **Windows NT** server media included **Note:** Mandatory return of 200, 233, or 266 MHz CPU and enclosure
PB78U-FX	AlphaServer 1000 4/2xx or 5/300	AlphaServer 1000A 5/400	400 MHz CPU and enclosure **Digital UNIX** license **Note:** Mandatory return of 4/2xx or 5/300 MHz CPU and enclosure
PB78U-MX	AlphaServer 1000 4/2xx or 5/300	AlphaServer 1000A 5/400	400 MHz CPU and enclosure **OpenVMS** license **Note:** Mandatory return of 4/2xx or 5/300 MHz CPU and enclosure
PB78U-AX	AlphaServer 1000 4/2xx or 5/300	AlphaServer 1000A 5/400	400 MHz CPU and enclosure **Windows NT** server media included **Note:** Mandatory return of 4/2xx or 5/300 MHz CPU and enclosure

AlphaServer 2000 CPU Upgrades

Order Number	From	To	Includes
460XR-UA[1]	AlphaServer 2000 4/200, 4/233	AlphaServer 2000 4/275	275 MHz, 4 MB cache CPU **Note:** Mandatory return of 190, 200 or 233 MHz CPU
470XR-UA[1]	AlphaServer 2000 4/200, 4/233, 4/275	AlphaServer 2000 5/250	250 MHz, 4 MB cache CPU **Note:** Mandatory return of 190, 233 or 275 MHz CPU
480XR-UA[1]	AlphaServer 2000 4/200, 4/233, 4/275	AlphaServer 2000 5/300	300 MHz, 4 MB cache CPU **Note:** Mandatory return of 190, 233 or 275 MHz CPU
480XR-UC[1]	AlphaServer 2000 5/250	AlphaServer 2000 5/300	300 MHz, 4 MB cache CPU **Note:** Mandatory return of 250 MHz CPU

1 To upgrade AlphaServer 2000 4/2xx systems with serial number(s) xx515xxxxxx or lower to a 4/275, 5/250, or 5/300 CPU, order a BA720-UA AlphaServer 2000 Enclosure EMC Upgrade Kit (at no charge) along with the CPU upgrade.

AlphaServer 2100 CPU Upgrades

Order Number	From	To	Includes
460XR-UA	AlphaServer 2100 4/200, 4/233	AlphaServer 2100 4/275	275 MHz CPU, 4 MB cache memory **Note:** Mandatory return of 190 or 233 MHz CPU
470XR-UA	AlphaServer 2100 4/200, 4/233, or 4/275	AlphaServer 2100 5/250	250 MHz CPU, 4 MB cache memory **Note:** Mandatory return of 190, 233, or 275 MHz CPU
480XR-UA	AlphaServer 2100 4/200, 4/233, or 4/275	AlphaServer 2100 5/300	300 MHz CPU, 4 MB cache memory **Note:** Mandatory return of 190, 233, or 275 MHz CPU
480XR-UC	AlphaServer 2100 5/250	AlphaServer 2100 5/300	300 MHz CPU, 4 MB cache memory **Note:** Mandatory return of 250 MHz CPU

AlphaServer 2100A CPU Upgrades

Order Number	From	To	Includes
470XR-UA	AlphaServer 2100A 4/275	AlphaServer 2100A 5/250	250 MHz, 4 MB cache CPU **Note:** Mandatory return of 275 MHz CPU
480XR-UA	AlphaServer 2100A 4/275	AlphaServer 2100A 5/300	300 MHz, 4 MB cache CPU **Note:** Mandatory return of 275 MHz CPU
480XR-UC	AlphaServer 2100A 5/250	AlphaServer 2100A 5/300	300 MHz, 4 MB cache CPU **Note:** Mandatory return of 250 MHz CPU

AlphaServer 2100 to AlphaServer 2100A Upgrades

Order Number	From	To	Includes
KFPEA-AA	AlphaServer 2100	AlphaServer 2100A	Hardware and Software Components to Upgrade AlphaServer 2100 to AlphaServer 2100A **Digital UNIX** V3.2-D2 media included **Note:** Does not include CPU upgrade
KFPEY-AA	AlphaServer 2100	AlphaServer 2100A	Hardware and Software Components to Upgrade AlphaServer 2100 to AlphaServer 2100A **OpenVMS** V6.2 1-1H1 media included **Note:** Does not include CPU upgrade
KFPEN-AA	AlphaServer 2100	AlphaServer 2100A	Hardware and Software Components to Upgrade AlphaServer 2100 to AlphaServer 2100A **Windows NT** Server V3.51B media included **Note:** Does not include CPU upgrade

AlphaServer 2100 RM to AlphaServer 2100A RM Upgrades

Order Number	From	To	Includes
KFPEA-BA	AlphaServer 2100 RM	AlphaServer 2100A RM	Hardware and Software Components to Upgrade AlphaServer 2100 RM to AlphaServer 2100A RM **Digital UNIX** V3.2-D2 media included **Note:** Does not include CPU upgrade
KFPEY-BA	AlphaServer 2100 RM	AlphaServer 2100A RM	Hardware and Software Components to Upgrade AlphaServer 2100 RM to AlphaServer 2100A RM **OpenVMS** V6.2 1-1H1 media included **Note:** Does not include CPU upgrade
KFPEN-BA	AlphaServer 2100 RM	AlphaServer 2100A RM	Hardware and Software Components to Upgrade AlphaServer 2100 RM to AlphaServer 2100A RM **Windows NT** Server V3.51B media included **Note:** Does not include CPU upgrade

AlphaServer 4000 to AlphaServer 4100 Upgrades

Order Number	From	To	Includes
DN-51Z1L-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer for Windows NT. **Note**: Requires mandatory return of AlphaServer 4000 System Drawer.
DA-51Z1J-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer and Digital UNIX base system license. **Note**: Requires mandatory return of AlphaServer 4000 System Drawer and Digital UNIX license.
DY-51Z1K-AA	AlphaServer 4000	AlphaServer 4100	AlphaServer 4100 System Drawer and OpenVMS base system license. **Note**: Requires mandatory return of AlphaServer 4000 System Drawer and OpenVMS license.

AlphaServer 8200 Upgrades

Upgrades for AlphaServer 8200 5/300 customers are available to upgrade current system platform to AlphaServer 8200 5/350 systems.

Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level AlphaServer 8200 5/300 systems to AlphaServer 8200 5/350 systems.

Step 1—AlphaServer 8200 System Upgrades

- Includes 350 MHz clock and two terminator modules.

Note: Must be ordered before AlphaServer 8200 5/350 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75UXX-AX	No license	Uni 8200 5/300 to Uni 8200 5/350 System Upgrade
75UXX-BX	No license	Dual 8200 5/300 to Dual 8200 5/350 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/300 CPUs to 5/350s.

Note: All CPUs in an AlphaServer 8200 system must be at the same speed

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8200 5/300 to AlphaServer 8200 5/350 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75U45-AX	**From - AlphaServer 8200 5/300 Uni CPU Module to AlphaServer 8200 5/350 Uni-CPU**, Requires the trade-in of one AlphaServer 8200 5/300 Uni CPU module. Includes processor module with one 21164/350 MHz CPU.
75U55-AX	**From - AlphaServer 8200 5/300 Dual CPU Module to AlphaServer 8200 5/350 Dual-CPU,** Requires the trade-in of one AlphaServer 8200 5/300 Dual CPU module. Includes processor module with two 21164/350 MHz CPUs.

Step 2b—CPU Symmetric Multi-Processing (SMP) Expansion—Additional 5/350 CPU modules

- Order up to two additional CPU modules for a maximum of three CPU modules.
- If more than two processor modules are in system, a minimum of two separate memory modules should be considered for optimal system performance.
- Part numbers are for adding additional AlphaServer 8200 5/350 CPUs to your system configuration.

753P2-AX	**Digital UNIX SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, Digital UNIX SMP extension license.
753P1-AX	**OpenVMS SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, OpenVMS SMP extension license.
754P2-AX	**Digital UNIX SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, Digital UNIX SMP extension license.
754P1-AX	**OpenVMS SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, OpenVMS SMP extension license.

Step 3—Memory

- Select additional memory if required; maximum 6 GB per system.
- Order up to two additional memory modules, for a maximum of three memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of three memory modules is reduced by **one** for each additional CPU module added from Step 2.

Note: A short term memory size restriction is currently in effect for the **5/300 MHz** systems **only** and does not exist for the 5/350 systems. Therefore any combination of memories (up to three modules) is supported with this upgrade, resulting in system maximum memory of 6 GB.

Step 3a—Memory Expansion

- To add additional memory, use the following part numbers.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades

- Field installation only (**not** configurable in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

AlphaServer 8200 5/300 to 5/440 Upgrades

Upgrades for AlphaServer 8200 5/300 customers are available to upgrade current system platform to AlphaServer 8200 5/440 systems.

Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level AlphaServer 8200 5/300 systems to AlphaServer 8200 5/440 systems. Digital UNIX V3.2G, Digital UNIX V4.0a, and OpenVMS V6.2-1H3 or later operating system releases are required for 5/440 support.

Step 1—AlphaServer 8200 System Upgrades

- Includes dual 437 MHz CPU module, 437 MHz clock module, and two terminator modules

Note: Must be ordered before AlphaServer 8200 5/440 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75UYY-AX	OpenVMS SMP license	Uni 8200 5/300 to Dual 8200 5/440 System Upgrade
75UYY-BX	Digital UNIX SMP license	Uni 8200 5/300 to Dual 8200 5/440 System Upgrade
75UYY-CX	No license	Dual 8200 5/300 to Dual 8200 5/440 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/300 CPUs to 5/440s.

Note: All CPUs in an AlphaServer 8200 system must be at the same speed.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8200 5/300 to AlphaServer 8200 5/440 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75UY3-AX	**From - AlphaServer 8200 5/300 Uni CPU Module to AlphaServer 8200 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8200 5/300 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, OpenVMS SMP license.
75UY4-AX	**From - AlphaServer 8200 5/300 Uni CPU Module to AlphaServer 8200 5/440 Dual-CPU,** requires the trade-in of one AlphaServer 8200 5/300 Uni CPU module. Includes processor module with two 21164/437 Mhz CPUs, Digital UNIX SMP license.
75UY5-AX	**From - AlphaServer 8200 5/300 Dual CPU Module to AlphaServer 8200 5/440 Dual-CPU,** requires the trade-in of one AlphaServer 8200 5/300 Dual CPU module. Includes processor module with two 21164/437 MHz CPUs.

Step 3—Memory

- Select additional memory if required; maximum 6 GB per system.
- Order up to two additional memory modules, for a maximum of three memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of three memory modules is reduced by **one** for each additional CPU module added from Step 2.

Note: A short term memory size restriction is currently in effect for the **5/300 MHz** systems **only** and does not exist for the 5/350 or 5/440 systems. Therefore any combination of memories (up to three modules) is supported with this upgrade, resulting in system maximum memory of 6 GB.

Step 3a—Memory Expansion

- To add additional memory, use the following part numbers.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades

- Field installation only (**not** configurable in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

AlphaServer 8200 5/350 to 5/440 Upgrades

Upgrades for AlphaServer 8200 5/350 customers are available to upgrade current system platform to AlphaServer 8200 5/440 systems.

Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level AlphaServer 8200 5/350 systems to AlphaServer 8200 5/440 systems. Digital UNIX V3.2G, Digital UNIX V4.0a, and OpenVMS V6.2-1H3 or later operating system releases are required for 5/440 support.

Step 1—AlphaServer 8200 System Upgrades

- Includes dual 437 MHz CPU module and 437 MHz clock module.

Note: Must be ordered before AlphaServer 8200 5/440 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75USS-AX	OpenVMS SMP license	Uni 8200 5/350 to Dual 8200 5/440 System Upgrade
75USS-BX	Digital UNIX SMP license	Uni 8200 5/350 to Dual 8200 5/440 System Upgrade
75USS-CX	No license	Dual 8200 5/350 to Dual 8200 5/440 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/350 CPUs to 5/440s.

Note: All CPUs in an AlphaServer 8200 system must be at the same speed.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8200 5/350 to AlphaServer 8200 5/440 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75US3-AX	**From - AlphaServer 8200 5/350 Uni CPU Module to AlphaServer 8200 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8200 5/350 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, OpenVMS SMP license.
75US4-AX	**From - AlphaServer 8200 5/350 Uni CPU Module to AlphaServer 8200 5/440 Dual-CPU,** requires the trade-in of one AlphaServer 8200 5/350 Uni CPU module. Includes processor module with two 21164/437 Mhz CPUs, Digital UNIX SMP license.
75US5-AX	**From - AlphaServer 8200 5/350 Dual CPU Module to AlphaServer 8200 5/440 Dual-CPU,** requires the trade-in of one AlphaServer 8200 5/350 Dual CPU module. Includes processor module with two 21164/437 MHz CPUs.

Step 3—Memory

- Select additional memory if required; maximum 6 GB per system.
- Order up to two additional memory modules, for a maximum of three memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of three memory modules is reduced by **one** for each additional CPU module added from Step 2.

Step 3a—Memory Expansion

- To add additional memory, use the following part numbers.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades

- Field installation only (**not** configurable in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

AlphaServer 8400 5/300 to 5/350 Upgrades

Upgrades for AlphaServer 8400 5/300 customers are available to upgrade current system platform to AlphaServer 8400 5/350 systems. Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level AlphaServer 8400 5/300 systems to AlphaServer 8400 5/350 systems.

Step 1—AlphaServer 8400 System Upgrades

- Includes dual 350 MHz CPU and clock modules.

Note: Must be ordered before AlphaServer 8400 5/350 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75UXX-CX	Digital UNIX SMP license	**Uni** 8400 5/300 to Dual 8400 5/350 System Upgrade
75UXX-EX	OpenVMS SMP license	**Uni** 8400 5/300 to Dual 8400 5/350 System Upgrade
75UXX-DX	No license	**Dual** 8400 5/300 to Dual 8400 5/350 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation.

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/300 CPUs to 5/350s

Note: All CPUs in an AlphaServer 8400 system must be at the same speed.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8400 5/300 to AlphaServer 8400 5/350 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75U45-AX **From - AlphaServer 8400 5/300 Uni CPU Module to AlphaServer 8400 5/350 Uni-CPU**, Requires the trade-in of one AlphaServer 8400 5/300 Uni CPU module. Includes processor module with one 21164/350 MHz CPU.

75U55-AX **From - AlphaServer 8400 5/300 Dual CPU Module to AlphaServer 8400 5/350 Dual-CPU**, Requires the trade-in of one AlphaServer 8400 5/300 Dual CPU module. Includes processor module with two 21164/350 MHz CPUs.

Step 2b—CPU Symmetric Multi-Processing (SMP) Expansion—Additional 5/350 CPU modules

- Order up to five additional CPU modules, for a maximum of six modules.
- If more than three processor modules are in system, a minimum of two separate memory modules should be considered for optimal system performance.
- Part numbers are for adding additional AlphaServer 8400 5/350 CPUs to current system configuration.

753P2-AX **Digital UNIX SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, Digital UNIX SMP extension license.

753P1-AX **OpenVMS SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, OpenVMS SMP extension license.

754P2-AX **Digital UNIX SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, Digital UNIX SMP extension license.

754P1-AX **OpenVMS SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, OpenVMS SMP extension license.

Step 3—Memory

- Select additional memory if required; maximum 14 GB per system.
- Order up to six additional memory modules, for a maximum of seven memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of seven memory modules is reduced by **one** for each additional CPU module added from Step 2.

Note: A short term memory size restriction is currently in effect for **5/300 MHz** systems **only** and does not exist for the 5/350 systems. Therefore, any combination of memories (up to seven modules) is supported with this upgrade, resulting in a system memory maximum of 14 GB.

Step 3a—Memory Expansion

- To add additional memory, use the following part numbers

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades

- Field installation only (**not** configurable in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

AlphaServer 8400 5/300 to 5/440 Upgrades

Upgrades for AlphaServer 8400 5/300 customers are available to upgrade current system platform to AlphaServer 8400 5/440 systems. Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level AlphaServer 8400 5/300 systems to AlphaServer 8400 5/440 systems. Digital UNIX V3.2G, Digital UNIX V4.0a, and OpenVMS V6.2-1H3 or later operating system releases are required for 5/440 support.

Step 1—AlphaServer 8400 System Upgrades

- Includes dual 437 MHz CPU Module and 437 MHz clock module

Note: Must be ordered before AlphaServer 8400 5/440 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75UYY-DX	OpenVMS SMP license	**Uni** 8400 5/300 to Dual 8400 5/440 System Upgrade
75UYY-EX	Digital UNIX SMP license	**Uni** 8400 5/300 to Dual 8400 5/440 System Upgrade
75UYY-FX	No license	**Dual** 8400 5/300 to Dual 8400 5/440 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation.

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/300 CPUs to 5/440s

Note: All CPUs in an AlphaServer 8400 system must be at the same speed.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8400 5/300 to AlphaServer 8400 5/440 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75UY3-AX	**From - AlphaServer 8400 5/300 Uni CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/300 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, OpenVMS SMP license.
75UY4-AX	**From - AlphaServer 8400 5/300 Uni CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/300 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, Digital UNIX SMP license..
75UY5-AX	**From - AlphaServer 8400 5/300 Dual CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/300 Dual CPU module. Includes processor module with two 21164/437 MHz CPUs.

Step 3—Memory

- Select additional memory if required; maximum 14 GB per system.
- Order up to six additional memory modules, for a maximum of seven memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of seven memory modules is reduced by **one** for each additional CPU module added from Step 2.

Note: A short term memory size restriction is currently in effect for **5/300 MHz** systems **only** and does not exist for the 5/350 or 5/440 systems. Therefore, any combination of memories (up to seven modules) is supported with this upgrade, resulting in a system memory maximum of 14 GB.

Step 3a—Memory Expansion

- To add additional memory, use the following part numbers

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades

- Field installation only (**not** configurable in Manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

AlphaServer 8400 5/350 to 5/440 Upgrades

Upgrades for AlphaServer 8400 5/350 customers are available to upgrade current system platform to AlphaServer 8400 5/440 systems. Upgrade kit includes all hardware items needed to upgrade base level AlphaServer 8400 5/350 systems to AlphaServer 8400 5/440 systems. Digital UNIX V3.2G, Digital UNIX V4.0a, and OpenVMS V6.2-1H3 or later operating system releases are required for 5/440 support.

Step 1—AlphaServer 8400 System Upgrades

- Includes dual 437 MHz CPU Module and 437 MHz clock module

Note: Must be ordered before AlphaServer 8400 5/440 SMP upgrades can be added.

Order Number	Operating System License Included	Type of Upgrade
75USS-DX	No license	**Dual** 8400 5/350 to Dual 8400 5/440 System Upgrade

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation.

Step 2—CPU Symmetric Multi-Processing (SMP)—for upgrading additional 5/350 CPUs to 5/440s

Note: All CPUs in an AlphaServer 8400 system must be at the same speed.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current AlphaServer 8400 5/350 to AlphaServer 8400 5/440 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

75US3-AX	**From - AlphaServer 8400 5/350 Uni CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/350 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, OpenVMS SMP license.
75US4-AX	**From - AlphaServer 8400 5/350 Uni CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/350 Uni CPU module. Includes processor module with two 21164/437 MHz CPUs, Digital UNIX SMP license..
75US5-AX	**From - AlphaServer 8400 5/350 Dual CPU Module to AlphaServer 8400 5/440 Dual-CPU**, requires the trade-in of one AlphaServer 8400 5/350 Dual CPU module. Includes processor module with two 21164/437 MHz CPUs.

Step 3—Memory

- Select additional memory if required; maximum 14 GB per system.
- Order up to six additional memory modules, for a maximum of seven memory modules.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of seven memory modules is reduced by **one** for each additional CPU module added from Step 2.

Step 3a—Memory Expansion

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3b—Memory Upgrades— Field installation only (not configurable in Manufacturing)

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

VAX/DEC 7000 In-cabinet Upgrades to AlphaServer 8400

Upgrades for VAX/DEC 7000 customers are available to upgrade current system platform to AlphaServer 8400 5/300, 5/350, or 5/440 systems.

Upgrades consist of replacing the current VAX/DEC 7000 System Backplane, CPU module(s), memory module(s), and I/O port module. All XMI plug-in unit(s) and disk/tapes are fully supported. In addition, adding new PCI plug-in unit options is supported.

Upgrade kit part numbers are available with OpenVMS or Digital UNIX licenses and include all hardware items needed to upgrade base level VAX/DEC 7000 system to AlphaServer 8400 system.

AlphaServer 8400 requires a new System Backplane assembly, new CPU module(s), new memory module(s), and new I/O port module(s). Special allowances and trade-ins are available to handle current memory modules.

Before undertaking this Step-by-Step procedure, obtain an up-to-date configuration listing of the system that you plan to upgrade.

Step 1—AlphaServer 8400 5/300, 5/350, and 5/440 Upgrades

- 5/300 and 5/350 upgrades require Digital UNIX V3.2B or later, and OpenVMS V6.2 or later.
- 5/440 upgrades require Digital UNIX V3.2G, Digital UNIX 4.0a, and OpenVMS V6.2-1H3 or later releases.
- Console terminal required unless available on site.
- Upgrade part numbers assume you start with a single CPU module VAX/DEC 7000 configuration (VAX/DEC 7610/7710/7810).
- Minimum system configuration must have the following: one AlphaServer 8400 Dual-CPU module, one KFTHA-AA or KFTIA-AA system I/O module, and one memory module.
  - Six slots available for additional modules (CPU modules, memory modules, or system I/O modules).
- CD-ROM is required—VAX 7000 upgrades require addition of RRDCD-CA option.
  - CD-ROM requires single-ended SCSI-2 connection from either KFTIA-AA or KZMSA-AB in XMI plug-in unit, or KZPAA-AA in PCI plug-in unit.

Upgrade Systems include

- AlphaServer 8400 9-slot backplane assembly.
- One Processor module with **two** Alpha microprocessor 21164 5/300; 5/350, or 5/440 CPUs, each CPU includes 4 MB Backup cache.
- System I/O module (KFTHA-AA) with **four** I/O channel connections **or** integrated I/O module (KFTIA-AA) with **one** I/O channel connection.
- No memory or a 2 GB memory carrier for upgrading current 2 GB memory module.
- Operating System Software
  - Digital UNIX base license **or**
  - OpenVMS base license
- One year hardware product warranty.
- 90 day software product warranty.

Order Number	Dual CPU	Operating System	I/O Module	Memory Notes
DA-291BU-YX	**5/300**	Digital UNIX	KFTHA	No memory included, see Step 3.
DA-291BU-FX	**5/300**	Digital UNIX	KFTHA	2 GB memory carrier included
DA-291BU-ZX	**5/300**	Digital UNIX	KFTIA	No memory included, see Step 3.
DA-291BU-HX	**5/300**	Digital UNIX	KFTIA	2 GB memory carrier included
DY-291BU-YX	**5/300**	OpenVMS	KFTHA	No memory included, see Step 3.
DY-291BU-FX	**5/300**	OpenVMS	KFTHA	2 GB memory carrier included
DY-291BU-ZX	**5/300**	OpenVMS	KFTIA	No memory included, see Step 3.
DY-291BU-HX	**5/300**	OpenVMS	KFTIA	2 GB memory carrier included
DA-291DU-YX	**5/350**	Digital UNIX	KFTHA	No memory included, see Step 3.
DA-291DU-FX	**5/350**	Digital UNIX	KFTHA	2 GB memory carrier included
DY-291DU-YX	**5/350**	OpenVMS	KFTHA	No memory included, see Step 3.
DY-291DU-FX	**5/350**	OpenVMS	KFTHA	2 GB memory carrier included
DA-292FU-YX	**5/440**	Digital UNIX	KFTHA	No memory included, see Step 3.
DA-292FU-FX	**5/440**	Digital UNIX	KFTHA	2 GB memory carrier included
DY-292FU-YX	**5/440**	OpenVMS	KFTHA	No memory included, see Step 3.
DY-292FU-FX	**5/440**	OpenVMS	KFTHA	2 GB memory carrier included

Note: All upgrades require the return of upgraded hardware to Digital Equipment Corporation

Step 2—CPU Symmetric Multi-Processing (SMP)

- Order up to five additional CPU modules, for a maximum of six modules.
- If more than three processor modules are in system, a minimum of two separate memory modules should be considered for optimal system performance.
- Use Step 2a to "trade-in" current VAX/DEC 7000 CPUs if more then One CPU is in current VAX/DEC 7000 system.
- Use Step 2b to add additional AlphaServer 8400 CPU modules to the configuration.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

- Part numbers provide for trade-in value of current VAX/DEC 7000 CPUs to AlphaServer 8400 CPUs.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.
- One year hardware product warranty included.

AlphaServer 8400 5/300 Systems	
75U14-AX	**From - VAX/DEC 7000 CPU Module to Digital UNIX SMP—Uni-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with one 21164/300 MHz CPU, Digital UNIX SMP extension license.
75U13-AX	**From - VAX/DEC 7000 CPU Module to OpenVMS SMP—Uni-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with one 21164/300 MHz CPU, OpenVMS SMP extension license.
75U24-AX	**From - VAX/DEC 7000 CPU Module to Digital UNIX SMP—Dual-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/300 MHz CPUs, Digital UNIX SMP extension license.
75U23-AX	**From - VAX/DEC 7000 CPU Module to OpenVMS SMP—Dual-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/300 MHz CPUs, OpenVMS SMP extension license.
75U34-AX	**From - two VAX/DEC 7000 CPU Modules to Digital UNIX SMP—Dual-CPU**, Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/300 MHz CPUs, Digital UNIX SMP extension license.
75U33-AX	**From - two VAX/DEC 7000 CPU Modules to OpenVMS SMP—Dual-CPU**, Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/300 MHz CPUs, OpenVMS SMP extension license.

AlphaServer 8400 5/350 Systems	
75U64-AX	**From - VAX/DEC 7000 CPU Module to Digital UNIX SMP—Uni-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with one 21164/350 MHz CPU, Digital UNIX SMP extension license.
75U63-AX	**From - VAX/DEC 7000 CPU Module to OpenVMS SMP—Uni-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with one 21164/350 MHz CPU, OpenVMS SMP extension license.
75U74-AX	**From - VAX/DEC 7000 CPU Module to Digital UNIX SMP—Dual-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/350 MHz CPUs, Digital UNIX SMP extension license.
75U73-AX	**From - VAX/DEC 7000 CPU Module to OpenVMS SMP—Dual-CPU**, Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/350 MHz CPUs, OpenVMS SMP extension license.
75U84-AX	**From - two VAX/DEC 7000 CPU Modules to Digital UNIX SMP—Dual-CPU**, Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/350 MHz CPUs, Digital UNIX SMP extension license.
75U83-AX	**From - two VAX/DEC 7000 CPU Modules to OpenVMS SMP—Dual-CPU**, Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/350 MHz CPUs, OpenVMS SMP extension license.

Step 2a—CPU Symmetric Multi-Processing (SMP) Trade-ins

AlphaServer 8400 5/440 Systems	
75UD4-AX	**From - VAX/DEC 7000 CPU Module to Digital UNIX SMP—Dual-CPU** Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/437 MHz CPU, Digital UNIX SMP extension license.
75UC3-AX	**From - VAX/DEC 7000 CPU Module to OpenVMS SMP—Dual-CPU** Requires trade-in of one VAX/DEC 7000 CPU module. Includes processor module with two 21164/437 MHz CPU, OpenVMS SMP extension license.
75UH5-AX	**From - two VAX/DEC 7000 CPU Modules to Digital UNIX SMP—Dual-CPU** Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/437 MHz CPU, Digital UNIX extension license.
75UG5-AX	**From - two VAX/DEC 7000 CPU Module to OpenVMS SMP—Dual-CPU** Requires trade-in of two VAX/DEC 7000 CPU modules. Includes processor module with two 21164/437 MHz CPU, OpenVMS SMP extension license.

Step 2b—CPU Symmetric Multi-Processing (SMP) Expansion

- Order up to five additional CPU modules, for a maximum of six modules.
- Part numbers are for adding additional AlphaServer 8400 CPUs to your system configuration.

AlphaServer 8400 5/300 Systems	
751P2-AX	**Digital UNIX SMP upgrade—Uni-CPU**, includes processor module with one 21164/300 MHz CPU, Digital UNIX SMP extension license.
751P1-AX	**OpenVMS SMP upgrade—Uni-CPU**, includes processor module with one 21164/300 MHz CPU, OpenVMS SMP extension license.
752P2-AX	**Digital UNIX SMP upgrade—Dual-CPU**, includes processor module with two 21164/300 MHz CPUs, Digital UNIX SMP extension license.
752P1-AX	**OpenVMS SMP upgrade—Dual-CPU**, includes processor module with two 21164/300 MHz CPUs, OpenVMS SMP extension license.
752P3-AX	**Digital UNIX SMP upgrade—Uni-CPU to Dual-CPU**, includes processor module with two 21164/300 MHz CPUs, Digital UNIX SMP extension license. Requires return of AlphaServer 8400 Uni-CPU module to Digital Equipment Corporation.
752P4-AX	**OpenVMS SMP upgrade—Uni-CPU to Dual-CPU**, includes processor module with two 21164/300 MHz CPUs, OpenVMS SMP extension license. Requires return of AlphaServer 8400 Uni-CPU module to Digital Equipment Corporation.
AlphaServer 8400 5/350 Systems	
753P2-AX	**Digital UNIX SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, Digital UNIX SMP extension license.
753P1-AX	**OpenVMS SMP upgrade—Uni-CPU**, includes processor module with one 21164/350 MHz CPU, OpenVMS SMP extension license.
754P2-AX	**Digital UNIX SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, Digital UNIX SMP extension license.
754P1-AX	**OpenVMS SMP upgrade—Dual-CPU**, includes processor module with two 21164/350 MHz CPUs, OpenVMS SMP extension license.
AlphaServer 8400 5/440 Systems	
756P2 -AX	**Digital UNIX SMP upgrade—Dual-CPU**, includes processor module with two 21164/437 MHz CPUs, Digital UNIX SMP extension license.
756P1-AX	**OpenVMS SMP upgrade—Dual CPU**, includes processor module with two 21164/437 MHz CPUs, OpenVMS SMP extension license.

Step 3—Memory

- Select additional memory if required; maximum 14 GB per system.
- Order up to six additional memory modules, for a maximum of seven memory modules.
- Use Step 3a to "trade-in" your current VAX/DEC 7000 memory modules.
- Use Step 3b to add additional AlphaServer 8400 memory modules to your configuration.
- Each memory module has built in two-way interleaving. Additional interleaving is accomplished by adding more memory modules.
- Maximum of seven memory modules is reduced by **one** for each additional CPU module added from Step 2.

Note: A short term memory size restriction is currently in effect for **5/300 MHz** systems **only**. Memory modules **must** be in quantity of one, two, or four memory modules of the same size. This means that maximum memory configuration is temporarily four 2 GB memory modules, resulting in system maximum memory of 8 GB. **Note:** Maximum 8 GB of memory for 5/300 systems restriction **does not** apply to 5/350 or 5/440 system upgrades.

Step 3a—Memory Trade-in

- Part numbers provide for trade-in value of current VAX/DEC 7000 memory modules to AlphaServer 8400 memory modules.
- All trade-in part numbers require return of hardware to Digital Equipment Corporation.

MS7CC-UD	DEC/VAX 7000 256 MB memory trade-in for a AlphaServer 8200/8400 256 MB module
MS7CC-UE	DEC/VAX 7000 256 MB memory trade-in for a AlphaServer 8200/8400 512 MB module
MS7CC-UF	DEC/VAX 7000 512 MB memory trade-in for a AlphaServer 8200/8400 512 MB module
MS7CC-UG	DEC/VAX 7000 512 MB memory trade-in for a AlphaServer 8200/8400 1 GB module

Step 3b—Memory Expansion

- These part numbers provide for adding additional AlphaServer 8400 memory to system configuration.

MS7CC-BA	128 MB memory module
MS7CC-CA	256 MB memory module
MS7CC-DA	512 MB memory module
MS7CC-EA	1073 MB memory module
MS7CC-FA	2147 MB memory module

Step 3c—Memory Upgrades

- Field installation only (**not** configurable in manufacturing).

MS7CC-UA	128 MB memory upgrade (8 MB SIMMs), upgrades 128 MB (-BA) module to a 256 MB (-CA) module
MS7CC-UB	512 MB memory upgrade (32 MB SIMMs), upgrades 512 MB (-DA) module to a 1 GB (-EA) module

Step 4—CD-ROM

- If VAX/DEC 7000 system does not include CD-ROM (located in the upper front right hand corner of the system cabinet) a CD-ROM device is required.
- CD-ROM device in StorageWorks shelf driven from the KZPSA-BB and a DWZZA-VA is **not** allowed.
- CD-ROM requires a single-ended SCSI-2 connection from either the KFTIA-AA or the KZMSA-AB in a XMI plug-in unit, or the KZPAA-AA in a PCI plug-in unit.
- All connections to the CD-ROM device will stop at the device, further daisy chaining is **not** allowed.

RRDCD-CA	**AlphaServer 8400 In-cabinet CD-ROM disk**—maximum of one per system. Must be ordered if no CD-ROM device exists in upgraded system. Includes CD-ROM device, mounting hardware, BN21H-0H cable (.75 meter length cable) - will require ordering longer cable to reach either the XMI PIU or the PCI PIU.
KZPAA-AA	**PCI SCSI Controller**—Single-ended narrow SCSI controller. **Only** for connecting the RRDCD-CA to the PCI plug-in unit.

Step 5—Three Phase Expansion Components

If VAX/DEC 7000 system being upgraded has one H7263 power regulator, recheck the EPUs to verify if second power regulator is needed.

H7263-AA/AB	**Three Phase 48 VDC power regulator with BBU capability**—maximum three per cabinet. A second regulator may be required to supply adequate power depending on configuration. See power configuration table in the AlphaServer 8400 section. A third regulator assures N+1 power redundancy and higher availability in the event of a power regulator failure.
H7263-AC/AD	Same as H7263-AA/AB except there is no built-in battery back-up (BBU) capability.

Step 6—Additional procedures needed

- Verify that T2028 module in DWLMA (XMI plug-in unit) is at minimum revision of "F05". If not replace with latest revision.
- Recheck new configurations "EPU" value to determine if second power regulator is now required.
- For additional items see the AlphaServer 8400 System Ordering Menu.

VAXstation 4000 Board Upgrades

Upgrade kits must be installed by Digital Services.

Order Number	From	To	Includes
PV71U-BF†	VAXstation 4000 Model 60 2D LCG graphics (66/72 Hz)	VAXstation 4000 Model 96 LCSPX 2D graphics (66/72 Hz)	VAXstation 4000 Model 96 CPU System enclosure and power supply 8-plane color/grayscale graphics board 2.7-m (9-ft) color/monochrome video cable Brackets for three internal SCSI devices (one removable, two fixed disks) ThinWire/Thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS** base license Digital NAS 150 license **Note:** Mandatory return of Model 60 CPU board and LCG graphics card
PV71U-BH	VAXstation 4000 Model 90/90A 2D LCSPX graphics - 66/72Hz	VAXstation 4000 Model 96 LCSPX 2D (66/72 Hz)	VAXstation 4000 Model 96 CPU Digital NAS 150 license **Note:** Mandatory return of Model 90/90A CPU board

† VAXstation Model 96 systems require minimum of 16 MBs of main memory; 8 MB memory embedded on Model 60 system board cannot be transferred. See Model 96 memory configurations. 4 MB and 16 MB SIMMs from Model 60 may be transferred to Model 96 in sets of four ONLY (e.g., two MS44L-BA = 4 x 4 MB SIMMs). Model 96 memory modules must be installed in sets of four matching value SIMMs.

MicroVAX 3100 Desktop Server Board Upgrades

Note: A non-return charge will be assessed if old CPU board is not returned to Digital

Order Number	From	To	Includes
31JXR-AA	MicroVAX 3100 Model 40 MicroVAX 3100 Model 80	MicroVAX 3100 Model 85 Server	MicroVAX 3100 Model 85 Server CPU 64 MB of memory **OpenVMS** base license
49GAX-E9	MicroVAX 3100 Model 40 MicroVAX 3100 Model 80	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU 64 MB of memory **OpenVMS** base license
49JAX-E9	MicroVAX 3100 Model 85 MicroVAX 3100 Model 90 MicroVAX 3100 Model 95	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU 64 MB of memory **OpenVMS** base license
49XR-AA	MicroVAX 3100 Model 90 MicroVAX 3100 Model 95	MicroVAX 3100 Model 96 Server	MicroVAX 3100 Model 96 Server CPU **OpenVMS** base license

VAX 4000 Model 106A CPU Board Upgrades

Order Number	From	To	Includes
53XR-BA	VAX 4000 Models 100, 100A, 105A,106A	VAX 4000 Model 106A	**OpenVMS** base license **Note:** A non-return charge will be assessed if old CPU board is not returned to Digital.

VAX 4000 Model 106A Rackmount System Upgrades

Order Number	From	To	Includes
53XRA-BA	Rackmount VAX 4000 Models 100, 100A, 105A	Rackmount VAX 4000 Model 106A	VAX 4000 Model 106A CPU **OpenVMS** base license **Note:** Mandatory return of old CPU

VAX 4000 Models 505A/705A CPU Board Upgrades

Note: A non-return charge will be assessed if old CPU board is not returned to Digital.

Order Number	From	To	Includes
691XU-CS[1]/DS	VAX 4000 Model 300	VAX 4000 Model 505A	CPU, BA440 backplane **OpenVMS** base license
691XU-DB	VAX 4000 Models 400, 500, 500A	VAX 4000 Model 505A	CPU **OpenVMS** base license
694XR-CS[1]/DS	VAX 4000 Model 300	VAX 4000 Model 705A	CPU, BA440 backplane **OpenVMS** base license
694XR-DB	VAX 4000 Models 400, 500, 500A	VAX 4000 Model 705A	CPU **OpenVMS** base license
694XR-JB	VAX 4000 Models 505A, 600, 600A, 700A	VAX 4000 Model 705A	CPU **OpenVMS** base license

1 The -CS upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WFO4899999 or lower, AYO4700100 and lower.

VAX 7000 Board Upgrades

Order Number	From	To	Includes
7FATA-LA	VAX 7000/1000 Model 610 Model 620 Model 630	VAX 7000 Model 620 Model 630 Model 640	Single CPU **OpenVMS** SMP extension license
7FETB-AA[1]	VAX 7000 Model 640	VAX 7000 Model 650	CPU **OpenVMS** SMP extension license
7FFTB-AA[1]	VAX 7000 Model 650	VAX 7000 Model 660	CPU **OpenVMS** SMP extension license
7JATB-LE	VAX 7000 Model 7xx	VAX 7000 Model 7xx+1	CPU **OpenVMS** SMP extension license
7JAVB-AA[2]	VAX 7000 Model 610 VAX 10000 Model 610	VAX 7000 Model 710	CPU module, VAX 7000 console kit **OpenVMS** base license **Note:** Mandatory return of Model 6xx CPU modules
7JAVB-LA[2]	VAX 7000 Model 6xx SMP System	VAX 7000 Model 7xx SMP System	CPU module **OpenVMS** SMP extension license **Note:** Mandatory return of Model 6xx CPU modules
7MATA-LE	VAX 7000 Model 8xx	VAX 7000 Model 8xx + 1	CPU module **OpenVMS** SMP extension license
7MAVA-AA	VAX 7000 Model 610/710 VAX 10000 Model 610	VAX 7000 Model 810	CPU module, VAX 7000 console kit **OpenVMS** base license **Note:** Mandatory return of Model 6xx CPU modules
7MAVA-LA	VAX 7000 Model 6xx/7xx VAX 10000 Model 6xx	VAX 7000 Model 8XX	CPU module, VAX 7000 console kit **OpenVMS** SMP extension license **Note:** Mandatory return of Model 6xx CPU modules

1 Note that OpenVMS VAX V6.0 or higher is required to support VAX 7000 Models 650 and 660, and a minimum of 512 MBs of memory

2 Use in conjunction with order number 7JAVB-AA to upgrade VAX 7000/10000 Model 6xx SMP systems to VAX 7000 Model 7xx SMP systems. For example, to upgrade from a VAX 7000 Model 640 to a VAX 7000 Model 740 system, order: (1) 7JAVB-AA and (3) 7JAVB-LA.

OpenVMS Cluster Systems Configuration Details

Overview

An OpenVMS Cluster system, one of Digital's most highly developed architectures, supports a wide variety of computing demands. An OpenVMS Cluster system is a distributed computing environment that can include Alpha and VAX systems in any combination. OpenVMS Cluster configurations are logically, closely coupled, while physically, loosely coupled. They provide the benefits of both high availability and scalability, within a single, easily managed, security environment. An OpenVMS Cluster configured with multiple Alpha and VAX systems appears as a single system to users and applications, regardless of the composition or physical location of the systems. Multiple Alpha and VAX systems may be linked together, regardless of size and capacity. Peripherals such as disks, tapes, printers are fully shared by all nodes in the OpenVMS Cluster.

An OpenVMS Cluster system offers a stable and predictable computing environment. OpenVMS Cluster system design provides high performance and high data integrity, and dramatically decreases—or even eliminates—the impact of the shutdown or failure of an individual system or storage subsystem. An OpenVMS Cluster system may be configured to provide varying levels of availability, including disaster tolerance.

OpenVMS Cluster systems provide the ability to add systems of vary computing performance and storage capacity by flexible increments. They support scalability across several dimensions: range of availability, size and number of host processor, number of users, storage capacity, interconnect bandwidth, and physical distance.

OpenVMS Cluster systems maximize an investment in computing resources, extend the life of existing systems, and can meet future growth needs. OpenVMS Cluster technology offers an economical means of expanding compute power and shared resources in gradual steps, by simply adding Alpha systems, VAX systems, and peripheral devices to the cluster as requirements grow. In addition, OpenVMS Cluster systems allow simplification of system management with the ability to manage the complete configuration—host processors, user workstations, disk and tape subsystems, and shared resources—as a single system.

OpenVMS Cluster systems represent a way to use multiple computer systems that is unique in the industry. Industry-leading availability, scalability, investment protection, and ease of system management are provided by OpenVMS Clusters.

OpenVMS Cluster systems are ideal for implementing the full range of computing needs—from high-end mission-critical production systems, to mainframe downsizing, to high availability departmental client server configurations, to medium-and high-end PC-LAN upsizing solutions.

OpenVMS Clusters can be configured entirely with Alpha systems, or with a mix of VAX and Alpha systems.

OpenVMS Cluster Systems Configuration Details *(continued)*

OpenVMS Cluster Benefits

OpenVMS Cluster technology offers many benefits through a variety of configurations. These benefits include:

- Power and flexibility of the OpenVMS operating system extended over a number of Alpha and VAX systems.
- Resource sharing of data, computes, printers, applications, backup capabilities.
- Availability spectrum based upon the use of element redundancy to satisfy application requirements.
- Single system management domain, regardless of e size or complexity of the configuration.
- Expandability of performance, number of systems in the OpenVMS Cluster, and storage devices with no requirement for application modification.
- Investment protection for growth and extension of CPUs, storage, and knowledge of MIS personnel and end users.

Configuring OpenVMS Cluster Systems

OpenVMS Cluster systems are configured with the following groups of components:

- **Systems**—Any Alpha or VAX system may be configured in an OpenVMS Cluster.
- **Interconnects**—There are six types of interconnect that are currently used in OpenVMS Cluster configurations. The capabilities varies:
  - Shared access by multiple nodes to storage devices and controllers, and node-to-node communication: CI, DSSI
  - Shared access by multiple nodes to storage devices and controllers, without node-to-node communication: SCSI
  - Node-to-node communication, with no storage capability: MEMORY CHANNEL
  - LAN-based node-to-node communication with no directly connected storage: FDDI and Ethernet. (FDDI provides access to a family of OpenVMS-based storage servers. Access to T3 or ATM for OpenVMS Cluster communication is possible using an FDDI in combination with a GIGAswitch configured with a T3/ATM adapter.)
- **Storage Subsystems**—The complete range of Digital SCSI, DSA, and DSSI storage subsystems may be configured in an OpenVMS Cluster system. The following table provides positioning based on the six interconnects:

OpenVMS Cluster Configurations												
		CI	DSSI						SCSI	Ethernet	FDDI	MEMORY CHANNEL
		Alpha Server 8200 8400 DEC 7000 10000	DEC 4000[1]	Alpha Server 1000/2000 2100/4000 4100	VAX 10000	VAX 7000	VAX 6000	VAX 4000				
Maximum distance (meters)	90	27	20	20	25	27	27	20	3-25	2K	40K	6
Systems supported per bus	16	4[4]	4	4	4[4]	4	4	4	3	96	96	4
Service CPU online	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service storage online	Yes	Yes	Yes[2]	Yes[2]	Yes	Yes	Yes	Yes[2]	Yes	N/A	N/A	N/A
Reconfigure cluster while online[3]	Yes	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Approximate maximum storage per bus [5] (configuration dependent)	2.5 TB	0.6 TB	0.6 TB	0.6 TB	0.6 TB	0.6 TB	0.6 TB	0.6 TB	0.3 TB	N/A	N/A	N/A
Maximum buses per system	2-12	4-24	2	4	24	24	24	1-2	6	No limit	No limit	2
Bandwidth (aggregate Mbits/s per bus)	140	32	32	32	32	32	32	32	80-160	10	100	800

1 Two DEC 4000 systems is the maximum that can be cabled on a DSSI bus.
2 Service storage in supported warm-swap enclosures only, i.e., can "warm-swap" RF disks in SF3x/7x storage building blocks, TF8x7 tape cartridge system, and all RF/TF ISEs in Model 400 series enclosures (BA44x, BA43x, R400X, B400X).
3 Systems and storage devices may be added/removed from a CI OpenVMS Cluster while the cluster continues. To add/remove systems in a DSSI/SCSI OpenVMS Cluster may require shutting down all or part of the cluster.
4 Cable length restrictions may restrict the practical node count, depending on specific configuration and system mix.
5 Based on 4GB disks; 15 HSJs per CI; 6 HSDs per DSSI; 2 HSZs per SCSI

OpenVMS Cluster Systems Configuration Details *(continued)*

Rules and Configuration Guidelines

The next sections focus on the rules and configuration guidelines for each OpenVMS Cluster interconnect. The rules and guidelines included here are to assist in planning purchases. For additional details, refer to the OpenVMS Cluster Software Product Description (SPD) (29.78.xx), and the *Guidelines for OpenVMS Cluster Configuration Manual* in the OpenVMS manual set.

Note: From OpenVMS V6.2, the same SPD (29.78.xx) is used to describe OpenVMS Cluster Software for both Alpha and VAX systems. However, OpenVMS Cluster Software must be ordered using architecture specific product names and part numbers. VAX processors in an OpenVMS Cluster system are licensed with the *VAXcluster Software for OpenVMS VAX* product (order number = QL-VBRA*-**), and Alpha processors are licensed with the *VMScluster Software for OpenVMS Alpha* product (order number = QL-MUZA*-**). Information describing which characters replace the asterisks can be found in the *Systems/Services Price List.* OpenVMS Cluster software media and documentation is included in the OpenVMS base operating system software media and documentation kit; an OpenVMS Cluster software license is required to enable the clustering software.

Note: OpenVMS V6.2 introduced a low-cost, reduced functionality clustering product called OpenVMS Cluster Client. This is available as part of the NAS 150 product for Alpha and VAX workstation systems and provides full clustering functionality with the restrictions that Client systems may not provide Votes to the cluster configuration, and may not MSCP or TMSCP serve disks and tapes. (Note that a cluster must be configured with at least one Voting node.)

The configuration rules below are condensed from the OpenVMS Cluster Software SPD.

OpenVMS Cluster information is located on the World Wide Web at http://www.openvms.digital.com

General OpenVMS Cluster Configuration Rules

The following rules apply to all OpenVMS Cluster systems:

- A maximum of 96 Alpha and VAX (combined total) systems can be configured in an OpenVMS Cluster.
- A VAX and an Alpha system may not boot from the same system disk. System disks are architecture specific, and may only be shared by systems of the same architecture.
- Every system in an OpenVMS Cluster system must be connected to every other system via any of the supported OpenVMS Cluster interconnects. Configurations that use a shared (multi-host) SCSI bus must also be configured with any of the other supported OpenVMS Cluster interconnects (this is because node-to-node communication does not occur across the SCSI bus).
- Cross architecture satellite booting is supported. Alpha satellites (clients) may boot from a VAX boot server, and VAX satellites (clients) may boot from an Alpha boot server.

The following table shows the OpenVMS Cluster interconnects supported for VAX and Alpha systems.

Systems	CI	MEMORY CHANNEL	DSSI	SCSI	FDDI	Ethernet
AlphaServer 8400, 8200	X	X	X	X	X[1]	X
AlphaServer 4100, 4000, 2100[2], 2100A, 2000	X	X	X	X	X[1]	X[1]
AlphaServer 1000, 1000A		X	X	X	X	X[1]
AlphaServer 400			X	X	X	X[1]
AlphaStation series				X	X	X[1]
AlphaBook laptop						X[1]
DEC 7000/10000	X		X		X[1]	X
DEC 4000			X		X	X[1]
DEC 3000				X	X[1]	X[1]
DEC 2000					X	X[1]
VAX 6000/7000/10000	X		X		X	X
VAX 4000, MicroVAX 3100			X		X	X[1]
VAXstation 4000					X	X[1]

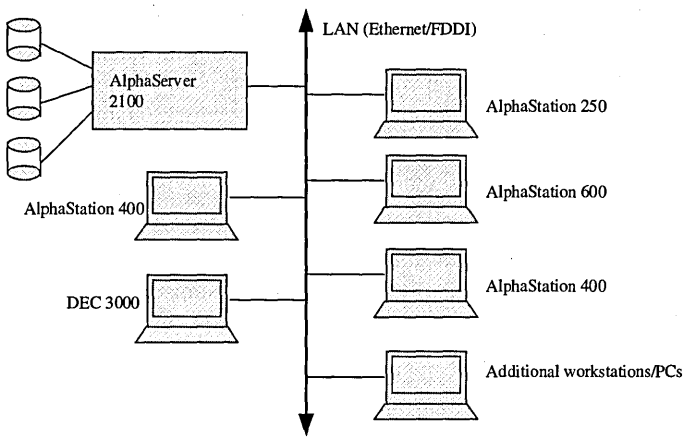
1 Denotes ability to boot over the interconnect as satellite node.
2 AlphaServer 2100 systems require a hardware ECO prior to installing MEMORY CHANNEL .

OpenVMS Cluster Systems Configuration Details *(continued)*

Example Configurations

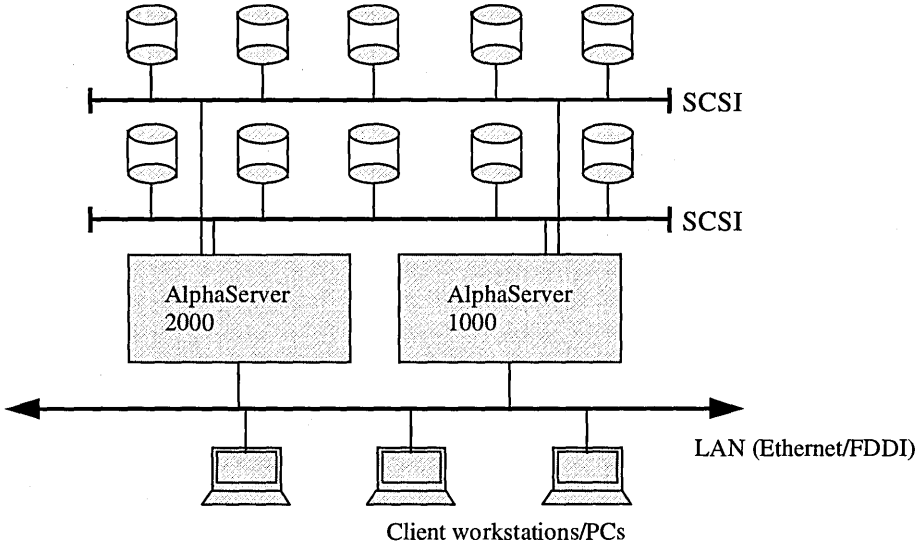
The following pages show some example OpenVMS Clusters - demonstrating the range and flexibility of configurations that is possible.

Alpha Client/Server LAN based OpenVMS Cluster



This configuration shows a simple client/server OpenVMS Cluster configuration based on Alpha systems. The AlphaServer 2100 system acts as a boot node and disk server for a collection of AlphaStation 250, 400 and 600 and DEC 3000 satellite clients. Ethernet is used as the OpenVMS Cluster interconnect. Up to 96 systems can be configured into an OpenVMS Cluster configuration.

Dual-Host Single-Ended SCSI based OpenVMS Cluster Configuration

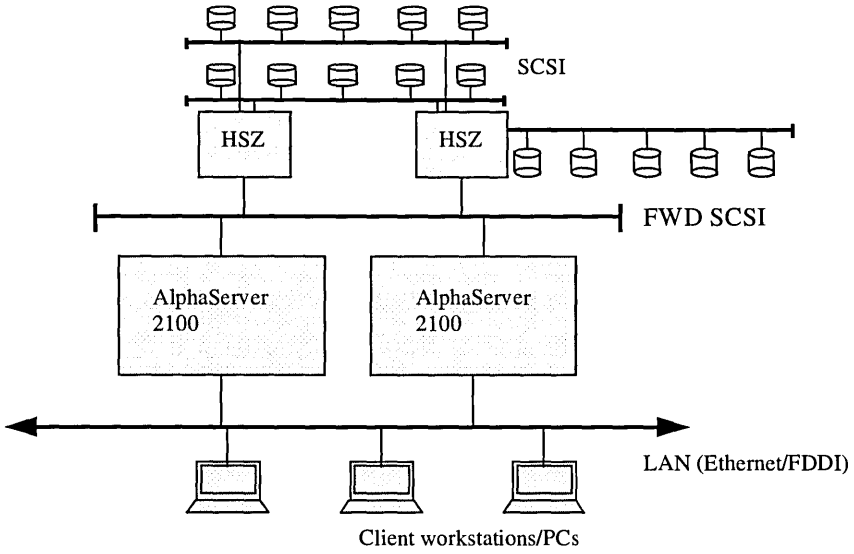


This configuration shows two AlphaServer systems configured into a SCSI OpenVMS Cluster. Each system is connected to two shared SCSI buses, giving, in this example, a total of ten fully shared disks. The configuration could be expanded to include up to 6 shared disks per SCSI bus, and up to six shared buses. An additional AlphaServer system could be added (note that this would reduce the maximum number of disks per SCSI bus to 5). OpenVMS Clusters provide full disk sharing, so a single system disk can be configured on a shared SCSI bus for both systems to boot off. SCSI Clusters can only be configured using Alpha systems. The disks are single-ended SCSI compliant, and so the SCSI buses and host adapters are also single-ended SCSI. Single-ended SCSI can provide up to 10 MB/second throughput. Note that the LAN is required in this configuration in order to provide node-to-node communication.

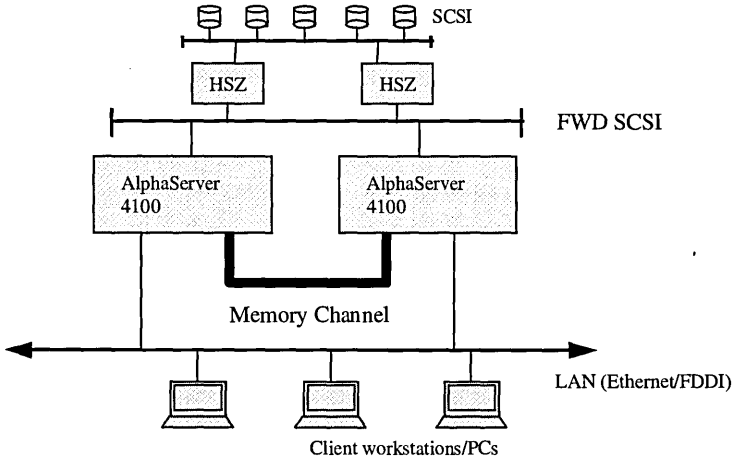
OpenVMS Cluster Systems Configuration Details *(continued)*

Dual-Host FWD SCSI based OpenVMS Cluster Configuration

This configuration shows a SCSI Cluster based on Fast Wide Differential SCSI components. The AlphaServer 2100 systems are configured with FWD SCSI adapters. The single-ended SCSI disks are configured on two HSZ series controllers, which connect to the shared FWD SCSI bus. HSZ series controllers can be configured with up to 42 disks. In this example, two single-ended SCSI buses are dual ported across the controllers - providing availability in the event that one HSZ controller is shut down. FWD SCSI can provide up to 20 MB/second throughput. This configuration can be expanded to include a third Alpha system, and up to six shared SCSI buses.

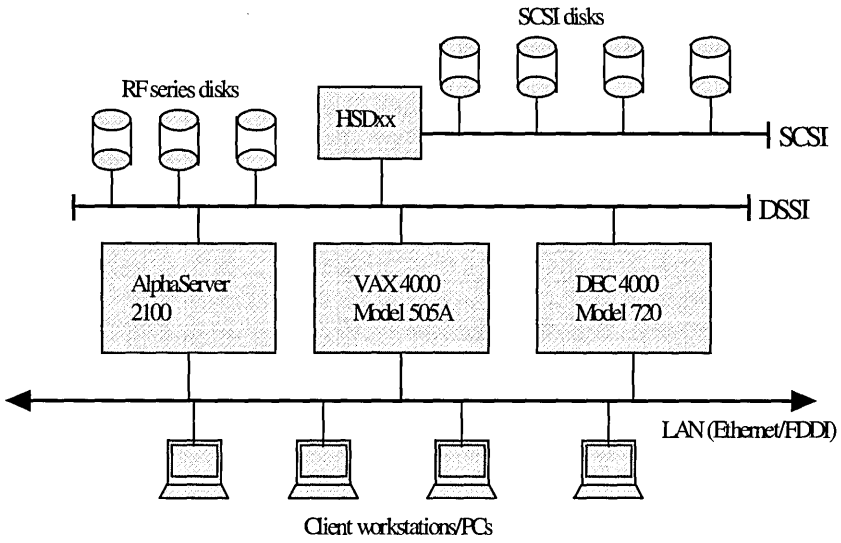


The configuration below shows another two-node SCSI-based cluster, but includes MEMORY CHANNEL for use as a high performance node-to-node interconnect. This allows the node-to-node traffic that would normally occur across the LAN to be off-loaded onto the MEMORY CHANNEL. This will result in higher cluster performance (primarily of the Lock Manager), and will also release LAN network capacity.



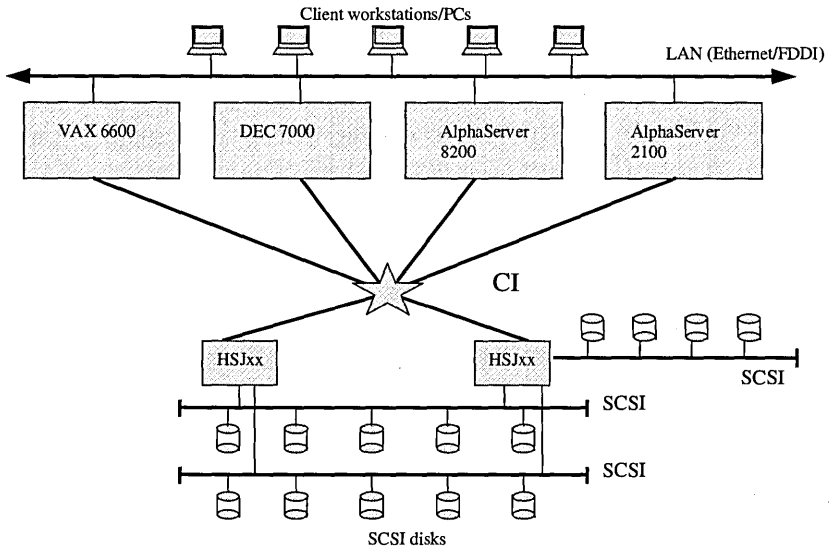
OpenVMS Cluster Systems Configuration Details *(continued)*

Tri-Host Mixed Architecture DSSI based OpenVMS Cluster



This configuration shows a tri-host mixed architecture OpenVMS Cluster based on the DSSI. It consists of one DEC 4000 Model 720 system, an AlphaServer 2100, and a VAX 4000 Model 505A system. The OpenVMS Cluster interconnect is the DSSI, which is also configured with an HSD series storage controller with SCSI disk drives.

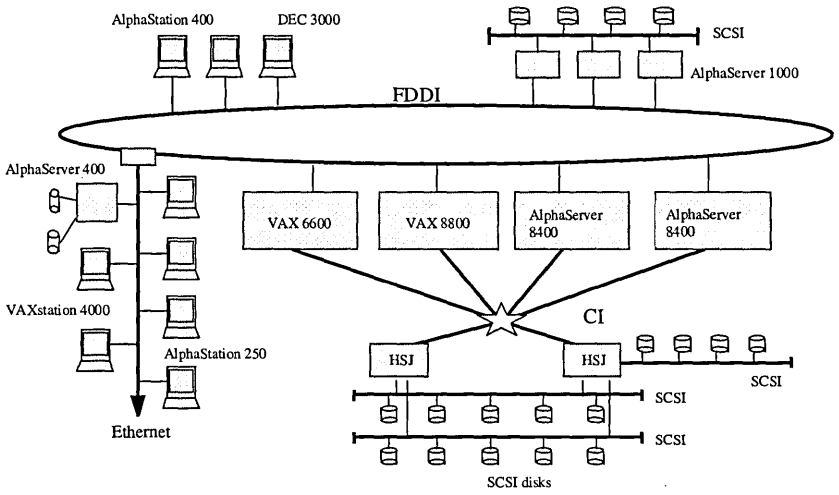
CI based OpenVMS Cluster



This configuration shows a four-node CI-based OpenVMS Cluster with VAX systems and Alpha systems. The AlphaServer 8200 and 2100 systems are configured with the CIPCA (PCI to CI) controller to connect to the CI bus. Two HSJ storage controllers provide high availability access to disks. Critical disks are accessible by both HSJ controllers. HSJ storage controllers provide access to StorageWorks SCSI-based disks.

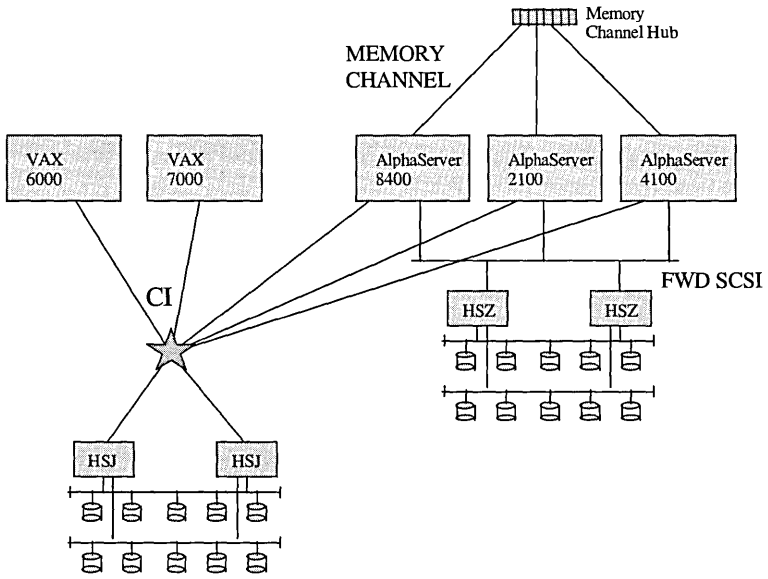
OpenVMS Cluster Systems Configuration Details *(continued)*

Mixed Interconnect, Mixed Architecture OpenVMS Cluster



This diagram shows a mixed interconnect, mixed architecture OpenVMS Cluster. A VAX 6000 Model 600 system and a VAX 8800 system are configured on a CI interconnect with two AlphaServer 8400 systems. Two HSJ storage controllers provide access to some dual-ported and single-ported RZ series disks. The CI systems are also connected to an FDDI ring. Configured around the ring are two AlphaStation 400 workstations, a DEC 3000 workstation, three AlphaServer 1000s, and a bridge to an Ethernet segment. The AlphaServer 1000 systems are configured as a tri-host SCSI Cluster (still part of the total cluster configuration) providing additional served storage for all the other cluster systems. The Ethernet segment is configured with an AlphaServer 400 which is serving six additional workstations, four AlphaStation 250s and two VAX 4000s. All these systems are configured into a single OpenVMS Cluster, providing high performance and high availability.

The configuration below shows a high-end mixed architecture cluster. All the systems are connected to the CI (making this a good interconnect on which to locate the system disks). The Alpha systems are also connected by MEMORY CHANNEL - for high performance node-to-node communication, and a shared SCSI bus. Because there are more than two systems connected to the MEMORY CHANNEL, a hub is required.



OpenVMS Cluster Systems Configuration Details *(continued)*

RAID usage in OpenVMS Cluster Configurations

All OpenVMS Cluster configurations may use any combination of host-based or controller-based RAID. RAID implementations can be used to increase both the performance and availability of the cluster storage subsystem.

Host software RAID products are as follows:

- Volume Shadowing for OpenVMS software layered product may be used by both VAX and Alpha systems in order to provide high availability RAID-1 access to storage.
- StorageWorks Raid Software for OpenVMS may be used to provide RAID-0 (Striping) and RAID-5 for VAX and Alpha systems.

For controller-based implementations refer to the documentation for the appropriate controller.

Configuration Rules for CI as an OpenVMS Cluster Systems

In addition to the rules mentioned previously, the following points should be adhered to when configuring CI systems:

- The maximum number of nodes that may be connected to a Star Coupler is 32; 16 of these nodes may be OpenVMS systems (see rules above). The remainder of the nodes may be HSC/HSJ storage controllers. **Note:** 32-node Star Couplers are configured by joining two 16-node Star Couplers together using a CISCE. (The CISCE is no longer available as an orderable product.)
- The number of Star Couplers is limited by the number of CI controllers configured on a system.
- Dual porting of devices between HSC/HSJ and local controllers is not supported. However, dual porting of devices between HSC/HSJ controllers connected to the same or separate Star Couplers is supported (as is dual porting of devices between HSD controllers connected to the same or separate DSSI buses).
- Different types of CI controllers may not be mixed in the same CPU, with the single exception that the CIPCA and the CIXCD can coexist in a system.
- Multiple CI controllers may be configured, either for redundancy or throughput. Throughput increase with a second CI controller connected to the same Star Coupler is likely to be minimal. Increased throughput can be achieved by connecting additional CI controllers to separate Star Couplers.
- The Star Coupler is a passive device, and extremely reliable. It is not a single point of failure. Additional CI controllers and Star Couplers may be installed to improve system bandwidth, total computing power, and total storage capacity.
- The CIPCA controller can coexist on a CI bus with systems configured with CIXCD and CIBCA-B controllers, and any HSC/HSJ storage controller except the HSC50.
- The CIPCA controller requires a PCI backplane slot and an EISA backplane slot. The EISA slot is required to supply additional power to the controller, no EISA logic signals are used.
- The CIPCA is not supported by OpenVMS V7.0. Systems configured with CIPCA controllers must run OpenVMS V6.2-1H2 (or a later V6.2-xxx variant) or OpenVMS V7.1.

Maximum CI Adapters per OpenVMS Cluster CPU				
CPU	**CIPCA**	**CIBCA-A**	**CIBCA-B**	**CIXCD**
AlphaServer 8400 (Maximum of 26 adapters may be configured.)	10 with V6.2-xxx 26 with V7.1			10
AlphaServer 8200	10 with V6.2-xxx 26 with V7.1			
AlphaServer 4100, 4000	4			
AlphaServer 2100, 2000	3			
DEC 7000/10000				10
VAX 6000		1	4	4
VAX 7000, 10000				10

OpenVMS Cluster Systems Configuration Details *(continued)*

Configuration Rules for MEMORY CHANNEL as an OpenVMS Cluster Interconnect

A new feature for OpenVMS Cluster Software V7.1 is the support of MEMORY CHANNEL as a cluster interconnect. Unlike the other cluster interconnects, which are network based, MEMORY CHANNEL uses a "shared memory" paradigm of operation. This permits very high bandwith with low latency, over short distances. The current hardware supports up to eight nodes, each configured with a MEMORY CHANNEL controller and 10 foot cable connected to a MEMORY CHANNEL hub in a radial topology.

- MEMORY CHANNEL delivers up to 100 MB per second aggregate bandwidth with latency of less than 5 microseconds. With current MEMORY CHANNEL controllers the achievable OpenVMS Distributed Lock Manager performance is approximately two to three times that of a CI (depending on CPU type).
- Since MEMORY CHANNEL requires no change to existing applications and integrates seamlessly with existing cluster software, configurations can take advantage of the increased performance of the MEMORY CHANNEL without application modification.
- MEMORY CHANNEL can be added to a cluster without replacing existing interconnects because OpenVMS cluster software has the intelligence to use the interconnect that offers the best performance. By offloading the node-to-node traffic from the CI and DSSI, it allows them to be dedicated to storage traffic. In SCSI clusters that use a LAN interconnect for node-to-node traffic, MEMORY CHANNEL offloads this traffic from the LAN, enabling it to handle more network traffic.

The following rules should be observed when configuring an OpenVMS MEMORY CHANNEL Cluster:

- OpenVMS Cluster Software supports a maximum of four nodes may be connected to a single MEMORY CHANNEL interconnect. A future release of OpenVMS will support the eight ports available in a MEMORY CHANNEL hub.
- Configurations that comprise two nodes can use a single MEMORY CHANNEL cable connected directly from one node to the other. Configurations that comprise three or more nodes require a MEMORY CHANNEL hub, to which all nodes are connected using MEMORY CHANNEL cables.
- A system may be configured with up to two MEMORY CHANNEL controllers, each of which must be connected to a different hub (in configurations with more than two nodes).
- It is not possible to connect storage directly to a MEMORY CHANNEL. Consequently, another interconnect is required for storage. This can be any of the other OpenVMS storage interconnects (CI, DSSI, SCSI).

See PCI-to-MEMORY CHANNEL Interconnect section for ordering information.

Configuration Rules for SCSI as an OpenVMS Cluster Storage Interconnect

Multiple Alpha hosts in an OpenVMS Cluster system can be connected to a single SCSI bus to share access to SCSI storage devices directly. This capability allows customers to build highly available servers using shared access to SCSI storage.

This section briefly describes how OpenVMS Cluster systems support the Small Computer Systems Interface (SCSI) as a storage interconnect. (Note that another interconnect—for example, a local area network (LAN) or MEMORY CHANNEL, is required for node-to-node OpenVMS Cluster communications.)

Customers can build a three-node OpenVMS Cluster system using a shared SCSI bus as the storage interconnect, or configure shared SCSI buses within a larger OpenVMS Cluster configuration. A quorum disk can be used on the SCSI bus to improve the availability of two-node configurations.

SCSI ANSI Standard

OpenVMS Cluster systems configured with the SCSI interconnect must use standard SCSI-2 components. The SCSI-2 components supported must be compliant with the architecture defined in the American National Standards Institute (ANSI) Standard SCSI-2. This standard defines extensions to the SCSI-1 standard. For ease of discussion, this chapter uses the term SCSI or SCSI-2 to refer to the SCSI-2 implementation as specified in the ANSI Standard SCSI-2 document X3T9.2, Rev. 10L.

OpenVMS Cluster Systems Configuration Details *(continued)*

SCSI Cluster Configuration Requirements and Hardware Support

This section lists the configuration requirements and supported hardware for SCSI OpenVMS Cluster configurations.

The following table shows the requirements and capabilities of the basic software and hardware components you can configure in a SCSI OpenVMS Cluster system.

Requirement	Description
SCSI tape, floppies and CD-ROM drives	SCSI tape drives, floppy drives, or CD-ROM drives cannot be configured on a multiple-host SCSI bus. If the configuration requires SCSI tape, floppy, or CD-ROM drives, configure them on a single-host SCSI bus. Note that SCSI tape, floppy, or CD-ROM drives may be MSCP or TMSCP served to other hosts in the OpenVMS Cluster configuration.
Maximum hosts on a SCSI bus	Up to three hosts can be configured on a multiple-host SCSI bus. Any mix of the hosts listed in the table below can be configured on the same shared SCSI interconnect.
Maximum SCSI buses per host	Each host can be connected to a maximum of six multiple-host SCSI buses. The number of nonshared (single-host) SCSI buses that can be configured is limited only by the number of available slots on the host bus and specific SCSI adapter model. For example, up to 24 non-shared KZPSAs can be configured on a single system.
Host-to-host communications	All members of the cluster must be connected by an interconnect that can be used for host-to-host (SCA) communication; for example, CI, MEMORY CHANNEL, DSSI, Ethernet, or FDDI.
SCSI device naming	The name of each SCSI device must be unique throughout the OpenVMS Cluster system. When configuring devices on systems that include a multiple-host SCSI bus, adhere to the following requirements: A host can have, at most, one controller attached to a particular SCSI interconnect. All host controllers attached to a given SCSI interconnect must have the same OpenVMS device name (for example, PKA0). This restriction is removed when the optional SCSI device naming feature in OpenVMS V7.1 is enabled.

OpenVMS Cluster Systems Configuration Details *(continued)*

SCSI Cluster Hardware Support

The following table shows the supported hardware components for SCSI OpenVMS Cluster systems; it also lists the minimum required revision for these hardware components. That is, for any component, use either the version listed, or a later revision.

The SCSI interconnect configuration and all devices on the SCSI interconnect must meet the requirements defined in the ANSI Standard SCSI-2 document.

Component	Supported Item	Minimum Version or H/W Revision	How to Find Your Version
Hosts	Any PCI-based AlphaServer or AlphaStation system[5] Any DEC 3000 series system	Refer to OpenVMS SPD	Console SHOW VERSION command
Disks[1] (Narrow and Wide variants of all drives listed)	RZ26 RZ26L RZ26N RZ28 RZ28B RZ28M RZ29B	392A 442D Any revision 442D 0006 Any revision 0009	Console SHOW DEVICE command
Controller	HSZ40B	2.5	Console SHOW DEVICE command
Bus Isolators	DWZZA DWZZB		Examine product sticker
Adapters[2] - V6.2 or later	NCR-810 based integral system adapter in PCI systems[3] Optional KZPAA (PCI)[3]		
Adapters[2] - V6.2-1H2-xxx, V7.1	Optional KZPSA (PCI)[4] Optional KZTSA (DEC 3000)[4]		

Note: RZ25 disks do not support Tagged Command Queuing, so are not supported for use on multi-host SCSI buses.

1 Any SCSI-II compliant disk that provides (1) Multi-host support, (2) Tagged Command Queuing and (3) Automatic Bad Block Revectoring may be configured on a multi-host SCSI bus. These requirements are fully described in the *OpenVMS V6.2 Release Notes*. The drives in the table above have been verified by Digital - for the complete list of verified disk drives please refer to the OpenVMS SPD.

2 Other types of SCSI adapters can be configured in a system for single-host access to local storage.

3 Single Ended SCSI adapter

4 Fast Wide Differential (FWD) SCSI adapter. KZPSA must be firmware minimum revision A10.

5 AlphaServer 4000/4100/8200/8400 systems must use KZPSA FWD SCSI adapters for connection to shared SCSI buses, and run OpenVMS V6.2-1H3 or V7.1. When using V6.2-1H3 and configuring shared SCSI buses with AlphaServer 8200/8400 and other AlphaServer/AlphaStation systems ensure that SCSI adapter device names match; all adapters connected to a common SCSI bus must have the same device name (for example, PKA or PKB, etc). Note that the KFTIA I/O controller usually configured in AlphaServer 8200/8400 systems, includes four SCSI adapters, each of which consumes a controller letter. Therefore, when configuring mixed systems it may be necessary to configure the AlphaServer 8200/8400 systems with a KFTHA I/O controller (which has no embedded SCSI adapters) in place of the KFTIA. This restriction is removed in OpenVMS V7.1 by using the optional new SCSI device naming scheme.

When configuring SCSI Clusters great care must be taken to ensure that the SCSI bus is correctly configured. Bus length and termination rules must be strictly adhered to in order to ensure reliable system operation. Refer to the *"Guidelines for OpenVMS Cluster Configuration" manual* for detailed information on SCSI configuration.

OpenVMS Cluster Systems Configuration Details (*continued*)

Configuration Rules for LAN-based OpenVMS Cluster Systems

LAN-based configurations are those that use Ethernet or FDDI for OpenVMS Cluster node-to-node communication. Ethernet and FDDI are industry-standard general-purpose communications interconnects that can be used to implement a local area network (LAN).

The following general rules apply to OpenVMS Cluster systems in LANs:

- Multiple distinct OpenVMS Cluster systems can be configured onto a single extended LAN. OpenVMS Cluster LAN software implements cluster membership validation to ensure that systems join the correct LAN OpenVMS Cluster
- Any number of LAN adapters can be configured on an Alpha or VAX system. LAN segments can be bridged to form an extended LAN.
- All systems in a LAN-based OpenVMS Cluster must exist on the same extended LAN.
- An OpenVMS Cluster can be configured on multiple LAN segments, and can use bridges to isolate or segment network traffic according to customer requirements
- CPUs that use an Ethernet for OpenVMS Cluster communications can concurrently use it for other network protocols that conform to the applicable Ethernet standards, such as Ethernet V2.0, IEEE 802.2, and IEEE 802.3.
- CPUs that use an FDDI for OpenVMS Cluster communications can concurrently use it for other network protocols that conform to the applicable FDDI standards, such as ANSI X3.139-1987, ANSI X3.148-1988, and ANSI X3.166-1990.
- All LAN paths used for OpenVMS Cluster communication must operate, at a minimum, with approximately 10-Mbits per second throughput and low-latency. Translating bridges must be used when connecting OpenVMS Cluster nodes on an Ethernet to those on an FDDI.
- Alpha and VAX systems can be configured with any mix of Ethernet or FDDI adapters.
- The HS1xx/HS2xx family storage servers provide FDDI-based storage access to OpenVMS Cluster nodes. This family of servers is based on Alpha systems and OpenVMS.
- All LAN adapters (Ethernet and FDDI) documented in the OpenVMS Version SPD are supported by OpenVMS Cluster software. Refer to the OpenVMS Operating System SPD (25.01.xx) for complete details.

Configuration Rules for DSSI OpenVMS Cluster Systems

The following configuration rules apply to **all** DSSI OpenVMS Cluster configurations:

- **The maximum number of systems that may be connected to a DSSI bus is four, regardless of system or DSSI adapter type.** Any mix of systems and adapters is permitted (except where noted below). In some cases physical cabling and termination limitations may restrict the number of systems that may be connected to a DSSI bus to two or three. For example:
  - Only two DEC 4000 systems can be configured on a DSSI bus. This is because the DEC 4000 DSSI adapter terminates the bus.
  - The size of a VAX/DEC 10000 system generally limits the number that may be connected to a DSSI to two.
  - Some variants of the DSSI adapter terminate the bus.
- Configure VAX 6000, VAX 7000 and VAX 10000 systems with KFMSA adapters.
- Configure DEC 7000 and DEC 10000 systems with KFMSB adapters.

OpenVMS Cluster Systems Configuration Details *(continued)*

Configuration Rules for DSSI OpenVMS Cluster Systems *(continued)*

- Configure PCI-based AlphaServer systems with KFPSA adapters. EISA adapters (KFESA/KFESB) may also be configured on most AlphaServer systems, but usage of the KFPSA is recommended whenever possible.
- Up to 6 KFMSA/Bs can be configured on an XMI bus. Up to 12 KFMSA/Bs may be configured on a system.
- Up to 4 KFPSAs may be configured on a system.
- All systems connected to the same DSSI bus must have a common power/ground.
- Each DSSI bus supports up to eight nodes. Each of the following counts as one DSSI node:
  - Any RF, TF, or EF ISE (integrated storage element)
  - DSSI adapter
  - Any member of the HSDxx family of DSSI-SCSI controllers
- Multiple DSSI adapters for each system are allowed, per the configuration restrictions as indicated in the DSSI Adapters per System table; each DSSI adapter in a single system must be connected to a different DSSI bus.
- Each DSSI bus must be terminated at each end at all times; breaking the bus while a cluster is operational may lead to data corruption.
- The general rule for maximum DSSI bus length supported, i.e., the total distance between end-node terminators on the DSSI bus, is 25-m (82-ft) in a computer room environment, 20-m (65.6-ft) in an office environment. The only exception to this rule is the 27-m (89-ft)computer room/allowable distance for quad-host VAX 7000 and VAX 6000 DSSI OpenVMS Cluster systems.
- These lengths are based on grounding conditions typically found in computer room and office environments. Improper grounding can result in voltage potentials, called ground offset voltages, between the enclosures in the configuration. If these voltages exceed certain limits, data transmission across the DSSI bus can be disrupted and the configuration can experience performance degradation or data corruption.
- For these reasons, a common ground must be maintained between all systems/enclosures in a DSSI OpenVMS Cluster at all times. It is, therefore, necessary that all systems receive their power from a common power feed, i.e., it is not advisable to power systems/enclosures from different circuit breaker panels.
- To verify site conditions, the following is strongly recommended:
  - Have a qualified electrician ensure that site power distribution meets all local electrical codes.
  - Also, have electrician inspect entire site power distribution system to ensure it does not have any of the following faults:

    1. Outlets do not have power ground connections.
    2. Grounding prong missing from computer equipment power cables.
    3. Power outlet neutral connections are actual ground connections.
    4. Grounds for the power outlets are not connected to the same power distribution panel.

    Devices that are not UL or IEC approved are connected to the same circuit breaker as the computer equipment.

If these conditions have been met, ground offset voltages should be within acceptable limits. Ground offset voltage limits are as follows:

Allowable Ground Offset Voltage		
Total DSSI Length	**DC**	**AC (rms)**
Up to 20-m (65- ft)	200 mV	70 mV
20–25 m (65–82 ft)	40 mV	14 mV
27-m (89-ft) for four-system VAX 6000 and VAX 7000	30 mV	10.5 mV

Ground offset voltages between enclosures can be measured after system installation to verify they fall within acceptable limits.

OpenVMS Cluster Systems Configuration Details *(continued)*

Maximum number of DSSI Adapters per System

System (Bus)	Embedded	KFPSA[6] (PCI)	KFQSA[1] (Q Bus)	KFESA (EISA)	KFESB (EISA)	KFMSA[2] (XMI)	KFMSB[2] (XMI)
AlphaServer 8400		4					12
AlphaServer 8200, 4100, 4000		4					
AlphaServer 2100		4		2	4		
AlphaServer 2000, 1000		4			4		
DEC 4000 (embedded N710)	2						
DEC 7000/10000							12
MicroVAX II and 3500/ 3600/ 3800/ 3900			2				
MicroVAX 3300/3400 (embedded EDA640)	1		2				
VAX 4000 Model 105A (embedded SHAC[3])	1 + 1[4]		2[5]				
VAX 4000 Model 200 (embedded SHAC[3])	1		2				
VAX 4000 Model 300 400/500/600	2		2				
VAX 4000 Model 505A/705A (embedded SHAC[3])	2 + 2[4]		2				
VAX 6000						6	
VAX 7000/10000						12	

1 The KFQSA cannot be used for node-to-node cluster communication. An additional interconnect must be configured between systems that use KFQSA for access to shared storage.
2 Each KFMSA/B (XMI-to-DSSI) adapter contains two DSSI VAX system ports.
3 Single Host Adapter Chip (SHAC)
4 Additional embedded on daughter card
5 Requires a Q-bus expansion enclosure
6 The KFPSA cannot be configured on the same DSSI as a KFMSB. Ensure that the specific AlphaServer system has sufficient PCI backlane slots to accept the number of KFPSAs required..

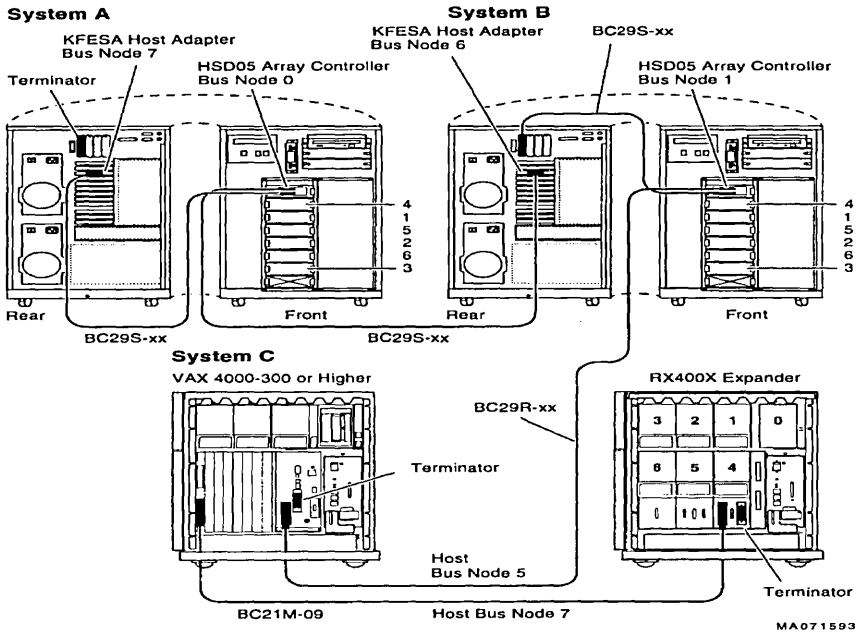
AlphaServer 2100/DEC 4000 Alpha/VAX 4000/MicroVAX DSSI OpenVMS Cluster Configurations

Useful information on AlphaServer 2100/DEC 4000/VAX 4000/MicroVAX DSSI OpenVMS Clusters:

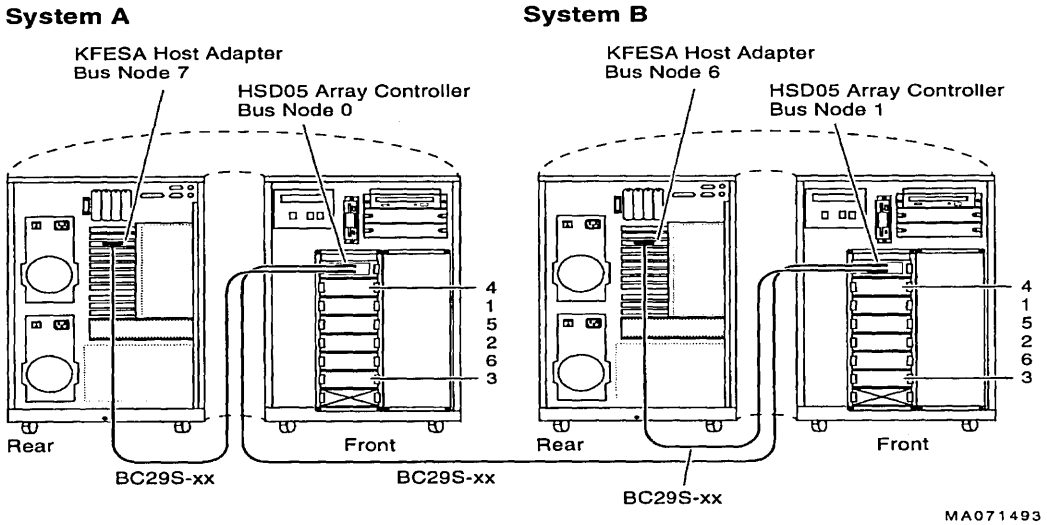
- Q-bus systems that do not support internal DSSI disk storage, e.g., MicroVAX II, can be integrated into a DSSI OpenVMS Cluster, containing other Q-bus or VAX 6000 systems, with the addition of a KFQSA storage adapter; RF-disks associated with that system are placed in the expansion enclosure for shared access.
- Any two Q-bus MicroVAX, VAX 4000, AlphaServer 2100, or DEC 4000 systems can share an expansion enclosure.
- When sharing an R400X expansion enclosure between two systems in a DSSI OpenVMS Cluster configuration on a single DSSI bus, only six of the seven storage bays can be used.
- The maximum configuration is determined by the number of DSSI adapters that can be configured on each system. Refer to the DSSI Adapters per System table.

OpenVMS Cluster Systems Configuration Details *(continued)*

Dual Architecture DSSI OpenVMS Cluster: AlphaServer 2100 and VAX 4000 systems



Alpha DSSI OpenVMS Cluster: Two AlphaServer 2100 systems



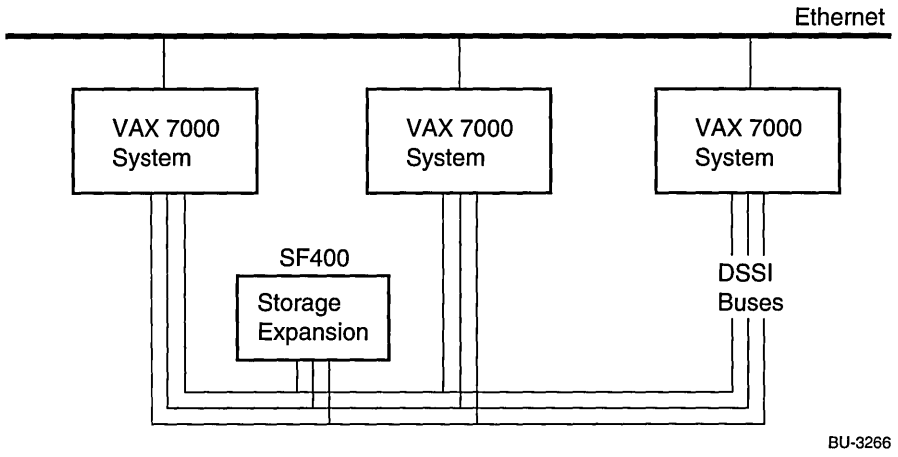
OpenVMS Cluster Systems Configuration Details (continued)

VAX 6000/7000/10000-Based DSSI OpenVMS Cluster Configurations

The following simple rule set may be used for VAX 6000/7000/10000 DSSI OpenVMS Cluster configurations:

The following configuration rules MUST be followed:

- Maximum DSSI bus length cannot exceed 27-meters (89-feet) and ground offset voltage cannot exceed 30 mV (dc) or 10.5 mV (rms).
- DSSI ISE disks or tapes must be placed at end of DSSI bus and termination at ISE end of bus must be implemented at ISE, not at bulkhead. If two SF2xx or SF400 cabs are required, one must be placed physically at each end of cluster.
- In order to meet the quad-host 89-foot bus length restriction, only 9-foot cabinet-to-cabinet DSSI cables are allowed for connections between system boxes, only 9-foot cables are allowed for connections between system boxes and SF2xx storage cabinets, and only 16-foot cables are allowed for connections between system boxes and SF400 storage cabinets. There are no exceptions to this rule.
- If two SF2xx or two SF400s (or one of each) cabinets are required, one must be placed physically at each end of cluster because neither the 9-foot intercabinet cables required for SF2xx connections or the 16-foot intercabinet cables required for SF400 connections are long enough to reach from a system cabinet to a storage cabinet if there is another storage cabinet in between.
- Up to four RFxx ISEs or two TF ISEs are allowed on same DSSI combinations of RFxx ISEs and TF8x ISEs are **not** allowed on same DSSI bus. All RFxx ISEs on any single DSSI bus must reside in same SFxx storage array. All TF8x ISEs on any single DSSI bus must reside in same cabinet.



AlphaServer 2100/DEC 4000 Alpha/VAX 4000/VAX 6000/VAX 7000 DSSI OpenVMS Cluster Configurations

Useful information on AlphaServer 2100/DEC 4000/VAX 4000/VAX 6000/VAX 7000 system DSSI OpenVMS Clusters:

- A VAX 6000/VAX 7000 series system can be added to an existing VAX 4000 or AlphaServer 2100/DEC 4000 DSSI OpenVMS Cluster configuration *and* also be configured as a member of a CI OpenVMS Cluster; the VAX 6000/VAX 7000 system then provides a "gateway" service, providing high-performance access to the CI OpenVMS Cluster data center-wide databases for the VAX 4000 and AlphaServer 2100/DEC 4000 systems.

OpenVMS Cluster Systems Configuration Details *(continued)*

Configuration Guidelines for DSSI OpenVMS Cluster Systems

The following are recommended guidelines and considerations, when configuring a DSSI OpenVMS Cluster:

- A VAX CPU and an Alpha CPU may not boot from the same system disk.
- VAX 7000 and VAX 6000 systems configured with KFMSA adapters may also be configured with CI controllers, simultaneously accessing data and resources in this mixed interconnect OpenVMS Cluster.
- An optional Uninterrupted Power Supply (UPS) can be added to the OpenVMS Cluster configuration to increase the level of availability.

DSSI Adapter Performance Characteristics

DSSI Adapter Type	Sustained I/O Rate (I/Os per second)
KFQSA	190
KFESA	1000
KFESB	Figure Not Available
KFPSA	2200 (Peak I/O rate)
Embedded EDA640 (MicroVAX 3300/3400 systems)	360
Embedded SHAC (VAX 4000 systems)	1200[1]
Embedded N710 (DEC 4000 Alpha systems)	1200
KFDDA	1200[2]
KFDDB	1200[3]
KFMSA	1600[4]
KFMSB	900[5]

1 For VAX 4000 Model 200 and VAX 4000 Model 300 systems, SHACs can only be driven to 800 I/Os per second.
2 One additional channel for VAX 4000 Model 100A.
3 Two additional channels for VAX 4000 Model 500A/600A/700A.
4 800 per DSSI bus.
5 450 per DSSI bus.

OpenVMS Cluster Systems Configuration Details *(continued)*

Electrical Lengths of DSSI Bus Components*

Description/Connector Types	Order Number	Length
3.5-foot intracabinet shielded cable used in SF2x0 and SF10x cabinets to connect between the drive enclosures SF72 and TF857/837 (MR/MR connectors)	**BC21Q-3F**	42 inches (3.5 ft, 1.06 m)
6-foot intracabinet shielded cable used in SF200/210/220 cabinets between drive enclosures and SF200/SF210/220 bulkhead (MR/MR-BH connectors)	**BC21R-5L**	70 inches (5.8 ft, 1.78 m)
9-foot external shielded cable (MR/MR connectors)	**BC21Q-09**	108 inches (9 ft, 2.74 m)
9-foot external shielded cable (MR/PS connectors)	**BC22Q-09**	108 inches (9 ft, 2.74 m)
9-foot external shielded cable (PS/PS connectors)	**BC21M-09**	108 inches (9 ft, 2.74 m)
16-foot external shielded cable (PS/PS connectors)	**BC21Q-16**	192 inches (16 ft, 4.8 m)
16-foot external shielded cable (MR/PS connectors)	**BC22Q-16**	192 inches (16 ft, 4.8 m)
16-foot external shielded cable (PS/PS connectors)	**BC21M-16**	192 inches (16 ft, 4.8 m)
25-foot external shielded cable (PS/PS connectors)	**BC21M-25**	300 inches (25 ft, 7.62 m)
25-foot external shielded cable (MR/MR connectors)	**BC21Q-25**	300 inches (25 ft, 7.62 m)
25-foot external shielded cable (MR/MR connectors)	**BC22Q-25**	300 inches (25 ft, 7.62 m)

* Electrical length may be different from apparent physical length by wide margins; for example: in a "Y" cable bundle the apparent physical length of the cable bundle is "1a" feet but the electrical length is actually "2a" between external connectors.

Notes:
MR is a micro-ribbon style external shielded connector; mates with MR-BH only.
PS is a pin-and-socket-style external shielded connector; mates with PS-BH only.
MR-BH is a micro-ribbon style shielded connector used for bulkhead mounting; mates with MR only.
PS-BH is a pin-and-socket-style shielded connector used for bulkhead mounting; mates with PS only.

Embedded DSSI Bus in VAX 6000 Enclosures

Description	Order Number	Length
4-foot intra-cabinet shielded cable used from XMI backplane with KFMSA to cabinet bulkhead in VAX 6000 (XMI-BP/MR-BH connectors)	**BC07T-04**	48 inches (4 ft, 1.22 m)
9-foot intra-cabinet shielded cable used from XMI backplane with KFMSA to cabinet bulkhead in special rackmount VAX 6000 (XMI-BP/MR-BH)	**BC07T-09**	108 inches (9 ft, 2.74 m)
8-foot intra-cabinet "Y" shielded cables used from cabinet bulkhead to XMI backplane with KFMSA to cabinet bulkhead in VAX 6000 (MR-BH/XMI-BP/MR-BH connectors)	**BC07W-08**	96 inches (8 ft, 2.43 m)
10-foot intra-cabinet shielded cable used from XMI backplane with KFMSA to internal TF interface board to cabinet bulkhead in VAX 6000 (XMI-BP/TFI/MR-BH connectors)	**BC07U-10**	124 inches (10.3 ft, 3.15 m)

Note: XMI-BP is a back panel connector for the XMI back panel.

OpenVMS Cluster Systems Configuration Details *(continued)*

Electrical Lengths of Embedded DSSI Bus in Enclosures

Enclosure	Internal DSSI Bus Length
R400x through bus mode No internal terminator Up to seven drives both upper and lower rows Two external PS-BH connectors	94.5 inches (7.875 ft, 2.40 m)
R400x split bus mode 1 No internal terminator Up to four drives on same bus—lower row only Two external PS-BH connectors	66 inches (5.5 ft, 1.68 m)
R400x split bus mode 2 No internal terminator Up to three drives on same bus—lower row only Two external PS-BH connectors	40 inches (3.33 ft, 1.02 m)
BA640 embedded storage Has internal terminator DEC 4000 Alpha Model 600 One external PS-BH connector for each of four buses (A-D)	70.9 inches (5.9 ft, 1.8 m)
BA440 embedded storage (Bus 0) Has internal terminator VAX 4000 Model 300 and higher One external PS-BH connector	52 inches approximately (4.3 ft, 1.32 m)
BA440 in/out port (Bus 1) No internal terminator VAX 4000 Model 300 and higher Two external PS-BH connectors	20 inches (1.6 ft, 0.51 m)
BA430 embedded storage Has internal terminator VAX 4000 Model 200 One external PS-BH connector	54 inches (4.5 ft, 1.37 m)
BA400x embedded storage Has internal terminator One external PS-BH connector	60 inches (5 ft, 1.52 m)
SF12 embedded storage No internal terminator. Two external PS-BH connectors	45 inches (3.7 ft, 1.14 m)
BA213 Has internal terminator One external PS-BH connector	45 inches (3.7 ft, 1.14 m)
B213F Has internal terminator One external PS-BH connector	20 inches (1.6 ft, 0.51 m)
BA215 Has internal terminator One external PS-BH connector	30 inches (2.5 ft, 0.76 m)
R215F No internal terminator Two external PS-BH connectors	60 inches (5 ft, 1.52 m)
R23F No internal terminator Two external PS-BH connectors	39 inches approximately (3.3 ft, 1.0 m)
KFDDB No internal terminator Two DSSI adapters Two external PS-BH connectors per adapter	20 inches approximately (1.6 ft, 0.51 m)
Enclosure	Internal DSSI Bus Length
KFQSA adapter with one external PS-BH connector directly attached to KFQSA (e.g., BA440)	12 inches (1 ft, .33 m)
KFQSA adapter with two external PS-BH connectors directly attached to KFQSA (e.g., BA440)	12 inches (1 ft, .33 m)
SF72 or SF73 enclosure in through bus mode 1-4 drives on same DSSI bus no internal terminator Two external MR-BH connectors	168 inches (14 ft, 4.27 m)
SF72 or SF73 enclosure in split bus mode 1 or 2 drives using internal SF72 terminator One external MR-BH connector	83.5 inches (6.96 ft, 2.12 m)
Half-rack SF3x enclosure in through bus mode 1-6 drives on same DSSI bus no internal terminator Two external MR-BH connectors	84 inches (7 ft, 2.13 m)
Half-rack SF3x enclosure in split bus mode 1-3 drives using internal SF35 terminator One external MR-BH connector	42 inches (3.5 ft, 1.07 m)
TF857 or TF837 No internal terminator Two external MR-BH connectors	10 inches (0.83 ft, 0.25 m)

OpenVMS Cluster Systems Configuration Details *(continued)*

SF2x0/SF10x: Cable lengths internal to the SF2x0/SF10x must be obtained by adding the intracabinet cable length to the lengths in the enclosures used (SF7x or TF8x7). Usually the SF10x has only a 3.5-foot intracabinet cable between the SABBs and the SF2x0 will have one or two 70-inch cables and possibly a 3.5-foot intracabinet cable; consider the specific implementation.

For example: an SF200 with the bulkhead connected to a through bus SF72 connected to a TF857 connected back to the bulkhead has 70 + 167 + 42 + 10 + 70 = 359-inches (29.9-feet) internal to the SF2x0 cabinet.

Note: SF300/SF400 cabinets do not have bulkhead connectors; therefore, the bus length is 219-inches internal to the SF300/SF400 storage cabinets.

Enclosures with no internal terminators may be used anywhere on the bus (end or middle). (If used on the bus end, an external terminator must be used on the enclosure.)

Enclosures with internal terminators must occupy bus end positions.

There are essentially three DSSI cable types used to connect various enclosures together in a DSSI cluster. The difference between these cables is essentially the style of connector used on each end. The Q-bus pedestal systems use one style of connector (P/S for pedestal style/pin socket) and the VAX 6000 systems use the M/R (mid-range/micro ribbon) style of connector. These two connector styles are **not** compatible with each other, thus three cable types are necessary.

BC21M-xx	Pedestal-to-pedestal style cable
BC21Q-xx	Mid-range-to-mid-range style cable
BC22Q-xx	Pedestal-to-mid-range style cable

Today only the BC21M-xx and the BC21Q-3F are orderable via the cable number.

The BC21M-xx is the pedestal-to-pedestal style DSSI cable used to connect Q-bus and DEC 4000 Alpha systems as well as pedestal DSSI expansion (R400X). Order this cable by its cable number.

The BC21Q-3F is the 40-inch cable used to interconnect SFxx and TF857 storage building blocks within SF2x0 and SF100 DECarrays.

Cable variants of BC21Q-xx and BC22Q-xx (where xx is the length in feet) must be ordered via cabinet kits.

Configuration Guidelines for DSSI OpenVMS Cluster Systems)

For connecting between a DEC 4000 Alpha/VAX 4000 system and an SF2xx DECarray:

Cable Required	Cabinet Kit to Order
BC22Q-09	**CK-SF200-LP**
BC22Q-16	**CK-SF200-L6**
BC22Q-25	**CK-SF200-L4**
BC22Q-50	**CK-SF200-L8**

For connecting between a VAX 6000 system and another VAX 6000, SF100 DECarray or tabletop TF85:

Cable Required	Cabinet Kit to Order
BC21Q-09	**CK-SF100-LM**
BC21Q-16	**CK-SF100-L5**
BC21Q-25	**CK-SF100-L3**

For connecting between a DEC 4000 Alpha/VAX 4000 and VAX 6000 system, SF100 DECarray or tabletop TF85:

Cable Required	Cabinet Kit to Order
BC22Q-09	**CK-SF100-LP**
BC22Q-16	**CK-SF100-L6**
BC22Q-25	**CK-SF100-L4**

OpenVMS Cluster Systems Configuration Details *(continued)*

General Recommendations When Configuring OpenVMS Cluster Systems

The following guidelines may be useful when configuring high-performance and high-availability OpenVMS Clusters.
Note: The rules for configuring OpenVMS Cluster systems with multiple interconnects are consistent with the rules for each individual interconnect.

The optimal OpenVMS Cluster system configuration for any computing environment is based on requirements of cost, functionality, performance, capacity, and availability. Factors that impact these requirements include:

- Applications in use
- Number of users
- Number and model of CPUs
- Interconnect and adapter throughput and latency characteristics
- Disk and tape I/O capacity and access time
- Number of disks and tapes being served
- Interconnect utilization

Digital recommends OpenVMS Cluster system configurations based on its experience with the OpenVMS Cluster Software Product. The customer should evaluate specific application dependencies and performance requirements to determine an appropriate configuration for the desired computing environment.

- OpenVMS Cluster CPUs should be configured using interconnects that provide appropriate performance for the required system usage. In general, use the highest performance interconnect possible. CI, MEMORY CHANNEL, DSSI, SCSI and FDDI are the preferred interconnects between powerful CPUs. For high performance SCSI clusters it is important to ensure that the node-to-node communication interconnect is capable of supporting the required lock manager performance, this is usually achieved by using MEMORY CHANNEL, CI or FDDI.
- While OpenVMS Cluster systems can include any number of system disks, system performance and management overhead should be considered in determining their number and location. It is important to recognize that while the performance of multiple system disk configurations may be higher than with a single system disk, system management efforts increase in proportion to the number of system disks.
- Data availability and I/O performance are enhanced when multiple OpenVMS Cluster nodes have direct access to shared storage; whenever possible, configure systems to allow direct access to shared storage in favor of OpenVMS MSCP Served access. Multi-access SCSI-, DSSI- and HSC-based storage provide higher data availability than singly accessed, local controller-based storage. Additionally, dual pathing of disks between local or HSC/HSJ/HSD/HSZ storage controllers enhances data availability in the event of controller failure.
- OpenVMS Cluster systems can provide enhanced availability by utilizing redundant components. For example, additional CPUs, storage controllers, and disks and tapes can be configured. Extra peripheral options such as printers and terminals can be included to further enhance availability. Multiple instances of all the OpenVMS Cluster interconnects (CI, MEMORY CHANNEL, DSSI, SCSI, FDDI, Ethernet) are supported.
- If possible, LAN-based and mixed interconnect OpenVMS Cluster systems should include multiple boot servers to enhance availability. When a server fails in configurations that include multiple servers, satellite access to multipath disks will fail over to another path. Disk servers should be the most powerful CPUs in the OpenVMS Cluster and should use the highest bandwidth LAN adapters available.
- Any Alpha CPU can be configured as an OpenVMS Cluster satellite node. Any VAX CPU can be configured as a OpenVMS Cluster satellite node, with the exception of VAX 11/7xx/6000/7000/8xxx/9000/10000 CPUs.
- When using systems with multiple LAN adapters, configure each adapter on a separate LAN segment. This helps provide higher performance and availability. (Multiple adapters may be configured to a single LAN segment, but this will generally not improve performance.)
- Distribute OpenVMS Cluster satellites among the LAN segments. This can help distribute the cluster load across the segments. Remember that bridges must exist between each LAN segment so that every OpenVMS Cluster member has a direct communication path to every other member. In bridged environments configure redundant bridges to ensure OpenVMS Cluster system availability in the event of bridge failure.
- Digital recommends that all CI connected CPUs are connected to at least one common Star Coupler. When CPUs are configured with multiple CI controllers it is recommended that each be connected to a different Star Coupler.
- OpenVMS system disks are architecture specific. Alpha systems may share a system disk, and VAX systems may share a system disk. However, Alpha systems cannot share a system disk with VAX systems.

OpenVMS Cluster Options

OpenVMS Cluster systems based on the Computer Interconnect (CI) offer high availability and performance through the CI's dual-path design, with 70-Mbit/second speed on each of the CI paths. These OpenVMS Cluster systems use OpenVMS Cluster software with CI hardware:

- CI OpenVMS Cluster hubs: SC008 Star Coupler
- CI Interfaces: CIPCA, CIXCD, CIBCA
- CI Cables
- OpenVMS Cluster configurations can be expanded by configuring multiple Star Couplers in a single OpenVMS Cluster configuration and multiple CI controllers in each system.

Star Coupler

The Star Coupler is a passive hub device providing dual CI path and electrical isolation between CPU nodes and HSJ/HSC storage controller nodes in a CI OpenVMS Cluster system. The Star Coupler supports eight CI ports and is expandable to 16 CI ports.

- Dimensions:
  - Width: 54-cm (21.25-in.)
  - Height: 106-cm (41.75-in.)
  - Depth: 76-cm (30-in.)

SC008-AC	Star Coupler passive hub device, supports 8 CI ports
SC008-AD	Upgrades SC008-AC from support of 8 CI ports to 16 CI ports (installed inside SC008-AC)

CI Interfaces

CI interfaces are intelligent controllers that connect systems to the CI. The CI bus consists of two transmit and two receive cables (which provide hardware redundancy and failover). Transmissions can be made across either available path simultaneously. The CI bus provides high availability since, if one path becomes unavailable, all traffic will use the surviving path. The OpenVMS operating system tests a failed path periodically. As soon as the path becomes available, it is automatically used again for normal traffic.

CIPCA PCI-to-CI Storage Host Controller

The CIPCA allows users to connect CI-based storage to high-performance PCI-based AlphaServer systems, thereby minimizing cost while maximizing total system performance. CIPCA is supported using OpenVMS V6.2-1H2. The following configuration rules apply:

- Up to 16 CI host systems per CI bus
- Up to 31 CI Hierarchical Storage Controllers (HSJ or HSC series) per CI bus
- Up 18 CIPCA controllers per system, depending on system type and OpenVMS version.

The CIPCA can coexist on a CI bus with other Alpha or VAX systems configured with CIXCD or CIBCA-B controllers. It can also coexist with all HSJ (with StorageWorks HSOF V2.5 or later) and HSC storage controllers except the HSC50.

CIPCA-AA	PCI-to-CI Storage Host Controller; requires BNCIA CI cable set

CIXCD XMI-to-CI Controller

The CIXCD allows connection of XMI-based VAX and Alpha systems to the CI.

CIXCD-AC	XMI-to-CI Controller; requires BNCIA CI cable set

CIBCA VAXBI-to-CI Controller

The CIBCA allows connection of VAXBI-based VAX systems to the CI.

CIBCA-BA	VAXBI-to-CI Controller; requires BNCIA CI cable set

CI Cables

CI cables are required for each CI controller ordered.

BNCIA-xx	CI cable set, select required length: 10/20/30meters, 32/65/126 ft.

Digital UNIX TruCluster Systems Configuration Information

Overview

The Digital UNIX TruCluster program consists of product offerings for the UNIX cluster market—offerings that are targeted to both technical and commercial markets.

Technical Offerings

The Digital UNIX Cluster program began with the TruCluster Compute Server and TruCluster File Server packages. The TruCluster Compute Server, (a pre-configured Alpha Farm for workstations), was targeted at compute-intensive computing applications and consisting of 4-32 Digital systems interconnected by Ethernet or FDDI and GIGAswitch. The TruCluster Compute Server provides extremely high throughput and simplifies batch processing and load balancing of applications across all of the hardware in the configuration. The TruCluster Compute Server offering is being extended to support MEMORY CHANNEL hardware configurations, with extensions like Parallel Virtual Machine (PVM), and Message Passing Interface (MPI) optimized to run with MEMORY CHANNEL. The TruCluster File Server is a packaged system with NFS. It provides high performance NFS operations, as measured by SPEC SFS benchmark.

Both of these offerings provide high scalability (performance) at low costs. These configurations do not provide availability, and therefore are not appropriate as configured for production environments.

The Digital UNIX Driver for MEMORY CHANNEL is also a new offering that is an enabler for highly optimized applications that require high performance data delivery over the MEMORY CHANNEL. The product's software library provides application programming interfaces for access to MEMORY CHANNEL data transfer and locking functions. Packaged systems containing hardware and software for these various servers is offered by CSS.

Commercial Offerings

The Digital UNIX Cluster offerings for commercial markets are the TruCluster Available Server (formerly DECsafe Available Server), and the TruCluster Production Server (TruCluster Software). These offerings provide availability as the key product attribute. In addition to availability, they allow the customer to choose to utilize all components for improved performance.

The TruCluster Available Server Software consists of TruCluster software with appropriate hardware configurations (multiple systems with shared storage buses). The TruCluster Available Server enhances high availability by monitoring cluster member health, and automatically initiating recovery procedures in the event of system or component failures. The TruCluster Available Server software depends on the POLYCENTER Advanced File System (AdvFS) for fast file system recovery and the Logical Storage Manager (LSM) for disk striping, shadowing and load balancing.

Digital UNIX TruCluster Systems Configuration Information (continued)

TruCluster Available Server software (formerly called DECsafe software) is a failover product. This means that workloads that run on an Available Server environment only execute on a single system with the cluster at any given time. The environment supports multiple workloads to allow all the systems to be doing productive work (at the customer's configuration choice). The TruCluster Available Server software ensures highly available user access to network services like NFS, mission critical business applications, and important data such as customer databases. Generally these applications are unmodified from the version that runs on standard Digital UNIX server configurations.

The Internet Business Group offers the TruCluster Internet Server in collaboration with CSS. This is a packaged system based on TruCluster Available Server, that includes Internet applications such as news, WWW server, and mail. The customer features of this are high performance and a highly reliable internet server.

For a single application to span the entire cluster (to achieve higher scalability or performance), the customer would choose the TruCluster Production server, with a parallelized application like Oracle Parallel Server (and in the future with Informix XPS). The TruCluster Production Server provides all the functionality of the TruCluster Available Server, and adds the capability to run parallelized databases like Oracle Parallel Server (OPS) from Oracle Corporation, and in the future XPS from Informix. Using TruCluster Software, these applications can provide high availability, and performance for a single database to client systems. On top of the cluster software and database, products like SAP, Oracle Financials and many others can provide high performance application services to clients, with unsurpassed reliability. The combination of these technologies results in very high speeds for data transactions. Using OPS allows an application to run concurrently on all of the nodes in a cluster, yet access a single database in a rapid way.

The TruCluster Production Server consists of Alpha Servers, TruCluster Software, and MEMORY CHANNEL interconnect hardware. MEMORY CHANNEL provides high performance, low overhead communications between cluster members, for services like distributed lock manager (DLM), and storage services or distributed raw disk (DRD).

TruCluster Available Server Software V1.4

Overview

TruCluster Available Server Software (Software Product Description 44.17.xx) provides customers with the high availability advantages of clustering on Digital UNIX client/server systems. It is a high availability solution that minimizes, but does not eliminate, the impact of hardware and software failures. TruCluster Available Server is designed for computing environments that can tolerate a short disruption but need critical applications automatically restarted.

An Available Server Environment (ASE) is an integrated organization of systems and external disks connected to shared SCSI buses that together provide highly available software and disk data to client systems.

TruCluster Available Server provides multi-host access to SCSI disks and a generic failover mechanism for disks and applications. Within the ASE, system administrators can set up services which make disks and applications highly available to client systems. For example, services may be set up for exported NFS file systems, raw disks, and disk-based applications such as database programs or mail. Services may also be set up as nondisk based applications such as a remote login service.

TruCluster Available Server provides all the necessary software to fail over shared disks. To fail over an application, shell scripts are created that are executed to start and stop the application.

The systems connected to the shared SCSI bus run the services. Client systems may access a service through the network to the system on which it is running. Each system can run every service and fail over all the disks on the shared bus. A service runs on only one system at a time, and can automatically be restarted on another system in the event of a device or system failure with the proper hardware configuration.

Each system within the ASE monitors the networks and the status of the systems, disks, and buses. If a hardware or software failure prevents a system from running a service, TruCluster Available Server automatically moves (relocates) the service to another system to maintain the availability of the applications and disks. A service can optionally have IP addresses assigned to it to provide transparent access to clients. TruCluster Available Server detects and responds to all major system failures and events including:

- Operating system crashes
- System reboot
- Network failures, including failed Ethernet controller, disconnected network cable, and network partitioning
- I/O failures, including failed SCSI controller and disconnected cable

TruCluster Available Server provides the ability to manually relocate a service from one system to another when needed to perform maintenance or load balancing on a system. In addition, it enables connection of systems and disks to the shared SCSI bus so that modifications may be made to the hardware configuration without affecting the ASE.

TruCluster Available Server is ideal for high availability applications such as order processing, point-of-sale transaction processing, on-line customer service, reservation, catalog, and database query systems.

TruCluster Available Server Software V1.4 *(continued)*

Other Features and Functionality

- If there are as many services as there are systems in an ASE, then each member can run a service. This enables all systems to optimize workload eliminating idle time for any systems.
- A Master/Standby configuration may be set up in which the Master system runs all the services. If a failure prevents the Master system from running the services, TruCluster Available Server then relocates the services to the Standby system(s). Master/Standby configurations generally provide more predictable performance within the environment before and after the occurrence of failures.
- In any event that TruCluster Available Server relocates a service that provides access to exported NFS data, the change in the system exporting the data is virtually transparent. Clients experience only a temporary NFS server time out. NFS locking is also supported.
- The POLYCENTER Advanced File System (AdvFS) is a journaled, local file system that provides higher availability, greater flexibility and recovery than traditional UNIX file systems. Using transaction journaling, AdvFS can recover file domains in seconds rather than hours after an unexpected restart such as a power failure. AdvFS journaling also provides increased file system integrity. In addition, a separately licensed, optional layered product, the POLYCENTER Advanced File System Utilities, can be utilized to perform management functions on-line while filesystems are active. Refer to the Optional Software section of this section for more information on AdvFS Utilities.
- Digital UNIX Logical Storage Manager (LSM) is an integrated host-based solution to data storage management. Basic LSM functionality, including disk spanning and concatenation, is provided with the Digital UNIX operating system. Extended functions such as striping (RAID 0), mirroring (RAID 1), and on-line management are available with a separate license. LSM is RAID Advisory Board (RAB) certified for RAID Levels 0 and 1. Refer to the Optional Software section of this chapter for more information.
- TruCluster Available Server can log messages about events that occur in the ASE to one or more systems. Administrators can also receive notification of critical problems through electronic mail.
- The systems in the ASE can be configured using multiple network adaptors to provide greater flexibility in client access to services. Network interfaces can be monitored for proper operation. The status of monitored network interfaces is passed to a script that can be customized.
- The Cluster Monitor provides a graphical view of the cluster configuration and can be used to determine the current state of availability and connectivity in the cluster. The administrator can invoke management tools allowing the system to be managed from a single location.

Benefits

- TruCluster Available Server can provide transparent, unattended recovery in seconds.
- Enables load-balancing and preventative maintenance during peak demand periods to optimize performance and uptime.
- Ensures manual service failover to provide flexible system management.
- Offers Concurrently Active "warm" or Master/Standby "hot" modes for maximum resource optimization and performance.

TruCluster Available Server Software V1.4 *(continued)*

Ordering Information

- Software License & Configuration Guide: QB-05SA*-AA
- Software License: QL-05SA*-AA
- Software Documentation: QA-05SAA-GZ
- Software Product Services: QT-05SA*-**

* Denotes variant fields. For additional information on available services, refer to the appropriate price book.

Note that the QB part number includes a software license plus a hardcopy of a guide to the TruClusterAvailable Server. The guide contains the hardware configuration information needed to set up the systems in the TruCluster Available Server environment. It is recommended that at least one QB part number be ordered for each environment.

Software Requirements

- TruCluster Available Server Software V1.4 requires the Digital UNIX V4.0A operating system, a separately licensed product. Please refer to the TruCluster Available Server Software Product Description 44.17.xx for further details.

Optional Software

- NetWorker Client Support provides the ability to save and restore file systems without regard to prior, current, or future TruCluster Production Server service domain locations. It can be used with non-failover NetWorker servers located inside or outside of a domain. NetWorker is a separately licensed software product for Digital UNIX. Refer to Software Product Description 50.98.xx for further details.
- POLYCENTER Advanced File System Utilities extend the high availability and flexibility of AdvFS. AdvFS Utilities provide a graphical user interface to ease management tasks, and online utilities to dynamically resize file systems, defragment files, balance percentage of space used on volumes, undelete files using trashcans, stripe files and clone files for hot backup. POLYCENTER AdvFS Utilities is a separately licensed software product for Digital UNIX. Refer to Software Product Description 44.52.xx for further details.
- Digital UNIX Logical Storage Manager (LSM) is an integrated, host-based solution to data storage management, providing concatenation, striping, mirroring, and a graphical user interface that allows data storage management functions to be performed online, without disrupting users or applications. Logical Storage Manager is a separately licensed software product for Digital UNIX. Refer to Software Product Description 51.24.xx for further details.
- POLYCENTER Console Manager (PCM) is a layered software product which enables a host system to manage, monitor and control client console devices. PCM can support up to 200 systems/devices of any platform type that sends ASCII data over RS232C direct, TELNET or LAT connections that support XON/XOFF and I/O buffering. PCM also supports the pseudo terminal interface that provides a "soft" console for use with user defined application programs. POLYCENTER Console Manager is a separately licensed product for Digital UNIX. Refer to Software Product Description 42.90.xx for further details.
- POLYCENTER Performance Solution for UNIX systems is a management application that centralizes the monitoring of UNIX system performance information for a network of systems. A single instance of POLYCENTER Performance Solution for UNIX systems can monitor resources for many systems and alert the user when problems arise. POLYCENTER Performance Solution is a separately licensed product for Digital UNIX. Refer to Software Product Description 46.97.xx for further details.

Software Configuration Requirements

- At least 64 MB of memory is required on each member system.
- Disk space required for installation: 12 MB
- Disk space required for use (permanent): 11.5 MB

These requirements refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on system environment, configuration, and software options.

TruCluster Available Server Software V1.4 *(continued)*

TruCluster Available Server Software Configuration Rules and Recommendations

Member Systems

The following systems are supported

- DEC 3000 Models 300, 300X, 400, 400S, 500, 500S, 600, 600S, 700, 800, 800S, 900
- DEC 7000 and 10000
- AlphaServer 400 4/166
- AlphaServer 1000 4/200
- AlphaServer 1000A
- AlphaServer 2000 4/200
- AlphaServer 2100 4/200
- AlphaServer 2100 5/250
- AlphaServer 2100A Models 4/233, 4/250, 4/275
- AlphaServer 4000 and 4100
- AlphaServer 8200 and 8400

Up to four supported systems can be configured in a TruCluster Available Server environment. However, if there is a system with a PMAZC module or a KZMSA adapter installed, only three member systems in the Available Server Environment (ASE) can be used.

Network Adapters and Options

- DEFEA (EISA/FDDI)
- DE425 (EISA/Ethernet)
- PMAD (TURBOchannel/Ethernet)
- DEFTA (TURBOchannel/FDDI)
- DEFZA (TURBOchannel/FDDI)
- DEMNA (XMI/Ethernet)
- DEMFA (XMI/FDDI)
- DEFPA (PCI/FDDI)
- DE435 (PCI/Ethernet)

SCSI Controllers

Each member system that is used in the Available Server Environment must have a supported SCSI controller installed to attach the system to a shared SCSI bus. The following are supported adapters and their transmission method:

- KZPSA - Fast Wide Differential
- KZTSA - Diferential
- PMAZC - Single-ended
- KZMSA - Single-ended

Storage Units

TruCluster Available Server Software supports the following storage expansion units:

- BA350 - Single-ended, Narrow
- BA353 - single-ended, Narrow
- BA356 - Single-ended, Wide

Disk Devices

- To determine if the disk has the correct firmware, use the *scu* utility or examine the messages that are displayed when the system is turned on.
- Supported disk devices, firmware and data paths are RZ26 (narrow), RZ26L (narrow and wide), RZ26N (narrow and wide), RZ28 (narrow and wide), RZ28B (narrow), RZ28D (narrow and wide), RZ28L (narrow and wide), RZ28M (narrow and wide), RZ29B (narrow and wide). Firmware revisions are listed in the TruCluster Available Server Software V1.4 Release Notes.
- Prestoserve can not be used to accelerate a disk on an Available Server Environment shared bus.

TruCluster Available Server Software V1.4 *(continued)*

DEC RAID Controllers

Supported controllers for DEC RAID subsystems:

- HSZ10-Ax
- HSZ40-Ax
- HSZ40-Bx
  - The HSZ10 controller must be used in an ASE that includes PMAZC modules exclusively.
  - The HSZ10 controller uses only one SCSI ID.
  - The HSZ40 controller can be configured with one to four SCSI IDs.
  - The HSZ40 controller can be configured with one to eight Logical Unit Numbers (LUNs) for each SCSI ID. For any number of disks, having more SCSI IDs with fewer LUNs for each SCSI ID provides better performance than a configuration with fewer SCSI IDs and more LUNs

SCSI Signal Converters

SCSI signal converters convert single-ended SCSI to differential SCSI. Signal converters are either standalone units or StorageWorks building blocks (SBBs) that are installed in a disk slot in an expansion unit.

TruCluster Production Server supports the following SCSI converters. Each type of SCSI converter has a minimum firmware requirement that is listed in the TruCluster Available Server V1.4 Release Notes.

- DWZZA-AA - Standalone - Converts single-ended/narrow SCSI to differential/wide SCSI. Use with BA350 or BA353.
- DWZZA-VA - SBB - Converts single-ended/narrow SCSI to differential/wide SCSI. Use with BA350 or BA353.
- DWZZB-AA- Standalone - Converts single-ended/wide SCSI to differential/wide SCSI. Use with BA356.
- DWZZB-VW - SBB - Converts single-ended/wide SCSI to differential/wide SCSI. Use with BA356.

SCSI Cables

The type of cables needed for an ASE depends on the hardware configuration. It must determined if cables with connectors that are either high density (small connector: 50-pin) or low density (large connector: 68-pin) will be used. In addition, each supported cable comes in various lengths. The shortest possible cables must be used in the ASE.

The following SCSI cables are supported:

- BN21V-0B - 3 connectors, 50-pin, high/low density. This Y cable attaches to a PMAZC and can be terminated if necessary.
- BN21W-0B - 3 connectors, 68-pin, high density. This Y cable attaches to a KZTSA adapter, KZPSA, HSZ10 or HSZ40 controller, and can be terminated if necessary.
- BN21R or BN23G - 2 connectors, 50-pin, high/low density. Connects a BA350 or BA353 storage shelf to the single-ended side of a DWZZA-AA signal converter. Replaces the BC09D cable.
- BN21H or BN21J - 2 connectors, 50-pin, high density. Connects narrow devices, such as a BA350 or a BA353.
- BC06P - 2 connectors, 50-pin, low density. Connects BN21V-0B cables.
- BN21K or BN21L - 2 connectors, 68-pin, high density. Connects KZPSA adapters, HSZ10s, HSZ40 controllers, the differential sides of two SCSI signal converters, or a BA356 storage shelf to a DWZZB-VA signal converter.

Terminators and Connectors

Depending on the hardware configuration, terminators and connectors may be needed for shared SCSI bus(es). The following are the supported terminators and connectors and the context in which they would be used:

- H8574-A or H8860-AA, low density, 50-pin, terminates a BN21V-0B cable.
- H879-AA, high density, 68-pin, terminates a trilink connector or BN21W-0B cable.
- 12-37004-04, high density, 50-pin, terminates a BA353 input connector.
- H885 trilink connector - high density, 68-pin, attaches to high-density, 68-pin cables or devices such as KZTSA, KZPSA, HSZ10, HSZ40, or the differential side of a SCSI signal converter, and can be terminated if necessary.

When connecting a cable to a trilink connector, do not block access to the screws that mount the trilink. This will not allow disconnecting the trilink from a device.

TruCluster Available Server Software V1.4 *(continued)*

SCSI Buses

- TruCluster Available Server Software requires that all shared buses have the same logical bus number on each member system.
- Only external buses can be shared in an ASE.
- Up to 30 shared buses in an ASE depending on system configurations.
- The length of each physical bus is strictly limited. The allowable bus length depends on whether fast or slow SCSI bus speed, single-ended SCSI, or differential SCSI are being used.
- Terminate each physical bus only at the ends. Too many or too few terminators can cause a SCSI bus to behave improperly.
- Use trilink connectors and Y cables to connect devices to a shared bus. This allows connection to devices without affecting bus termination. Trilink connectors or a Y cable can be attached to a shared bus. This enables the adding of a device later to the ASE without affecting bus termination.
- Use a SCSI signal converter to connect devices with different transmission methods and data paths.
- Care must be taken when performing maintenance on any device that is on a shared bus because of the constant activity on the bus. Usually, to perform maintenance on a device without shutting down the ASE, the device must be isolatied from the shared bus so it will not affect bus termination.
- If a storage unit is disconnected from a shared bus (without affecting the bus termination) or remove a disk from a slot, TruCluster Available Server stops any service that uses the disks, unless the disks are part of a mirrored Logical Storage Manager (LSM) volume or are contained in a RAID set.

TruCluster Available Server Software Configuration

- TruCluster Available Server Software V1.4 subset ASEBASE130 can be installed only on systems running the Digital UNIX V4.0A operating system.
- It is required that at least 64 MB of memory available on each member system.

TruCluster Available Server Software V1.4 *(continued)*

TruCluster Available Server Diagrams

The following diagrams are examples of TruCluster Available Server Software configurations. All configurations require at least one Ethernet or FDDI on each system in the cluster.

Diagram 1

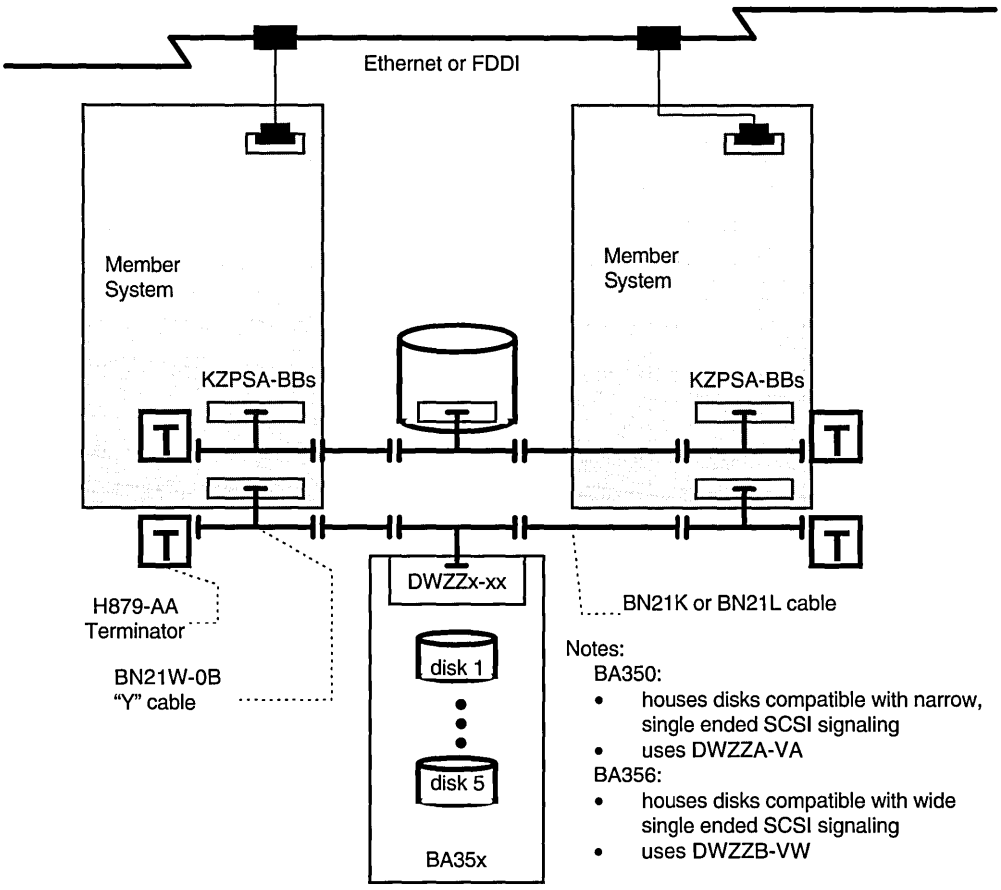


Diagram 1 illustrates a cluster with two AlphaServer 2100a Systems and dual shared SCSI buses. Only one storage unit is shown in detail, but there could be identical redundant units. TruCluster Available Server V1.4 supports up to 30 shared SCSI buses. Note: Total SCSI bus length not to exceed 25 meters.

Diagram 2

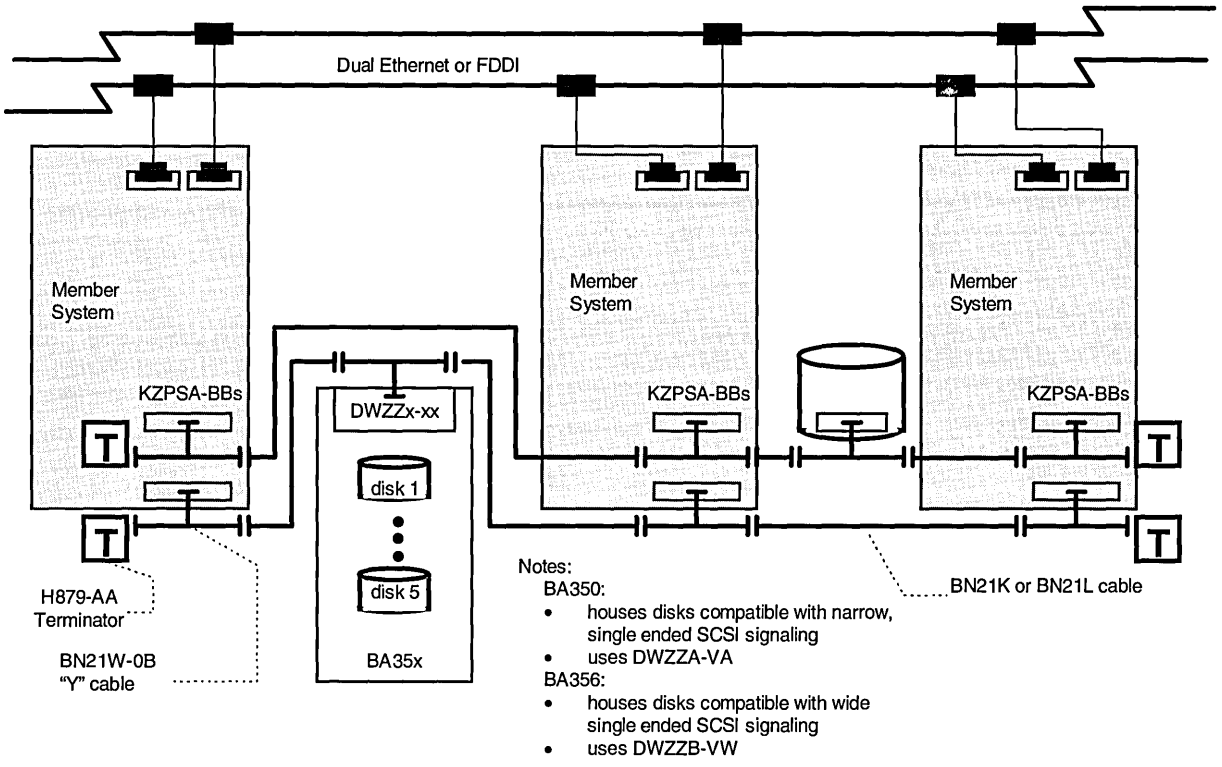


Diagram 2 shows a three-system cluster with redundant networks and network connections, and two SCSI buses. Note that up to 30 shared buses are supported in TruCluster Available Server V1.4. **Note:** For custom packages, call Digital Services Sales Support Team at 800-832-6277 or 603-884-8990.

Digital UNIX TruCluster Systems Configuration Information

TruCluster Production Server Software V1.4 Overview

Digital offers TruCluster Production Server Software (TruCluster Software) V1.4 (Software Product Description 63.92.xx) for Digital UNIX for customers wanting availability, scalability and performance advantages of clustering on Digital UNIX client/server systems.

By combining the advantages of symmetric multiprocessing, distributed computing, and fault resilience, a cluster running TruCluster Software offers users high availability and achieves superior performance, providing scalability beyond the *limits* of a single system. TruCluster Production Server now creates an offering even more attractive to customers by providing an enterprise-level production server at a very affordable cost.

TruCluster Software supports highly parallelized database applications, such as OracleParallel Server. Trucluster Software allows the processing components of an application to concurrently access raw devices, regardless of where the devices are located in the cluster. Using the TruCluster Production Server Distributed Lock Manager (DLM), an application can synchronize clusterwide access to shared resources, thus ensuring data integrity. To a client, the cluster appears to be a powerful single-server system; a client is minimally, if at all, impacted by hardware and software failures in the cluster. In addition, DLM provides services to notify a process owning a resource that it is blocking another process requesting the resource. An application can also use DLM routines to coordinate the application's activities efficiently with the state of the cluster.

A cluster configuration consists of systems and external disks connected to shared SCSI buses. TruCluster Software provides multi-host access to shared disks, and a generic failover mechanism that makes applications and data highly available. TruCluster Software operates over the PCI to MEMORY CHANNEL Interconnect, a breakthrough high performance technology. By providing direct memory connections between systems, the PCI to MEMORY CHANNEL Interconnect reduces system overhead and provides a significant improvement in message latency. This allows TruCluster Production Server configurations to achieve performance like that of symmetric multiprocesesors (SMP) while enhancing overall reliability of data.

An administrator defines services for applications which are to remain highly available in the cluster. If a hardware or software failure prevents a system from running a service, the failover mechanism automatically relocates the service to a viable system in the cluster, thus maintaining the availability of applications or data. Administrators can manually relocate services for load balancing or hardware maintenance.

TruCluster Production Server Software V1.4 *(continued)*

Overview ***(continued)***

TruCluster Production Server supports a variety of hardware configurations that are cost-effective, and meet performance and availability requirements. Hardware configurations can include different types of systems and storage units, and can be set up to allow easy maintenance of systems and storage. In addition, it is possible to set up hardware configurations that allow the addition of a system or storage unit without shutting down the cluster.

TruCluster Production Server is ideal for high availability applications such as order processing, point-of-sale transaction processing, on-line customer service, reservation, catalog, and database query systems and for other mission-critical applications.

Other Features and Functionality

- The Connection Manager maintains cluster membership. In addition, it establishes and maintains connection paths between each cluster member.
- The Distributed Raw Disk (DRD) allows a raw disk-based, user-level application to run within a cluster, regardless of where in the cluster the physical storage is located. DRD allows applications, such as distributed database systems or TP monitor systems, parallel access to storage media from multiple cluster members. DRD can provide cluster members access to RAID volumes.
- TruCluster Production Server enables parallelized, concurrently active, and master/standby server configurations. Distributed components of an application can run simultaneously on different cluster members.
- TruCluster Production Server can provide highly available access to exported NFS data. In the event of a system failure, the change in the system exporting the data is virtually transparent. Clients experience only a temporary NFS server time out.
- POLYCENTER Advanced File System (AdvFS) is a journaled, local file system that provides higher availability and greater flexibility than traditional UNIX file systems. Using transaction journaling, AdvFS recovers file domains in seconds rather than hours after an unexpected restart such as a power failure. AdvFS journaling also provides increased file system integrity. In addition, an optional separately licensed product, the POLYCENTER Advanced Filed System Utilities, can be used to perform management functions on-line while filesystems are active. Refer to the Optional Software section of this chapter for more details.
- Digital UNIX Logical Storage Manager (LSM) is an integrated host-based solution to data storage management. Basic LSM functionality, including disk spanning and concatenation, is provided with the Digital UNIX operating system. Extended functions such as striping (RAID 0), mirroring (RAID 1), and on-line management are available with a separate license. LSM is RAID Advisory Board (RAB) certified for RAID Levels0 and 1. Refer to the Optional Software section of this chapter for more information.
- TruCluster Production Server can log messages about events that occur in the TruCluster environment to one or more systems. TruCluster administrators can also receive notification of critical problems when they occur through electronic mail.
- The systems in the TruCluster Production Server environment can be configured using multiple network adaptors to provide greater flexibility in client access to services. Network interfaces can be monitored for proper operation. The status of monitored network interfaces is passed to a script that can be customized.
- Cluster Monitor provides a graphical view of the cluster configuration and can be used to determine the current state of availability and connectivity in the cluster. The administrator can invoke management tools allowing the system to be managed from a single location.

TruCluster Production Server Software V1.4 *(continued)*

Benefits

- PCI to MEMORY CHANNEL Interconnect provides high-speed, low latency, reliable node-to-node connections to enable distributed memory. This facilitates highly available clusters with performance approaching SMP with shared memory.
- Distributed Lock Manager manages data locks and controls access to shared resources. Parallelized applications can run smoothly and efficiently across multiple nodes.
- Support for highly parallelized database applications (such as OPS) enable concurrent access to databases enabling database instances to be run simultaneously on multiple nodes.
- Distributed Raw Disk enables remote access to raw disks over the MEMORY CHANNEL enabling applications to survive failures of any remote system or mirrored disk.
- TruCluster Available Server Software, AdvFS, and LSM technology provide failover, journaling, and maximum storage utilization enabling optimal system availability with rapid file recovery

Software Requirements

- TruCluster Software V1.0 requires the Digital UNIX V4.0A operating system. For more information on the Digital UNIX operating system, a separately licensed product, refer to Software Product Description 41.61.xx.

Ordering Information

- Software License and Documentation: QB-3RLA*-AA
- Software License: QL-3RLA*-AA
- Software Upgrade License: QL-3RLA*-RA
- Software License (30 day loan): QL-3RLA9-LB
- Software License (60 day loan): QL-3RLA9-LD
- Software License (90 day loan): QL-3RLA9-LA
- Software License (180 day loan): QL-3RLA9-LG
- Software Documentation: QA-3RLAA-GZ

*Denotes variant fields. For additional information on available services, refer to the appropriate price book

Optional Software

- Optional software Oracle Parallel Server (OPS) technology is a relational database management system that capitalizes on the benefits of high availability, performance, and expandability made possible by Digital UNIX clusters. Oracle Parallel Server must be ordered separately through the Oracle Corporation.
- NetWorker Client Support provides the ability to save and restore file systems without regard to prior, current, or future TruCluster Production Server service domain locations. It can be used with non-failover NetWorker servers located inside or outside of a domain. NetWorker is a separately licensed software product for Digital UNIX. Refer to Software Product Description 50.98.xx for further details.
- POLYCENTER Advanced File System Utilities extend the high availability and flexibility of AdvFS. The AdvFS Utilities provide a graphical user interface to ease management tasks, and online utilities to dynamically resize file systems, defragment files, balance percentage of space used on volumes, undelete files using trashcans, stripe files and clone files for hot backup. The POLYCENTER AdvFS Utilities is a separately licensed software product for Digital UNIX. Refer to Software Product Description 44.52.xx for further details.
- Digital UNIX Logical Storage Manager (LSM) is an integrated, host-based solution to data storage management, providing concatenation, striping, mirroring, and a graphical user interface that allows data storage management functions to be performed online, without disrupting users or applications. Logical Storage Manager is a separately licensed software product for Digital UNIX. Refer to Software Product Description 51.24.xx for further details.
- POLYCENTER Console Manager (PCM) is a layered software product which enables a host system to manage, monitor and control client console devices. PCM can support up to 200 systems/devices of any platform type that sends ASCII data over RS232C direct, TELNET or LAT connections that support XON/XOFF and I/O buffering. PCM also supports the pseudo terminal interface that provides a "soft" console for use with user defined application programs. The POLYCENTER Console Manager is a separately licensed product for Digital UNIX. Refer to Software Product Description 42.90.xx for further details.
- POLYCENTER Performance Solution for UNIX systems is a management application that centralizes the monitoring of UNIX system performance information for a network of systems. A single instance of POLYCENTER Performance Solution for UNIX systems can monitor resources for many systems and alert the user when problems arise. The POLYCENTER Performance Solution is a separately licensed product for Digital UNIX. Refer to Software Product Description 46.97.xx for further details.

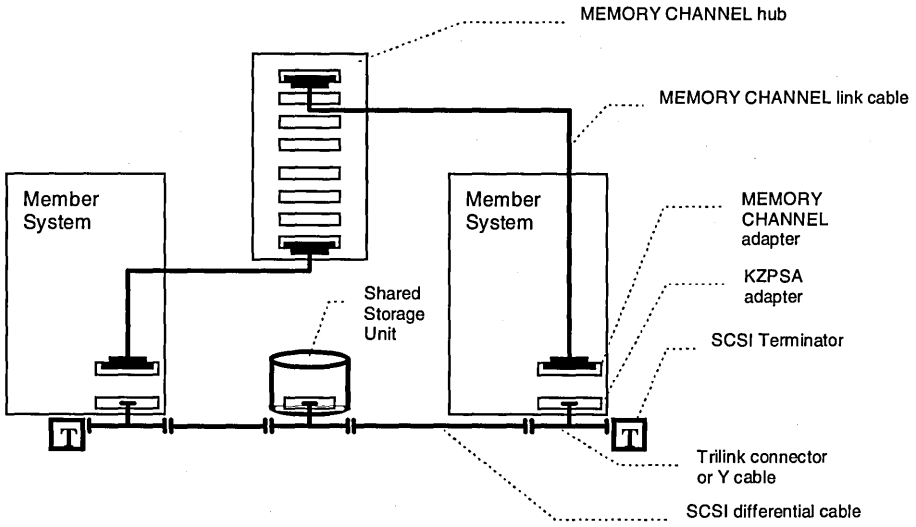
TruCluster Production Server Software V1.4 *(continued)*

Software Configuration Requirements

- At least 96 MB of memory is required on each member system.
- Disk space required for installation: 12 MB
- Disk space required for use (permanent): 11.5 MB

These requirements refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on system environment, configuration, and software options.

TruCluster Production Server Basic Configuration Components



A TruCluster Production Server configuration comprises the following components:

- **Member systems**: Use any combination of supported member systems. Configurations of up to 4 nodes are supported
- **KZPSA adapters**: Install KZPSA SCSI adapters in PCI slots to provide member systems with connections to SCSI buses.
- **Shared storage shelves**: Use any combination of supported storage shelves. A single-ended SCSI storage shelf, such as a BA350 must be connected via a SCSI Signal converter
- **Trilink connectors or Y cables**:Use trilink connectors and Y cables to connect KZPSA adapters, HSZ40 controllers, or SCSI signal converters installed in single ended storage shelves.
- **Differential SCSI cables**: Use BN21K or BN21L cables to connect trilink connectors and Y cables attached to member systems and storage shelves to create a shared SCSI bus. The DWZAA-AA signal converter requires a BN21R or BN23G cable. The DWZZV-AA signal converter requires a BN21K or BN21L cable.
- **SCSI terminators**: Both ends of the SCSI bus must be terminated
- **MEMORY CHANNEL controllers:** Install CCMAA MEMORY CHANNEL controllers in PCI slots to connect member systems to cluster interconnects
- **MEMORY CHANNEL hubs**: Install up to eight linecards in a MEMORY CHANNEL hub. A hub is required if there are more than two member systems.
- **MEMORY CHANNEL link cables**: Link cables connect a MEMORY CHANNEL controller to a MEMORY CHANNEL controller on another system, or connect an adapter to a linecard installed in a hub.
- Optional FDDI or Ethernet Adapters: Use any combination of supported network adapters.

TruCluster Production Server Software V1.4 *(continued)*

TruCluster Production Server Configuration Rules and Recommendations

Member systems

- Up to four supported systems can be configured in a TruCluster Production Server environment.
- Supported systems: AlphaServer 2000/2100/2100A/8200/8400
- Each supported member system has a required minimum firmware revision. These firmware revisions are listed in the TruCluster Release Notes.
  - AlphaServer 2000 Models 4/200, 4/233, 4/275
  - AlphaServer 2000 Models 5/250 and 5/300
  - AlphaServer 2100 Models 4/200, 4/233, 4/275, 5/250, 5/300
  - AlphaServer 2100A Models 4/200, 4/233, 4/275, 5/250, 5/300
  - AlphaServer 4000 and 4100
  - AlphaServer 8200 and 8400 Models 5/300, 5/350
- Any network interfaces should be installed and configured.
- TruCluster Production Server does not support the XMI CIXCD on an AlphaServer 8200 or 8400 system.

MEMORY CHANNEL Interconnect

- MEMORY CHANNEL interconnect can use either a virtual hub mode (two member systems connected via link cables without a MEMORY CHANNEL hub) or standard mode (two or more systems connected to a MEMORY CHANNEL hub).
- Two MEMORY CHANNEL controllers can be installed per member system. One adapter is in use by the member system while the other adapter is in standby mode. The member system will fail over to use the redundant adapter in the advent of a failure of the adapter in current use.
- If there are redundant MEMORY CHANNEL interconnects, both interconnects must use the same mode, either virtual hub mode or standard mode.
- For an AlphaServer 8200 or 8400 system, a MEMORY CHANNEL adapter must be installed in the first two segments (PCI slots 0 to 7) of the DWLPA/DWLPB card cage. If there are redundant MEMORY CHANNEL interconnects, both adapters must be installed in the same DWLPA/DWLPB card cage.
- For an AlphaServer 2100A Model 4/233, 4/250, or 4/275 system, install MEMORY CHANNEL controllers only in the bottom four PCI slots.
- MEMORY CHANNEL controllers and hubs must be completely connected, and hubs must be turned on before member systems are booted.

  If using redundant MEMORY CHANNEL interconnects and standard mode, each adapter installed in a system must be connected to a different hub. Each system must maintain its node ID. To accomplish this, cable both the MEMORY CHANNEL controllers in each system to the same linecard slot on each hub. Node ID in standard mode is determined by the linecard slot to which the adapter is connected. When systems are cabled to each hub in the same way, on failover, node ID will not change. That is, the adapters must be connected to linecards that are in the same slot position in each hub. For example, if an adapter is connected to a linecard installed in the bottom slot in one hub, then the other adapter must be connected to a linecard installed in the bottom slot in the second hub.
- The maximum length of a MEMORY CHANNEL link cable is 3-meters (10-feet).

KZPSA Adapters

- TruCluster Production Server requires a specific minimum hardware and firmware revision for the KZPSA adapter. Minimum firmware revision is required for each KZPSA-BB PCI-to-Fast-Wide-Differential SCSI-2 adapter installed in a member system. Refer to the TruCluster Release Notes for minimum firmware revisions.
- Before a KZPSA adapter is installed in a PCI slot, the termination in the adapter must be disabled.
- Each KZPSA adapter must have a unique SCSI ID (0 to 7) on a shared SCSI bus.

TruCluster Production Server Software V1.4 *(continued)*

Disk Devices

- For each type of disk, TruCluster Production Server requires a specific minimum firmware requirements. Refer to the TruCluster Release Notes for minimum firmware requirements.
- Supported disk devices, firmware and data paths are RZ26 (narrow), RZ26L (firmware 442D - narrow), RZ26L (wide), RZ26N (narrow and wide), RZ28 (wide), RZ28 (wide), RZ28B (narrow), RZ28D (narrow and wide), RZ28L (narrow and wide), RZ28M (narrow and wide), RZ29B (narrow and wide).
- Disks on shared SCSI buses must be intalled in external storage shelves.
- Each SCSI device connected to a shared SCSI bus uses a device address and must have a unique SCSI ID (from 0 to 7). Each disk in BA350, BA353, or BA356 storage shelf uses a device address. An HSZ40 array controller can use one to four device addresses.
- TruCluster Production Server does not support Prestoserve on any shared disk.

Storage Shelves

- A SCSI signal converter must be connected to a storage shelf with a single SCSI interface, such as a BA350, BA353, or BA356 storage shelf.

HSZ40 Array Controllers

- Heirarchical Storage Operating Firmware (HSOF) revision 2.5, 2/5, or later is required for each HSA40-Ax RAID controller on a member system. HSOF revision 2.5 or later is required for each HSZ40-Bx RAID controller configured on a member system.
- TruCluster Production Server supports single-controller HSZ40 array controller configurations and dual controller, single-bus HSZ40 array controller configurations.
- The HSZ40 array controller can be configured with one to four SCSI Ids.
- The HSZ40 array controller can be configured with one to eight Logical Unit Numbers (LUNs) for each SCSI ID. For any number of disks, having more SCSI Ids with fewer LUNs for each SCSI ID provides better performance than a configuration with fewer SCSI IDs and more LUNs.
- Storage subsystems, such as RAID controllers, that use volatile writeback caches can not be used.

SCSI Converters

- If a storage shelf with a single-ended SCSI interface is being used in the TruCluster Production Server hardware configuration, it must be connected to a SCSI signal converter. SCSI signal converters convert narrow or wide single-ended SCSI to wide differential SCSI. Some signal converters are desktop units and some are StorageWorks building blocks (SBBs) that are installed in disk slots in storage shelves.
- TruCluster Production Server supports the following SCSI converters. Each type of SCSI converter has a minimum firmware requirement.
  - DWZZA-AA - Standalone - Converts single-ended/narrow SCSI to differential/wide SCSI. Use with BA350 or BA353.
  - DWZZA-VA - SBB - Converts single-ended/narrow SCSI to differential/wide SCSI. Use with BA350 or BA353.
  - DWZZB-AA- Standalone - Converts single-ended/wide SCSI to differential/wide SCSI. Use with BA356.
  - DWZZB-VW - SBB - Converts single-ended/wide SCSI to differential/wide SCSI. Use with BA356.
- If the cover is removed from a standalone unit, ensure that the star washers on all four screws that hold the cover in place are replaced when the cover is reattached. If the washers are not replaced, the SCSI signal converter may not function correctly because of noise.
- If disconnecting a SCSI signal converter from a shared SCSI bus, the signal converter must be turned off prior to the disconnecting of cables. To reconnect the signal converter to the shared bus, connect the cables before turning on the signal converter.

TruCluster Production Server Software V1.4 *(continued)*

SCSI Cables

- If using shared SCSI buses, it must be determined if cables with connectors that are either high density (large connector), or low density (small connector), 50-pin, 68-pin or right angle will be used. In addition, each supported cable comes in various lengths. The shortest possible cables must be used to adhere to the limits on SCSI bus length.
- The following SCSI cables are supported:
  - BN21W-0B - 3 connectors, 68-pin, high density. A Y cable that attaches to a KZPSA adapter, HSZ40 controller, or the differential side of a SCSI signal converter and can be terminated if necessary.
  - BN21R or BN23G - 2 connectors, 50-pin, high/low density. Connects a BA350 or BA353 storage shelf to the single-ended side of a DWZZA-AA signal converter.
  - BN21K or BN21L - 2 connectors, 68-pin, high density. Connects KZPSA adapters, HSZ40 controllers, the differential sides of two SCSI signal converters, or a BA356 storage shelf to a DWZZB-VA signal converter.
- Always check a SCSI cable for bent or broken pins.

SCSI Terminators and Trilink Connectors

- The following SCSI terminators and trilink connectors are supported:
  - H879-AA - one connector, 68-pin, high density. Terminates a trilink connector or BN21W cable.
  - 12-37004-04 - one connector, 50-pin, high density. Terminates a BA353 input connector.
  - H885 trilink - three connectors, 68-pin, high density. Attaches a KZPSA adapter, HSZ40 controller, or the differential side of a SCSI signal converter, and can be terminated if necessary.
- If a SCSI cable is connected to a trilink connector, ensure that access to the screws that mount the trilink are not blocked. This will enable disconnection of the trilink from the device without disconnecting the cable.

Shared SCSI Buses

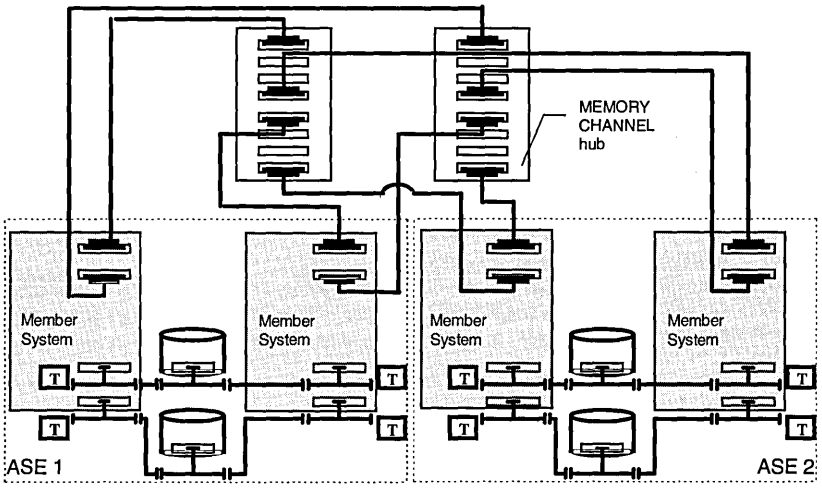
- Disks on a shared SCSI bus must have the same device number on each member system that is connected to the bus.
- Two Available Server Environments (ASE) can be set up in a cluster if it is a four member configuration.
- A member system can be in only one ASE.
- Up to 30 shared SCSI buses can be used in an ASE. A shared SCSI bus can be in only one ASE.
- On a SCSI-2 bus, the SCSI specification limits the number of device addresses to eight, and each SCSI device must have a unique SCSI ID (0 to 7).
- The length of each physical bus is strictly limited.
- For each physical bus, only two terminators (one at each end) can be used.
- Use trilink connectors and Y cables to connect devices to a shared bus, so devices can be disconnected without affecting bus terminatiaon.
- Devices can only be directly connected if they have the same transmission mode (differential or single-ended) and data path (narrow or wide). Use a signal converter to connect devices with different transmission modes or data paths.

Supported Network Adapters:

- DEFEA (EISA/FDDI)
- DE425 (EISA/Ethernet)
- DEFPA (PCI/FDDI)
- DE435 (PCI/Ethernet)
- DEMNA (XMI/Ethernet)
- DEMFA (XMI/FDDI)
- DE422 (EISA Lance Ethernet)

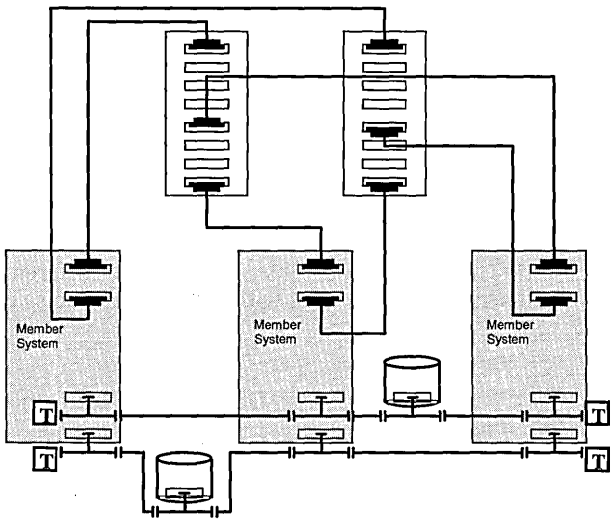
TruCluster Production Server V1.4 *(continued)*

Sample Four Member dual ASE TruCluster Production Server Configuration



In a four node dual ASE configuration, each Available Server Environment (ASE) includes two member systems connected to two shared SCSI buses. Each member system is connected to redundant MEMORY CHANNEL interconnects that include MEMORY CHANNEL hubs. Note that since this configuration requires the use of four PCI slots on each member system, it is supported only for AlphaServer 2100A, AlphaServer 4000, AlphaServer 4100, AlphaServer 8200, and Alphaserver 8400 systems.

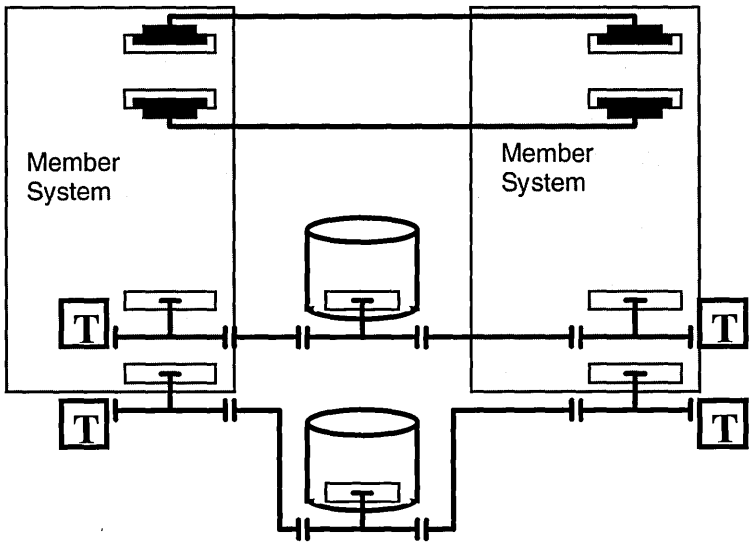
Sample Three Member single ASE TruCluster Production Server Configuration



In the three member system configuration, all three systems are on each of the shared SCSI buses. A MEMORY CHANNEL hub is required for the interconnect. The configuration depicted here has redundant MEMORY CHANNEL interconnects and two shared SCSI buses which requires four PCI slots on each member system. It is not required that the MEMORY CHANNEL be redundant. Note that since this configuration requires the use of four PCI slots on each member system, it is supported only for AlphaServer 2100A, AlphaServer 4000, AlphaServer 4100, AlphaServer 8200, and Alphaserver 8400 systems.

TruCluster Production Server V1.4 *(continued)*

Sample two member hubless highly available configuration



This figure depicts a TruCluster Production Server hardware configuration that includes two member systems, two terminated shared SCSI buses and redundant MEMORY CHANNEL interconnects that do not use MEMORY CHANNEL hubs.

MEMORY CHANNEL Controller

The MEMORY CHANNEL interconnect is a high-bandwidth, low-latency PCI-based communications interconnect for up to eight AlphaServer systems. Its performance characteristics make it ideal for use as a high-speed communications interconnect for compute servers and a high-availability cluster interconnect.

The MEMORY CHANNEL Interconnect is designed to speed inter-processor communications by reducing the overhead imposed by traditional network communications. The PCI to MEMORY CHANNEL host controller performs many of the functions normally performed by network software, thus eliminating the associated latency delays and host overhead. This allows applications to communicate directly with the hardware. The reduction in message latency is approximately a hundred-fold, resulting in significant performance gain. Applications running on MEMORY CHANNEL hardware have shown a dramatic performance improvement over a standard FDDI network and other interconnects. The efficiency and performance of the MEMORY CHANNEL interconnect enables clusters of AlphaServers to deliver the computing power of specialized, massively parallel processors but at a commodity price. At the same time, cluster configurations offer high availability to the application.

Features

- High bandwidth: Up to 100 MB/second
- Low latency: As low as 2.9 microseconds (depending on system)

Software Support and Prerequisites

Use of MEMORY CHANNEL requires OpenVMS V7.1 or above, or Digital UNIX operating system software V3.2E or above. For OpenVMS, MEMORY CHANNEL software is licensed as part of the standard OpenVMS Cluster Software product. OpenVMS Cluster configurations require no additional license in order to use MEMORY CHANNEL. For Digital UNIX, each system node in a MEMORY CHANNEL cluster requires a software license which varies, depending on cluster usage. Servers in a compute-server array require a Digital UNIX Driver for MEMORY CHANNEL license. Servers used in a TruCluster high-availability environment require a license for TruCluster for Digital UNIX. Digital Parallel Software Environment (PSE), Digital Parallel Virtual Machine (PVM), and Digital High Performance Fortran (HPF) also include support for MEMORY CHANNEL in technical applications.

Prerequisite Hardware

For Digital UNIX and OpenVMS, the following systems are supported:

- AlphaServer 2000
- AlphaServer 2100
- AlphaServer 2100A
- AlphaServer 4000
- AlphaServer 4100
- AlphaServer 8200
- AlphaServer 8400

Refer to system ordering menus for MEMORY CHANNEL configuring information. Additionally, OpenVMS supports AlphaServer 1000/1000A systems.

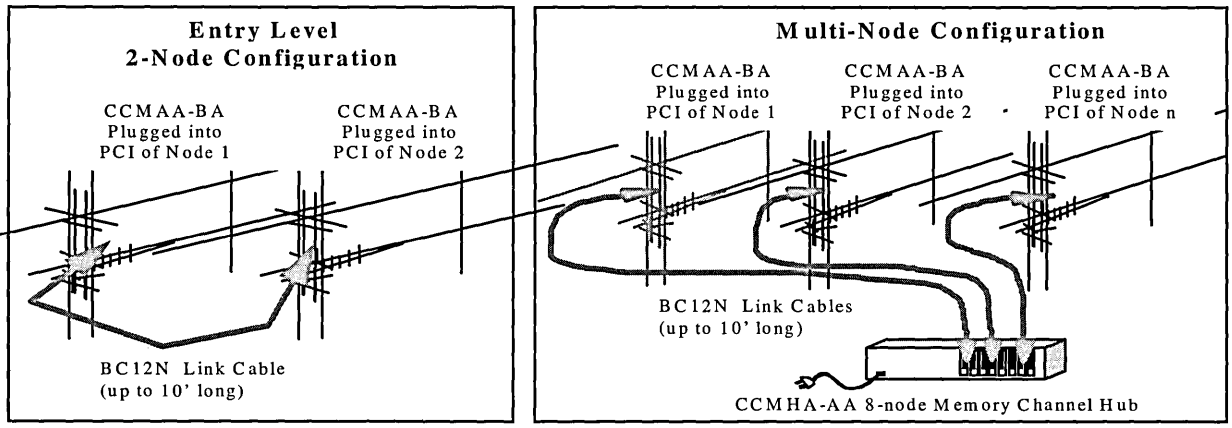
MEMORY CHANNEL Controller *(continued*

Configuration and Ordering Information

Modularity of MEMORY CHANNEL allows for flexible configuration options:

- At the entry level, two systems, each equipped with a MEMORY CHANNEL controller (CCMAA), can be connected together directly by a 10-foot cable (BC12N-10).
- A MEMORY CHANNEL Hub (CCMHA-AA) is used to connect 3 or more (up to 8) server nodes. The cables connect the MEMORY CHANNEL controllers in each node to the Hub. The Hub houses Line Cards (CCMLA-AA), one for each node connected. The basic Hub comes standard with 4 line cards and can support four nodes. To support more than 4 nodes, up to 4 more line cards can be added to the Hub. Up to 8 nodes can be supported in this fashion. The CCMAA is a free-standing enclosure that can be placed adjacent to the systems or mounted in a 19" rack by using the CCMRA-AA rack-mount kit.

If redundancy is required for OpenVMS and Digital UNIX, duplicate the hardware configuration for a maximum of two CCMAA controllers per system node. Additionally, OpenVMS will spread SCS connections across up to two MEMORY CHANNEL interconnects in order to increase overall cluster bandwidth. If two MEMORY CHANNEL controllers are used with Digital UNIX for redundancy, both controllers must be located on the same PCI bus.



MEMORY CHANNEL Controller

CCMAA-BA	PCI-to-MEMORY CHANNEL Controller
CCMHA-AA	MEMORY CHANNEL Hub with 4 Line Cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA); use one each as needed for system nodes 5-8.
CCMRA-AA	Rack-mount kit for MEMORY CHANNEL Hub
BC12N-10	MEMORY CHANNEL Cable
QL-MUZA*-AA	VMScluster Software for OpenVMS Alpha
QB-3RLAG-AA	TruCluster Software for Digital UNIX, Departmental system class
QB-3RLAQ-AA	TruCluster Software for Digital UNIX, Enterprise system class
QB-4ZCAG-AA	Digital UNIX Driver for MEMORY CHANNEL license; Departmental system class
QB-4ZCAQ-AA	Digital UNIX Driver for MEMORY CHANNEL license; Enterprise system class

- The maximum distance between two systems connected by the MEMORY CHANNEL controller is 2.1-meters (7-feet). When three or more systems are configured using a MEMORY CHANNEL Hub (CCMHA-AA), the maximum distance from the hub to each system is 2.1-meters (7-feet).
- The CCMHA-AA MEMORY CHANNEL Hub includes a BN19P-2E line cord for Canada, Japan, US operation. For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19C-2E	Central Europe
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19S-2E	Egypt, India
BN18L-2E	Israel
BN24X-2E	Italy
BN19H-2E	Australia, New Zealand

StorageWorks Storage Solutions

For a storage solution that helps balance growing demands for capacity, performance, availability, and data protection while managing costs—now and in the future—turn to StorageWorks. Based on four fundamental benefits, the StorageWorks family of products can help manage storage more efficiently and effectively via:

- Built-in investment protection through modular packaging. Based on easy-to-use, swappable, standardized components, the "building blocks" approach of StorageWorks provides unmatched versatility of use and configuration.
- With StorageWorks products, new devices and capabilities can be added while protecting most or all of the initial investment. Devices can be moved easily between platforms as system platforms change. Standard device interconnects ensure compatibility across Digital's full range of Alpha processors running both OpenVMS and Digital UNIX, as well as SUN OS and Solaris, Novell Netware, Windows NT, HP-UX, and IBM RS6000 system platforms.
- High performance and availability for any application delivered via innovative cache and RAID capabilities—StorageWorks controllers connect StorageWorks devices to a variety of host buses. Starting with simple and cost effective storage connections, these controllers provide powerful features and options that include RAID Levels 0, 1, 3, and 5, with both read cache and battery-protected Write-Back Cache. The controller family provides connectivity to a broad range of hosts and networks, including Fast Wide Differential SCSI, PCI, FDDI, and Digital's CI and DSSI system interconnects.
- Enhanced user productivity and data protection through comprehensive storage management solutions—the StorageWorks family includes hardware and software products that meet the need for data protection and storage management. StorageWork's tape and optical libraries support from 20 GBytes to 5.2 TBytes. Comprehensive software solutions include archive/backup and hierachical storage management products for OpenVMS and Digital UNIX. StorageWorks also partners with leading companies to support non-Digital platforms.

A view to the future—as storage needs change, StorageWorks provides new, innovative solutions. For example, to meet the need for increasing amounts of network-served storage that improves performance and lowers costs, StorageWorks has introduced the family of FDDI Storage Servers.

StorageWorks Storage Solutions *(continued)*

StorageWorks Modular Packaging

Device Carriers: At the core of Digital's modular packaging design are 3.5- and 5.25-inch device carriers that hold disk and tape drives, optical and CD-ROM drives, solid state devices, and other critical components such as power supplies, signal converters and battery backup modules. Device carriers provide more than consistent, modular packaging; they also deliver radio frequency shielding, shock protection, and provide for the mechanical and electrical mounting of the devices.

Cabinets: Digital offers a wide range of cabinets, conveniently designed to hold any combination and quantity of storage devices enclosed in carriers. StorageWorks Device Carriers insert easily into cabinets, plugging into a backplane in the back of the cabinet. StorageWorks cabinets are available in a variety of sizes to meet user needs.

StorageWorks Devices

The StorageWorks product family offers a full complement of interchangeable storage devices incorporating the latest proven technology. All devices are subjected to exhaustive, three-stage testing and debugging—at the device, subsystem, and system level—to assure their dependability and reliability. From fast-wide and fast-narrow SCSI disk drives, available in 1, 2 and 4 Gbyte capacities, to signal converters that can be linked to extend cable connections to up to 170 feet, StorageWorks devices deliver unprecedented flexibility in configuring storage solutions.

StorageWorks Controllers and Adapters

Because StorageWorks controllers use devices from the StorageWorks family, all disks, tapes, and other devices are interchangeable and can be easily migrated across controllers. Digital provides three categories of controllers:

- Cluster-capable array controllers (including the HSJ30/40, HSD30, and HSZ40) are high connectivity, high performance controllers with operator updateable software, dynamic parity RAID and Universal Read/Write-Back Cache.
- Backplane array controllers (including the RAID ARRAY 110, 210, and 230) are low cost, high performance workgroup or departmental level RAID subsystems that support RAID Levels 0, 1, 0+1, and 5.
- Expansion storage controllers (including HSD10) bring low cost connectivity to DSSI and SCSI environments.

All StorageWorks controllers connect with StorageWorks devices via a high performance, standardized SCSI-2II cable. The cable has a single-ended design and requires adherence to a maximum distance of 3 meters. For longer data cable connections, single-ended, differential signal connecters (DWZZA, DWZZB) allow storage devices to be located up to 25 meters from the StorageWorks controller or bus adapter.

StorageWorks RAID Products for High Availability

Digital pioneered RAID-based storage in the mid-1980s. Digital's StorageWorks RAID Array subsystems family provides flexible, pre-configured solutions for high availability, fault tolerant storage. StorageWorks RAID Arrays support RAID Level 0 (striping), Level 1 (mirroring or shadowing), Level 0+1 (striping plus mirroring), Level 3 (striped parity) and Level 5 (parity RAID). They can be easily tailored using simple, menu-driven options that allow the selection of RAID level or levels required. StorageWorks RAID Arrays feature hot swappable drives, that allow replacement of failed drives without disrupting applications. They also offer optional write-back cache or write-through cache.

Dynamic Parity RAID

- The StorageWorks array controller families, including the HSJ, HSD and HSZ series array controllers, allow custom configured RAID arrays. The controllers support Raid Level 0 (striping) and optional RAID levels 3 and 5 (parity RAID).
- StorageWorks' innovative implementation of parity RAID combines the best of RAID Levels 3 and 5. Levels 3 and 5 are generally suited to different types of applications. Level 3 is optimal for applications that transfer large amounts of data with each I/O request, with low request rates. Level 5 is optimal for small data requests with high request rates. StorageWorks parity RAID option dynamically adjusts its update algorithms, adapting between I/O-intensive applications and data transfer-intensive applications to provide excellent, across-the-board, parity-based RAID performance.

StorageWorks Storage Solutions *(continued)*

StorageWorks Network Storage Arrays

The StorageWorks Family of Network Storage Arrays (including the HS211, HS221, HS241 and HS280) integrate Alpha technology with StorageWorks modular design to meet the requirements of large, FDDI-based VMScluster systems and NFS clients. All models support a wide range of StorageWorks media. They feature high I/O performance and data integrity, an easy growth path, optional full redundancy for fault tolerance, and automated central storage management. Additionally, the StorageWorks FDDI servers allow comprehensive storage management capabilites to execute independently, reducing client CPU cycles spent on storage management and the associated management network traffic.

StorageWorks Libraries

Digital offers a full range of tape and optical libraries for economical nearline and off-line data storage. The flexible StorageWorks RW500 series optical libraries (jukeboxes) handle multiple applications and are multifunctional, combining rewritable and write-once capabilities in one unit. Capable of random data access, optical libraries provide quick retrieval of the particular data needed. Optical libaries are ideal for tamperproof, long term archiving.

Tape libraries typically offer a faster overall transfer rate than optical, while average access times tend to be slower. Therefore, tape libraries work better for storing large quantities of infrequently accessed data or when very large data items may be retrieved. Digital offers a variety of tape libraries, including systems based on the ultra-reliable, high-performance Digital Linear Tape (DLT) technology. DLT offers unsurpassed data integrity, plus DLT drives last up to five times longer than helical scan devices. StorageWorks DLT libraries, such as the TL820 and TL810, provide the most economical automated large-scale backup, with high capacity in a very small footprint.

Storage Management Solutions

StorageWorks provides more than hardware—it also delivers the management software needed to optimize system efficiency and maximize productivity. Data protection products such as POLYCENTER Archive/Backup, Storage Library System, and POLYCENTER NetWorker deliver distribution, backup and restore services to networks and clusters, ensuring that data is protected against human error, machine failure, or site disaster. Other storage management products, such as RAID Software for OpenVMS and POLYCENTER File Optimizer can help improve system performance and data availability, while tools such as Save Set Manager, Sequential Media Filesystem, and Hierarchical Storage Manager for OpenVMS and Digital UNIX provide new ways of increasing user productivity while dramatically lowering storage costs.

Warranty and Maintenance

All of Digital's StorageWorks products are supported by a comprehensive warranty: 5 years for disks, 3 years for controllers, 2 years for tape devices, and 1 year for other components. The first year of all warranties includes customer site support provided by Digital's Customer Service; the balance is provided by Digital's Return-to-factory Repair/Exchange Service.

For the first time, customers can choose self-maintenance or Digital maintenance on all 3.5- and 5.25-inch devices. The StorageWorks packaging and fault indicators make it safe and easy to identify, remove and replace devices.

Multivendor Products

StorageWorks products are qualified in a variety of non-Digital platforms. For complete information about Storageworks products for SUN, Novell, Windows NT, Hewlett Packard, and IBM applications, please call the StorageWorks hotline at 1-800-STORWORK (1-800-786-7967).

StorageWorks Device Carriers and BA356 Shelves

StorageWorks supported devices are mounted in green rugged carriers, creating a StorageWorks Building Block (SBB).

The basic element is the shelf which can be installed in different storage arrays using cabinet- or system-specific mounting brackets. Shelves can be mounted horizontally or vertically in system enclosures and/or cabinets. A pedestal unit is created by mounting shelves inside a pedestal enclosure.

A single modular shelf supports a combination of 3.5" and 5.25" devices, plus a power supply. All supported devices (disk, tapes, power supplies, and adapters) are mounted in carriers. Shelves can be configured for seven 3.5" devices, or four 3.5" devices and one 5.25" full-height device, or one 3.5" device and two 5.25" full-height devices, or four 5.25" devices if two half-height devices are installed in each carrier.

Power for each shelf is furnished by an AC or DC subsystem power supply and there are provisions for optional redundant power supplies and optional battery backup units. Cooling for each shelf is provided by two field-replaceable dual-speed blowers mounted on the back of the shelf.

Shelves can be configured with two SCSI data channels for high data rate applications and high performance devices. With the appropriate I/O personality module, the BA356 shelf can operate with either 8- or 16-bit host controllers/adapters. All components of the modular shelf are customer installable without any special tools or training. Carriers with devices and blowers can be removed and installed without turning off the subsystem or individual shelf power.

16-Bit Wide Shelf

BA356-SB Single-height 16-bit shelf, configured for seven 3.5" devices, or four 3.5" devices and one 5.25" full-height device, or one 3.5" device and two 5.25" full-height devices. Installation of redundant power supply reduces number of 3.5" devices by one. Two 5.25" half-height devices (RRD4x, TZK10/11) can be mounted in one 5.25" full-height carrier. FCC class B certified. Includes 1 BA35X-MH.

BA356-SC Single-height shelf, can be configured for 8-bit or 16-bit devices. Can configure for up to seven 3.5" devices, or four 3.5" devices and one 5.25" full-height device, or one 3.5" device and two 5.25" full-height devices. Installation of redundant power supply reduces number of 3.5" devices by one. Two 5.25" half-height devices (RRD42/43, TZK10/11) can be mounted in one 5.25" full-height carrier. FCC class B certified. Requires either BA35X-MG 8-bit or BA35X-MH 16-bit I/O module.

Shelves for HSJ and HSZ controllers

See HSJ and HSZ controller section for required cables and ordering information.

BA350-MA Shelf for hardware RAID controllers, maximum 2 per shelf plus 2 cache module

BA350-MB Shelf for hardware RAID controllers, maximum 2 per shelf plus 2 cache module, BA35X-HF power supply, BA35X-RD metric mounting brackets

Shelves for SW500 and SW800

BA356-JC 16-bit shelf includes power supply, dual-speed blowers and mounting brackets. Supports maximum of seven 3.5" devices (8- or 16-bit). FCC class B certified. Requires either BA35X-MG 8-bit or BA35X-MH 16-bit I/O module. For split bus node order BA35X-ME active terminator.

BA356-SB 16-bit shelf includes dual-speed blowers and 16-bit personality module (BA35X-MH). Supports maximum of seven 3.5" devices (8- or 16-bit). FCC class B certified. For split bus node order BA35X-ME active terminator.

BA356-SC 16-bit shelf includes dual-speed blowers. Supports maximum of seven 3.5" devices (8- or 16-bit). FCC class B certified. Requires either BA35X-MG 8-bit or BA35X-MH 16-bit I/O module. For split bus node order BA35X-ME active terminator

Shelf Options

BA35X-MB 8-bit SCSI terminator board for BA350. Replacement unit for customer installation

BA35X-MC 8-bit SCSI jumper board for BA350. Replacement unit for customer installation

BA35X-MD Dual-speed blowers for BA350, BA356, and SW300

BA35X-ME 16-bit active terminator for BA356 to configure in split bus node

BA35X-MF 16-bit SCSI jumper board for BA356. Replacement unit for customer installation.

StorageWorks BA356 Shelves *(continued)*

Shelf Options

BA35X-MG	8-bit I/O module for the BA356 shelf to run 8- or 16-bit devices with 8-bit host controllers/adapters
BA35X-MH	16-bit I/O module for the BA356 shelf to run 8- or 16-bit devices with 16-bit host controllers/adapters
BA35X-MJ	Dual-speed blower plus foam, upgrade kit for BA350-K pedestal
BA35X-RB	Rackmount kit for BA350/BA356 shelf in RETMA cabinets. Assembly requires 7 inches of vertical space
BA35X-RD	Rackmount kit for BA350/BA356 shelf in Metric cabinets. Assembly requires 150 mm of vertical space
BA35X-VA	Vertical mounting kit for BA350/BA356 shelf for deskside use with locking translucent front door. BN27S-03 U.S./Japan power cord, and daisychained power switch.
BA655-AA	Double shelf specifically designed for use with DEC 7000 and 10000 Alpha systems. Includes power supplies (BA35X-HG), special mounting brackets, system-supplied cooling

Shelf Specifications

Physical Characteristics	
Height	15 cm (5.9 in.)
Width	44.5 cm (17.5 in.)
Depth	35 cm (13.8 in.)/ 30 cm (11.8 in) (with 5.25" carriers)
Weight	
Installed	15.9 kg (35 lb) / 15.0 kg (33 lb)
Shipping	20.4 kg (45 lb) / 19.5 kg (43 lb)

StorageWorks Power Supply

- Power supply choice is determined by the power supply design of system.
- Power supply mounted in shelf provides connection for devices mounted in shelf. Power cords for devices mounted in pedestals are not required.

BA35X-HF	150-Watt universal ac input power supply. Maximum two per BA350 shelf. Occupies single 3.5" carrier.
BA35X-HG	150-Watt 48-Vdc input power supply. Maximum two per BA350 shelf. Occupies single 3.5" carrier. (**Note:** One power supply included in each of two shelves in BA655, for redundant power or spare).
BA35X-HC	Optional battery backup for BA350 power supply. Provides 2 minutes of power to full shelf. Occupies single 3.5" carrier.

Power Supply Specifications

BA35X-HF Universal ac Input Power Supply	
Input	90–264 Vac, 47–63 Hz, auto-ranging
Output	150 W +12 Vdc, +5 Vdc
Power Cable Connector	IEC C14, Shrouded
BA35X-HG Universal DC Input Power Supply	
Input	32–72 V DC, auto-ranging
Output	150 W +12 Vdc, +5 Vdc
BA35X-VA Pedestal Mounting Kit	
Power Connector	IEC C14, Shrouded

StorageWorks BA35R and BA36R Rackmount Shelves

The BA35R and BA36R Rackmount StorageWorks shelves for wide and narrow SCSI options provide a cost effective way to organize storage with systems and other options in an easily accessible 19 inch wide EIA/ANSI industry standard rack. The rackmount shelves offer comparable functionality to the BA356-KC StorageWorks pedestal, with the same option storage space and support for a redundant BA35X-HF 150 watt power supply. These shelves are compatible with the RZ29B 4.3 GB disks. The BA36R series supports both 16 bit and 8 bit devices, while the BA35R series supports 8 bit devices only.

Each Rackmount StorageWorks shelf requires seven inches of vertical space, although a front and a rear shelf can be mounted back-to-back, front, and rear in the same seven inch spacing. The front mounted shelves include an operator viewing bezel, while the rear shelves have open access.

Supported devices for these enclosures are listed later in this section.

StorageWorks BA35R/BA36R 8-bit and 16-bit Rackmount Shelves

BA36R-AF	BA356 16-bit Rackmount StorageWorks Shelf with Front Mount and Power
BA36R-AR	BA356 16-bit Rackmount StorageWorks Shelf with Rear Mount and Power
BA35R-SF	BA350 8-bit Rackmount StorageWorks Shelf with Front Mount and Power
BA35R-SR	BA350 8-bit Rackmount StorageWorks Shelf with Rear Mount and Power

Spare/Maintenance Items

BA35X-MD	Dual-speed blower for SW300, BA356, and BA350.
BA35X-ME	Active terminator, 16-bits for BA356, SCSI-2.
BA35X-MF	Jumper module for 16-bit SCSI-2 bus in BA356.
BA35X-MG	8-bit I/O module for the BA356 shelf to run 8- or 16-bit devices with 8-bit host controllers/adapters
BA35X-MH	16-bit I/O module for the BA356 shelf to run 8- or 16-bit devices with 16-bit host controllers/adapters

Country Power Kits[1]

BN19H-2E	Australia, New Zealand
BN19C-2E	Central Europe
BN19A-2E	UK, Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

1 BA356-KC has an IEC C14 standard power plug.

StorageWorks BA355 Rackmount Enclosure

The BA355 is a rackmount unit with devices and controllers in a single system. The BA355 is optimized for high availability. The enhanced backplane provides six internal single-ended SCSI buses that eliminate the need for device SCSI cables. BA355 features an environmental monitor to access all available status signals, an ac power entry box., six SCSI buses, and 8 dual-speed blowers.

Optional N+1 power redundancy with only five power supplies, or N+N power with 8 power supplies for full redundant power, and ac input are available.

The enclosure requires either BA35X-RA or BA35X-RJ rackmount brackets, and BA35X-HF universal ac power supply, a mimimum of four power supplies are required for unit to run. All supported devices (disks, tapes, power supplies, and adapters) are mounted in carriers. The BA355 provides packages for twenty-four 3.5" SBBs or eight 5.25" SBBs, and two controllers with cache. 8-bit narrow and 16-bit wide drives are supported. **Note:** All drives run in 8-bit narrow mode since SCSI controllers supported in BA355 are 8-bit narrow (HSxx) controllers. Supported devices are listed later in this section.

BA355 Rackmount Enclosure Options

BA355-AA*	Integrated backplane, six single-ended SCSI buses, eight dual-speed blowers, ac power entry unit, environmental monitor, and user documentation.

* A minimum of four power supplies (BA35X-HF) are required for unit to run.

Options

BA35X-HF	3.5" universal power supply in SBB, 150 Watts, Maximum 8 supported per BA355/SW300
BA35X-HE	AC power entry unit for redundancy, Maximum 2 supported per BA355/SW300
BA35X-EA	Environmental Monitor for redundancy, Maximum 2 supported per BA355/SW300
BA35X-MD	Dual-Speed Blower replacement, Maximum 8 blowers supported per BA355/SW300

Supported Controllers

Note: HSD05/HSD10 controllers are not supported in the BA355 Rackmount enclosures.

Controller	Interface	Storage Device Buses
HSD30	Digital Standard System Interconnect (DSSI)	3 8-bit single-ended SCSI-maximum of two
HSJ30	Computer Interconnect (CI) bus	3 8-bit single-ended SCSI-maximum of two
HSJ40	Computer Interconnect (CI) bus	6 8-bit single-ended SCSI-maximum of two
HSZ10	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ15	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ40	Fast wide differential SCSI	6 8-bit single-ended SCSI-maximum of two

Supported Devices

RX26-VA	2.88 MB removable diskette drive
RZ26L-VA	1.05 GB 8-bit narrow hard disk drive
RZ26N-VA	1.05 GB 8-bit narrow hard disk drive
RZ28-VA	2.1 GB 8-bit narrow hard disk drive
RZ28B-VA	2.1 GB 8-bit narrow hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow hard disk drive 7200 RPM
RZ28M-VA	2.1 GB 8-bit narrow hard disk drive 7200 RPM
RZ29B-VA	4.3 GB 8-bit narrow hard disk drive 7200 RPM
RZ26L-VW	1.05 GB 16-bit wide hard disk drive
RZ26N-VW	1.05 GB 16-bit wide hard disk drive
RZ28-VW	2.1 GB 16-bit wide hard disk drive
RZ28D-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM

StorageWorks BA355 Rackmount Enclosure *(continued)*

Supported Devices

RZ28M-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM
RZ29B-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM
RWZ52-VA	1.3 GB removable optical disk drive in 5.25" carrier
EZ51R-VA	107 MB solid state disk in 5.25" carrier
EZ54R-VA	428 MB solid state disk in 5.25" carrier
EZ58R-VA	856 MB solid state disk in 5.25" carrier
EZ31-VW	134 MB solid state drive in 3.5" carrier
EZ32-VW	268 MB solid state drive in 3.5" carrier
EZ64-VA	475 MB solid state drive in 3.5" carrier
EZ69-VA	950 MB solid state drive in 3.5" carrier
RRD43-VA	600 MB dual speed CD-ROM in 5.25" carrier
RRD43-VU	600 MB add in dual speed CD-ROM for RRD4x-VA or TZK11-VA
RRD44-VA	600 MB dual speed CD-ROM in 5.25" carrier
RRD44-VU	600 MB add in dual speed CD-ROM for RRD4x-VA or TZK11-VA
RRD45-VA	600 MB quad speed CD-ROM in 5.25" carrier
RRD45-VU	600 MB add in quad speed CD-ROM for RRD4x-VA or TZK11-VA
TZ87-VA	10/20 GB DLT drive mounted in BA35X-CD
TZ87N-VA	20 GB DLT drive mounted in BA35X-CD
TZ88N-VA	20/40 GB DLT drive mounted in BA35X-CD
TZK11-VA	2 GB QIC cartridge tape drive in 5.25" carrier
TZK11-VU	2 GB QIC add in cartridge tape drive for TZK11-VA or RRD4x-VA
TKZ15-VA	5 GB 8mm cartridge tape drive
TLZ06-VA	4 GB 4mm DAT catridge tape drive
TLZ6L-VA	16 GB 4mm DAT four catridge tape loader
TLZ07-VA	8 GB 4mm DAT catridge tape drive in 3.5" carrier
TLZ09-VA	8 GB 4mm DAT catridge tape drive
TLZ7L-VA	32 GB 4mm DAT four catridge tape loader
TKZ09-VA	5 GB 8mm helical scan cartridge tape drive
SWXTE-AA	10 GB 8mm helical scan cartridge tape drive
SWXTE-AB	10 GB 8mm helical scan cartridge tape drive

Country Kits

Order country-specific 13-20 amp input power cords

Order Number	Country/Voltage	Amps	Plug	Meters (Feet)
BN27S-03	U.S./Japan, 250 V	15	NEMA 5-15	3.0 (9.8)
BN19H-2E	Australia/New Zealand, 250 V	10	AS 3112-1981	2.5 (8.2)
BN19C-2E	Central Europe, 250 V	10	CEE 7/7(Schuko)	2.5 (8.2)
BN19A-2E	U.K./Ireland, 250 V	10	BS 1363	2.5 (8.2)
BN19E-2E	Switzerland, 250 V	10	SEV 1011	2.5 (8.2)
BN19K-2E	Denmark, 250 V	10	Afsnit 107	2.5 (8.2)
BN19Z-2E	Italy, 250 V	10	CEI 23-16/VII	2.5 (8.2)
BN19S-2E	India/South Africa, 250 V	10	BS 546	2.5 (8.2)
BN18L-2E	Israel, 250 V	10	SI 32	2.5 (8.2)

StorageWorks BA355 Rackmount Enclosure *(continued)*

Specifications

Physical Dimensions	
Height	838.20 mm (29.44 in)
Width	476.25 mm (18.75 in)
Depth	482.60 mm (19.00 in)
Weight	
Cabinet with shipping packaging	106.65 kg (242.00 lb)
Maximum configuration	77.85 kb (178.00 lb)
Agency Compliance	FCC, UL, CSA, TUV, CE-mark
Electrical Rating	100-120/220-240 V ac, 50/60 Hz, single phase, 12/6 amps
Power Requirements of BA35X power supply	
Input	90–264 V ac, 47–63 Hz, auto-ranging, power factor corrected
Output	150 W +12 V dc, +5 V dc
Power Cable Connector	IEC C14, Shrouded
Power Requirements of BA355	
Voltage	100-120/220-240 V ac, 50/60 Hz
Number of phases	1
Rated current	12/6 Amps
Operating Environment	
Temperature	10° C to 40° C (50° F to 95° F) Derate 1.8° C for each 1000 m altitude (1.0° F for each 1000 ft altitude)
Relative humidity	0% to 90% (noncondensing) Maximum wet bulb temperature: 28° C (82° F) Minimum dew point: 2°C (36° F)
Altitude	From sea level to 2400 m (8000 ft)
Air quality(maximum particle count)	Not to exceed 500,000 particles per cubic foot of air at 0.5 micron or larger
Non-operating Environment	
Temperature	-40° C to 66° C (-40° F to 151° F) (During transportation and associated short-term storage)
Relative humidity	8% to 95% in original shipping container (noncondensing); otherwise, 50% (noncondensing)
Altitude	3600 m (12,000 ft)

StorageWorks Pedestal Comparison Chart

Pedestal Comparison Chart	BA356-KC	BA346-KB
Bus width	16-bit	16-bit
Maximum SCSI buses	2	2*
Maximum number of devices	7	9
Maximum 3.50" SBBs	7	7
Maximum 5.25" SBBs	2	None
Rear access SCSI	No	Yes
Hot-swap power (uses one device slot)	Yes	No
Power capacity	150 watts	200 watts
Hot swap blowers	Yes	No
Multiple blowers	Yes	Yes

* Second SCSI bus optional. Requires mounting assembly kit (BA35X-AA).

StorageWorks 16-bit BA356 Deskside Expansion Pedestal

BA356 StorageWorks deskside expansion pedestals support 8-bit and 16-bit devices when connected to a qualified 8- or 16-bit SCSI controller. BA356-KC and BA356-KD support a PCI-based Wide Differential SCSI controller with a wide differential to wide single-ended converter (DWZZB-VW). System layout that requires more than 3 meters of SCSI bus length are also supported when a DWZZB-VW converter is installed.

The BA356-KC and BA356-KD pedestals support up to seven 16-bit, 3.5" SBB devices. A table of supported devices is provided later in this section. Dual-speed blowers provide the cooling required by 7200 RPM disk drives. An optional power supply can be added to provide high data availability. There are no slot restrictions and many StorageWorks devices may be migrated and re-used in these pedestals without modifications. Refer to the 8-bit Supported Devices table later in this section for required minimum revision levels for support of older devices.

Installation and use is easy. SCSI cable connections are easily accessible, and access to drives for hot-swapping has been simplified. Shelf-OK indicators on power supply indicate condition of supplies and blowers. BA356-KC and BA356-KD support Digital Fault Bus standards and provide signals to host controllers/adapters for remote system management.

BA356-KC/KD and options come with a one-year on-site and two additional years return-to-factory warranty.

Supported Systems

AlphaServer 2100, AlphaServer 2000, and AlphaServer 1000 systems, Pentium Prioris HX Servers

StorageWorks BA356-KC/KD Options

- Bus 1 connection requires right angle connector. Use BN21L-E/01/02 (right angle to right angle)
- Bus 2 connection requires straight connector. Use BN21K-01 (straight to straight)
- See system ordering menus for SCSI cable information.

BA356-KC Deskside unit with BA356 shelf and power supply BA35X-HF, pedestal kit BA35X-VA, dual-speed blowers, 16-bit I/O module BA35X-MH, BN27S-03 U.S./Japan power cords. FCC class B certified.

BA356-KD Deskside unit with BA356 shelf and BA35X-Vx pedestal kit, BA35X-HF universal power, dual-speed blowers, BN27S-03 U.S./Japan power cords. FCC class B certified. Requires either 8-bit (BA35X-MG) or 16-bit (BA35X-MH) I/O module.

BA35X-VA BA35X-VA pedestal kit and BA27S-03 power cord.

BA35X-YA Factory Integration (for all devices ordered with a BA356-KC).

BA35X-HF* 150 Watt Universal ac Input Power Supply, maximum of two per enclosure, occupies a single 3.5" carrier (for SW300 and BA356).

* BA35X-HG and BA35X-HC may be used with BA356 instead of BA35X-HF.

StorageWorks 16-bit BA356 Deskside Expansion Pedestal *(continued)*

BA356-KC Specifications

Physical Characteristics	
Height	61 cm (24 in.)
Width	25.4 cm (10 in.)
Depth	36.8 cm (14.5 in.)
Weight	
Installed	16.26 kg (35.8 lb)
Shipping	20.76 kg (45.8 lb)
Electrical	
Input voltage	94-264 V ac, autoranging power supply
Optimum	+18 to +24 degrees C; maximum rate of change 3 degrees C; maximum step change 3 degrees C
Maximum	+10 to +40 decrees C; 10 to 90 percent non-condensing
Compliance	
	Enclosure, devices, and subsystem fully comply with FCC Class B, and meet UL, TUV, CSA, and CE Mark
Spin-up	Device spin-up must be staggered by a minimum of four seconds
Regulatory approval	FCC Class B and CE Class B (this does not include the RZ28-VA/VW, TZ87, and TLZ7L, which are Class A qualified only).

StorageWorks 16-bit BA346 Deskside Expansion Pedestal

The BA346-KB Deskside Expansion Pedestal is a 16-bit direct storage expansion pedestal that offers maximum capacity and performance at a low cost. The pedestal can be configured with up to seven 3.5" SBBs plus up to two 5.25" half height devices or one full height device, and one SCSI bus. An optional BA35X-AA kit configures the top slot of the BA346 to support one full-height or two half-height 5.25" fixed devices. The optional BA35X-AB kit splits the backplane into two independent buses. A full width, translucent door allows for easy viewing of device activity lights and is removable, providing easy access to devices. Device hot swapping is supported. A list of supported devices for this enclosure is provided later in this section.

StorageWorks BA346-KB

BA346-KB	9 device Deskside unit with non-redundant power supply. Supports seven 3.5", 16-bit devices and two 5.25" half-height devices.
BA35X-AA	Optional fixed mounting assembly kit configures the top slot of the BA346 to support one full-height or two half-height 5.25" fixed devices.
BA35X-AB	Optional dual bus kit, splits BA346-KB backplane into two independent SCSI buses.
BA35X-VB	Optional stabilizer kit for applications requiring extra stability.
BA35X-YA	BA346-KB with factory mounted and tested devices.

Specifications

Physical Characteristics	
Height	53.4 cm (21 in.)
Width	20.4 cm (08 in.)
Depth	48.3 cm (19 in.)
Front clearance	30.5 cm (12 in)
Rear clearance	30.5 cm (12 in)
Weight (empty)	16.8 kg (37 lb)
Access	Through removable side panel
Environmental	Front to back airflow controlled impedance
SCSI	Auto SCSI ID select. Multiple configurations for upper or lower range device ID, 68-pin P connectors. Internal bus length, 1 meter as shipped
Power	NEMA 15 connector, 120 or 240 Vac 60/50 Hz, switch selectable, A/C switch on front, behind key locked door, 200 Watts, 20 Amp @ +5 vdc, 8 Amp @ +12 vdc, disk spin up interval, 4 sec, min.

StorageWorks BA362 and BA364 Office Expansion Enclosures

StorageWorks BA362 and BA364 Office Expansion Enclosures offer new levels of flexibility and investment protection. The enclosures allow users to place storage on or under the desk, worktable, or office shelf, allowing users to expand their storage capacity while maximizing the space in their work areas. The enclosures have locking doors for security.

Both units support new high performance devices, including intermixed 8-bit and 16-bit SCSI devices and 7200 RPM disk drives. The BA362 holds two 3.5-inch devices. The BA364 includes a slot for a fixed CD-ROM, plus holds four 3.5-inch devices or one 3.5-inch device and one 5.25-inch device. For even greater configuration flexibility, a stacking kit lets users electronically interconnect the two enclosures, allowing the advantage of two power sources for RAID mirroring applications.

Features

- Investment protection: users can easily migrate StorageWorks devices from other enclosures to the office, extending the useful life of older devices
- Efficient use of space: expand storage capacity while maximizing space in work areas
- Security: locking door provides security and easy device access
- Flexibility: support for a broad range of StorageWorks devices
- High Availability options: stack capability allows two power sources for RAID mirroring applications.

Ordering Information

BA362-AA	Office expansion unit holds up to 2 3.5" modular storage devices, 120V
BA362-AB	Office expansion unit holds up to 2 3.5" modular storage devices, 240V
BA364-AA	Office expansion unit holds up to 4 3.5" modular storage devices and 1 fixed CD-ROM, 120V
BA364-AB	Office expansion unit holds up to 4 3.5" modular storage devices and 1 fixed CD-ROM, 240V
BA36X-AA	Stack Mounting Kit enables electronic connection of BA362 and BA364

Specifications

Physical Characteristics	BA362	BA364
Height	10.5 inches	14.5 inches
Width	7.0 inches	7.0 inches
Depth	12.67 inches	12.67 inches
Weight	17 pounds (empty) 21 pounds (with disks)	20 pounds (empty) 32 pounds (4 disks, 1 CD-ROM)
Voltage	120/240 volts	120/240 volts
Amps	3.25/1.26	5.00/2.45
Frequency	50-60 Hz	50-60 Hz
SCSI buses	1	1
Bus width	8/16 bits	8/16 bits
Maximum no. of devices	2	5
Maximum 3" disks	2	4
Maximum 5" disks	0	1
Fixed CD-ROMs	0	1
Rear SCSI access	Yes	Yes
SCSI connector	68 pin, high density, female, "D" sub SCSI external	
Operational clearance	4" rear of enclosure for cable bends, 8" front of enclosure for door swing	
Power cables	Standard country power cords	
SCSI cables	Standard SCSI cables specific to interconnected system	

StorageWorks 8-bit BA353 Desktop Expansion Unit

Digital's Desktop Expansion Unit adds storage capacity to high-end PCs, workstations, and desktop server configurations. The expansion unit's size and construction allow it to be placed under a workstation. It is less than 6 cm (2.4 in.) high, so the screen's height and tilt remain virtually unchanged, enabling the user to enjoy the same working comfort.

It accommodates three devices and supports combinations of: one 5.25-inch half-height device (RRD45-VE) and two 3.5-inch half-height devices or three 3.5-inch half-height devices (TLZ06-VA, RZ2x-VA at 5400RPM or lower).

BA353-AA	Desktop expansion unit, universal power supply, 120-V power cord, and user documentation. Requires SCSI cable for 3 SBBs.
BA353-AB	Desktop expansion, universal power supply, 120-V power cord, and user documentation. Requires SCSI cable for 2 SBBs and 1 CD-ROM (RRD45-VE).

Specifications

Physical Characteristics	
Height	60 mm (2.4 in.)
Width	431.8 mm (17 in.)
Depth	400 mm (15.8 in.)
Weight	3.5 kg (7.7 lb) (empty)
Loading	Supports 45 kg (99 lb)

Power Requirements	
Input	86–264 Vac (auto-ranging), 1.8 A 47–63 Hz
Output DC power	78 Watts
	+5.0 V +-5%, 6.0 A
	+12.0 V +-5%, 4.0 A, 6.0 A (peak)
Each slot	+5.0 V +-5%, 2.0 A
	+12.0 V +-5%, 1.3 A
Forced-air cooling	Front to rear 6 CFM/slot
system	12.0 V, 0.2 A

Configuration Information	
Storage slots	Three
Interface	8-bit, single-ended SCSI-2
Single host	In/out SCSI connectors with active
Device ID	
for 3.5" devices	User-selectable
for 5.25" devices	User-selectable

StorageWorks Supported Devices for 8-bit BA350, BA35R and BA353

DWZZA-VA*	Fast Wide Differential to Fast Narrow single-ended SCSI adapter in 3.5" carrier. BA350 and BA35R only.
EZ51R-VA*	107 MB solid state disk in 5.25" carrier. BA350 and BA35R only.
EZ54R-VA*	428 MB solid state disk in 5.25" carrier. BA350 and BA35R only.
EZ58R-VA*	856 MB solid state disk in 5.25" carrier. BA350 and BA35R only.
RRD42-VB*	CD-ROM device in 5.25" carrier (BA35X-CD). BA350 and BA35R only.
RRD42-VU*	CD-ROM device, can be added to RRD42-VB. BA350 and BA35R only.
RRD45-VA*	Quad-speed high-performance CD-ROM drive in 5.25" carrier with space for additional half-height device. BA350 and BA35R only.
RRD45-VE*	Quad-speed high-performance CD-ROM drive. BA353 only.
RRD45-VU*	Quad-speed high-performance CD-ROM upgrade, must be added to RRD4x-VA, TZK1x-VA. BA350 and BA35R only.
RWZ52-VA	1.2 GB multifunction optical drive in 5.25" carrier
RX26-VA	2.88 MB diskette drive in 3.5" carrier
RZ25-VA	426 MB disk drive in 3.5" carrier
RZ25L-VA	535 MB disk drive in 3.5" carrier
RZ26-VA	1.05 GB disk drive in 3.5" carrier
RZ26L-VA	1.05 GB disk drive in 3.5" carrier
RZ28-VA	2.1 GB disk drive in 3.5" carrier
RZ28B-VA	2.1 GB disk drive in 3.5" carrier
RZ29B-VA*	4.3 GB disk drive in 3.5" carrier. BA350 and BA35R only
SWXTE-AA*	5 GB 8-mm helical scan tape drive in 5.25" carrier. BA350 and BA35R only.
SWXTE-AB*	5 GB 8-mm helical scan tape drive, can be added to SWXTE-AA. BA350 only.
TKZ09-VA*	5 GB 8-mm tape drive in 5.25" carrier. BA350 and BA35R only.
TLZ06-VA	4 GB 4-mm digital audio tape (DAT) in 3.5" carrier
TLZ07-VA	8 GB 4-mm digital audio tape (DAT) in 3.5" carrier
TLZ7L-VA	8 GB 4-mm digital audio tape (DAT) minilibrary in 5.25" carrier
TLZ6L-VA*	16 GB 4-mm digital audio tape (DAT) in 5.25" carrier. BA350 and BA35R only.
TZ86-VA*	6 GB DLT in 5.25" carrier. BA350 and BA35R only
TZ87-VA*	20 GB DLT in 5.25" carrier. BA350 and BA35R only
TZ87N-VA*	20 GB tape in 5.25" carrier, reads TK50. BA350 and BA35R only
TZ88N-VA*	40 GB tape in 5.25" carrier, reads TK50. BA350 and BA35R only
TZK10-VA*	525 MB QIC tape in 5.25" carrier. BA350 and BA35R only
TZK10-VU*	525 MB QIC tape, add-on to TZK10-VA for two TZK10 tapes in one 5.25" carrier. BA350 and BA35R only
TZK11-VA*	2 GB QIC tape in 5.25" carrier. BA350 and BA35R only
TZK11-VU*	2 GB QIC tape, add-on to TZK11-VA for two TZK10 tapes in one 5.25" carrier. BA350 and BA35R only
TKZ15-VA*	5 GB 8 mm full-height 5.25" tape. BA350 and BA35R only

* Supported by BA350, BA35R, or BA353 **only** as noted in description.

StorageWorks 8-bit Supported Devices for 16-Bit BA356 and BA36R

- Most installed 8-bit StorageWorks devices may be installed and intermixed with wide 16-bit StorageWorks devices. All models of all StorageWorks devices, now shipping, are 16-bit compliant. Table lists minimum revision level for all 8-bit devices supported by BA356.
- Compliance date is when factory began shipping 16-bit compliant revision. Blanks indicate the date is not absolute and all devices should be carefully checked. "All" means the device has been 16-bit compliant since its first shipments.
- Note:Hardware platform and operating system support may be different than the table.
- 16-bit StorageWorks devices will not work in and may not be used in 8-bit enclosures.
- Out-of-REV 8-bit devices plugged into a bit bus will instantly freeze bus activity. Removing the device allows bus and attached devices to operate properly again.

Device	Description	Minimum Revision	16-bit Compliance Date
EZ51R-VA	107 MB solid state disk	E03	02/28/95
EZ54R-VA	428 MB solid state disk	E03	02/28/95
EZ58R-VA	856 MB solid state disk	C03	02/28/95
RRD42-VB	CD-ROM	B03	02/28/95
RRD42-VU	CD-ROM	B04	02/28/95
RRD43-VA	600 MB dual speed CD-ROM	B05	02/28/95
RRD43-VU	600 MB dual speed CD-ROM	B05	02/28/95
RRD44-VA	600 MB dual speed CD-ROM	B03	02/28/95
RRD44-VU	600 MB dual speed CD-ROM	B03	02/28/95
RWZ52-VA	1.2 GB optical drive	B03	02/28/95
RX26 -VA	2.88 MB diskette drive	B03	02/28/95
RZ25 -VA	426 MB disk	D01	11/93
RZ25L-VA	535 MB disk	—	All
RZ26 -VA	1.05 GB disk drive	H02	11/93
RZ26L-VA	1.05 GB disk drive	B01	11/93
RZ28 -VA	2.1 GB disk	C01	11/93
RZ28B-VA	2.1 GB disk	A01	All
SWXTE-AA	5 GB 8-mm helical scan tape	B03	02/28/95
SWXTE-AB	5 GB 8-mm helical scan tape	B03	02/28/95
TZ86-VA	6 GB DLT in 5.25" carrier	C01	4/94
TZ87-VA	20 GB DLT in 5.25" carrier	—	All
TZ87N-VA	20 GB DLT in 5.25" carrier	—	All
TZ88N-VA	40 GB DLT in 5.25" carrier	—	All
TLZ06-VA	4 GB 4mm DAT drive	D06	02/28/95
TLZ6L-VA	16 GB 4mm DAT drive	B04	02/28/95
TLZ07-VA	8 GB 4mm DAT drive	—	All
TLZ7L-VA	32 GB 4mm DAT loader	B03	02/28/95
TKZ09-VA	5 GB 8 mm full-height tape	B03	02/28/95
TKZ15-VA	5 GB 8 mm full-height tape	B03	02/28/95
TZK10-VA	525 MB QIC tape	C04	02/28/95
TZK10-VU	525 MB QIC tape add-on	C04	02/28/95
TZK11-VA	2 GB QIC tape	B03	02/28/95
TZK11-VU	2 GB QIC tape add-on	B03	02/28/95

StorageWorks 8-bit and 16-bit Supported Devices for 16-bit BA356 and BA36R

8-Bit Devices	16-Bit Devices	Description
	DWZZB-VW	FWD to FWSE or FNSE SCSI converter
EZ51R-VA		107 MB solid state disk
EZ54R-VA		428 MB solid state disk
EZ58R-VA		856 MB solid state disk
RRD44-VA		600 MB dual speed CD-ROM
RRD45-VA		600 MB quad speed CD-ROM
RRD45-VU		600 MB quad speed CD-ROM
RZ26-VA		1.05 GB disk drive
RZ26L-VA	RZ26L-VW	1.05 GB disk drive
RZ26N-VA	RZ26N-VW	1.05 GB disk drive
RZ28-VA	RZ28-VW	2.1 GB disk drive
RZ28B-VA	RZ28B-VW	2.1 GB disk drive
RZ28M-VA	RZ28M-VW	2.1 GB disk drive
RZ29B-VA	RZ29B-VW	4.3 GB disk drive
RX26-VA		2.88 MB diskette drive
TLZ06-VA		4 GB 4mm DAT drive
TLZ6L-VA		16 GB 4mm DAT drive
TLZ07-VA		8 GB 4mm DAT drive
TLZ7L-VA		32 GB 4mm DAT loader
TKZ09-VA		5 GB 8 mm full-height tape
SWXTE-AA/AB		5 GB 8-mm helical scan tape in 5.25" full-height SBB

StorageWorks 8-bit Supported Devices for 16-bit BA346

- Most installed 8-bit StorageWorks devices may be installed and intermixed with wide 16-bit StorageWorks devices. All models of all StorageWorks devices, now shipping, are 16-bit compliant. Table lists minimum revision level for all 8-bit devices supported by BA346.
- Compliance date is when factory began shipping 16-bit compliant revision. Blanks indicate the date is not absolute and all devices should be carefully checked. "All" means the device has been 16-bit compliant since its first shipments.
- Note:Hardware platform and operating system support may be different than the table.
- 16-bit StorageWorks devices will not work in and may not be used in 8-bit enclosures.

Out-of-REV 8-bit devices plugged into a bit bus will instantly freeze bus activity. Removing the device allows bus and attached devices to operate properly again.

Device	Description	Minimum Revision	16-bit Compliance Date
RX26 -VA	2.88 MB diskette drive	B03	02/28/95
RZ25 -VA	426 MB disk	D01	11/93
RZ26 -VA	1.05 GB disk	H02	11/93
RZ26L-VA	1.05 GB disk	B01	11/93
RZ28B-VA	2.1 GB disk	A01	All
TLZ06-VA	4 GB 4mm DAT drive	D06	02/28/95
TLZ07-VA	8 GB 4mm DAT drive	—	All

StorageWorks 8-bit and 16-bit Supported Devices for 16-bit BA346

8-Bit Devices	16-Bit Devices	Description
	DWZZA-VW	FWD to FNSE SCSI adapter in 3.5" carrier
EZ51R-VA		107 MB solid state disk
EZ54R-VA		428 MB solid state disk
EZ58R-VA		856 MB solid state disk
RRD43-AA		600 MB dual speed CD-ROM (fixed slot)
RRD44-AA		600 MB dual speed CD-ROM (fixed slot)
RRD45-AA		600 MB quad speed CD-ROM (fixed slot)
RZ26-VA		1.05 GB disk drive
RZ26L-VA		1.05 GB disk drive
RZ26N-VA		1.05 GB disk drive
RZ28B-VA	**RZ28B-VW**	2.1 GB disk drive
RZ28D-VA	**RZ28D-VW**	2.1 GB disk drive
RZ28M-VA	**RZ28M-VW**	2.1 GB disk drive
RZ29B-VA	**RZ29B-VW**	4.3 GB disk drive
RX26-VA		2.88 MB diskette drive
TLZ06-VA		4 GB 4mm DAT drive
TLZ07-VA		8 GB 4mm DAT drive
TLZ7L-AA		32 GB 4mm DAT loader
TZK11-AA		2 GB QIC tape drive

StorageWorks Cabinet Comparison Chart

StorageWorks Cabinet	SW300-AA	SW500-AC	SW500-FC	SW800-AA	SW800-FA
Maximum 3.5" SBBs	24	70	63	168	161
Maximum 5.25" SBBs	8	20	18	48	46
Maximum BA35x shelves	0	10	9	24	23

StorageWorks SW300 Deskside Cabinet

The SW300 is an integrated unit which holds devices and controllers in a single system. The SW300 is optimized for high availability. The enhanced backplane provides six internal single-ended SCSI buses that eliminate the need for device SCSI cables. SW300 features an environmental monitor to access all available status signals, an ac power entry box configurable to N+1 power redundancy with only five power supplies, and N+1 redundant dual-speed blowers. Optional N+N full redundant power and ac input are available.

Supported devices for this enclosure are listed later in this section. The SW300 accomodates packages for 24 3.5" SBBs or 8 5.25" SBBs and 2 controllers with cache. 8-bit and 16-bit wide drives are supported. Note: All drives run in 8-bit narrow mode if an 8-bit drive is installed.

SW300 Expansion Cabinet Options

SW300-AA	SW300 Expansion Pedestal includes integrated blackplane, six single-ended SCSI buses, eight dual-speed blowers, five power supplies, ac power entry unit, environmental monitor, and user documentation
BA35X-EA	Environmental monitor for redundancy, maximum two per SW300
BA35X-HE	ac power entry unit for redundancy, maximum two per SW300
BA35X-HF	3.5" universal power supply in SBB, 150 Watts for SW300-AA, maximum eight per SW300
BA35X-MD	Dual-speed blower replacement

Supported Controllers

Note: HSD05 controllers are not supported in SW300 Deskside Cabinets

Controller	Interface	Storage Device Buses
HSD30	Digital Standard System Interconnect (DSSI)	3 8-bit single-ended SCSI-maximum of two
HSJ30	Computer Interconnect (CI) bus	3 8-bit single-ended SCSI-maximum of two
HSJ40	Computer Interconnect (CI) bus	6 8-bit single-ended SCSI-maximum of two
HSZ10	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ15	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ40	Fast wide differential SCSI	6 8-bit single-ended SCSI-maximum of two

Supported Devices

RX26-VA	2.88 MB removable diskette drive
RZ26L-VA	1.05 GB 8-bit narrow hard disk drive
RZ26N-VA	1.05 GB 8-bit narrow hard disk drive
RZ28-VA	2.1 GB 8-bit narrow hard disk drive
RZ28B-VA	2.1 GB 8-bit narrow hard disk drive
RZ28D-VA	2.1 GB 8-bit narrow hard disk drive 7200 RPM
RZ28M-VA	2.1 GB 8-bit narrow hard disk drive 7200 RPM
RZ29B-VA	4.3 GB 8-bit narrow hard disk drive 7200 RPM

StorageWorks SW300 Deskside Cabinet *(continued)*

Supported Devices

RZ26L-VW	1.05 GB 16-bit wide hard disk drive
RZ26N-VW	1.05 GB 16-bit wide hard disk drive
RZ28-VW	2.1 GB 16-bit wide hard disk drive
RZ28D-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM
RZ28M-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM
RZ29B-VW	2.1 GB 16-bit wide hard disk drive 7200 RPM
RWZ52-VA	1.3 GB removable optical disk drive in 5.25" carrier
EZ51R-VA	107 MB solid state disk in 5.25" carrier
EZ54R-VA	428 MB solid state disk in 5.25" carrier
EZ58R-VA	856 MB solid state disk in 5.25" carrier
EZ31-VW	134 MB solid state drive in 3.5" carrier
EZ32-VW	268 MB solid state drive in 3.5" carrier
EZ64-VA	475 MB solid state drive in 3.5" carrier
EZ69-VA	950 MB solid state drive in 3.5" carrier
RRD43-VA	600 MB dual speed CD-ROM in 5.25" carrier
RRD43-VU	600 MB add in dual speed CD-ROM for RRD4x-VA or TZK11-VA
RRD44-VA	600 MB dual speed CD-ROM in 5.25" carrier
RRD44-VU	600 MB add in dual speed CD-ROM for RRD4x-VA or TZK11-VA
RRD45-VA	600 MB quad speed CD-ROM in 5.25" carrier
RRD45-VU	600 MB add in quad speed CD-ROM for RRD4x-VA or TZK11-VA
TZ87-VA	10/20 GB DLT drive mounted in BA35X-CD
TZ87N-VA	20 GB DLT drive mounted in BA35X-CD
TZ88N-VA	20/40 GB DLT drive mounted in BA35X-CD
TZK11-VA	2.0 GB QIC cartridge tape drive in 5.25" carrier
TZK11-VU	2.0 GB QIC add in cartridge tape drive for TZK11-VA or RRD4x-VA
TKZ15-VA	5.0 GB 8mm cartridge tape drive
TLZ06-VA	4.0 GB 4mm DAT catridge tape drive
TLZ6L-VA	4.0 GB 4mm DAT four catridge tape loader
TLZ07-VA	8.0 GB 4mm DAT catridge tape drive in 3.5" carrier
TLZ09-VA	8.0 GB 4mm DAT catridge tape drive
TLZ7L-VA	32 GB 4mm DAT four catridge tape loader
TKZ09-VA	5.0 GB 8mm helical scan cartridge tape drive
SWXTE-AA	10.0 GB 8mm helical scan cartridge tape drive
SWXTE-AB	10.0 GB 8mm helical scan cartridge tape drive

StorageWorks SW300 Deskside Cabinet *(continued)*

Country Kits

Order country-specific 13-20 amp input power cords

Order Number	Country/Voltage	Amps	Plug	Meters (Feet)
BN27S-03	U.S./Japan, 250 V	15	NEMA 5-15	3.0 (9.8)
BN19H-2E	Australia/New Zealand, 250 V	10	AS 3112-1981	2.5 (8.2)
BN19C-2E	Central Europe, 250 V	10	CEE 7/7(Schuko)	2.5 (8.2)
BN19A-2E	U.K./Ireland, 250 V	10	BS 1363	2.5 (8.2)
BN19E-2E	Switzerland, 250 V	10	SEV 1011	2.5 (8.2)
BN19K-2E	Denmark, 250 V	10	Afsnit 107	2.5 (8.2)
BN19Z-2E	Italy, 250 V	10	CEI 23-16/VII	2.5 (8.2)
BN19S-2E	India/South Africa, 250 V	10	BS 546	2.5 (8.2)
BN18L-2E	Israel, 250 V	10	SI 32	2.5 (8.2)

Specifications

Physical Dimensions	
Height	838.20 mm (33.00 in)
Width	476.25 mm (18.75 in)
Depth	482.60 mm (19.00 in)
Weight	
Cabinet with shipping packaging	106.65 kg (242.00 lb)
Maximum configuration	77.85 kb (178.00 lb)
Agency Compliance	FCC, UL, CSA, TUV, CE-mark
Electrical Rating	100-120/220-240 V ac, 50/60 Hz, single phase, 12/6 amps
Power Requirements of BA35X power supply	
Input	90–264 V ac, 47–63 Hz, auto-ranging, power factor corrected
Output	150 W +12 V dc, +5 V dc
Power Cable Connector	IEC C14, Shrouded
Power Requirements of SW300	
Voltage	100-120/220-240 V ac, 50/60 Hz
Number of phases	1
Rated current	12/6 Amps
Operating Environment	
Temperature	10° C to 40° C (50° F to 95° F) Derate 1.8° C for each 1000 m altitude (1.0° F for each 1000 ft altitude)
Relative humidity	0% to 90% (noncondensing) Maximum wet bulb temperature: 28° C (82° F) Minimum dew point: 2°C (36° F)
Altitude	From sea level to 2400 m (8000 ft)
Air quality(maximum particle count)	Not to exceed 500,000 particles per cubic foot of air at 0.5 micron or larger
Non-operating Environment	
Temperature	-40° C to 66° C (-40° F to 151° F) (During transportation and associated short-term storage)
Relative humidity	8% to 95% in original shipping container (noncondensing); otherwise, 50% (noncondensing)
Altitude	3600 m (12,000 ft)

StorageWorks SW500 Departmental Cabinet

The StorageWorks SW500 Departmental Cabinet provides high-capacity storage expansion for OpenVMS- and UNIX-based systems. Slots in cabinet can be used to support up to 10 StorageWorks shelves or up to 6 shelves and 2 tape subsystems. Two tape subystems use the top four StorageWorks shelf slots of the SW500 cabinet.

Maximum SW500 configurations are:

- Nine device shelves and one controller shelf (BA350-MB)
- Eight device shelves and two controller shelves
- Five device shelves, one controller shelf, and two tape subsystems (maximum number of controller shelves is limited to one when tape subsystem is installed).
- The number of devices supported in the cabinet is a function of the number of hosts or controllers accessing the cabinet, and the number of SCSI channels supported by each host/controller.

The StorageWorks Departmental Cabinet measures 43 inches (1100 mm) high and supports a single-phase power option that allows isolated disk arrays in a single cabinet. Electronic temperature sensing automatically matches air flow to cooling requirements.

SW500 Departmental Cabinet Options

SW500-AC/AD	Basic StorageWorks Departmental Cabinet includes one power distribution unit for supporting up to 10 StorageWorks shelves and ac power cords with each shelf. Requires 1-phase power.
SW500-FC/FD	Basic StorageWorks Departmental Cabinet includes one power distribution unit for supporting up to 9 StorageWorks shelves and ac power cords with each shelf and a thermal fan try kit to support 7200 RPM drives. Requires 1-phase power.
SW5XP-AC/AD	Second power distribution unit—supports up to 10 additional shelf power supplies and ac power cords with each shelf.

Supported Controllers

Controller	Interface	Storage Device Buses
HSD30	Digital Standard System Interconnect (DSSI)	3 8-bit single-ended SCSI-maximum of two
HSJ30	Computer Interconnect (CI) bus	3 8-bit single-ended SCSI-maximum of two
HSJ40	Computer Interconnect (CI) bus	6 8-bit single-ended SCSI-maximum of two
HSZ10	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ15	Fast wide differential SCSI	5 8-bit single-ended SCSI-maximum of two
HSZ40	Fast wide differential SCSI	6 8-bit single-ended SCSI-maximum of two

Supported Tape Subsystems

The SW500 supports 2 tape subsystems in the top 4 shelf slots of the cabinet (2 shelf slots in front and 2 shelf slots in rear).

- TZ857-AE/AF
- TZ867-AE/AF
- TZ875-AE/NE
- TZ877-AE/AF

Tape Mounting Kit

CK-SF400-TE	Tape mounting bezel kit (supports two tape subsystems; not required for TZ875-AE/NE)

StorageWorks SW500 Departmental Cabinet *(continued)*

Specifications

Physical Characteristics	
Height	1100 mm (43 in.)
Width	600 mm (23.6 in.)
Depth	875 mm (34.5 in.)
Weight	140 kg (309 lb) (empty) 290 kg (689 lb) (full)
Power Requirements	
Voltage	120 V ac, 240 V ac
AC plug type	NEMA L5-20P, IEC 309
Number of phases	1
Rated current	10 Amps (120 V), 16 Amps (240 V)
Operating Environment	
Class A	

StorageWorks SW8xx Data Center Cabinet

The StorageWorks Data Center Cabinet SW8xx provides high-capacity storage expansion for OpenVMS- and UNIX-based systems. Slots in the cabinet can be used to support up to 24 StorageWorks shelves or up to 16 shelves and 4 tape subsystems. Cabinets are pre-configured with 2 sets of power distribution cabling; 1 for the primary distribution unit and 1 for the optional redundant power distribution unit (SW8XP-BA/BB).

Maximum SW8xx configurations are:

- Any combination of 24 device or controller shelves
- 10 TZ875-AE/NE or TZ877-AE/AF Tape Subsystems
- 4 TZ857-AE/AF or TZ867-AE/AF tape subsystems which occupy 8 shelf slots (top 4 shelf slots in cabinet front and top 4 shelf slots in cabinet rear)
- The number of devices supported in a cabinet is a function of the number of hosts or controllers accessing the cabinet, and the number of SCSI channels supported by each host/controller

The StorageWorks Data Center Cabinet measures 67 inches (1700mm) high and supports a 3phase power option that allows isolated disk arrays in a single cabinet.

SW8xx Data Center Cabinet Options

SW800-AA/AB	Basic StorageWorks Data Center Cabinet. Includes 1 power distribution unit and 2 sets of AC power cords. One power distribution unit supports 24 StorageWorks shelves and uses 1 set of AC power cords. Requires 3-phase power.
SW800-FA/FB	Basic StorageWorks Data Center Cabinet. Includes 1 thermal fan tray to support 7200 RPM drives, 1 power distribution unit and 2 sets of AC power cords. One power distribution unit supports 23 Storageworks shelves and uses 1 set of AC power cords. Requires 3-phase power.
SW8XP-AA/AB	Second Power Distribution Unit—Includes 1 power distribution unit and 1 set of AC power cords. Supports up to 24 additional Storageworks shelf power supplies.
SW8XP-BA/BB	Second Power Distribution Unit. Supports up to 24 additional StorageWorks shelf power supplies. Additional power cords required for second power distribution unit are pre-configured in the SW8xx Data Center Cabinet.

StorageWorks SW8xx Storage Arrays

Order Number	Shelves	I/O Modules	PDU	Cables and Terminators	Power Supply
High Bandwidth/Medium Capacity					
SW820-LA/LB	15 BA356-JC 5 BA350-MB	15 BA35X-MG	2 SW8XP	30 BN21H-02 15 BA35X-ME	35 BA35X-HF
High Bandwidth/Lower Capacity					
SW821-LA/LB	14 BA356-JC 7 BA350-MB	14 BA35X-MG	2 SW8XP	28 BN21H-02	36 BA35X-HF
High Bandwidth/High Capacity					
SW822-LA/LB	18 BA356-JC 3 BA350-MB	18 BA35X-MG	2 SW8XP	12 BN21H-02 6 BN21H-01	36 BA35X-HF

StorageWorks SW8xx Data Center Cabinet *(continued)*

Supported Tape Subsystems

The SW8xx supports up to 4 TZ857-AE/AF or TZ867-AE/AF tape subsystems. The tape subsystems must be mounted in the top 4 shelf slots in the front or rear of the cabinet. The SW8xx supports up to 10 TZ875-AE/NE or TZ877-AE/AF tape subsystems.

- TZ857-AE/AF
- TZ867-AE/AF
- TZ875-AE/NE
- TZ877-AE/AF

Tape Mounting Kit

One tape bezel mounting kit supports one or two tape subsystems; select additional tape bezel mounting kits to support extra tape subsystems.

CK-SF400-TE Tape mounting bezel kit (supports two tape subsystems; not required for TZ875-AE/NE)

Specifications

Note: Maximum input wattage for fully loaded SW82X data center cabinet with drives and controllers is 5200 watts. This equates to 45 Amps @ 115 Volts (15 Amps/phase) or 22.5 Amps @ 230 Volts (7.5 Amps/phase). Maximum thermal load is 37,000 BTUs/hour.

Physical Characteristics	
Height	1700 mm (67 in.)
Width	800 mm (31 in.)
Depth	875 mm (34.5 in.)
Weight	454 kg (1000 lb) (approx.)
Power Requirements	
Voltage	120/208 V ac, 240/416 V ac
AC plug type	NEMA L21-30, IEC 309-516P6W
Number of phases	3
Rated current	24 Amps/phase
Operating Environment	
Class A	

KZPSA—PCI-Based Fast Wide Differential (FWD) SCSI Controller

KZPSA is a high performance, intelligent, PCI-based Fast Wide Differential storage controller which provides a solution for the most demanding AlphaServer with heavy PCI I/O requirements. KZPSA maximizes I/O and data processing performance on AlphaServers.

Support of HSZ40-Ax Storage Works controller with the KZPSA provides a winning storage solution for high availability and high performance to take advantage of the fast access to SCSI-2 storage subsystems. This availability is delivered through support of such features as RAID 0,3,5 and warm disk swap.

Features

- Maximum off-loading of host CPU requirements offered by any adapter. Supports HSZ40-Ax (High performance, high availability RAID array PCI StorageWorks controller)
- Differential interconnect for up to 25 meter connections allowing greater configuration flexibility
- Up to 20 Mbyte per second throughput. Greater than 2000 I/O's per second
- Single slot 4.6" x 5.6" PCI Module
- Target Mode Support. Tagged Queue Support
- On board EEROM can be customized using the configuration utility
- 68-pin high density external connector
- Supports DECsafe Available Server and OpenVMS SCSI clusters

DECsafe Available Server V1.2 support of the KZPSA is an ideal part of a highly available and highly reliable total system CPU resource. The KZPSA, 16-bit wide SCSI bus supports both 8-bit and 16-bit devices with

- Up to 6 devices in a two node DECsafe environment
- Up to 5 devices in a three node DECsafe environment
- Up to 4 devices in a four node DECsafe environment
- KZPSA differential bus can be configured in lengths up to 25 meters and supports most StorageWorks industry standard devices.

Software Prerequisites

- KZPSA requires Digital UNIX V3.2, Windows NTAS V3.5, or OpenVMS V62.
- DECsafe V1.2 with KZPSA requires Digital UNIX V3.2.
  - Minimum supported revisions of DWZZA for DECSAFE are:
  - DWZZA-AA E01
  - DWZZA-VA F01

The KZPSA supports up to 6 HSZ40-Ax's per adapter. The minimum supported revision of the HSZ40-Ax is V2.0.

DWZZA Signal Converter

KZPSA Fast Wide Differential controller supports single-ended storage devices via the DWZZA. The DWZZA is a signal converter which permits connection of a single-ended storage device to a differential SCSI-2 bus.

Ordering Information

KZPSA-BB	PCI-based Fast Wide Differential SCSI-2 Controller

Additional Hardware Installation Items

Hardware installation items must be ordered separately, if required.

BN31G-xx	SCSI Cable- 68 pin BN21K-xx (90 degree connector) -xx denotes length of cable
H879-AA	SCSI Cable - 68 pin 16 bit differential terminator
H885-AA	Tri-Link Connector
BN21W-OB	SCSI "Y" Cable
DWZZA-VA	SCSI Bus Converter 16-bit differential to 8-bit single-ended

KZPAA PCI-Based Fast SCSI-2 Controller

The KZPAA is a PCI-based Fast SCSI-2 8-bit narrow single-ended controller which supports up to seven SCSI devices. Built with the identical microchip that supports an embedded SCSI bus in the AlphaServer 2100 system, the KZPAA provides another SCSI bus connected via the PCI bus.

No RAID capabilities are supported in the KZPAA. For RAID performance and/or availability, choose the EISA-based or PCI-based SCSI RAID controllers.

Features

- Full 32-bit DMA (Direct Memory Access) capability transfers data to memory without CPU overhead
- Connector options: 50-pin high-density (for external cable) or 50-pin low-density (for internal cable)
- Active SCSI bus termination with disable option for configuration flexibility
- 5.0- x 3.25-inch PCI module uses single slot
- OpenVMS Alpha V6.1, Digital UNIX V3.0 and Windows NT Server V3.5
- Supports all StorageWorks industry-standard devices including:

Configuration Rules

- Supported on AlphaServer 2000/2100 systems.
- External cables must be ordered separately. Use BN21H-02 SCSI cable.
- When ordered with a system, cables to connect adapter to internal drives are included.

Ordering Information

KZPAA-AA PCI-based one port high-performance Fast SCSI-2 controller

KZQSA Q-bus Storage Adapter

The KZQSA adapter provides the capability to connect TLZ06, RRD42, and TSZ07 devices to Q-bus MicroVAX and VAX 4000 systems (only one TSZ07 per KZQSA is supported).The KZQSA is a quad-height module with an integral handle that has two standard connectors. There is no termination on the module.

Ordering Information

KZQSA-AA For use with MicroVAX II system in BA23 enclosure; field installed.
KZQSA-BA Same as above except for BA123 enclosure
KZQSA-SA/SF For use with BA2xx, BA4xx, and B400X enclosures; factory/ field installed.
KZQSA-CA For use with DECsystem 5500; factory or field installed.

Configuring Information

- Q-bus MicroVAX and VAX 4000 systems support two KZQSA adapters per system; each KZQSA supports two devices. Each adapter requires one Q-bus slot.

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
		KZQSA	1	27.0	4.4	0.5

KFMSA XMI Disk/Tape Adapter (DSSI)

The KFMSA disk and tape Integrated Storage Element (ISE) adapter is an XMI- based adapter that offers full compliance with the Digital Storage Architecture (DSA). It is available for VAX 6000/7000/9000/10000 systems. The KFMSA incorporates two 7-MIP I/O processors and a 45,000-gate array to create a very powerful storage adapter. It provides two 4-Mbyte packet multi-plexing paths to storage elements with full error detection and retry. The KFMSA adapter's bandwidth and extremely low latency permit unconstrained performance of all attached storage elements.

Features

- Two DSSI buses supported
- Supports up to 14 DSSI Integrated Storage Elements (ISEs)
- Latency less than 1.5 ms on each DSSI bus
- Data rate: 8.0 Mbytes/second peak, 5.5 Mbytes/second sustained aggregate of both buses
- Request rate: capable of over 1600–1800 I/O requests per second
- Built-in automatic self-diagnosis
- VAXsimPLUS support

Ordering Information

KFMSA-BA	XMI-to-DSSI adapter for VAX 6000/7000/9000/10000 DSSI OpenVMS Cluster and storage-sharing applications. Required for VAX 6000 systems in DSSI OpenVMS Cluster configurations. Includes installation and user documentation. Requires one XMI slot.
CK-KFMSA-LJ	Cable kit, two 1.2-meter (4-foot) internal cabinet DSSI cables. Connects XMI backplane (adapter) to VAX 6000 host computer I/O bulkhead. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators. Does not support KFMSA warm-swap and, within a DSSI OpenVMS Cluster configuration, can only be used on end-node VAX 6000 systems.
CK-KFMSA-LN	Cable/bulkhead kit includes two 2.4-meter (8-foot) internal cabinet DSSI cables. Connects host system I/O bulkhead to XMI backplane (adapter) and then connects the XMI backplane back to the I/O bulkhead. Required for KFMSA-BA warm-swap and KFMSA-BAs in the middle-node position of a DSSI OpenVMS Cluster configuration. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators.

Note: The KFMSA and CIBCA-A are not supported on the same system. The CIBCA-AA must be upgraded to the CIBCA-BA or CIXCD.

		dc Amps Drawn @					
Option	**Mounting Requirements**	**5 V**	**12 Vc**	**-12 V**	**-5.2 V**	**-2 v**	**I/O Panel Units**
KFMSA	1 XMI slot	6.0	0.00	0.00	0.00	0.00	2

StorageWorks HSD10 Array Controller

The StorageWorks HSD10 array controller expands DSSI support in the StorageWorks family of products. It connects to a single port on the DSSI bus providing connectivity for up to seven non-redundant SCSI-1 or SCSI-2 devices. It allows users the flexibility to expand the amount of DSSI-connected storage devices or to free up DSSI nodes for host connections. The inclusion of 16 or 32MB of read cache can reduce response time substantially. The HSD10 replaces the HSD05 array controller.

The HSD10 array controller is housed in a 3.5-inch StorageWorks form factor System Building Block; it mounts in a BA350-SA shelf, or a BA350-KA StorageWorks Deskside Expansion Unit, along with up to six SCSI devices. The StorageWorks shelves may be mounted in the SW500 or SW800. A tri-link connector and a bus terminator are shipped with the HSD10. The maximum DSSI bus length is 60 feet.

Two HSD10 array controllers may be used in conjunction with separate DSSI buses to provide device access with no single points-of-failure in the access path.

Features

- Direct connection to the DSSI Bus
- Provides controller based Raid 0 (striping)
- Multihost operation; up to four hosts on the DSSI bus
- Up to 1000 I/O requests per second and 3.0 MB/second
- Attached disks can be warm-swapped
- Up to 32MB of read cache
- Connection to a VCS console via RS communications port
- Wide drive support (controller operates in 8-bit mode)

SCSI Devices Supported

- RZ26, 1.05-Gbyte disk
- RZ26L, 1.05-Gbyte disk
- RZ28, 2.1-Gbyte disk
- RZ28B, 2.1-Gbyte disk
- RZ28D, 2.1-Gbyte disk
- RZ29B, 4.3-Gbyte disk
- RZ73, 2.1-Gbyte disk
- RZ74, 3.6-Gbyte disk
- EZ51R, 107-Mbyte SCSI solid state disk
- EZ54R, 428-Mbyte SCSI solid state disk
- TLZ06, 4mm tape device 4-Gbyte
- TLZ6L, 4mm tape device with loader 16-Gbyte
- TLZ07, 4mm tape device 8-Gbyte
- TLZ7L, 4mm tape device with loader 32-Gbyte
- TZ86, 6-Gbyte tape device
- TZ87, 10-Gbyte tape device
- RRD43/44/45, 600-Mbyte optical devices (read only)
- TZ88, 20-Gbyte tape device

Adapters Supported

- EDA670, KFDDA/B, KFMSA, KFMSB, KFQSA, KFESA

StorageWorks Environments Supported

BA350-SX	Storage shelf assembly, SCSI-2 compliant
BA350-JA	Storage BA350-SB shelf kit
BA350-KA	Storage Deskside Expansion Unit
BA356-SC	Shelf, no personality module
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet

Operating System Support

OpenVMS VAX Version V5.5-2, V6.0, and OpenVMS Alpha V6.1 or greater

StorageWorks HSD10 Array Controller *(continued)*

Device/Option Capabilities

- Supported
  - Up to six non-redundant disk storage devices (hard disk or solid state disk) on same SCSI bus from HSD10
  - Up to two tape storage devices on same SCSI bus from HSD10
  - Two solid-state storage devices on SCSI bus from HSD10
  - Up to two tapes and two disks or one tape and five disk devices on a SCSI bus from HSD10
- Not Supported
  - Combined use of HSD10 and DWZZA adapters

Recommendation

For optimal performance operate the HSD10 at a maximum of 80% utilization. This will allow for optimal performance with workload peaks. If an HSD10 is more than 80% utilized, order an additional controller.

Ordering Information

HSD10-AA	StorageWorks Array Controller
HSD10-AD	StorageWorks Array Controller with 16-Mbyte read cache
HSD10-AF	StorageWorks Array Controller with 32-Mbyte read cache

StorageWorks Cables for the HSD10

BC29R-xx	DSSI cable to VAX or DEC 4000 systems to HSD (06, 09, 16, 30 ft)
BC29S-xx	DSSI cable to VAX or DEC 7000, 10000 systems to HSD DEC 2000, 2100, VAX 6000, VAX/DEC 7000, VAX/DEC 10000 (06, 09, 16, 30 ft)
BC29T-03	3-foot DSSI cable, horizontal shelf to vertical shelf link for shelves on same side of cab to HSD
BC29T-09	9-foot DSSI cable, horizontal shelf to vertical shelf link for use with shelves that have one in back of cabinet to HSD
BC29U-02	2-foot DSSI cable, horizontal shelf to horizontal shelf link for use when shelves are on same side of the cabinet to HSD
BC29V-06	6-foot DSSI cable, StorageWorks pedestal to pedestal cable
BC29V-16	16-foot DSSI cable, StorageWorks pedestal to pedestal cable

StorageWorks HSD30 Array Controller

The StorageWorks HSD30 array controller expands DSSI support in the StorageWorks family of products. Each HSD30 occupies one DSSI address location (there are 8 addresses per DSSI bus) on the DSSI bus providing connectivity for up to 21 SCSI devices. The HSD30 allows customers to significantly expand the number of DSSI-connected storage devices.

The HSD30 array controller provides a StorageWorks controller shelf compatible form factor. It can be installed in StorageWorks SW500 or SW800 cabinets, controlling up to 21 Digital SCSI-2 devices, connected to up to three SCSI ports. It can also be installed in the SW300 cabinet which allows connection for up to 12 Digital SCSI-2 devices. Up to two HSD30 array controllers may be daisychained together on a single DSSI interconnect. A combined maximum of up to 7 DSSI targets may reside on the same DSSI bus. The DSSI targets include: HSD30 array controllers, TF tapes, RF drives, and HSD10 devices. The tri-link and bus terminator are shipped with the HSD30 array controllers. HSD30 array controllers come standard with RAID 0 and support 16- or 32-Mbyte read cache as an optional feature. Other optional features include Write-back Cache, Disk Mirroring (RAID Level 1), and Adaptive Raid (Dynamic Parity 3/5).

Features

- Direct connection to the DSSI Bus
- Connection for up to 21 SCSI Devices, 7 SCSI devices per StorageWorks shelf
- Provides controller based striping (Raid 0) and supports host-based Raid 1 (Phase II Volume Shadowing)
- Optional Write-back Cache, Disk Mirroring (RAID Level 1) and Adaptive Raid (Dynamic Parity 3/5).
- Multihost operation, up to 3 hosts on the DSSI bus
- Supports a 60-foot maximum DSSI bus length with up to 16 feet between DSSI nodes
- Wide drive operate in 8-bit mode)

SCSI 8-bit Devices Supported

- RZ25, .426-Mbyte 8-bit disk (V1.4 or above)
- RZ26, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26L, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26N, 1.05-Gbyte 8-bit disk (V2.0 or above)
- RZ28, 2.1-Gbyte 8-bit disk (V1.4)
- RZ28B, 2.1-Gbyte 8-bit disk (V1.4 or above)
- RZ28D, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ28M, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ29B, 4.3-Gbyte 8-bit disk (V2.0 or above)
- RZ74, 3.57-Gbyte 8-bit disk, 5.25" (V1.4 or above)
- EZ51/54/58R SCSI solid state disks (V1.4 or above)
- RRD42/43/44/45 optical devices
- TLZ06/TLZ6L 4mm tape devices (V1.4 or above)
- TLZ07/TLZ7L 4mm tape devices (V2.0 /V2.5 or above)
- TZ86/87/87N/87D tape devices
- TZ867/77/75 tape devices with loader
- TL820/810 DLT tape library
- TKZ60/61/61 tape device
- TSZ07 reel to reel tape device
- RWZ52 optical device

SCSI 16-bit Drives Supported

- RZ26L-W, 1.05-Gbyte 16-bit disk (V2.7)
- RZ28-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ28D-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ29B-W, 4.3-Gbyte 16-bit disk (V2.7)

Adapters Supported

- KFMSA, KFMSB, KFESA/B, SHAC-based embedded, DEC 4000 embedded

StorageWorks HSD30 Array Controller *(continued)*

StorageWorks Environments Supported

BA350-SA/SB	Storage shelf assembly
BA356-SC	Shelf, no personality module (V2.7 required)
BA35X-MG	8-bit module for BA356 (V2.7 required)
BA35X-HF	150 Watt 48 volt power supply
BA350-MA/MB	Storage controller shelf
BA350-JA	Storage BA350-SA shelf kit
SW300-AA	StorageWorks mini cabinet
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet

Operating System Support

OpenVMS VAX Version 5.5-2 or higher and OpenVMS Alpha V1.5 (or mixed clusters) support the HSD30 with limitations. The limitations are the devices being identified as generic or unknown device types. The model type identifiers are not present in the operating system software. In addition, complete error log decoding is not provided under ERF.

Device/Option Capabilities

- Supported
  - Up to seven disk storage devices on same SCSI bus from HSD30
  - Up to two tape storage devices on same SCSI bus from HSD30
  - Two solid-state storage devices on SCSI bus from HSD30
  - Up to two tapes and two disks or one tape and five disk devices on a SCSI bus from HSD30
  - Redundant configurations of two HSD30 on same, or separate, DSSI bus providing controller failover
  - Tri-host DSSI clusters
- Not Supported
  - Use of devices attached to the HSD30 as boot device on VAX 7000/10000 and DEC 7000/10000 Alpha systems
  - Combined use of HSD30 and DWZZA adapters
  - More than two HSD30 on same DSSI bus

Recommendation

For optimal performance operate the HSD30 at a maximum of 80% utilization. This will allow for optimal performance with workload peaks. If an HSD30 is more than 80% utilized, order an additional controller and host adapter.

Ordering Information

HSD30-CA	StorageWorks Array Controller, 18 SCSI-2 disk, tape, SSD, optical device support; RAID 0, base firmware and license
HSD30-CD	StorageWorks Array Controller, 18 SCSI-2 disk, tape, SSD, optical device support; RAID 0, 16-Mbyte cache, base firmware and license
HSD30-CF	StorageWorks Array Controller, 18 SCSI-2 disk, tape, SSD, optical device support; RAID 0, 32-Mbyte cache, base firmware and license
HSD30-XD	16-Mbyte read cache option for HSD30-AA
HSD30-XF	32-Mbyte read cache option for HSD30-AA, 32-Mbyte total
HSD30-XE	16-Mbyte read cache option for HSD30-AD, 32-Mbyte total, mandatory return of installed 16-Mbyte cache
HSD30-YX	HSD30 Write-back Cache Option., license and batteries
QL-4DRA9-AA	HSD30 Disk Mirroring license
QL-3HYA9-AA	HSD30 RAID license

StorageWorks HSD30 Array Controller *(continued)*

StorageWorks Cables for the HSD30

BC29S-xx	DSSI cable to VAX or DEC 7000, 10000 Alpha systems to HSD
BC29R-xx	DSSI cable to VAX or DEC 4000 Alpha systems to HSD
BC29T-03	3-foot DSSI cable horizontal shelf to vertical shelf link for shelves on same side of cab to HSD
BC29U-09	9-foot DSSI cable horizontal shelf to vertical shelf link for shelves that have one in front and one in back to HSD
BC29T-02	2-foot DSSI cable horizontal shelf to horizontal shelf link for shelves on same side of cab to HSD
BC29V-01	1-foot DSSI cable StorageWorks HSD30 to HSD30 cable for when DSSI bus is continued from HSD30 to HSD30 in same StorageWorks shelf HSD
BC29V-06	6-foot DSSI cable StorageWorks pedestal to pedestal cable for when DSSI bus is continued from pedestal to pedestal HSD
BC29V-16	16-foot DSSI cable StorageWorks pedestal to pedestal cable for when DSSI bus is continued from pedestal to pedestal HSD

StorageWorks HSJ-Series Array Controllers

The StorageWorks HSJ-series subsystems bring CI support to the StorageWorks family. These subsystems interface directly to the CI Star Coupler to provide scalability and customer-defined SCSI-2 storage capacity with high performance and availability.

Available in two cabinet sizes, the SW500 and SW800 series, the StorageWorks HSJ-series subsystems provide up to 227 Gbytes of disk storage within the SW800 cabinet, which can also house optional tape, solid state disk, and CD-ROM storage devices in StorageWorks building block shelves. One or two HSJ controllers are supported in each controller shelf. Device shelves may be configured with either one or two SCSI buses for device interconnect, allowing easy storage capacity expansion and controller load balancing.

SW5xx/8xx Subsystems

SW500 series cabinets support up to ten shelves, including two controller shelves. The SW800 series data center cabinets support up to 18 storage device shelves and four controller shelves. An optional power controller is available for redundant AC power distribution. Up to 36 RZ29 disk drives (or other 3.5-inch storage devices) can be supported by one or two dual-redundant HSJ40s within the data center cabinets.

Features

- Direct connection to CI— channel card functionality included
- High-performance and connectivity storage controllers, with up to 32-Mbyte read cache
- RAID, Disk Mirroring and Write-back Cache option
- Coexistence with all HSC models
- Optional controller redundancy with automatic failover and redundant power option
- StorageWorks packaging for maximum configuration flexibility
- Wide drive ready support (controller operates in 8-bit mode)

HSJ-Series Array Controllers

The expanded family of HSJ-Series Array subsystems provide new, scaleable solutions for CI OpenVMS Clusters. For all models, storage device support includes a broad and increasing range of disk, tape, solid state disk and optical alternatives. Each model includes standard RAID 0 (striping) for enhanced performance in interactive applications. Disk Mirroring (Raid 1) and Adaptive Raid (Dynamic Parity 3/5) are available options.

For high availability and performance environments, HSJ-Series Array Controllers may be deployed in dual-redundant configurations for dual-path access with automatic failover. Up to 32 Mbytes of Read Cache is available on each Array Controller.

Device support has been expanded to include the following storage devices.

8-bit Narrow SCSI Devices Supported

- RZ25, .426-Gbyte 8-bit disk (V1.4 or above)
- RZ26, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26L, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26N, 1.05-Gbyte 8-bit disk (V2.0 or above)
- RZ28, 2.1-Gbyte 8-bit disk (V1.4)
- RZ28B, 2.1-Gbyte 8-bit disk (V1.4 or above)
- RZ28D, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ28M, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ29B, 4.3-Gbyte 8-bit disk (V2.0 or above)
- RZ74, 3.57-Gbyte 8-bit disk - 5.25" (V1.4 or above)
- EZ51/54/58R SCSI solid state disk devices (V1.4 or above)
- RRD42/43/44/45 optical devices
- TLZ06/TLZ6L 4mm tape devices (V1.4 or above)
- TLZ07/TLZ7L 4mm tape devices (V2.0 /V2.5 or above)
- TZ86/87/87N/87D tape devices
- TZ867/77/75 tape devices with loader
- TL820/810 DLT tape library
- TKZ60/61/62 tape device
- TSZ07 reel to reel tape device
- RWZ52 optical device

StorageWorks HSJ-Series Array Controllers *(continued)*

16-bit Wide SCSI Drives Supported

- RZ28-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ28D-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ29B-W, 4.3-Gbyte 16-bit disk (V2.7)
- RZ26L-W, 1.05-Gbyte 16-bit disk (V2.7)
- RZ26N-W, 1.05-Gbyte 16-bit disk (V2.7)
- RZ28M-W, 2.1-Gbyte 16-bit disk (V2.7)

Adapters Supported

- CI780, CIBCA, CIXCD, DWZZA/B

StorageWorks Environments Supported

BA350-SA/SB	Storage shelf assembly
BA356-SC	Shelf, no personality module (V2.7 required)
BA35X-MG	8-bit module for BA356 (V2.7 required)
BA35X-HF	150 Watt 48 volt Power Supply
BA350-MA/MB	Storage controller shelf
BA350-JA	Storage BA350-SA shelf kit
BA350-LA	Storage shelf assembly, for System Plug-in-unit (PIU)
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet
BN21K-xx	FWD-SCSI Host Interconnect Cabling

HSJ30—HSJ30 Array Controller provides a low-cost subsystem entry platform, which can be used as a dedicated tape server. Support for up to 18 storage devices is provided on three industry-standard SCSI-2 buses. Optional Read Cache capacity of 32 Mbytes can be added for increased performance. This model can be upgraded to each of the other HSJ-Series Array Controllers. Write-back cache and RAID options are available.

HSJ40—HSJ40 Array Controller supports up to 36 SCSI-2 devices. Internal performance is 1400 I/O per second. Fast response time requirements are met by the standard 16-Mbyte Read Cache (expandable to 32 Mbytes). Write-Back Cache options may improve performance times.

HSJ42—Packaged as a dual-redundant HSJ40 configuration, the HSJ42 provides support for a maximum of 36 storage devices in a high performance/availability subsystem. Alternatively, the HSJ42 may be configured as two subsystems, supporting up to 72 devices. A combined Read Cache capacity of 32 Mbytes is standard, with optional expansion to 64 Mbytes. Write-back cache and RAID options are available

HSJ44—Providing over 4000 I/Os per second, the HSJ44 contains two dual-redundant HSJ40s, supporting up to 72 disk, tape, solid state disk, and optical devices. When optionally configured as four independent storage subsystems, the HSJ44 support is increased to 144 devices. Total Read Cache capacity is expandable from the 64 Mbytes (included) up to 128 Mbytes. Write-back cache and RAID options are available.

Operating System Support

HSJ-series controller subsystems supported by OpenVMS VAX V5.5-2 and above; and OpenVMS Alpha V1.5.

Ordering Information

HSJ30-CA	StorageWorks Array Controller 18 SCSI-2 device support, RAID 0, Base Firmware and license
HSJ30-CD	StorageWorks Array Controller 18 SCSI-2 device support, RAID 0, Base Firmware and license, 16-Mbyte Read Cache
HSJ30-CF	StorageWorks Array Controller 18 SCSI-2 device support, RAID 0, Base Firmware and license, 32-Mbyte Read Cache
HSJ30-XD	16-Mbyte Read Cache option for HSJ30-AA
HSJ30-XE	16-Mbyte Read Cache option for HSJ30-AD (32-Mbyte total) **Note:** Mandatory return of installed cache required
HSJ3X-AA	HSJ30 to HSJ40 upgrade

StorageWorks HSJ-Series Array Controllers *(continued)*

Ordering Information

HSJ40-CD	StorageWorks Array controller 36 SCSI-2 device support; 16-Mbyte Read Cache, RAID 0, Base Firmware and license
HSJ40-CF	StorageWorks Array controller 36 SCSI-2 device support; 32-Mbyte Read Cache, RAID 0, Base Firmware and license
HSJ40-XE	16- Mbyte Read Cache option for HSJ40-AD (32-Mbyte total) **Note:** Mandatory return of installed cache required
HSJ42-CD	Two HSJ40-AD StorageWorks Array Controller 36/72 SCSI-2 device support, 32-Mbyte total Read Cache, RAID 0, Base Firmware and license
HSJ42-CF	Two HSJ40-AD StorageWorks Array Controller; 36/72 SCSI-2 device support, 64-Mbyte total Read Cache, RAID 0, Base Firmware and license
HSJ44-CD	Four HSJ40-AD StorageWorks Array Controller; 72/144 SCSI-2 device support, 64-Mbyte total Read Cache, RAID 0, Base Firmware and license
HSJ44-CF	Four HSJ40-AD StorageWorks Array Controller; 72/144 SCSI-2 device support, 128-Mbyte total Read Cache, RAID 0, Base Firmware and license

StorageWorks HSZ40 Array Controller

The StorageWorks HSZ40 Array Controller provides connectivity and performance extensions for locally-attached SCSI devices on systems. Up to 42 SCSI-2 Disk and Solid State Disk devices may be attached to each HSZ40, with up to 181 Gbytes of disk storage when deploying the RZ29. RAID 0 (striping) is standard, with 16-Mbyte or 32-Mbyte Read Cache optionally available. Write-back Cache, Disk Mirroring and Raid options are available. The HSZ40 is supported within standard StorageWorks cabinets.

Host connection from the HSZ40 is over a 20 MB/s Fast Wide Differential SCSI bus; each host bus supports up to seven SCSI targets, including one or more HSZ40s. Internal performance of the HSZ40 is 2250 I/O/s request rate and up to 13.6 MB/s bandwidth with the KZPSA adapter. Other adapters will provide different performance metrics. SCSI devices are attached to HSZ40 on six, independent 10 MB/s Single Ended Fast SCSI buses; each device bus supports up to seven storage devices. With the HSZ40 appearing as one target on the host bus, the connected devices are addressed as up to eight Logical Units. The HSZ40 can optionally be configured with up to four Target Addresses, thus allowing 8 Logical Unit (LUNs) addressing of up to thirty-two.

Features

- Connection for up to 42 industry standard Disk and Solid State Disk devices
- Standard RAID 0 (striping) and optional Read Cache to 32MB for increased performance
- Disk Mirroring (RAID Level 1), Adaptive RAID (Dynamic Parity 3/5), and Write-back Cache Options available
- Supported on Digital UNIX V3.2 for enhanced Failover support
- Supported on OpenVMS V6.2 or greater

8-bit SCSI Devices Supported

- RZ25, .4-Gbyte 8-bit disk
- RZ26, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26L, 1.05-Gbyte 8-bit disk (V1.4 or above)
- RZ26N, 1.05-Gbyte 8-bit disk (V2.0 or above)
- RZ28, 2.1-Gbyte 8-bit disk (V1.4)
- RZ28B, 2.1-Gbyte 8-bit disk (V1.4 or above)
- RZ28D, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ28M, 2.1-Gbyte 8-bit disk (V2.0 or above)
- RZ29B, 4.3-Gbyte 8-bit disk (V2.0 or above)
- RZ74, 3.57-Gbyte 8-bit disk, 5.25" (V1.4 or above)
- EZ51/54/58R SCSI solid state disk devices (V1.4 or above)
- RRD42/43/44 /45 optical devices (V2.7)
- TZ87/87N tape devices (V2.7)
- TZ8/77/75 tape devices with loader

Note: A maximum of two, EZ5xx devices per HSZ40 device bus is recommended.

16-bit SCSI Disks Supported

- RZ26L-W 1.05-Gbyte 16-bit disk (V2.7)
- RZ28-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ28D-W, 2.1-Gbyte 16-bit disk (V2.7)
- RZ29B-W, 4.3-Gbyte 16-bit disk (V2.7)
- RZ26-W, 1.05-Gbyte 16-bit disk (V2.7)
- RZ26N-W, 1.05-Gbyte 16-bit disk (V2.7)
- RZ28M-W, 2.1-Gbyte 16-bit disk (V2.7)

Host Adapter Support

Processor	Adapter	Configuration Guidelines
DEC 3000	**KZTSA**	Up to 3 HSZ40 Array Controllers supported per KZTSA; dual target feature supported. OpenVMS Alpha Version 6.2 and high or Digital UNIX.
DEC 7000/10000	**KZMSA**	Maximum one HSZ40 per KZMSA bus or two HSZ40s per KZMSA; dual target feature not supported. OpenVMS Alpha Version 6.2 and higher or Digital UNIX.
AlphaServer 1000/2000/2100	**KZPAA**	OpenVMS Alpha Version 6.2 and higher only.
AlphaServer 1000/2000/2100	**KZPSA**	OpenVMS Alpha Version 6.2 and higher, or Digital UNIX
DEC 3000 Systems via DWZZA	**PMAZ-C**	OpenVMS Alpha Version 6.2 and higher, or Digital UNIX

StorageWorks HSZ40 Array Controller *(continued)*

StorageWorks Enclosures Support

BA350-SA/SB	Storage shelf assembly
BA356-SC	Shelf, no personality module (V2.7 required)
BA35X-MG	8-bit module for BA356 (V2.7 required)
BA35X-HF	150 Watt 48 volt Power Supply
BA350-MA/MB	Storage controller shelf
BA350-JA	Storage BA350-SA shelf kit
BA350-LA	Storage shelf assembly, for System Plug-in-Unit (PIU)
SW300-M	Storage Works mini cabinet
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet
BN21K-xx	FWD-SCSI Host Interconnect Cabling

Operating System Support

Digital UNIX V2.0 operating system or higher. Digital UNIX Version 3.2 or higher is recommended for HSZ40 controllers for failover operations.

OpenVMS Alpha Version 6.2 operating system or higher.

Ordering Information

HSZ40-BA	StorageWorks Array Controller; 42 SCSI-2 Disk/SSD Support; RAID 0, Base Firmware and license
HSZ40-BD	StorageWorks Array Controller; 42 SCSI-2 Disk/SSD Support; 16-Mbyte Read Cache, RAID 0, Base Firmware and license
HSZ40-BF	StorageWorks Array Controller; 42 SCSI-2 Disk/SSD Support; 32-Mbyte Read Cache, RAID 0, Base Firmware and license, RAID license, Disk mirroring license, Write-back Cache option
HSZ40-XD	16-Mbyte Read Cache Option for HSZ40-BA, 16-Mbyte total
HSZ40-XE	16-Mbyte Read Cache Option for HSZ40-BD, 32-Mbyte total; Mandatory return of installed cache
HSZ40-XF	32-Mbyte Read Cache Option for HSZ40-AA, 32-Mbyte Total
HSZ40-YX	HSZ40 Write-back Cache Option
QL-4DTA9-AA	HSZ40 Disk Mirroring license
QL-3J0A9-AA	HSZ40 RAID license

StorageWorks RAID Array 230/Plus Controller/Subsystem

StorageWorks RAID Array 230/Plus subsystem is a hardware-based RAID solution for Alpha system platforms that use the industry-standard PCI bus. Depending upon the workload, system and storage configurations, and RAID subsystem parameter settings, the StorageWorks RAID Array 230/Plus will generally demonstrate higher performance and throughput than its predecessor, the StorageWorks RAID Array 230.

RAID Array 230/Plus provides RAID levels 0 (striping), 1 (mirroring), 0+1 (striped mirrored sets), and 5 (striping with distributed parity). By providing RAID functionality, it binds a collection of disk drives into logical drives to provide data redundancy and/or increased performance. Performance improvements are obtained by striping user data across a number of disk drives, thus overlapping disk operations (RAID 0, 0+1).

Redundancy is obtained by keeping additional copies of user data on a redundant disk drive (RAID 1), or by generating and storing data parity so that user information can be reconstructed in the event of a disk failure (RAID 5). In either case, the application continues to run without data loss in the event of a single disk drive failure.

For more information on RAID, see the *Buyer's Guide to RAID Storage* (EC-G2412-45).

The StorageWorks RAID Array 230/Plus subsystem comprises a PCI backplane RAID controller, operating system specific RAID drivers and utilities (software), documentation, and disk drives with appropriate cables and enclosures. The controller provides RAID functionality. It is a backplane controller, and plugs directly into PCI bus inside system enclosure. Therefore, RAID functionality can be provided for disk drives inside, as well as outside, system enclosure.

In a standalone RAID subsystem, disks are housed in separate StorageWorks pedestal enclosures. The combination of a PCI adapter and a RAID controller (as a single component) provides a lower-cost solution than traditional standalone RAID controllers. The StorageWorks RAID Array 230/Plus controller is available in three models:

- Single SCSI channel model with 4 MB of cache that supports up to 7 disk drives,
- Three SCSI channel model with 4 MB of cache that supports up to 21 drives, and
- Three SCSI channel model with 8 MB of cache that supports up to 21 drives

RAID drivers and utilities provide the following functionality:

- RAID subsystem configuration (display drive array map, bind disks into RAID sets, configure array parameters, etc.)
- RAID subsystem monitoring and fault reporting. Status changes are reported to OPCOM (OpenVMS), System Console (Digital UNIX) Event Viewer (Windows NT); written to a log file (Digital UNIX and OpenVMS); and notification can be sent via MAIL (OpenVMS).
- RAID subsystem maintenance (parity check and repair, firmware updates)

System Support

The StorageWorks RAID Array 230/Plus subsystem is supported on Alpha systems that use the industry-standard PCI bus. Please refer to system specific ordering menus for currently supported options and configuration guidelines.

Operating System Support

StorageWorks RAID Array 230/Plus subsystem is supported on Digital UNIX V3.2F with Patch ID: OSF350-135 or later, OpenVMS 6.2-1H3 or later and Windows NT for Alpha V3.51 with Service Pack 4 or later.

Ordering Information

StorageWorks RAID Array 230/Plus Subsystem can be configured with disk drives inside the system enclosure or in standalone configurations where the disk devices are contained in StorageWorks pedestal enclosures.

StorageWorks RAID Array 230/Plus Subsystem consists of the following key components:

- PCI backplane RAID controller, which plugs-in directly into PCI system backplane.
- Software and documentation kit, which includes device drivers and RAID utilities for chosen system platform. (Software/Documentation kits are bundled with controllers).
- StorageWorks disk drives
- Enclosures, as required, to house disks
- Cables to connect controller to disk drives
- Additional StorageWorks components (redundant power supplies, fans, etc.)

StorageWorks RAID Array 230 Plus Controller/Subsystem *(continued)*

Ordering Information

KZPAC-AA	**Single (FWSE) SCSI channel PCI backplane RAID controller with 4 MB of cache memory** for Alpha systems, 68-pin HD connector on the module for internal connection and an 0.8 mm 68 pin connector on the module's standard PCI bulkhead for external connections. Includes StorageWorks RAID Array 230/Plus Subsystem Software, StorageWorks RAID Array 200 Management Utility, media licenses, and documentation. Requires SCSI cables, not included.
KZPAC-CA	**Three (FWSE) SCSI channel PCI backplane RAID controller with 4 MB of cache memory** for Alpha systems, 68-pin HD connectors on the module for internal connection, two channels available through 0.8 mm 68 pin connectors on the module's standard PCI bulkhead for external connection, the third channel can be connected to a 0.8 mm 68-pin connector on a standard PCI bulkhead connector via an adapter cable. Includes StorageWorks RAID Array 230/Plus Subsystem Software, StorageWorks RAID Array 200 Management Utility, media licenses, and documentation. Requires SCSI cables, not included.
KZPAC-CB	**Same as the KZPAC-CA, but includes 8 MB of cache memory.**
BN31K-0E	**SCSI cable and bulkhead assembly** for internal connection from KZPAC-CA/CB module to system cabinet bulkhead (17-04108-01). Use to connect KZPAC-CA/CB 3rd SCSI channel to system bulkhead. - 16 bit capable - 0.5m.
BN31L-1E	**External 1.5 m, 8-bit SCSI-2 cable.** (17-04107-01). Connects 0.8 mm 68-pin HD connector from PCI bulkhead connector to 50-pin HD SCSI connector on StorageWorks 8-bit device enclosure. Use one for each KZPSC external SCSI channel.
BN31M-1E	**External 1.5 m, 16-bit SCSI-2 cable** (17-04107-02). Connects 0.8 mm 68-pin HD connector from PCI bulkhead connector to 68-pin HD SCSI connector on StorageWorks 16-bit enclosure (BA354). Use one for each KZPSC external SCSI channel.
BN31S-1E	**External 1.5 m, 16-bit SCSI-2 cable** (17-04107-03 Connects 0.8 mm connector from the PCI bulkhead to 68-pin HD SCSI connector on a BA356, StorageWorks 16-bit enclosure, I/O personality module (BA35X-MH). Use one for each KZPSC external SCSI channel.
BN31S-02*	**External 2.0 m, 16-bit SCSI-2 cable** (17-04107-03 Connects 0.8 mm connector from the PCI bulkhead to 68-pin HD SCSI connector on a BA356, StorageWorks 16-bit enclosure, I/O personality module (BA35X-MH). Use one for each KZPSC external SCSI channel. Specific to AlphaServer 4100 systems.
KZPSC-UB	**Battery module for all KZPAC cache memory.** Provides up to 12 hours of memory retention for 4 Mbyte of cache memory or 8 hours with the 8 MB cache memory. These guidelines are based upon new, fully-charged batteries. Some deterioration in memory retention time should be expected over time.

* This cable is required for AlphaServer 4100 configurations **only** when one of three internal storage shelf is at the maximum distance from the CPU. For all other storage shelves, the BN31S-1E is the required cable.

Drives supported

RAID Level	Physical Drives per logical drive	Usable Storage	Data Redundancy	Max. Number drives KZPSC-AA	Max. Number drives KZPSC-BA
0	2-8	All	No	7	21
1	2	50%	Yes	6	16
0+1	3-8	50%	Yes	7	21
5	3-8	66%-87%	Yes	7	21
JBOD	1	All	No	7	8

StorageWorks RAID Array 230/Plus Controller/Subsystem *(continued)*

Specifications

Non-RAID device support	Yes, disk drives (JBOD)
Non-Disk device support	Yes, Tape drives and CD-ROM drives for Windows NT V 3.5 only
Drives supported	1.05 Gbytes RZ26L-VA, (Rev D05 or higher) 1.05 Gbytes, RZ26L-VW (Rev D05 or higher) 1.05 Gbytes, RZ26N 2.1 Gbytes RZ28D 2.1 Gbytes RZ28M 4.3 Gbytes, RZ29B
Drive Reconstruct	Automatic.
Disk hot swap	Yes
Disk hot spare	Yes
Redundant power supplies	Yes
Redundant controllers	No
Redundant fans	Yes
Mixed drive types	Yes
Mixed RAID levels within Drive Group	Yes
Configurable reconstruct time	Yes
Stripe size	Variable, 8K-64 KB
Write through cache	Yes, User Selectable (default)
Write back cache	Yes, User Selectable (optional)
Battery Backup for Cache	Yes
Boot capability	Bootable from RAID set (System dependent)
Number of controllers/system	4 RAID controllers per system in any combination of RAID Array 210, 230, or 230/Plus subject to minimal operating system levels and system specific configuration guidelines.
Cache support	4 - 8 Mbytes as specified in model numbers

Technical Information

System bus interface	Industry-standard PCI
Controller form factor	Industry-standard PCI card
Supported RAID levels	0, 1, 0+1, 5, JBOD ("just a bunch of disks")
Supported drive channels	1 or 3 SCSI channels
Number of drive groups	Up to 8 per controller
SCSI channels	SCSI-2, 8 and 16 bit, Single-Ended,Fast (10/20 Mbytes/second)
Number of disks supported per controller	Up to 7 per SCSI channel: KZPAC-AA = 7 disk drives maximum, per 'Drives supported' table KZPAC-CA/CB = 21 disk drives maximum, per 'Drives supported' table

StorageWorks RAID Array 230 Controller/Subsystem

StorageWorks RAID Array 230 subsystem is a hardware-based RAID solution for Alpha and Intel system platforms that use the industry-standard PCI bus. It provides RAID levels 0 (striping), 1 (mirroring), 0+1 (striped mirrored sets), and 5 (striping with distributed parity). By providing RAID functionality, it binds a collection of disk drives into logical drives to provide data redundancy and/or increased performance. Performance improvements are obtained by striping user data across a number of disk drives, thus overlapping disk operations (RAID 0, 0+1).

Redundancy is obtained by keeping additional copies of user data on a redundant disk drive (RAID 1), or by generating and storing data parity so that user information can be reconstructed in the event of a disk failure (RAID 5). In either case, the application continues to run without data loss in the event of a single disk drive failure.

For more information on RAID, see the *Buyer's Guide to RAID Systems*(EC-G4136-45).

The StorageWorks RAID Array 230 subsystem comprises a PCI backplane RAID controller, operating system specific RAID drivers and utilities (software), documentation, and disk drives with appropriate cables and enclosures. The controller provides RAID functionality. It is a backplane controller, and plugs directly into PCI bus inside system enclosure. Therefore, RAID functionality can be provided for disk drives inside, as well as outside, system enclosure.

In a standalone RAID subsystem, disks are housed in separate StorageWorks pedestal enclosures. The combination of a PCI adapter and a RAID controller (as a single component) provides a lower-cost solution than traditional standalone RAID controllers. The KZPSC controller is available in two models, a single SCSI channel variant that supports up to 7 disk drives, and a three channel model that supports up to 21 drives. RAID drivers and utilities provide the following functionality:

- RAID subsystem configuration (display drive array map, bind disks into RAID sets, configure array parameters, etc.)
- RAID subsystem monitoring and fault reporting. Status changes are reported to OPCOM (OpenVMS), System Console (Digital UNIX) Event Viewer (Windows NT); written to a log file (Digital UNIX and OpenVMS); and notification can be sent via MAIL (OpenVMS).
- RAID subsystem maintenance (parity check and repair, firmware updates)

System Support

The StorageWorks RAID Array 230 subsystem is supported on Alpha systems and Intel Servers that use the industry-standard PCI bus. Refer to system ordering menus.

Operating System Support

StorageWorks RAID Array 230 subsystem is supported on Digital UNIX V3.0B, OpenVMS 6.2, and Windows NT V3.5 SCO Unix V3.2.4, Novell NetWare V3.1x, 4.10, and Intel Windows NT V3.5.

Ordering Information

StorageWorks RAID Array 230 Subsystem can be configured with disk drives inside system enclosure, or in standalone configurations, where the disk devices are contained in StorageWorks pedestal enclosures.

StorageWorks RAID Array 230 Subsystem consists of the following key components:

- PCI backplane RAID controller, which plugs-in directly into PCI system backplane.
- Software and documentation kit, which includes device drivers and RAID utilities for chosen system platform. (Software/Documentation kits are bundled with controllers).
- StorageWorks disk drives
- Enclosures, as required, to house disks
- Cables to connect controller to disk drives
- Additional StorageWorks components (redundant power supplies, fans, etc.)

RAID Array 230 Controller/Subsystem *(continued)*

Ordering Information

KZPSC-AA **Single Channel PCI backplane RAID controller for Alpha Platforms.** Provides one FWSE SCSI channel through a 68-pin HD connector on module, for internal connection, or via an 0.8 mm 68 pin connector on the module's standard PCI bulkhead for external connection. Includes StorageWorks RAID Array 230 Subsystem Family Software and Documentation Kit for Digital UNIX, Open VMS, and Windows NT, 4 Mbyte Cache. Requires SCSI cable.

KZPSC-BA **Three Channel PCI backplane RAID controller for Alpha Platforms**. Provides three FWSE SCSI channels through 68-pin HD connectors on module, for internal connection. For external connection, two of the channels are available through 0.8 mm 68 pin connectors on module's standard PCI bulkhead; third channel can be connected to an 0.8 mm 68-pin connector on a standard PCI bulkhead connector via an adapter cable (BN31K-0E). Includes StorageWorks RAID Array 230 Subsystem Family Software and Documentation Kit for Digital UNIX, Open VMS, and Windows NT, 4-Mbyte cache. Requires SCSI cables.

BN31K-0E **SCSI cable and bulkhead assembly** for internal connection from KZPSC-BA module to system cabinet bulkhead (17-04108-01). Use to connect KZPSC-BA 3rd SCSI channel to system bulkhead. - 16 bit capable - 0.5m

BN31L-1E **External 1.5 m, 8-bit SCSI-2 cable**. (17-04107-01). Connects 0.8 mm 68-pin HD connector from PCI bulkhead connector to 50-pin HD SCSI connector on StorageWorks 8-bit device enclosure. Use one for each KZPSC external SCSI channel.

BN31M-1E **External 1.5 m, 16-bit SCSI-2 cable** (17-04107-02). Connects 0.8 mm 68-pin HD connector from PCI bulkhead connector to 68-pin HD SCSI connector on StorageWorks 16-bit enclosure (BA354). Use one for each KZPSC external SCSI channel.

BN31S-1E **External 1.5 m, 16-bit SCSI-2 cable** (17-04107-03. Connects 0.8 mm connector from the PCI bulkhead to 68-pin HD SCSI connector on a BA356, StorageWorks 16-bit enclosure, I/O personality module (BA35X-MH). Use one for each KZPSC external SCSI channel.

KZPSC-UB **Battery backup for KZPSC cache memory**. Provides up to 20 hours of memory retention for 4 Mbyte of cache memory.

MS100-AA **16 Mbyte Cache memory for KZPSC and KZESC.** 16 Mbyte, 4Mx36,70ns,72 pin, Industry standard SIMM (54-23170-AA). Replaces 4 Mbyte SIMM on KZPSC and KZESC backplane RAID controller

MS100-AB **32 Mbyte Cache memory for KZPSC and KZESC**. 32 Mbyte, 8Mx36,70ns,72 pin, Industry standard SIMM (54-21277-AA). Replaces 4 Mbyte SIMM on KZPSC and KZESC backplane RAID controller

Drives supported

RAID Level	Physical Drives per logical drive	Usable Storage	Data Redundancy	Max. Number drives KZPSC-AA	Max. Number drives KZPSC-BA
0	2-8	All	No	7	21
1	2	50%	Yes	6	16
0+1	3-8	50%	Yes	7	21
5	3-8	66%-87%	Yes	7	21
JBOD	1	All	No	7	8

RAID Array 230 Controller/Subsystem *(continued)*

Specifications

Non-RAID device support	Yes, disk drives (JBOD)
Non-Disk device support	Yes, Tape drives and CD drives (Windows NT V 3.5, Novell NetWare, SCO Unix)
Drives supported	0.5 Gbytes RZ25L-VA, (Rev C06 or higher) 1.05 Gbytes RZ26L-VA, (Rev D05 or higher) 1.05 Gbytes RZ26L-VW (Rev D05 or higher) 1.05 Gbytes RZ26N-VA and -VW 2.1 Gbytes RZ28-VA and -VW 2.1 Gbytes RZ28D-VA and -VW 2.1 Gbytes RZ28M-VA and -VW 4.3 Gbytes, RZ29B-VA and -VW
Drive Reconstruct	Automatic.
Disk hot swap	Yes
Disk hot spare	Yes
Redundant power supplies	Yes
Redundant controllers	No
Redundant fans	Yes
Mixed drive types	Yes
Mixed RAID levels within Drive Group	Yes
Configurable reconstruct time	Yes
Stripe size	Variable, 8 K-64 KB
Write through cache	Yes, User Selectable (default)
Write back cache	Yes, User Selectable (optional)
Battery Backup for Cache	Yes
Boot capability	Bootable from RAID set (System dependent)
Number of controllers/system	4 RAID controllers in any combination of KZESC or KZPSC with OpenVMS, Digital UNIX, Windows NT, or Novell NetWare are subject to specific CPU configuration limitations
Cache support	4-32 Mbyte; 4 Mbytes standard

Technical Information

System bus interface	Industry-standard PCI
Controller form factor	Industry-standard PCI card
Supported RAID levels	0, 1, 0+1, 5, JBOD ("just a bunch of disks")
Supported drive channels	1 or 3 SCSI channels
Number of drive groups (logical drives) supported	Up to 8 per controller
SCSI channels	SCSI-2, 8 and 16 bit, Single-Ended, Fast (10/20 Mbytes/second)
Number of disks supported per controller	Up to 7 per SCSI channel: KZPSC-AA = 7 disk drives maximum KZPSC-BA = 21 disk drives maximum (See drive support table)

StorageWorks RAID Array 210 Subsystem

The StorageWorks RAID Array 210 subsystem is a hardware-based RAID subsystem for Alpha and Intel system platforms that use the industry-standard EISA bus. It provides RAID levels 0 (striping), 1 (shadowing), 0+1 (striped shadowed sets), and 5 (striping with distributed parity). By providing RAID functionality, it binds a collection of disk drives into a smaller number of logical drives to provide data redundancy and/or increased performance.

Performance improvements are obtained by striping user data across a number of disk drives, thus overlapping disk operations (RAID 0, 0+1). Redundancy is obtained by keeping additional copies of user data on a redundant disk drive (RAID 1), or by generating and storing data parity so that user information can be reconstructed in the event of a disk failure (RAID 5). In either case, the application continues to run without data loss in the event of a single disk drive failure.

For more information on RAID, see the *Buyer's Guide to RAID Systems* (EC-G4136-45).

The StorageWorks RAID Array 210 subsystem comprises a RAID controller, RAID software (drivers and utilities) and documentation, and disk drives with appropriate cables and enclosures.

The SWXCR-Ex controller provides the RAID functionality. It is an EISA backplane controller, and plugs directly into the EISA bus inside the system enclosure. Therefore, RAID functionality can be provided for the disk drives inside, as well as outside, the system enclosure.

In a standalone RAID subsystem, the disks are housed in separate StorageWorks pedestal enclosures. The combination of an EISA adapter and a RAID controller (as a single component) provides a lower-cost solution than traditional standalone RAID controllers. The SWXCR-Ex controller is available in two models, a single SCSI channel variant that supports up to 7 disk drives, and a three channel model that supports up to 21 drives.

The RAID software includes device drivers, standalone, and on-line utilities which provide following functionality:

- EISA bus configuration
- RAID subsystem configuration (display drive array map, bind disks into RAID sets, configure array parameters, etc.)
- RAID subsystem monitoring and fault reporting. Status changes are reported to OPCOM (OpenVMS), System Console (Digital UNIX), Event Viewer (Windows NT); written to a log file (Digital UNIX and OpenVMS); and notification can be sent via MAIL (OpenVMS)
- RAID subsystem maintenance (parity check and repair, firmware updates)

The hardware components of the StorageWorks RAID Array 210 subsystem are standard StorageWorks components. This includes the disk drives as well as the enclosures. Many of the redundancy attributes of the StorageWorks RAID Array 210 subsystem, such as disk drive, power supply, and fan hot swapping, are standard StorageWorks attributes.

Supported Systems

The StorageWorks RAID Array 210 subsystem is supported on Alpha systems and Intel servers that use the industry-standard EISA bus.

Operating System Support

The StorageWorks RAID Array 210 subsystem is supported on OpenVMS, Digital UNIX, SCO UNIX, Novell Netware, and Windows NT.

StorageWorks RAID Array 210 Subsystem *(continued)*

Ordering Information

The StorageWorks RAID Array 210 Subsystem can be configured with the disk drives inside the system enclosure, or in standalone configurations, where the disk devices are contained in StorageWorks pedestal enclosures.

- StorageWorks RAID Array 210 Subsystems include: SWXCR-Ex EISA backplane RAID controller; plugs directly into the EISA system backplane
- Software and documentation kit; includes device drivers and RAID utilities for chosen system platform. (Software/documentation kits are bundled with the controllers)
- StorageWorks disk drives
- Enclosures, as required, to house disks
- Cables to connect controller to disk drives
- Additional StorageWorks components (redundant power supplies, fans, etc.)
- StorageWorks Raid Array 210 Subsystem

KZESC-AA **Single Channel EISA backplane RAID controller for Alpha Platforms.** Provides one SCSI channel through standard 50-pin EISA card connector. Includes StorageWorks RAID Array 200 Subsystem Family Software and Documentation Kit for **Open VMS, Digital UNIX**, and **Windows NT,** 4-Mbyte cache. Requires SCSI cable.

KZESC-BA **Three Channel EISA backplane RAID controller for Alpha Platforms.** Provides three SCSI channels. One SCSI channel is available through standard 50-pin EISA card connector. All three SCSI channels are available on module via standard 50-pin connectors. Includes StorageWorks RAID Array 200 Subsystem Family Software and Documentation Kit for Open VMS, Digital UNIX, and Windows NT, 4-Mbyte cache. Requires SCSI cables.

CK-SWXCR-AA **Cable and bulkhead connector kit for KZESC-BA.** Includes 0.3-meter (1-foot), internal "Y" cable (17-03998-01) which connects two SCSI channels from the controller module to one 68-pin bulkhead connector. **Note:** 68-pin bulkhead connector is attached to a standard PC connector mounting plate (74-48600-01). AlphaServer 2100 mounting plate (70-47879-03) is also included.Kit also includes external "Y" SCSI cable (17-04000-01) which connects 68-pin bulkhead connector to two 1.7-meter SCSI cables with 50-pin connectors. Use to connect to two external pedestal enclosures.

BN21H-02 **2-meter SCSI cable.** Connects 50-pin EISA card connector to SCSI device enclosure (disk pedestal/cabinet).

BC25R-3B **38-inch 50 Pos female to 50 Pos female SCSI cable assembly** (17-03948-01) for SCSI drives inside AlphaServer 2100 system enclosure. Use one per SCSI channel.

FR-PCTAR-AA **Single Channel EISA backplane RAID controller for Intel Servers.** Includes single channel RAID controller, StorageWorks RAID Array 200 Subsystem Family Software and Documentation Kit for Windows NT, Novell NetWare, and SCO UNIX, and an internal SCSI cable (17-03459)

FR-PCTAR-AB **Single Channel EISA backplane RAID controller for Intel Servers.** Includes a single channel RAID controller, StorageWorks RAID Array 200 Subsystem Family Software and Documentation Kit for Windows NT, Novell NetWare, and SCO UNIX, and an external SCSI cable (BN21H-02).

Drives Supported

RAID Level	Physical Drives per logical drive	Usable Storage	Data Redundancy	Max. # of Drives KZESC-AA	Max. # of Drives KZESC-BA
0	2-8	All	No	7	21
1	2	50%	Yes	6	16
0+1	3-8	50%	Yes	7	21
5	3-8	66%-87%	Yes	7	21
JBOD	1	All	No	7	8

StorageWorks RAID Array 210 Subsystem *(continued)*

Specifications

Non-RAID device support	Yes, disk drives (JBOD)
Non-Disk device support	Yes, tape drives and CD drives (Windows NT, Novell Netware, SCO UNIX)
Drives supported	0.5 Gbytes RZ25L-VA 1.05 Gbytes RZ26L-VA 1.05 Gbytes RZ26N 2.1 Gbytes RZ28D 2.1 Gbytes RZ28M 4.3 Gbytes RZ29B
Drive Reconstruct	Automatic
Disk hot swap	Yes
Disk hot spare	Yes
Redundant power supplies	Yes
Redundant controllers	No
Redundant fans	Yes
Mixed drive types	Yes
Mixed RAID levels within Drive Group	Yes
Configurable reconstruct time	Yes
Stripe size	8–64 KB
Write through cache	Yes, user selectable (default)
Write back cache	Yes, user selectable (optional)
Boot capability	Bootable from RAID set (system dependent)
Number of controllers/system	4 RAID controllers in any combination of KZESC or KZPSC with OpenVMS, Digital UNIX, Windows NT, or Novell NetWare are subject to specific CPU configuration limitations
Cache support	Yes (4 Mbytes standard)

Technical Information

System bus interface	Industry-standard EISA
Controller form factor	Industry-standard EISA card
Supported RAID levels	0, 1, 0+1, 5, JBOD ("just a bunch of disks")
Supported drive channels	1 or 3 SCSI channels
Number of drive groups (logical drives) suppported	Up to 8 per controller
SCSI channels	SCSI-2, 8-bit, Single-Ended, Fast (10 Mbytes/second)
Number of disks supported per controller	Up to 7 per SCSI channel: SWXCR-EA = 7 disk drive maximum SWXCR-EB = 21 disk drive maximum **Note:** Subject to RAID level and group restrictions

StorageWorks DWZZB SCSI Bus Extender and Signal Converter

DWZZB is a Fast Wide Differential to single-ended SCSI bus extender and signal converter. It is 8 or 16 bit Fast Wide Differential SCSI on one side and an 8 or 16 bit single-ended SCSI on the other side. DWZZB is SCSI-3 (ANSI X3T9.2-10R3) compliant, can handle data rates up to 20 (16-bit) Mbytes per second, and operates transparently to SCSI bus. The product fully supports all the latest SCSI-3 bus phases as well as all earlier standard SCSI compatible implementations, back to SASI.

DWZZB is bi-directional in operation and can be cascaded. A maximum of two can be attached to a bus in a series. Termination on the single-ended side is user selectable. The 16-bit fast wide differential side features user removable resistors. DWZZB handles the more powerful 16-bit SCSI buses as well as 8-bit buses and handles data rates up to 20 Mbytes per second on Fast SCSI. It is fully compatible with 2- to 5-Mbyte per second data rates of earlier SCSI interconnects. It extends SCSI buses from 3 or 6 meters to 25 meters using synchronous transfers.

DWZZB can be used to connect the widening range of available differential SCSI storage devices and subsystems to single-ended hosts. No changes are required to existing devices or software; the DWZZB does not occupy a SCSI bus node.

The standard warranty includes one year of onsite service and an additional two years of return-to-factory service.

Features:

- Connecting a user supplied 16-bit differential device to a 16-bit single-ended adapter.
- Extending a 16-bit SCSI single-ended bus so that very loud devices may be located in a lights-out closet or away from noise-sensitive work spaces.
- Creating "clumps" with UNIX systems so that non-dynamic disk sharing can occur should one of two worksystems fail.
- Centrally locating devices for several members of a workgroup for administrative or security control.
- DWZZB family consists of DWZZB-AA standalone product, DWZZB-MA module for OEM use, and DWZZB-VW for StorageWorks pedestals and shelves.

DWZZB SCSI Bus Extender and Signal Converter

DWZZB-AA	**Standalone Product**—includes built-in universal power supply for general purpose SCSI bus length and signal conversion needs, can be used with any SCSI-2 compatible device.
DWZZB-MA	**Module for OEM use**—includes basic module that operates at 20 Mbyte per second and is fully ANSI compliant for embedded applications (power suppler and packaging to be ordered separately by OEM or system integrator).
DWZZB-VW	**StorageWorks Pedestals and Shelves**—occupies a single Storage Building Block (SBB) slot in BA356 StorageWorks Deskside Wide Expansion Pedestal. It converts single-ended disks and tapes in BA356 shelf to differential SCSI host adapter as much as 25 meters away.

Accessories and Supplies

DWZZB-AA	68-pin "P" connectors for both SCSI buses Box size: 8.3 inches long x 4.5 inches wide x 3.0 high Universal AC power, 20 watts
DWZZB-MA	68 pin "P" connectors—hi-density female, shielded, jack screw retention AMPS 749076-7—Mates with AMPS 750752-1 or equivalent Power connector—Mates with AMPS 1-480424-0. Female pins are AMPS 61320-1 (3 required) or equivalents: Pin 1—no connection; Pin 2—Frame ground; Pin 3—Power ground (+5 VDC return); Pin 4 - +5 VDC; Indicators: none; Dimensions: 3.88 inches x 6.00 inches; Power Required: 5 VDCat 4 AMPS maximum
DWZZB-VW	Connector—same as DWZZB-MA. Occupies one single 3.5-inch carrier position

StorageWorks DWZZA SCSI Bus Extender and Signal Converter

DWZZA StorageWorks Signal Converter adapts 16-bit Fast Wide Differential SCSI systems to 8-bit single-ended SCSI signals to provide long (up to 25 meters) cable support. The signal converter connects a customer-supplied differential device to a single-ended adapter. It also extends a SCSI single-ended bus so that loud devices may be located away from noise-sensitive work spaces. It creates "clumps" with UNIX systems so that non-dynamic disk sharing can occur if one of two work systems fails. Customers can be freed of the 6-meter SCSI limit and locate SCSI devices over 25 meters apart using synchronous transfers. No changes are required to existing devices or software.

DWZZA signal converter is bi-directional in operation, and can be cascaded; more than one can be attached to a bus. Termination on the 8-bit side is user- selectable active. A second DWZZA may be used to convert the differential voltages back to single-ended voltages at the far end.

Features

- 16-bit Fast-Wide Differential SCSI on one side and 8-bit single-ended SCSI on the other side
- Handles data rates to 10 Mbytes per second
- Operates transparently to the SCSI bus
- Fully supports all the latest SCSI-3 (ANSI X3T9.2-10R3) bus phases including arbitration, disconnect/reconnect, and selection during reselection as well as all earlier standard SCSI compatible implementations back to SASI.

DWZZA SCSI Bus Extender and Signal Converter

DWZZA-MA	Module for embedding in SCSI systems; used with customer-supplied power and packaging.
DWZZA-VA	Single active electronics module encased in standard 3.5-inch modular storage carrier; supports single-ended disks **only**. DWZZA-VA supports disks configured in normal arrays and those used with software RAID.
DWZZA-AA	Includes DWZZA-MA and a power supply encased in small standalone unit; used for DEC 7000 and DEC 10000 systems, and for HSCs that require connectivity to the StorageWorks family.

SCSI Signal Converter Kits

SWX01-AA	Shelf and signal converter kit for attaching external SCSI storage (single-ended SCSI bus to the systems. Extends single-ended SCSI bus from systems into SW800 cabinet. Includes DWZZA-AA stand-alone single-ended to fast-wide differential signal converter, BC09D-06 (6-feet) single-ended SCSI cable, BN21K-10 (10-meter) differential SCSI cable, DWZZA-VA differential to single-ended signal converter, BA350-JA shelf, with power supply and mounting bracket.
HSS9X-RA	Signal converter kit and SCSI channel card for attaching external SCSI storage to the HSC. Includes DWZZA-AA, BN21K-10 (10-meter) differential SCSI cable to connect SCSI channel card to DWZZA-VA; BA350-JA shelf which includes power supply and mounting bracket; and HSC9X-SX SCSI data channel card.

Specifications

DWZZA-MA	3.25-inch x 6.5-inch module
DWZZA-VA	Standard 3.5-inch StorageWorks Building Block
DWZZA-AA	4.5-inch wide, 3-inch high, 8-inch long tabletop unit
Connectors	
Single-ended	50-pin low-density shielded SCSI device (A cable connector).
Differential	68-pin panel-mounted SCSI ``P'' connector
Power Required	
Input voltage	5 Vdc
Input current	Electronics 1.5 Amps; Terminators 0--3 Amps
Total power consumption	7.5–22.5 Watts

CIPCA PCI-to-CI Storage Host Adapter for OpenVMS Systems

The CIPCA is a PCI-to-CI storage host bus adapter. The CIPCA allows users to connect their existing CI-based storage to high-performance PCI-based AlphaServer systems, thereby minimizing costs while maximizing total system performance. CIPCA is the only product available on the market that allows PCI to CI connectivity and increases th eperformance of the CI with support for 4k packet.

Features

CIPCA is supported using the current OpenVMS V6.2 and OpenVMS V7.0 OpenVMS Cluster SPD CI configuration rules. The standard CI node count restrictions that apply to the CIPCA are as follows:

- Up to and including 16 CI host systems
- Up to and including 16 CI Hierarchical Storage Controllers
- Up to and including 32 CI products/Star Coupler (16 without CISCE)
- Up to and including 96 OpenVMS Cluster member systems

Supported CIPCA host systems

AlphaServer 8400, 8200, 2100A, 2100, and 2000 running OpenVMS V6.2

The CIPCA requires one PCI backplane slot and one EISA backplane slot. A maximum of two CIPCA adapters are supported per system.

Supported CI connected hosts

- Any OpenVMS VAX or Alpha host using CIXCD or CIBCA-B

CI hierarchal storage controllers supported

- HSJ30/40 with StorageWorks HSOF V2.5 or higher
- All HSC devices except HSC50

CI host adapters supported

- CIXCD, CIBCA-B, and CISCE (CISCE is no longer available; however existing installations are supported)

OpenVMS VAX and Alpha versions

Standard "warrantied" and "migration" pairings for mixed architecture/version clusters apply. Please refer to OpenVMS Cluster Software Product Description (SPD 29.78.12) for full details.

OpenVMS Cluster is the same as OpenVMS VAX or Alpha V6.2, which is

- Warranted support
- Migration support back to and including OpenVMS V5.5-2

CIPCA is not supported by Digital UNIX or Windows NT.

The CIPCA requires one of the following additional configuration dependent CI cables:

- BNCIA-10 CI cable 10 M Length
- BNCIA-20 CI cable 20 M Length
- BNCIA-45 CI cable 45 M Length

Ordering Information

CIPCA-AA	PCI to-CI-Storage Host Bus Adapter

StorageWorks Network Storage Array Family—SWXNA

StorageWorks Network Storage Arrays integrate industry-leading Alpha technology with StorageWorks modular design to meet fault-tolerant storage requirements of large FDDI- and CDDI-based systems. The StorageWorks Network Storage Array Family extends the StorageWorks line with entry-level, mid-level and high-performance/high-availability storage arrays (including CPUs to manage storage processes) to meet the I/O needs of even the largest FDDI- or CDDI-based systems. Several models are available that can provide centralized storage management capability.

- SWXNA-DA/Ex/HA/Jx entry-level models provide storage capacity up to 154 Gigabytes
- SWXNA-Ax/Fx models are the high availability systems that provide up to 154 Gigabytes of storage
- SWXNA-Bx/Gx products provide high performance, high availability, and up to 309 Gigabytes of storage
- SWXNA-CA/CB expansion cabinets offer up to 309 Gigabytes of additional storage; when attached to SWXNA-Bx/Gx Network Storage Arrays they provide a total of up to 619 Gigabytes on-line
- Capacities listed above assume SWXD3-xE, 4.3 Gigabyte disk drives

The hardware consists of standard StorageWorks components. SWXNA-Ax/Fx StorageWorks Network Storage Arrays include Dual Attachment Station (DAS) FDDI (CDDI for -Fx/Gx/HA/Jx models) Adapters, two AlphaServer Processors (with 128 Megabytes RAM, one 3.5-inch SCSI Diskette Drive, and one CD-ROM Drive each), two 2-Gigabyte Disks (configured into a two-member shadowset system disk), one 1-Gigabyte Quorum Disk, two Bus Adapters, and two Device Channel Processors with 32 Mbytes of write-back cache housed in a single SWXSC cabinet. The SWXNA-Bx/Gx models provide additional redundant components. Entry-level models SWXNA- DA/Ex/HA/Jx have only one AlphaServer. See details in the ordering information section.

Network File System (NFS) adds network file serving capability to non-OpenVMS client systems that support the TCP/IP protocol suite, including Digital UNIX and Windows NT clients; a version of PerfectCache read cache software (by Raxco Software, Incorporated, customized for the SWXNA) enhances I/O performance; and a new Software Customization Procedure streamlines installation.

Standard software includes licenses: Software Customization Procedure, OpenVMS operating system, OpenVMS cluster, Volume Shadowing, TCP/IP Services (NFS) and a customized version of PerfectCache for each AlphaServer; Operating Software (including RAID0), Write-Back Cache, RAID1, and Dynamic Parity RAID3/5 for the Device Channel Processors. For more information, see StorageWorks Network Storage Array Software Product Description, SPD 64.18 and HS1CP Device Channel Processor Operating Software, SPD 64.19.

All StorageWorks Network Storage Array models support a wide range of StorageWorks devices, so the FDDI/CDDI storage solution can be configured to exact application needs. Additionally, Network Storage Arrays allow comprehensive storage management capabilities to execute independently, reducing client CPU cycles spent on storage management and effectively eliminating storage management associated network traffic.

Finally, Digital's commitment to investment protection is evidenced by the breadth of upgrade options which ease the transition from earlier generations of FDDI Server network attached storage products to the capabilities and features of the SWXNA generation.

AlphaServers: Functionality Up Front

StorageWorks Network Storage Array AlphaServers combine Digital's advanced Alpha technology with 128 Mbyte RAM (upgradeable to 512 Mbytes), to provide the internal performance required to handle the I/O load of FDDI/CDDI-based OpenVMS cluster systems as well as traffic from open systems platforms.

SWXNA-Ax/Bx/Fx/Gx's two AlphaServers share the I/O load under normal circumstances. When a failure occurs, the surviving AlphaServer takes over the load of its failed partner, and continues to deliver data from all devices until repair can be effected. The AlphaServers are separately powered and cooled, so a power supply or cooling failure does not interrupt data access; and the shadowed system disk provides redundancy of operating system parameters.

High Capacity/High Performance Device Channel Processors

In SWXNA-Ax/Fx/Ex/Jx products, two Device Channel Processors (as a dual redundant pair) connect AlphaServers to a maximum of 36 redundant industry-standard SCSI-2 devices on six independent Fast (10-Mbyte/second) SCSI-2 buses for full failover capability. In SWXNA-Bx/Gx products, four Device Channel Processors (two dual redundant pairs) connect up to 72 devices; and capacity is doubled by up to 72 additional devices with the addition of an SWXNA-Cx. A wide range of StorageWorks magnetic, solid state, and optical disks, tapes, and media loader devices is supported.

StorageWorks Network Storage Array Family—SWXNA (continued)

Caching Further Increases Device Channel Processor I/O Performance

Each Device Channel Processor includes a 32 Mbyte non-volatile read/write cache that further reduces I/O request execution times. Advanced software allocates the cache dynamically based on actual I/O activity.

For optimal resource utilization, management facilities allow the system administrator to enable or disable read and write caching for each storage unit attached to a Device Channel Processor. In the event of a power failure, on-board batteries keep write cache contents intact for up to 100 hours to prevent data loss.

Dual-Redundant Device Channel Processors Enhance Data Integrity

In all SWXNA Device Channel Processor configurations, either dual redundant Device Channel Processor can assume control of all storage devices in the event of its partner's failure, including flushing any unsaved data from the partner's write cache to storage media.

For further information, see HS1CP Device Channel Processor Operating Software, Software Product Description (SPD) 64.19.03.

RAID Extends Data Availability Dimensions

To further enhance performance in both transaction and data transfer intensive environments, a built-in disk striping feature allows the system administrator to create stripesets of up to 14 disks.

For even greater data protection, disk shadowing, disk mirroring, and parity RAID are standard. Digital's innovative implementation of parity RAID technology dynamically adjusts to I/O workload, optimizing I/O performance in high data transfer rate and high transaction rate environments. Using dynamic parity RAID, Device Channel Processors in StorageWorks Network Storage Arrays economically provide continued access to data in the event of a disk failure.

Mirroring (RAID Level 1) is also provided via the HS1CP operating software. It provides the highest data availability, allowing fully redundant data disks to operate at a remote site.

For further information, see HS1CP Device Channel Processor Operating Software, SPD 64.19.03.

Digital TCP/IP Software Adds Network File System (NFS) Support

Digital TCP/IP Services for OpenVMS software is pre-loaded. It expands the capability of the Network Storage Array family to network file-serve clients operating Digital UNIX, SunOS, HP-UX, IBM AIX, SCO UNIX, and NFS-served PCs. For more information, see Digital TCP/IP Services for OpenVMS Software Product Description, SPD 46.46.

PerfectCache Read Cache

A pre-loaded, customized version of PerfectCache (by Raxco Software, Incorporated) read cache software is furnished with each AlphaServer in the SWXNA family. PerfectCache intercepts OpenVMS I/O requests and retrieves the data from cache in the AlphaServer CPU RAM, to enhance QIO performance. PerfectCache has both menu-driven and command-line interfaces to enable the following functions:

- Start/Stop Caching
- Display a summary of caching statistics (snapshot or continuous)
- Reset caching statistics

System Support

With full duplex 100 Megabits per second communications over inter-system distances of up to 40 kilometers, and GIGAswitch technology for ultra-high backbone performance of up to 3.6 Gigabits per second, Digital's FDDI technology has greatly broadened the range of OpenVMS cluster systems. Up to 96 widely separated high- performance VAX and Alpha computers can participate in a OpenVMS cluster attached to a single FDDI network, which may also contain other OpenVMS clients, OpenVMS clusters, or TCP/IP clients.

StorageWorks Network Storage Array Family—SWXNA (continued)

StorageWorks Network Storage Arrays function as full members of OpenVMS cluster systems, providing block I/O services to hosts. As full OpenVMS cluster members, they provide the complete range of OpenVMS data features. Network Storage Arrays are transparent to other elements within the OpenVMS cluster environment, as well as to end users. When the Network Storage Array is added to the cluster, other functions are unaffected; that is, there are no functional changes to existing applications.

Because each StorageWorks Network Storage Array is an independent OpenVMS cluster member, multiple Network Storage Arrays can be used in the same OpenVMS cluster systems, up to the maximum of 96 nodes supported by the OpenVMS Operating System.

In today's complex computing environment, "simpler is better." To enhance the "ease of use" of the Network Storage Array series, a user-friendly Software Customization Procedure and one year's worth of software updates (from the day of purchase) are provided.

Operating System Support

Each StorageWorks Network Storage Array ships with the OpenVMS Alpha operating system installed and pre-configured for use as a storage server. System administrators need only set the array up for a few system parameters and the specific storage device configuration (e.g., defining appropriate OpenVMS allocation classes, device names, and storagesets), and install optional storage management software. Initial installation can be accomplished in 10 to 15 minutes using the Software Customization Procedure designed specifically for these Network Storage Arrays.

Order Information

Each SWXNA or SWXUA model comes with an installation/user's guide, and software documentation in hardcopy or CD-ROM. Each SWXSC-Dx enclosure comes with dual cable distribution units, so that separate, redundant power sources can feed the enclosure. Electrical power requirements can be found at the SWXSC-Dx/SW800 Datacenter Cabinet entry in the Systems and Options Catalog.

Each AlphaServer contained in SWXNA/SWXUA products below is a model 1000 4/233 MHz. Each comes standard with 128 Megabytes of RAM, one CD-ROM drive, one 3.5-inch diskette drive, one power supply, and the following software and licenses: OpenVMS Operating System, OpenVMS cluster, Software Customization Procedure, Volume Shadowing, Digital TCP/IP Services, and a version of PerfectCache by Raxco Software, customized for the SWXNA. One or two 2-Gigabyte disks are provided for system disks on a redundantly-powered SWXSS-06 shelf with 8-bit personality module,

All Device Channel Processors come with a 32-Mbyte, non-volatile read/write-back cache module, as well as software and licenses for Write-Back Cache, Mirroring, and Dynamic Parity RAID. Each SWXSS-01 shelf provides power and physical attachment for two Device Channel processors. For further details and additional supported devices, see HS1CP Device Channel Processor Operating Software, SPD 64.19.

All FDDI/CDDI network adapters have Dual Attachment Station (DAS) connectors.

Network Storage Arrays

SWXNA-AA 60 Hz **SWXNA-AB** 50 Hz	High Availability FDDI Network Storage Array. Two AlphaServers, 1-Gbyte quorum disk, 2 FDDI adapters, 4 bus adapters, 2 Device Channel Processors, SWXSC-Dx enclosure with SWXSS-01 shelf, full redundant power.
SWXNA-BA 60 Hz **SWXNA-BB** 50 Hz	High-Availability/High Performance FDDI Network Storage Array. Two AlphaServers, 1-Gbyte quorum disk, 2 FDDI Adapters, 8 Bus Adapters, 4 Device Channel Processors, SWXSC-Dx enclosure with 2 SWXSS-01 shelves, full redundant power.
SWXNA-CA 60 Hz **SWXNA-CB** 50 Hz	FDDI/CDDI Network Storage Array Expansion Cabinet. 4 Device Channel Processors; SWXSC-Dx enclosure with 2 SWXSS-01 shelves, fan tray, redundant cabinet power.
SWXNA-DA	FDDI Network Storage Array Upgrade for empty SW800 (SWXSC-Dx) cabinet. One AlphaServer; one FDDI Adapter, 2 Bus Adapters, 2 Device Channel Processors; SWXSS-01 shelf, 50/60HZ
SWXNA-EA 60 Hz **SWXNA-EB** 50 Hz	Entry-Level FDDI Network Storage Array. One AlphaServer; one FDDI Adapter, 2 Bus Adapters, 2 Device Channel Processors; SWXSC enclosure with 1 SWXSS-01 shelf.
SWXNA-FA 60 Hz **SWXNA-FB** 50 Hz	High-Availability CDDI Network Storage Array. Two AlphaServers; 1-Gbyte quorum disk; 2 CDDI Adapters, 4 Bus Adapters; 2 Device Channel Processors; SWXSC-Dx enclosure with SWXSS-01 shelf, full redundant power.

StorageWorks Network Storage Array Family—SWXNA (continued)

SWXNA-GA **SWXNA-GB**	60 Hz 50 Hz	High-Availability/High Performance CDDI Network Storage Array. Two AlphaServers; 1-Gbyte quorum disk; 2 CDDI Adapters, 8 Bus Adapters; 4 Device Channel Processors; SWXSC-Dx enclosure with 2 SWXSS-01 shelves, full redundant power.
SWXNA-HA		CDDI Network Storage Array Upgrade for empty SW800 (SWXSC-Dx) cabinet. One AlphaServer; one CDDI Adapter, 2 Bus Adapters, 2 Device Channel Processors; SWXSS-01 shelf, 50/60HZ
SWXNA-JA **SWXNA-JB**	60 Hz 50 Hz	Entry-Level CDDI Network Storage Array. One AlphaServer; CDDI Adapter, 2 Bus Adapters, 2 Device Channel Processors; SWXSC-Dx enclosure with SWXSS-01 shelf.

Upgrade Options

SWXUA upgrade kits SWXUA-A1, SWXUA-A2, SWXUA-B1 or SWXUA-B2 require minimum HS1CP operating software of at least HSOF Version 2.5 (Version 2.7 preferred). SWXUA upgrade kits SWXUA-E1 or SWXUA-E2 require minimum HS1CP operating software of HSOF Version 2.7. Consult with Digital sales or service representative for updates to the HS1CP operating software if necessary.

SWXUA-A1		Upgrade HS121 to FDDI Network Storage Array SWXNA-Ax. System disk upgrade, FDDI Adapter, 2 Bus Adapters, Device Channel Processor; Software: Network Storage Array, HS1CP WBC, 2 RAID1, 2 RAID3/5, licenses, documentation, 50/60HZ.
SWXUA-A2		Upgrade HS221 to FDDI Network Storage Array SWXNA-Ax. System disk upgrade, Bus Adapter, Device Channel Processor; Software: Network Storage Array Operating Software, 2 HS1CP WBC, 2 RAID1, 2 RAID3/5, licenses, documentation, 50/60HZ.
SWXUA-AA **SWXUA-AB**	60 Hz 50 Hz	Upgrade FDDI Network Storage Array SWXNA-DA/Ex to SWXNA-Ax. One AlphaServer, 1-GByte quorum disk, FDDI Adapter, 2 Bus Adapters, documentation.
SWXUA-B1		Upgrade HS121 to FDDI Network Storage Array SWXNA-Bx. System disk upgrade, 2 64-Mbyte RAM upgrade, 2 FDDI Adapters, 8 Bus Adapters, 2 Device Channel Processors, SWXSS-01 shelf; Software: Network Storage Array Operating Software, 2 DEC TCP/IP Svcs, 2 PerfectCache, 4 HS1CP Software, 4 HS1CP WBC, 4 RAID1, 4 RAID3/5; licenses, documentation, 50/60HZ.
SWXUA-B2		Upgrade HS241 to FDDI Network Storage Array SWXNA-Bx. System disk upgrade, 2 64-Mbyte RAM upgrade; Software: 2 Network Storage Array Operating Software, 2 DEC TCP/IP Svcs, 2 PerfectCache, 4 RAID1, 4 RAID3/5, licenses, documentation, 50/60HZ.
SWXUA-BA		Upgrade FDDI Network Storage Array SWXNA-Ax/Fx to SWXNA-Bx/Gx. Four Bus Adapters, 2 Device Channel Processors, SWXSS-01 shelf, licenses, documentation, 50/60HZ.
SWXUA-E1		Upgrade HS110/111 to FDDI Network Storage Array SWXNA-DA/Ex. System disk upgrade, 64-MByte RAM upgrade, FDDI Adapter, 2 Bus Adapters, Device Channel Processor; Software: Network Storage Array, HS1CP WBC, 2 RAID1, 2 RAID3/5, licenses, documentation, 50/60HZ.
SWXUA-E2		Upgrade HS210/211 to FDDI Network Storage Array SWXNA-DA/Ex. System disk upgrade, Bus Adapter, Device Channel Processor; Software: Network Storage Array Operating Software, HS1CP WBC, 2 RAID1, 2 RAID3/5, licenses, documentation, 50/60HZ.
SWXUA-FA **SWXUA-FB**	60 Hz 50 Hz	Upgrade CDDI Network Storage Array SWXNA-HA/Jx to SWXNA-Fx. One AlphaServer, 1-GByte quorum disk, CDDI Adapter, 2 Bus Adapters, documentation.
SWXUA-M1		64-Mbyte AlphaServer RAM Upgrade.
SWXUA-M2		128-Mbyte AlphaServer RAM Upgrade.
SWXUA-PA		Redundant AlphaServer Power Supply.

Options

SW8XP-BA **SW8XP-BB**	60 Hz 50 Hz	Additional (redundant) power controller for SW800 (SWXSC-Dx) enclosure.
SWXSS-06		StorageWorks device shelf with mounting kit and power supply. Provides mounting for up to 7 StorageWorks devices.
SWXBP-SD		StorageWorks Shelf Power Supply. Occupies one device slot in SWXSS-06.
BN21H-01		One-meter cable for connecting the front shelves of the SWXNA to Device Channel Processors.
BN21H-02		Two-meter cable for connecting the rear shelves of the SWXNA to Device Channel Processors.
BN34A-xx		FDDI Cable SC-ST connectors.
BN34B-xx		FDDI Cable SC-SC connectors.
BN34D-xx		FDDI Cable SC-MIC connectors.
BN25H-03		CDDI Cable UTP/RJ45-UTP/RJ45 connectors.

StorageWorks Network Storage Array Family—SWXNA (continued)

16-bit Wide Disk Drives

SWXD3-WC	1.05 GB wide SCSI 5400 RPM
SWXD3-WG	2.1 GB wide SCSI 7200 RPM
SWXD3-WH	2.1 GB wide SCSI 5400 RPM
SWXD3-WE	4.3 GB wide SCSI 7200 RPM

8-bit Narrow Disk Drives

SWXD3-SF	1.05 GB narrow SCSI 5400 RPM
SWXD3-SG	2.1 GB narrow SCSI 7200 RPM
SWXD3-SH	2.1 GB narrow SCSI 5400 RPM
SWXD3-SE	4.3 GB narrow SCSI 7200 RPM

Supporting Software

QL-3J1A9-AA	POLYCENTER Hierarchical Storage Management Software License (one each per CPU / 20 GBytes + QL-2AWAA-xx)
QL-2GNAE-AA	POLYCENTER File Optimizer, License (one each per CPU)
QL-0YPAE-AA	Storage Library System Software License (one each per CPU)

Ordering Suggestions

Determine the desired SWXNA/SWXUA model, based on user requirements. Determine network hardware requirements (GIGAswitch, Concentrator, DEChub 900 MultiSwitch chassis/VNswitch 900, others as appropriate).

Determine quantity of disk storage and sufficient numbers of device shelves and internal cables, with additional power supplies for redundancy, if required.

Determine desired storage management and networking software (including DECnet where necessary). Ensure that the licenses accommodate the ordered storage capacity and/or number of AlphaServers.

Determine cables to connect between FDDI/CDDI network and SWXNA DAS FDDI/CDDI adapters.

Technical Information

The following restrictions and considerations apply.

- OpenVMS operating system supports up to 96 nodes in a single OpenVMS cluster system. Each StorageWorks Network Storage Array's Server Processor is a full OpenVMS cluster member, and therefore decreases maximum number of supported host nodes by 2 (Models SWXNA-Ax/Fx and SWXNA-Bx/Gx), and by 1 (Models SWXNA-DA/Ex and SWXNA-HA/Jx).
- StorageWorks Network Storage Array-attached storage may be used to boot client nodes if the client processors' consoles support the FDDI remote boot feature. Consult your client processor documentation for support details. DECnet is not required to boot Network Storage Arrays; however, some applications (such as Storage Library System) require DECnet for proper operation.
- OpenVMS cluster Software supports specifically designated combinations of OpenVMS Alpha and VAX versions in a single OpenVMS cluster system. SWXNA-Series StorageWorks Network Storage Arrays use Version 6.2 of OpenVMS Operating System. A maximum of one other version of OpenVMS may be used in the same OpenVMS cluster. For OpenVMS version support, consult the OpenVMS cluster Software for OpenVMS Alpha Software Product Description, SPD number 29.78.
- Introduction of OpenVMS Alpha Version 6.2 into the cluster has clusterwide implications that should be considered by knowledgeable system managers. OpenVMS Alpha Version 6.2 includes Phase II Volume Shadowing interoperability changes from previous ECO kits. If Phase II Volume Shadowing is used, then the Volume Shadowing interoperability patches must be installed on any cluster member running an operating system version earlier than OpenVMS Version 6.2 to ensure correct shadowing operation throughout the cluster.
- Disks which participate in Volume Shadowing for OpenVMS Alpha or host-based RAID cannot be read cached on StorageWorks Network Storage Arrays.
- Only one host-based, block serving caching software product should be run in a OpenVMS cluster which includes a SWXNA. Digital supports the use of the embedded PerfectCache version only.

StorageWorks Enterprise Storage Arrays

StorageWorks Enterprise Storage Arrays provide a complete storage subsystem solution for the demanding enterprise Information Technology (IT) environment. Capacity points range from hundreds of gigabytes to several terabytes and provide performance and scalability needs for various application environments.

These pre-configured subsystems take the guesswork out of ordering and configuring large-scale RAID (Redundant Array of Independent Disk) solutions. Each subsystem is fully configured and tested with all available options, including drives, controllers, the latest HSOF firmware, full hardware redundancy, read and write-back cache, StorageWorks Command Console (SWCC) graphical user interface, and all applicable software licenses, ensuring maximum data availability and performance. Included with each subsystem are basic installation services, remote RAID initialization and configuration, one-year of Enterprise MCS Support (24 x 7 on-site hardware support and telephone support for HSOF and SWCC, and an additional 40 hours of consulting support for storage and RAID reconfiguration, HSOF and SWCC update and license services.)

The Enterprise Storage Arrays (ESA) are fully integrated solutions for customers deploying varied applications throughout the enterprise. ESA solutions are pre-configured into three base models, each of which is optimized for different application workload requirements. The models include the C-Series which is ideal for heavy transaction oriented applications such as SAP/R3 or most office automation applications; the M-Series that is suited best for a mix of applications such as transaction processing, decision support, and data warehousing; and the L-Series that is optimized for very heavy bandwidth-intensive decision support applications.

RAID Extends Data Availability Dimensions

Digital's innovative implementation of parity RAID technology dynamically adjusts to I/O workload, optimizing I/O performance in high data transfer rate and high transaction rate environments. The StorageWorks Enterprise Storage Arrays come standard with RAID levels 0,1,0+1,3, and 5, economically providing continued access to data in the event of a disk failure. This functionality increases data availability to a level comparable to that of shadowing at significantly lower cost.

In addition, continuous availability is ensured through fully redundant, hot-swappable components throughout the subsystem, eliminating single points of failure.

For further information, see the HSZ50 Family Controller Operating Software SPD 61.36.00.

StorageWorks Command Console V1.1

The StorageWorks Command Console utility is included as standard in each Enterprise Storage Array. The standard license provides connectivity for up to 10 servers which can connect up to 35 subsystems each. Additional server licenses are available in increments of 25.

This tool provides on-line configuration and monitoring capability. It supports industry standard configuration and monitoring protocols such as Simple Network Management Protocol (SNMP) to facilitate the integration with other Storage, Network and Operating system layered products relevant to storage configuration and monitoring. The result is a highly usable and feature rich tool for Storage system administrators and managers.

Both a graphical user interface (GUI) and command line interface (CLI) are available to users, to provide a common "look and feel" across all storage products for configuration and monitoring. The product is a client/server implementation and therefore offers the option to centrally manage all storage from a "storage management station". In V1.1 the storage management station must be a 32-bit Intel PC running Windows NT 3.51, 4.0 or Windows 95.

A key feature of StorageWorks Command Console is its integration with various enterprise and system management products. It includes the ability to notify system management applications of storage events using the SNMP protocol. Those applications will also have the ability to launch Command Console "with context" to the proper screen within the GUI for a system manager to perform further analysis.

StorageWorks Enterprise Storage Arrays *(continued)*

Ordering Information

- Each part number includes, as standard, basic installation services from MCS, and RAID initialization and configuration provided by SI.
- Enterprise Multivendor Support is included for one year. This includes 24 x 7 on-site hardware support, 24 x 7 telephone support for HSOF and SWCC, an additional 40 hours of consulting support for storage and RAID reconfiguration provided by SI, and HSOF and SWCC update and license services.

SW8D1-AA	**Model 150-L4, StorageWorks 155 Gbyte Enterprise Storage Array, 1 SW821-GA 60 Hz Cabinet** 3 HSZ52-AJ controller pairs, 36 RZ29B-VW 4.3 GB wide disks with snap in carriers, 3 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8D1-AB	Same as above except 50 Hz Cabinet
SW8D2-AA	**Model 350-L4, StorageWorks 361 Gbyte Enterprise Storage Array, 1 SW821-GA 60 Hz Cabinet** 7 HSZ52-AJ controller pairs, 84 RZ29B-VW 4.3 GB wide disks with snap in carriers, 7 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8D2-AB	Same as above except 50 Hz Cabinet
SW8D3-AA	**Model 700-L4, StorageWorks 722 Gbyte Enterprise Storage Array, 2 SW821-GA 60 Hz Cabinet** 14 HSZ52- AJ controller pairs, 168 RZ29B-VA 4.3 GB wide disks with snap in carriers, 14 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8D3-AB	Same as above except 50 Hz Cabinet
SW8D4-AA	**Model 1050-L4, StorageWorks 1084 Gbyte Enterprise Storage Array, 3 SW821-GA 60 Mz Cabinet** 21 HSZ52-AJ controller pairs, 252 RZ29B-VW 4.3 GB wide disks with snap in carriers, 21 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8D4-AB	Same as above except 50 Hz Cabinet
SW8M1-AA	**Model 150-M4, StorageWorks 155 Gbyte Enterprise Storage Array, 1 SW820-GA 60 Hz Cabinet** 2 HSZ52-AJ controller pairs, 36 RZ29B-VW 4.3 GB wide disks with snap in carriers, 2 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8M1-AB	Same as above except 50 Hz Cabinet
SW8M2-AA	**Model 350-M4, StorageWorks 387 Gbyte Enterprise Storage Array, 1 SW820-GA 60 Hz Cabinet** 5 HSZ52-AJ controller pairs, 90 RZ29B-VW 4.3 GB wide disks with snap in carriers, 5 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8M2-AB	Same as above except 50 Hz Cabinet
SW8M3-AA	**Model 1150-M4, StorageWorks 1161 Gbyte Enterprise Storage Array, 3 SW820-GA 60 Hz Cabinet** 15 HSZ52-AJ controller pairs, 270 RZ29B-VW 4.3 GB wide disks with snap in carriers, 15 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8M3-AB	Same as above except 50 Hz Cabinet
SW8T1-AA	**Model 150-C4, StorageWorks 155 Gbyte Enterprise Storage Array, 1 SW822-GA 60 Hz Cabinet** 1 HSZ52- AJ controller pair, 36 RZ29B-VW 4.3 GB wide disks with snap in carriers, 1 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8T1-AB	Same as above except 50 Hz Cabinet
SW8T2-AA	**Model 450-C4, StorageWorks 464 Gbyte Enterprise Storage Array, 1 SW822-GA 60 Hz Cabinet** 3 HSZ52-AJ controller pairs, 108 RZ29B-VA 4.3 GB wide disk with snap in carrier, 3 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.0, media, documentation, and services described above.
SW8T2-AB	Same as above except 50 Hz Cabinet

StorageWorks Enterprise Storage Arrays *(continued)*

Ordering Information

SW8T3-AA	**Model 900-C4, StorageWorks 929 Gbyte Enterprise Storage Array, 2 SW822-GA 60 Hz Cabinet** 6 HSZ52-AJ controller pairs, 216 RZ29B-VW 4.3 GB wide disks with snap in carriers, 6 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.0, media, documentation, and services described above.
SW8T3-AB	Same as above except 50 Hz Cabinet
SW8T4-AA	**Model 1850-C4, StorageWorks 1858 Gbyte Enterprise Storage Array, 4 SW822-GA 60 Hz Cabinet** 12 HSZ52-AJ controller pairs, 432 RZ29B-VW 4.3 GB wide disks with snap in carriers, 12 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1, media, documentation, and services described above.
SW8T4-AB	Same as above except 50 Hz Cabinet
SW8T5-AA	**Model 3700-C4, StorageWorks 3715 Gbyte Enterprise Storage Array, 8 SW822-GA 60 Hz Cabinet** 24 HSZ52-AJ controller pairs, 864 RZ29B-VW 4.3 GB wide disks with snap in carriers, 24 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.0, media, documentation, and services described above.
SW8T5-AB	Same as above except 50 Hz Cabinet
SW8T6-AA	**Model 10200-C4, StorageWorks 10217 Gbyte Enterprise Storage Array, 22 SW822-GA 60 Hz Cabinet** 66 HSZ52-AJ controller pairs, 2376 RZ29B-VW 4.3 GB wide disks with snap in carriers, 66 BN21K-20 host SCSI-2 cables, StorageWorks Command Console V1.1 media, documentation, and services described above.
SW8T6-AB	Same as above except 50 Hz Cabinet

Upgrades and Supporting Options

Refer to the appropriate product entry

- SW8XX Data Center Cabinet
- BA35R Shelves
- HSZ50 Controller

SCSI Devices Supported for expansion

- RZ25-VA, .426-Gbyte 8-bit disk
- RZ26-VA, 1.05-Gbyte 8-bit disk
- RZ26L-VA/VW*, 1.05-Gbyte 8-bit disk
- RZ26N-VA/VW*, 1.05-Gbyte 8-bit disk
- SWXD3-SF/WF*, 1.05-Gbyte 8-bit disk
- RZ28-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28B-VA, 2.1-Gbyte 8-bit disk
- RZ28D-VA/VW*, 2.1-Gbyte 8-bit disk
- SWXD3-SG/WG*, 2.1-Gbyte 8-bit disk
- RZ28M-VA/VW*, 2.1-Gbyte 8-bit disk
- SWXD3-SH/WH*, 2.1-Gbyte 8-bit disk
- RZ29B-VW/Wx*, 4.3-Gbyte 8-bit disk
- SWXD3-SE/WE*, 4.3-Gbyte 8-bit disk
- RZ74-VA, 3.57-Gbyte 8-bit disk - 5.25"
- EZ31/32-VW*, SCSI solid state disk devices
- EZ64/69-VA, SCSI solid state disk devices
- EZ51/54/58R-VW* SCSI solid state disk devices

* -VW/-Wx variants are 16-bit Wide drives operating in 8-bit narrow mode

Adapters Supported

The following host adapters are supported by Digital UNIX V3.2d operating system for the HSZ50 controllers:

- KZMSA (for DEC 7000, DEC 10000, and AlphaServers 8200/8400 , requires a DWZZ- series signal converter)
- KZPSA (for AlphaServers 1000/2000/2100/8200/8400)
- KZTSA (for DEC 3000)
- PMAZC (for DEC 3000, requires a DWZZ- series signal converter)

The following host adapters are supported by OpenVMS V6.2 or higher on Alpha systems

- KZMSA (for DEC 7000, DEC 10000, requires a DWZZ- series signal converter)
- KZPAA (for AlphaServers 1000/2000/2100)
- KZPSA (for AlphaServers 1000/2000/2100/8200/8400)
- KZTSA (for DEC 3000)
- PMAZC (for DEC 3000, requires a DWZZ- series signal converter)

StorageWorks Enterprise Storage Arrays *(continued)*

The following host adapters are supported for MVD platfotms

- SWSAP-BC and X1062 for Sun Solaris
- HP4107 for HP-UX 700 systems
- SWHAP-BC, HP28696, and HP2696 for HP-UX 800 systems
- FC2416, FC2412, and FC2409 for IBM AIX

Operating System Support

- Digital UNIX V3.2C, V3.2D, V3.2G
- Digital OpenVMS Alpha V6.2 and V7.0
- Windows NT 3.51 and 4.0
- Sun Solaris V2.4, V2.5, and V2.5.1
- Hewlett Packard HP-UX V10.01 and 10.10 host for 700 and 800 series systems
- IBM AIX V4.1.4 and V4.2

Technical Specifications

	SW8D1 ESA 150-L4	SW8D2 ESA 350-L4	SW8D3 ESA 700-L4	SW8D4 ESA 1050-L4	SW8M1 ESA 150-M4	SW8M2 ESA 350-M4	SW8M3 ESA 1150-M4	SW8T1 ESA 150-C4	SW8T2 ESA 450-C4	SW8T3 ESA 900-C4	SW8T4 ESA 1850-C4	SW8T5 ESA 3700-C4	SW8T6 ESA 10200-C4
Cabinets	1	1	2	3	1	1	3	1	1	2	4	8	22
Max Configuration (Controller Pairs/ Device Shelves)	7/14	7/14	14/28	21/42	5/15	5/15	15/45	3/18	3/18	6/36	12/72	24/144	66/396
EISA Configuration (Controller Pairs/ Device Shelves)	3/6	7/14	14/28	21/42	2/6	5/15	15/45	1/6	3/18	6/36	12/72	24/144	66/396
Disk Drives in Configuration	36	84	168	252	36	90	270	36	108	216	432	864	2376
Number of Host Connections	3	7	14	21	2	5	15	1	3	6	12	24	66

StorageWorks FDDI Server Family—HS211, HS221, and HS241

StorageWorks FDDI Servers integrate industry-leading Alpha technology with StorageWorks modular design to meet storage requirements of large FDDI-based VMScluster systems. The StorageWorks FDDI Server Family extends the StorageWorks line with both entry-level and highly available servers to meet the I/O needs of even the largest FDDI-based VMScluster systems. Several models are available; all provide central storage management capability. The HS241 and HS221 are high availability, fault tolerant systems. The HS211 provides basic connectivity.

The hardware consists of standard StorageWorks components. A single StorageWorks FDDI Server includes an FDDI adapter, a server processor, one RZ28 system disk, one RX26 3.5-inch SCSI diskette, one CD-ROM drive, one bus adapter, and a Device Channel Processor with 32-Mbytes of write-back cache standard housed in a single SW800 cabinet. The HS241 and HS221 models provide redundant components; see details in the ordering information section. Expansion to over 600 Gigabytes of on-line storage (using RZ29 disk drives) is available with the purchase of the HS280, enclosed in an additional SW800 cabinet.

All StorageWorks FDDI Server models support a wide range of StorageWorks media, so the FDDI storage solution can be configured to exact application needs. Additionally, FDDI Servers allow comprehensive storage management capabilities to execute independently, reducing client CPU cycles spent on storage management and associated management network traffic.

Server Processor: Functionality Up Front

StorageWorks FDDI Server Processors combine Digital's advanced Alpha technology with 64-Mbyte RAM, to provide the internal performance required to handle the I/O load of FDDI-based VMScluster systems.

Model HS241's (and Model 221's) two Server Processors share the I/O load under normal circumstances. If a failure occurs, the surviving Server Processor takes over the load of its failed partner, and continues to deliver data from all devices until repair can be effected. Server Processors are separately powered and cooled, so a power supply or cooling failure does not interrupt data access.

High Capacity/High Performance Device Channel Processors

A single Device Channel Processor connects a Server Processor to a maximum of 42 industry-standard SCSI-2 devices on six independent Fast (10-Mbyte/second) SCSI-2 buses. In a dual Device Channel Processor configuration, up to 36 devices can be connected for full failover capability. A wide range of StorageWorks magnetic, solid state, and optical disks, tapes, and media loader devices are also supported.

To further enhance performance in both transaction and data transfer intensive environments, a built-in disk striping feature allows the system administrator to create stripesets of up to 14 disks.

Caching Further Increases Device Channel Processor I/O Performance

Each Device Channel Processor includes a 32-Megabyte non-volatile read/write cache that further reduces I/O request execution times. Advanced firmware allocates the cache dynamically based on actual I/O activity.

For optimal resource utilization, management facilities allow the system administrator to enable or disable read and write caching for each storage unit attached to a Device Channel Processor. In the event of a power failure, on-board batteries keep write cache contents intact for up to 100 hours to prevent data loss.

Dual-Redundant Device Channel Processors Enhance Data Integrity

In a dual Device Channel Processor configuration such as an HS221 or HS241, each Device Channel Processor can assume control of all storage devices in the event of its partner's failure, including flushing any unsaved data from partner's write cache to storage media.

For even greater data protection, disk shadowing and parity RAID options are offered.

For further information, see HS1CP Device Channel Processor Operating Firmware Software Product Description, 64.19.01.

StorageWorks FDDI Server Family— HS211, HS221, and HS241 *(continued)*

RAID Option Extends Data Availability Dimensions

Digital's innovative implementation of parity RAID technology dynamically adjusts to I/O workload, optimizing I/O performance in high data transfer rate and high transaction rate environments. Using distributed parity, the StorageWorks FDDI Server RAID option economically provides continued access to data in the event of a disk failure. This functionality increases data availability to a level comparable to that of shadowing at significantly lower cost.

Mirroring RAID (LEVEL 1) is optional via HS-SERIES operating firmware. It provides the highest data availability, allowing fully redundant data disks to operate at a remote site.

For further information, see HS1CP Device Channel Processor Optional Operating Firmware Software Product Description, 64.20.01.

Network File System (NFS) Option Adds TCP/IP Support

Digital TCP/IP Services for OpenVMS software expands the capability of the FDDI Server family to network file-serve Digital UNIX, SunOS, HP-UX, IBM AIX, SCO UNIX, and NFS-served PCs. For more information, see Digital TCP/IP Services for OpenVMS Software Product Description, SPD 25.A4.07.

System Support

With full duplex 100 Mbit/second communications over intersystem distances of up to 40 kilometers, and GIGAswitch technology for ultra-high backbone performance of up to 3.6 Gbits/second, Digital's FDDI technology has greatly broadened the range of VMScluster systems. Up to 96 widely separated high-performance VAX and Alpha computers can participate in a single FDDI VMScluster system.

StorageWorks FDDI Servers function as full members of VMScluster systems, providing block I/O services to hosts. As full VMScluster members, they provide the complete range of OpenVMS data features. FDDI Servers are transparent within the VMScluster environment. When the FDDI Server is added to the cluster, other functions are unaffected and it is also transparent to end-users. There are no functional changes to existing applications.

In today's complex computing environment, "simpler is better." To enhance the "ease of use" of the FDDI Server series, a user-friendly Software Customization Procedure and one year's worth of software updates (from the day of purchase) are provided.

Because each StorageWorks FDDI Server is an independent VMScluster member, multiple StorageWorks FDDI Servers can be used in the same VMScluster systems, up to the maximum of 96 nodes supported by the OpenVMS Operating System.

Each StorageWorks FDDI Server ships with OpenVMS operating system installed and pre-configured for use as a storage server. System administrators need only set the server up the for specific storage device configuration (e.g., defining appropriate OpenVMS allocation classes), and install optional storage management software. Initial installation can be accomplished in 10 to 15 minutes using the Software Customization Procedure designed specifically for these FDDI Servers.

Standard software functionality includes Software Customization Procedure, OpenVMS operating system, VMScluster, Volume Shadowing and Write-Back cache. For more information, see StorageWorks FDDI Server Software Product Description, SPD 64.18.01.

StorageWorks FDDI Server Family— HS211, HS221, and HS241 *(continued)*

Ordering Information

Server Options

HS211-AA **HS211-AB**	60 Hz 50 Hz	Single 233 MHz Alpha-based Server Processor with 64-Mbyte memory, FDDI Adapter, Bus Adapter, OpenVMS Operating System, VMScluster, Software Customization Procedure, and Volume Shadowing licenses; 1 Device Channel Processor, 32-Mbyte non-volatile read/write cache and write-back cache module and firmware licenses; SW800 enclosure with BA350-MB shelf.
HS221-AA **HS221-AB**	60 Hz 50 Hz	Two 233 MHz Alpha-based Server Processors with 64-Mbyte memory each, 2 FDDI Adapters, 4 Bus Adapters, 2 OpenVMS Operating System; 2 VMScluster, 2 Software Customization Procedure, and 2 Volume Shadowing licenses; 2 Device Channel Processors with 32-Mbyte non-volatile read/write cache module and firmware license; SW800 enclosure with BA350-MB shelf, full redundant power.
HS241-AA **HS241-AB**	60 Hz 50 Hz	Two 233 MHz Alpha-based Server Processors with 64-Mbyte memory each, 2 FDDI Adapters, 8 Bus Adapters, 2 OpenVMS Operating System, 2 VMScluster, 2 Software Customization Procedure, and 2 Volume Shadowing licenses; 4 Device Channel Processors with 32-Mbyte non-volatile read/write cache module and firmware license; SW800 enclosure with 2 BA350-MB shelves, full redundant power.

Upgrade Options

HS1MM-AA		64-Mbyte SIMM memory expansion for Server Processor
HS2MM-AA		128-Mbyte SIMM memory expansion for Server Processor
HS210-AA		SW800 cabinet to FDDI Server Model HS211 Upgrade (50Hz or 60Hz). Single 233 MHz Alpha-based Server Processor with 64-Mbyte memory, FDDI Adapter, Bus Adapter; OpenVMS Operating System, VMScluster, Software Customization Procedure, and Volume Shadowing licenses; 1 Device Channel Processor; BA350-MB shelf; 32-Mbyte non-volatile read/write cache and write-back cache module and firmware licenses. (Configures StorageWorks FDDI Server in an existing SW800 cabinet.)
HS211-AX		FDDI Server Model HS110/111 to HS210/211 Upgrade (50Hz or 60Hz). FDDI Adapter, Bus Adapter.
HS221-AX		FDDI Server Model HS121 to HS221 Upgrade (50Hz or 60Hz). 2 FDDI Adapters, 4 Bus Adapters, BA350-MB shelf.
HS221-BX **HS221-BY**	60 Hz 50 Hz	FDDI Server Model HS211 to HS221 Upgrade. Additional 233 MHz Alpha-based Server Processor with 64-Mbyte memory, FDDI Adapter, Bus Adapter, OpenVMS Operating System, VMScluster, Software Customization Procedure, and Volume Shadowing (software & licenses); 1 Device Channel Processor.
HS241-AX		FDDI Server Model HS121 to HS241 Upgrade (50Hz or 60Hz). 2 FDDI Adapters, 2 Device Channel Processors, 8 Bus Adapters, BA350-MB shelf.
HS241-BX		FDDI Server Model HS221 to HS241 Upgrade (50Hz or 60Hz). 2 Device Channel Processors, 4 Bus Adapters, BA350-MB shelf.
HS280-AA **HS280-AB**	60 Hz 50 Hz	Expansion package for HS241 Server. 4 Device Channel Processors; SW800 enclosure, 2 BA350-MB shelves.

Supporting Options

BA356-JC	StorageWorks device shelf with mounting kit and power supply. Provides mounting for up to 7 StorageWorks devices, requires BA35X-MG 8-bit personality module.
BA35X-HF	StorageWorks Shelf Power Supply
HS1PW-AA	Redundant power supply for Server Processor
QB-HS2AA-AA	FDDI Server NFS Solution
QL-4D7A9-AA	HS1CP RAID License
QL-4E3A9-AA	HS1CP Disk Mirroring License
SW8XP-Ax	Additional power controller for SW800 enclosure

StorageWorks FDDI Server Family— HS211, HS221, and HS241 *(continued)*

Technical Information

StorageWorks FDDI Servers are designed to operate in a wide variety of FDDI-based VMScluster systems. The following restrictions and considerations apply.

- OpenVMS operating system supports up to 96-nodes in a single VMScluster system. Each StorageWorks FDDI Server's Server Processor is a full VMScluster member, and therefore decreases maximum number of supported host nodes by 1 (Models HS210 and HS211) or 2 (Models HS221 and HS241).
- StorageWorks FDDI Server-attached storage may be used to load OpenVMS Operating System if the client processors' console supports FDDI remote boot feature. Consult Alpha and VAX processor documentation for support details.
- VMScluster Software supports specifically designated combinations of OpenVMS Alpha and VAX versions in a single VMScluster system. HS2XX-Series
- StorageWorks FDDI Servers use Version 6.2 of OpenVMS Operating System. A maximum of one other version of OpenVMS may be used in the same VMScluster. For OpenVMS version support, consult the VMScluster Software for OpenVMS Alpha Software Product Description, SPD number 42.18.02.

StorageWorks SW830 CI RAID Subsystem

The SW830 series of three CI RAID subsystems are based on the HSJ40 CI-to-SCSI controller and the high capacity SW800 data center cabinet to provide high capacity storage solutions to data centers. These easy to configure subsystems take the guesswork out of ordering large-scale RAID solutions. Each subsystem is fully configured with all available options, including full hardware redundancy, read and write-back cache, and all applicable software licenses, ensuring customers obtain maximum data availability and performance.

All subsystems support 8-bit (narrow) and 16-bit (wide) devices (in 8 bit mode) for maximum flexibility and investment protection.

Digital's innovative implementation of parity RAID technology dynamically adjusts to I/O workload, optimizing I/O performance in high data transfer rate and high transaction rate environments. The StorageWorks SW830 comes standard with RAID levels 0,1,0+1,3, and 5 and economically provides continued access to data in the event of a disk failure. This functionality increases data availability to a level comparable to that of shadowing at significantly lower cost.

For further information, see the latest SPD for the HSJ Family Controller Operating Software.

Operating System Support

- HSJ series controller subsystems are supported by OpenVMS V5.5-2 and above on VAX systems, OpenVMS V1.5 and above on Alpha systems, and OpenVMS V5.5-1 and above on Alpha and VAX systems.

Adapters Supported

- CI780, CIBCA, CIXCD, DWZZA/B

SCSI Devices Supported

Note: 16-bit Wide drives (-VW variants) operate in 8-bit Narrow mode

- RZ25-VA, .426-Gbyte 8-bit disk
- RZ26-VA, 1.05-Gbyte 8-bit disk
- RZ26N-VA/VW*, 1.05-Gbyte 8-bit disk
- RZ28-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28B-VA, 2.1-Gbyte 8-bit disk
- RZ28D-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28M-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ29B-VA/VW*, 4.3-Gbyte 8-bit disk
- RZ74-VA, 3.57-Gbyte 8-bit disk - 5.25"
- EZ31/32-VW* SCSI solid state disk devices
- EZ64/69-VW* SCSI solid state disk devices
- EZ51/54/58R-VW* SCSI solid state disk devices
- RRD42-VB optical device
- RRD43/44/45-VA optical devices
- TLZ06/TLZ6L-VA 4mm tape devices
- TLZ09/TLZ7L-VA 4mm tape devices
- TZ86/87/87N/87D/88N-VA tape devices
- RWZ52-VA optical device

Ordering Information

- Cables and storage devices are not included, they must be ordered separately.
- Refer to StorageWorks SW8xx Data Center Cabinet, BA356 Shelves, and HSJ Controller for additional ordering information.

SW830-AA/AB	SW800-FA cabinet with redundant power controllers SW8XP-BA, 2 HSJ40-CF controllers with 64 MB total cache and firmware licenses, 6 BA356-JC shelves with redundant power supplies BA35X-HF, 6 BA35X-MG I/O modules, and 1 BA350-MB controller shelf. 60Hz/50Hz
SW830-BA/BB	SW800-FA cab with redundant power controllers SW8XP-BA, 4 HSJ40-CF controllers 50 Hz with 128MB total cache and firmware licenses, 12 BA356-JC shelves with redundant power supplies BA35X-HF, 12 BA35X-MG I/O modules, and 2 BA350-MB controller shelves. 60Hz/50Hz
SW830-CA/CB	SW800-FA cab with redundant power SW8XP-BA, 6 HSJ40-CF controllers with 192MB total cache and firmware licenses, 18 BA356-JC shelves with redundant power supplies BA35X-HF, 18 BA35X-MG I/O modules, and 3 BA350-MB controller shelves.

Note: -xA = 60 Hz / -xB = 50 Hz

StorageWorks SW830 CI RAID Subsystem *(continued)*

Specifications

Performance	SW830-Ax	SW830-Bx	SW830-Cx
I/O per second	3100	6200	9300
MB/Second Read	12	24	36
MB/Second Write	9	18	27
Maximum Devices *	36	72	108
Device Channels	6	12	18
Controllers	2-HSJ40	4-HSJ40	6-HSJ40
Device Shelves*	6	12	18
Controller Shelves*	1	2	3
Controller Cache (MB)	64	128	192
Power Supplies	14	28	42
RAID Levels Included	0,1,0+1,3,5	0,1,0+1,3,5	0,1,0+1,3,5
Write-Back Cache	Yes	Yes	Yes
Internal SCSI Bus Cables	6	12	18

* As pre-configured. Maximum number of shelves in the SW8XX cabinet is 23.

StorageWorks SW301 DSSI RAID Subsystem

The SW301 DSSI RAID subsystem is a packaged storage solution based on the HS1CP DSSI-to-SCSI 6-channel array controller and the SW300 deskside expansion cabinet with an Environmental Monitoring Unit (EMU). This departmental computing solution provides customers with more DSSI device connectivity than ever, up to 24 devices. Each subsystem is fully configured with full controller and power redundancy, read and write-back cache, and all applicable software licenses to ensure maximum data availability and performance.

Digital's innovative implementation of parity RAID technology dynamically adjusts to I/O workload, optimizing I/O performance in high data transfer rate and high transaction rate environments. The StorageWorks SW301 RAID subsystem includes RAID levels 0,1,0+1,3,and 5 which economically provides continued access to data in the event of a disk failure. This functionality increases data availability to a level comparable to that of shadowing at significantly lower cost.

For further information, see the latest SPD for the HS1CP Device Channel Processor Operating Software

Operating System Support

- HS1CP device channel processors are supported by OpenVMS V5.5-2 and above on VAX systems, and OpenVMS V6.0 and above on Alpha and VAX systems.

SCSI Devices Supported

Note: 16-bit Wide drives (-VW variants) operate in 8-bit Narrow mode

- RZ25-VA, .426-Gbyte 8-bit disk
- RZ26-VA, 1.05-Gbyte 8-bit disk
- RZ26N-VA/VW*, 1.05-Gbyte 8-bit disk
- RZ28-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28B-VA, 2.1-Gbyte 8-bit disk
- RZ28D-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28M-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ29B-VA/VW*, 4.3-Gbyte 8-bit disk
- RZ74-VA, 3.57-Gbyte 8-bit disk - 5.25"
- EZ51/54/58R-VA* SCSI solid state disk devices
- RRD42-VB/VU optical device
- RRD43/44/45-VA optical devices
- TLZ06/TLZ6L-VA 4mm tape devices
- TLZ09/TLZ7L-VA 4mm tape devices
- TZ86/87/87N-VA tape devices
- RWZ52-VA optical device

Ordering Information

- Cables and storage devices are not included, they must be ordered separately.
- Refer to StorageWorks SW300 Deskside Cabinet and FDDI Server Family HS1CP Device Channel Processor for additional ordering information.

SW301-AA SW300-AA (60Hz) cabinet with two HS1CP-CF device channel processors

Specifications

Performance	SW301-AA
I/O per second	2200
MB/Second Read	6.4
MB/Second Write	6.4
Maximum Devices	24
Device Channels	6
Controllers	2-HS1CP
Device Shelves	N/A
Controller Shelves	N/A
Controller Cache (MB)	64
Power Supplies	5 (N+1)
RAID Levels Included	0,1,0+1,3,5
Write-Back Cache	Yes
Internal SCSI Bus Cables	N/A

StorageWorks SF346 DSSI Expansion Subsystem

The SF346 DSSI expansion subsystem is a packaged storage solution based on an embedded HSD10 DSSI-to-SCSI array controller and the BA346 deskside expansion pedestal. This work-group computing solution provides easy to implement DSSI storage expansion. Each subsystem is fully configured with an embedded controller, power supply, and cooling fans.

For further information, see the latest SPD for the HSD10 Array Controller Operating Software.

Operating System Support

- HSD10 Array Controllers are supported on OpenVMS VAX V5.5-2 and above on VAX systems, and OpenVMS V6.1 and above on Alpha systems.

SCSI Devices Supported

Note: 16-bit Wide drives (-VW variants) operate in 8-bit Narrow mode

- RZ26-VA, 1.05-Gbyte 8-bit disk
- RZ26N-VA/VW*, 1.05-Gbyte 8-bit disk
- RZ28-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28B-VA, 2.1-Gbyte 8-bit disk
- RZ28D-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ28M-VA/VW*, 2.1-Gbyte 8-bit disk
- RZ29B-VA/VW*, 4.3-Gbyte 8-bit disk
- RZ73-VA, 2.0-Gbyte 8-bit disk - 5.25"
- RZ74-VA, 3.57-Gbyte 8-bit disk - 5.25"
- EZ51/54-VA SCSI solid state disk devices
- EZ64/69-VA SCSI solid state disk devices
- RRD43/44/45-VA optical devices
- TLZ06/TLZ6L-VA 4mm tape devices
- TLZ09/TLZ7L-VA 4mm tape devices
- TZ86/87/88-VA tape devices
- RWZ52-VA optical device

Ordering Information

- Cables and storage devices are not included, they must be ordered separately.
- Refer to StorageWorks SF346 Deskside pedestal and HSD10 array controller for additional ordering information.

SW346-AA BA346-KB (60Hz) pedestal with one HSD10-AA embedded array controller.

Specifications

Performance	SF346-AA
I/O per second	1000
MB/Second Read	3
MB/Second Write	3
Maximum Devices	7
Device Channels	1
Controllers	1-HSD10
Device Shelves	N/A
Controller Shelves	N/A
Controller Cache (MB)	N/A
Power Supplies	1
RAID Levels Included	0
Write-Back Cache	N/A
Internal SCSI Bus Cables	N/A

StorageWorks RZ Family of Disk Drives

The RZ family of SCSI disk drives consists of 3.5-inch 5400 RPM and 7200 RPM, 8-bit and 16-bit drives with capacities ranging from 1 Gbyte to 4 Gbyte. The family offers a variety of capacity points and performance characteristics that can be matched to the system or application environment. The drives are typically mounted in the system enclosure of both Alpha and VAX desktop and deskside systems and servers. They are also available in StorageWorks external expansion enclosures for desktop datacenter needs.

Features

- Extra-high performance 7200 RPM and high performance 5400 RPM models
- All models available in 8-bit (narrow) and 16-bit (wide) variants
- 96-bit error correction code ensures data integrity
- Quadruplicate headers ensure proper identification and transfer of correct data
- Comprehensive power-up, periodic self-diagnostics, and device testing provide early warning of potential drive failure
- Extended operating temperature specifications provide reliability in the desktop or office environment

7200 RPM Disk Drives

The StorageWorks 4.3 Gbyte 7200 RPM disk drive is 30% faster than comparable 5400 RPM drives for most transaction processing workloads. Its large cache enhances overall subsystem performance, while a dedicated servo ensures quick access to data. The StorageWorks 4.3 Gbyte disk drive is ideal for applications with high I/O transactions or for high capacity needs. The 2.1 Gbyte 7200 RPM drive is also well suited for request-intensive environments with lower capacity requirements.

5400 RPM Disk Drives

High performance, 5400 RPM drives are available in 2.1 Gbyte and 1.05 Gbyte capacities. For frequently needed additional disk storage, the StorageWorks 2 Gbyte drive provides a solid solution for most transaction processing applications, as well as situations where moderate capacity growth is required. The 1.05 Gbyte drive delivers 5400 RPM performance at a low cost, offering an optimal solution for single-user platforms with lower capacity needs.

Ordering Information

Note: See system ordering menus for specific variants and quantities supported.

Supported in StorageWorks 8-bit narrow shelves

RZ26N-VA	1.05 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier—narrow
RZ28M-VA	2.1 GB 8-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier—narrow
RZ28D-VA	2.1 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier—narrow
RZ29B-VA	4.3 GB 8-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier—narrow

Supported in StorageWorks 16-bit wide shelves

RZ26N-VW	1.05 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier—wide
RZ28M-VW	2.1 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier—wide
RZ28D-VW	2.1 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier—wide
RZ29B-VW	4.3 GB 16-bit 7200 RPM SCSI-2 disk drive in 3.5-inch carrier—wide

StorageWorks RZ Family of Disk Drives *(continued)*

Specifications

	5400 RPM Drives		7200 RPM Drives	
Drive/capacity formatted	1.05 GB	2.1 GB	2.1 GB	4.3 GB
Cache buffer size	480 KB	480 KB	480 KB	1 MB
Average seek time (ms)	9-10.5	9-10.5	8-9	8-9
Average latency (ms)	5.54	5.54	4.17	3.17
Average access time (ms)	14.5	14.5	12.2	12.2
Max data transfer rate To/from media	32-58 MB/s	37-63 MB/s	49-72 MB/s	47-72 MB/s
Bus/synchronous 8-bit	10 MB/s	10 MB/s	10 MB/s	10 MB/s
Bus/synchronous 16-bit	20 MB/s	20 MB/s	20 MB/s	20 MB/s
Error Correcting Code	96 bits	96 bits	96 bits	96 bits
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch x 1.6-inch
Operating Environment				
Temperature	5-50 C	5-50 C	5-50 C	5-50 C
Relative humidity	8-80%	8-80%	5-95%	5-95%
Physical Characteristics				
Form Factor	Height (mm/in)	Width (mm/in)	Depth (mm/in)	
3.5-inch	121/4.8	51/2.0	216/8.5	
5.25-inch	121/4.8	152/6.0	267/10.5	

StorageWorks EZ3x/EZ6x Solid State Disks

StorageWorks solid state disks, based on the standard 3.5-inch and 5.25-inch form factors, are available in a range of capacities from 134 to 950 Mbyte. With an access time less than 100 microseconds, solid state disks support a wide range of response time critical applications such as OLTP, as well as bandwidth-hungry applications such as video.

All StorageWorks solid state disks incorporate a complete data retention system to provide data permanence if power is lost. When a power loss is sensed, the data retention system (comprising voltage-sensing logic, batteries, and a hard drive) off-loads the data to its internal magnetic disk for secure storage until power is restored.

To provide the highest availability, the StorageWorks solid state disk family data retention system employs industry unique "continuous backup." Continuous backup constantly updates the contents of the hard drive to best mirror the data contained in the DRAMs. This feature conserves battery power, reduces backup time to less than 1.5 minutes, and affords virtually an unlimited number of off-load/restore data retention cycles. Additionally, patented ECC (Error Correction Code) schemes further enhance availability by providing unprecedented tolerance to a DRAM malfunction.

Features

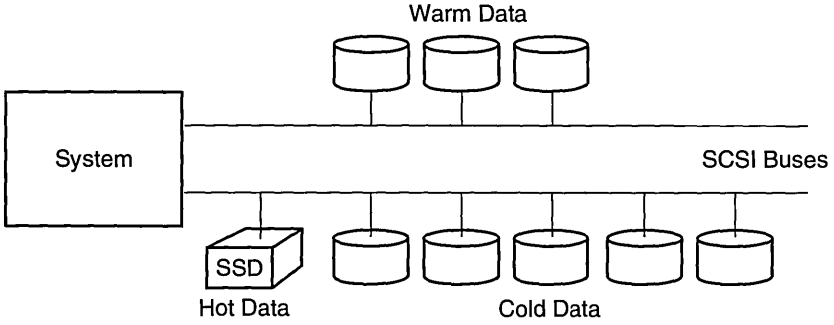
- Time-critical data is accessed 100+ times faster than magnetic disks
- Access times under 100 microsec
- Supports bandwidth-critical applications with very high data transfer rates
- Sophisticated continuous backup and ECC provides industry-leading availability
- Industry standard and open, executes the SCSI-2 Common Command Set
- Wide SCSI support (EZ3x)

Operating System Support

- OpenVMS VAX V5.5-2
- OpenVMS V6.2
- Digital UNIX V3.2C

Installation Kits and Cables

- EZxx-VA drives are packaged as StorageWorks Building Blocks. No additional mounting hardware or cabling is required.
- EZ3x-W and EZ6x-E drives are supplied as a "brick only" for integration into other enclosures or non-Digital systems which are able to accept standard 3.5" half-height (EZ3x) and standard 5.25-inch full-height (EZ6x) storage devices. No mounting hardware or cabling is included.
- **Configuring Solid State Disks:**
  - In a typical I/O active application, the vast majority of I/O requests is directed toward 1%–5% of the on-line data. Placing this small percentage of data ("hot" files) on solid state disk reduces I/O wait-time (CPU idle) and enables CPU cycles to do work.
- **I/O Balancing:**
  - Given the I/O profile above, when multiple SCSI buses are implemented, optimum performance will be achieved by "balancing" the I/O as shown below to achieve an average "warm temperature" across the buses. NOTE: For maximum system performance, SSDs should reside on a dedicated bus and not be mixed with other SCSI devices.
- **Wide SCSI:**
  - Wide SCSI solid state disks (EZ3x) should be configured behind KZTSA adapter for optimal performance benefits.



StorageWorks EZ3x/EZ6x Solid State Disks *(continued)*

Ordering Information

EZ64-E	475 MB 5.25-inch SCSI solid state disk with data retention system, field installed
EZ64-VA	475 MB 5.25-inch SCSI solid state disk with data retention system in StorageWorks Building Block
EZ69-E	950 MB 5.25-inch SCSI solid state disk with data retention system, field installed
EZ69-VA	950 MB 5.25-inch SCSI solid state disk with data retention system in StorageWorks Building Block
EZ31-W	134 MB 3.5-inch SCSI solid state disk with data retention system, field installed (16-bit)
EZ31-VW	134 MB 3.5-inch SCSI solid state disk with data retention system in StorageWorks Building Block (16-bit)
EZ32-W	268 MB 3.5-inch SCSI solid state disk with data retention system, field installed (16-bit)
EZ32-VW	268 MB 3.5-inch SCSI solid state disk with data retention system in StorageWorks Building Block (16-bit)

* See the "Installation Kits and Cables" section.

Specifications

	EX6x	**EZ3x**
SCSI-2 Interface	8-bit	16-bit
Capacity (MBs)	475/950	134/268
Form Factor	5.25-inch x 3.2-inch	3.5-inch x 1.6-inch
Access Time	<100 microseconds	<100 microseconds
Bandwidth (sustained)	9.4 MBPS	>13 MBPS
I/O Throughput (maximum)	2,200+ I/Os	2,200+ I/Os
Physical Dimensions		
Height	82.6 cm (3.25 in.)	41.4 cm (1.63 in.)
Depth	203.2 cm (8.0 in.)	146 cm (5.75 in.)
Width	146.0 cm (5.75 in.)	101.0 cm (4.0 in.)
Weight	2.55 kg (5 lb., 10 oz)	1.4 kg (3.0 lbs.)

StorageWorks RX26 Flexible Diskette Drive

The RX26 flexible diskette drive is designed for high-capacity floppy-disk storage for desktop systems. It provides 2.8 Mbytes of formatted storage capacity (4 Mbytes unformatted) in a compact 3.5-inch form factor. Utilizing industry-standard 3.5-inch microfloppy diskettes, the RX26 adds a second level to the existing industry diskette structure of 1.4 Mbytes formatted (2 Mbytes unformatted).

It is fully backward compatible on both read and write capabilities with the RX23L 3.5-inch media. This important feature provides users with access to complete range of industry-standard software published on 3.5-inch microfloppies. The RX26 may be operated in these modes as well. The RX employs the industry-standard FDD interface.

Ordering Information

Note: See system ordering menus for specific variants and quantities supported.

RX26-VA	StorageWorks 3.5 inch RX26 Flexible diskette drive
RX26K-10	Pack of ten 4.0 MB (unformatted) 3.5-inch flexible diskettes

Specifications

Formatted capacity per diskette	2.8 MBs (4 MBs unformatted)
Peak transfer rate	1 MB/second (in 2.8 / 4 MB mode)
Average seek time	95 ms
Average rotational latency:	100 ms
Tracks per diskette	60

StorageWorks RRD45 CD-ROM Drive

Digital offers an industry standard quad-speed, multimedia-capable CD-ROM drive, the RRD45. CD-ROM drives provide an excellent vehicle for software, documentation, and subscription-based information/database distribution. The RRD45 supports all CD-ROM standards including CD-ROM-XA (CD-ROM eXtended Architecture), Multisession, Photo CD, and MPC (Multimedia Products Council) 1 and 2. The drives are also CD-I ready.

Ordering Information

Note: See system ordering menus for specific variants and quantities supported.

RRD45-FA	Tabletop CD-ROM drive with North American power cord
RRD45-DG	Tabletop CD-ROM drive, requires country specific power cord
RRD45-AC	CD-ROM drive without mounting or brackets
RRD45-VA	CD-ROM drive in StorageWorks 5.25-inch carrier
RRD45-VE	CD-ROM drive for BA353 Desktop expansion unit
RRD45-VU	CD-ROM drive to add half-height device to existing RRD45-VA 5.25-inch StorageWorks carrier

Power Cords

Note: Select country specific power cord for 240V use.

BN19A-2E	U.K./Ireland
BN19D-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19N-2E	Italy
BN19S-2E	India
BN19U-2E	Israel

Specifications

Capacity	600 MBs
Average access time	600 KB/s
Loading mechanism	Motorized tray, no caddy
Mounting	Horizontal or vertical
Rotational speed (RPM)	
Normal, variable	530-200
Double, variable	1,060-400
Quad, variable	2,120-800
Conforms to industry standards	
CD-ROM	Mode 1 and 2
CD XA	Mode 2, Form 1 and Form 2
CD-I and CD-I Ready	Mode 2, form 2 and Form 2
CD-Bridge and PhotoCD	Single and multiple session MPC-2

StorageWorks RWZ52 Multifunction Optical Drive

The RWZ52 is a 5.25-inch full-height multifunction optical disk drive the supports write-once and rewritable operations subject to the storage management software capabilities. The drive provides removable, random access storage through low cost-per megabyte write-once or rewritable optical cartridges. Digital Optical Storage Desktop Software provides necessary drivers for host operating system, and should be ordered at same time RWZ52 drive. RWZ01 is the first generation optical drive; the RWZ52 drive is a compatible, lower-cost replacement second generation 1.2 Gbyte multifunction (rewritable and write-once) optical drive.

Write-once optical media is often the preferred media for long-term archiving, due to its long life and ability to prevent accidental and/or deliberate overwriting of data. RWZ52 uses random access, removable media for fast application access to data.

An unlimited number of media cartridges can be used in an RWZ52 drive, the average cost per megabyte decreases rapidly as usage increases. Since the RWZ52 drive is multifunction, customers can standardize on one drive for both archival and "working storage" applications, lowering total system costs.

Operating System Support

Integration software options required prior to installing RWZ52:

- OpenVMS VAX V5.5-2 or later requires Optical Storage Desktop Software for device integration.

Ordering Information

RWZ52-FA	Tabletop 5.25" multifunction optical drive
RWZ52-VA	5.25" Multifunction optical drive for StorageWorks
RWX5K-01	Rewritable Media for RWZ52
RWX5K-02	Write-Once Media for RWZ52
QL-0U9A9-AA	Optical Storage Desktop Software license for OpenVMS VAX
QL-2VPA9-AA	Optical Storage Desktop Software license for Digital UNIX

Note: Digital branded media is recommended.

Specifications

Interface	Single-ended SCSI-2; one cable supports robot and drives
Media technology	Magneto-optical (130 mm/5.25 in.)
Archival life	30 years

Capacity	**High-Capacity Mode**	**Low-Capacity Mode**
512-byte sectors	1.2 GB (600 MBs/side)	594 MB (297 MBs/side)
1024-byte sectors	1.3 GB (650 MBs/side)	650 MB (325 MBs/side)
Rewritable standards	ECMA 184	ISO/IEC 10089A
(CCS format)	ISO/IEC DIS 13549 (draft)	ANSI X3.212-1992
Write-once standards	ECMA 184	ISO/IEC 11560
(CCW format)	ISO/IEC DIS 13549 (draft)	ANSI X3.220-1992
Average access time	36.0 ms	31.8 ms
Average load time	2.3 seconds with spin-up	2.8 seconds with spin-up
Data transfer rates		
Reads (maximum sustained)	1.6 MBs/s	1.0 MBs/s
Writes (maximum sustained)		
With verification	0.53 MBs/s	0.33 MBs/s

StorageWorks RW500 Optical Library Family

The StorageWorks RW500 Optical Library (Jukebox) family provides a range of solutions for automated access to large quantities of data—at costs lower than either on-line or operator-attended off-line storage. The RW500 family meets requirements for data-intensive applications and industries, including document image processing, CAD/CAM, CASE, COLD (Computer Output to Laser Disk), financial services, health care, technical publishing, and scientific data collection. Digital's RW500 Optical Library family includes four models with formatted capacities ranging from 19 to 170 Gbyte. Multifunction drives support a mix of both rewritable and write-once (WORM) operations to maximize application design flexibility—subject to the functionality of the storage management software.

With Digital's Optical Storage Management Software (OSMS), the RW500 family can form a complete OpenVMS or Digital UNIX solution. OSMS provides transparent disk-like access to all platters within the jukebox. Functionally, the software makes each side of every platter in the jukebox appear as a logically mounted device to the applications, and mounts platters as those volumes are requested by the application. When a drive detects the presence of WORM or rewritable media, OSMS automatically invokes the appropriate file system (either Files-11 for Rewritable or the OSMS-supplied write-once file system) subject to the functionality of the particular operating system implementation of OSMS.

POLYCENTER Hierarchical Storage Management solution for Digital UNIX is an alternative storage management product which automatically stores files in the most effective media when considering the total cost of storage, frequency access, and latency to data. Active files are promoted to reside on magnetic disks for faster access times while infrequently used files revert to optical storage. Users and applications perceive a single integrated file system which may span magnetic disks and physical platters to offer a single logical volume thereby facilitating storage management and accessibility.

Features

- Wide range of product meets price/capacity requirements that vary by application or site
- Multifunction drive support for maximum flexibility
- Multi-density (600 Mbyte/1.2 Gbyte) drive for multiple generation compatibility
- Easy-to-use development platform
- Widespread applications support.
- Commitment to media standards
- Industry leadership reliability for library mechanism (robot), electronic, and the optical drive

Configuration Guidelines

- All jukeboxes include universal power supplies.
- Each jukebox requires one SCSI for the robot, plus one for each drive, all of which must appear sequentially on the same SCSI bus.
- A complete configuration requires the appropriate RW500 library, media, and storage management software. A software license corresponding to the jukebox ordered must be selected from the ordering information contained in the SPD.

Prerequisite Hardware

Refer to the specific storage management SPD for a list of supported CPUs and additional details.

- KZQSA Adapter required for Q-bus MicroVAX and VAX 4000 systems.
- On most systems, a BC06P-06 50-pin low-density SCSI cable, supplied with the jukebox, is needed to connect the jukebox to the system.
- VAXstation 3100 Models 38 and 48 require a BC56H-xx cable.

Prerequisite Software

- Optical Storage Management Software (OSMS)
  - Alpha Systems OpenVMS V6.1 or later, or Digital UNIX V3.0 or later
  - VAX Systems OpenVMS V5.5-2 or later
- POLYCENTER Hierarchical Storage Management for Digital UNIX V2.1, V3.0, V3.2

StorageWorks RW500 Optical Library Family *(continued)*

RW500 Optical Library Ordering Information

RW525-ZA	19 GB (formatted) single-drive optical library
RW536-ZF	170 GB (formatted) four-drive optical library
RW531-ZC	38 GB (formatted) dual-drive optical library
RW532-ZF	76 GB (formatted) four drive optical library

Software

SPD 47.45	Optical Storage Desktop Software for OpenVMS (OSDS)
SPD 53.39	Optical Storage Desktop Software for Digital UNIX (OSDS)
SPD 47.46	Optical Storage Management Software for OpenVMS (OSMS)
SPD 53.38	Optical Storage Management Software for Digital UNIX (OSMS)
SPD 50.71	POLYCENTER Hierarchical Storage Management for Digital UNIX

Optical Media

RWX5K-01	1.2 GB 5.25-inch rewritable media
RWX5K-02	1.2 GB 5.25-inch CCW WORM media

Note: Digital branded media is recommended.

Specifications

Interface	Single-ended SCSI-2; one cable supports robot and drives
Media technology	Magneto-optical (130 mm/5.25 in.)
Archival life	30 years

Capacity	**High-Capacity Mode**	**Low-Capacity Mode**
512-byte sectors	1.2 GB (600 MBs/side)	594 MB (297 MBs/side)
1024-byte sectors	1.3 GB (650 MBs/side)	650 MB (325 MBs/side)
Rewritable standards	ECMA 184	ISO/IEC 10089A
(CCS format)	ISO/IEC DIS 13549 (draft)	ANSI X3.212-1992
Write-once standards	ECMA 184	ISO/IEC 11560
(CCW format)	ISO/IEC DIS 13549 (draft)	ANSI X3.220-1992
Average access time	36.0 ms	31.8 ms
Average load time	2.3 seconds with spin-up	2.8 seconds with spin-up
Data transfer rates:		
Reads (maximum sustained)	1.6 MBs/s	1.0 MBs/s
Writes (maximum sustained)		
With verification	0.53 MBs/s	0.33 MBs/s

Jukebox Characteristics	**RW525**	**RW531/RW532**	**RW536**
Average disk exchange time	8 seconds	6 seconds	8 seconds
Height (mm/in.)	494/19.4	910/35.8	1847/72.7
Width (mm/in.)	220/8.7	375/33.5	651/25.6
Depth (mm/in.)	694/27.3	480/19.0	971/38.2
Weight (kg/lb)	21/45	100/220	360/792
Environmental			
Operating temperature	5° to 50° C	10° to 40° C	10° to 40° C
Non-operating	–40° to 70° C	–40° to 60° C	–30° to 60° C
Operating humidity	10% to 90%	10% to 90%	10% to 90%
Non-operating	5% to 95%	5% to 95%	5% to 95%
Power Requirements			
Voltage	110–240 Vac	100–240 Vac	110–240 Vac
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Power consumption			
Typical/maximum	70/100 W	250/275 W	200/457 W

StorageWorks TL810 DLT Automated Tape Library

The TL810 is a mid-range automated tape library based on DLT technology. The TL810 library, the second member of Digital's library family, has a smaller capacity, higher ratio of drive-to-cartridge units and a smaller footprint than the high-capacity TL820 library. With a capacity of 52 cartridges and 4 Digital Linear Tape (DLT) TZ87 drives, the TL810 library offers a range of capacity from 0.5 to 1.0 Terabyte. This storage library includes robotic hardware and firmware necessary to store and move up to 52 DLT cartridges, 4 of which are contained in a built-in four-cartridge Load Port (Import/Export).

The TL810 provides a faster access automated tape library that is ideal for data-center applications for Digital systems, platforms, clusters, and networks. The unsurpassed speed, capacity, and reliability of DLT technology (ANSI standard), integrated with highly reliable proven robotics design, provide a high capacity, high performance, quality product for departmental storage needs.

Combined with Digital's POLYCENTER Storage Management software application solutions, or third party applications, the TL810 tape library makes backup, archive, and POLYCENTER Hierarchical Storage Management operations easy, quick, reliable, and cost effective.

- Extends the benefits of automated storage management to department and client/server applications presently enjoyed by larger enterprisewide datacenters.
- Integrates automated backup and archiving, and hierarchical storage management to department operations.
- Protects against data loss by providing accurate, secure, auditable archiving and backup of information.
- Provides near-on-line storage in huge capacities but with a small footprint for data-center, network, and server applications.
- Boosts productivity and lowers costs for data-center management and operations through automated access to data.
- Provides cost effective and reliable storage for POLYCENTER Hierarchical Storage Manager applications.
- With appropriate application support, provides built-in Automatic Drive Cleaning feature that allows high availability of drives without operator intervention.

Operating System Support

- OpenVMS Alpha V6.2 and OpenVMS VAX V6.x
- Digital UNIX V3.0 or later (requires SCSI CAM Layered Software V3.0) see POLYCENTER NetWorker Save and Restore SPD for details

POLYCENTER Support

- POLYCENTER suite of NetWorker Save and Restore V3.1 or later
- POLYCENTER Hierarchical Storage Management for OpenVMS V1.1 or later
- Storage Library System V2.5B or later
- POLYCENTER Archive Backup V1.0 or later
- POLYCENTER Sequential Media File System V1.1 or later
- HSOF V2.5 firmware for HSJ30/40 and HSD30 controllers and V8.4 for HSC65/95 controllers is planned

The TL810 ships with four TZ87 drives installed in system, one cleaning cartridge, and one DLT data cartridge. Application software and external cabling for adapters and controllers must be ordered separately.

TL810-BA TL810 Automated Tape Library

Specifications

Storage media	4 DLT TZ87N tape drives
Library cartridge capacity	52 tape cartridges
Single cartridge capacity	10 GB (native)/ 20 GB (compressed)
Single drive transfer rate	1.25 MB (native)/ 2.5 MB (compressed)
Compatibility	VAX and Alpha platforms, OpenVMS and Digital UNIX operating systems
Interface	SCSI-2 (Differential)
Height	43.3 inches (1.10 meters)
Width	23 inches (0.58 meters)
Depth	31.9 inches (0.81 meters)
Weight	378 lbs. (171.51 Kg.) with 52 cartridges and DLT tape drives
Power	115V/230V, 50Hz/60Hz (nominal)

StorageWorks TL812 DLT Automated Tape Library

The TL812 is a mid-range automated tape library based on DLT technology. With a capacity of 48 cartridges for data storage and 4 Digital Linear Tape (DLT) TZ88 drives, the TL812 library offers a range of data storage capacity from 0.96 to 1.92 Terabytes. This storage library includes robotic hardware and firmware necessary to store and move up to 52 DLT cartridges, 4 of which are contained in a built-in four-cartridge Load Port (Import/Export).

The TL812 provides a faster access automated tape library ideal for data-center applications for Digital systems, platforms, clusters, and networks. The unsurpassed speed, capacity, and reliability of DLT technology (ANSI standard), integrated with highly reliable proven robotics design, provide a high capacity, high performance, quality product for departmental storage needs.

Combined with Digital's POLYCENTER Storage Management software application solutions, or third party applications, the TL812 tape library makes backup, archive, and POLYCENTER Hierarchical Storage Management operations easy, quick, reliable, and cost effective.

- Extends the benefits of automated storage management to department and client/server applications presently enjoyed by larger enterprisewide data-centers.
- Integrates automated backup and archiving, and hierarchical storage management to department operations.
- Protects against data loss by providing accurate, secure, auditable archiving and backup of information.
- Provides near-on-line storage in huge capacities but with a small footprint for data-center, network, and server applications.
- Boosts productivity and lowers costs for data-center management and operations through automated access to data.
- Provides cost effective and reliable storage for POLYCENTER Hierarchical Storage Manager applications.
- With appropriate application support, provides built-in Automatic Drive Cleaning feature that allows high availability of drives without operator intervention.

Operating System Support

- OpenVMS Alpha V6.2 and OpenVMS VAX V6.1 (see specific POLYCENTER Application SPDs for details).
- Digital UNIX V3.2 (see specific POLYCENTER Application SPDs for details).

POLYCENTER Support (see specific POLYCENTER Application SPDs for details).

- POLYCENTER NetWorker Save and Restore (NSR) V3.2
- POLYCENTER Hierarchical Storage Management for OpenVMS (VHSM) V1.2A
- Storage Library System for OpenVMS (SLS) V2.6
- POLYCENTER Archive Backup for OpenVMS (PAB) V1.1
- POLYCENTER Sequential Media File System (SMF) V1.2 (requires OpenVMS V6.2 on Alpha systems)
- Media Robot Utility (MRU) V1.0
- HSOF V2.7 firmware for HSJ30/40 and HSD30 controllers

TL812 ships with four TZ88 drives installed in system, one cleaning cartridge, and one DLT data cartridge. Application software and external cabling for adapters and controllers must be ordered separately.

TL812-BA TL812 Automated Tape Library

Specifications

Storage media	4 DLT TZ88 tape drives
Library cartridge capacity	52 tape cartridges
Single cartridge capacity	20 GB (native)/ 40 GB (compressed)
Single drive transfer rate	1.5 MB /sec (native)/ 3.0 MB /sec (compressed)
Compatibility	VAX and Alpha platforms, OpenVMS and Digital UNIX operating systems
Interface	SCSI-2 (Differential)
Height	43.3 inches (1.10 meters)
Width	23 inches (0.58 meters)
Depth	31.9 inches (0.81 meters)
Weight	378 lbs. (171.51 Kg.) with 52 cartridges and DLT tape drives
Power	115V/230V, 50Hz/60Hz (nominal) IEC 320 male connector

StorageWorks TL820 DLT Automated Tape Library

The TL820 Digital Linear Tape (DLT) library is the newest member of Digital's family of near-line automated storage products, providing up to 5.2 Terabytes of storage for unattended backup operations, archiving, hierarchical storage management, large-scale data storage, and video-on-demand applications.

With up to twice the storage capacity of current IBM 3480-compatible ATL subsystems, in a significantly smaller footprint and at significantly lower cost, the TL820 will provide users with the ability to automate large-scale backup and archiving and hierarchical storage management operations at a fraction of the cost of other technologies. The extensible nature of the units, combined with future growth in drive capacity, provide a scaleable solution for application and system growth.

The performance and capacity of the TL820 subsystem are ideally suited to the implementation of large-scale archival, hierarchical storage management and near-line storage, significantly reducing the total cost of implementing advanced automated solutions. The TL820 uses three high performance TZ87 tape drives for unsurpassed data integrity, and high capacity (up to 20 Gbytes compressed per cartridge).

The TL820 is a high capacity, 264-cartridge automated tape library (ATL) designed to provide high capacity storage and robotic access for Digital's DLT series of tape drives. Housed in a 79-inch (200 cm) tall cabinet, each 28-inch (72 cm) wide tower contains up to 264 DLT tape cartridges and three differential SCSI-2 DLT drives. A single TL820 can provide 2.6 Terabytes of storage capacity, or approximately 5.2 Terabytes utilizing the TZ87 drive's hardware data compression. With some applications, up to five TL820 towers can be connected together with their robots supported by one differential SCSI-2 multi-unit controller.

Features

- Based on industry-leadership DLT tape technology
- High capacity and performance in small (9 sq. ft) footprint
- Lowers entry-price for large-scale unattended backup and archiving
- Available now for Digital UNIX, OpenVMS VAX and Alpha systems

Prerequisites

- Each library cabinet requires two SCSI-2 buses
- Use of the TL820 requires robotics and media management software.
- OpenVMS VAX and Alpha supported Storage Management Solutions include the following Digital products:
  - POLYCENTER Archive Backup (PAB V1.0) and Storage Library System (SLS V2.5b)
  - POLYCENTER Hierarchical Storage Management (HSM V1.1)
  - POLYCENTER Sequential Media Filesystem (SMF V1.1)

Note: The above applications incorporate the Media and Device Management Services (MDMS).

- Digital UNIX V3.0 operating system support is provided by POLYCENTER NetWorker and Restore V3.1 (NSR V3.1) or later applications software. Refer to the NSR SPD for application and SCSI CAM Layered Software support prerequisites.
- Users who purchase the 2T-TL820-BA receive DECLS software and service. DECLS provides software connectivity under OpenVMS VAX and Alpha operating systems compatible with third party tape management software products which issue OPCOM messages to load and unload tape devices. POLYCENTER VMS solutions no longer require DECLS software. Refer to the DECLS SPD for DECLS prerequisites.
- Hardware is supported on OpenVMS Alpha V1.5 and V6.1 and V6.2 for DEC 3000/4000/7000/10000 and AlphaServer 2100 systems
- Hardware is supported on OpenVMS V5.5-2, V6.0, V6.1 and V6.2 for VAX 6000/7000/9000 and VAX-11/750 and VAX-11/780 systems.

Note: Software applications may require different levels of operating system support. Refer to applications SPDs for the application minimum requirements

StorageWorks TL820 DLT Automated Tape Library *(continued)*

The first unit ordered must be TL820-BA or 2T-TL820-BA. TL820-AC is an add-on for expandability and requires a base library unit. Check applications for support of add-on library towers.

TL820BA	DLT tape library with three TZ87 drives and Inport/Outport Device
TL820-AC	DLT library expansion cabinet with three TZ87 drives and attachment kit
TL82X-BA	Cartridge bin pack for TL820, holds 11 cartridges
2T-TL820-BA	DLT tape library with three TZ87 drives and Inport/Outport Device; DECLS software

Specifications

TL820 Tape Library Unit Specifications	
Height	78.7 in/200 cm
Width	36 in/ 72 cm
Depth	47 in/120 cm
Weight	784 lbs (356 kg) with drives, unloaded
Power	90–132 and 176–264V autoranging, 47 to 63 Hz
MSBF	500,000 swaps
TZ87 Drive Specifications	
Transfer rate	Up to 1.25 MB/s native; up to 2.5 MB/s, compressed
Maximum capacity	20 GB compressed
Durability	500,000 tape-head passes

Note: These performance statistics reflect only the drive capabilities; actual drive performance is a function of the system configuration and its application

StorageWorks TL822 DLT Automated Tape Library

The TL822 Digital Linear Tape (DLT) library providing up to 10.56 Terabytes of storage for unattended backup operations, archiving, hierarchical storage management, large-scale data storage, and video-on-demand applications.

With significantly greater storage capacity than the IBM 3480-compatible ATL subsystems, in a smaller footprint, the TL822 provides users with the ability to automate large-scale backup and archiving and hierarchical storage management operations at a fraction of the cost of other technologies.

The performance and capacity of the TL822 subsystem are suited to the implementation of large-scale archival, hierarchical storage management and near-line storage. The TL822 uses three high performance TZ88 tape drives for unsurpassed data integrity, and high capacity (up to 40 Gbytes compressed per cartridge)

The TL822 is a high capacity, 264-cartridge automated tape library (ATL) designed to provide high capacity storage and robotic access for Digital's DLT series of tape drives. Housed in a 79-inch (200 cm) tall cabinet, each 28-inch (72 cm) wide tower contains up to 264 DLT tape cartridges and three differential SCSI-2 DLT drives. A single TL822 can provide 5.28 Terabytes of storage capacity, or approximately 10.56 Terabytes using the TZ88 drive's hardware data compression. With some third party applications, up to five TL822 towers can be connected together with their robots supported by one differential SCSI-2 multi-unit controller.

Features

- Based on industry-leadership DLT tape technology
- High capacity and performance in small (9 sq. ft) footprint
- Lowers entry-price for large-scale unattended backup and archiving
- Available now for Digital UNIX, OpenVMS VAX and Alpha systems

Prerequisites

- Each library cabinet comes configured for three SCSI-2 buses. Internal library cabling modifications can be made (on-site) to support systems with less than three SCSI-2 adapters.
- Use of the TL822 requires robotics and media management software.
- OpenVMS VAX and Alpha supported Storage Management Solutions include the following Digital products:
  - Storage Library System for OpenVMS (SLS) V2.6
  - POLYCENTER Hierarchical Storage Management for OpenVMS (VHSM) V1.2A
  - POLYCENTER Archive Backup for OpenVMS (PAB) V1.1
  - POLYCENTER Sequential Media File System (SMF) V1.2 (requires OpenVMS V6.2 on Alpha systems)
  - Media Robot Utility (MRU) V1.0

Note: The above applications incorporate the Media and Device Management Services (MDMS)

- Digital UNIX Alpha supported Storage Management Solutions include the following Digital products:
  - POLYCENTER NetWorker Save and Restore (NSR) V3.2
  - Media Robot Utility (MRU) V1.0
- Every TL822 Library comes with Media Robot Utility (MRU) software.

Note: Software applications may require different levels of operating system support. Refer to applications SPDs for the application minimum requirements.

The first unit ordered must be TL822-BA. TL822-AC is an add-on for expandability and requires a base library unit. Check applications for support of add-on library towers.

TL822-BA	DLT tape library with three TZ88 drives and Inport/Outport Device
TL822-AC	DLT library expansion cabinet with three TZ88 drives and attachment kit
TL82X-BA	Cartridge bin pack for TL822, holds 11 cartridges

StorageWorks TL822 DLT Automated Tape Library *(continued)*

Specifications

TL822 Tape Library Unit Specifications	
Height	78.7 in/200 cm
Width	36 in/ 72 cm
Depth	47 in/120 cm
Weight	784 lbs (356 kg) with drives, unloaded
Power	90–132 and 176–264V autoranging, 47 to 63 Hz
MSBF	600,000 swaps
TZ88 Drive Specifications	
Transfer rate	Up to 1.5 MB/s native; up to 3.0 MB/s, compressed
Maximum capacity	40 GB compressed

Note: These performance statistics reflect only the drive capabilities; actual drive performance is a function of the system configuration and its application

StorageWorks TZ87/TZ88 DLT Cartridge Tape Drives

The Digital Linear Tape Drive (DLT) family cartridge tape drives are industry-leading 5.25-inch streaming linear recording tape devices, designed for systems requiring high performance, high data integrity, and unattended backup. The performance and capacity of the DLT cartridge tape drive subsystem is unrivaled. With a sustained transfer rate of up to 2.5M Kbytes per second and up to 40 Gbytes of formatted capacity (2 to 1 compression), the TZ87/TZ88 tape drives can complete full backups in under an hour. A 512-Kbyte adaptive cache matches the speed of the tape subsystem to system performance, minimizing repositioning delays, and a dual-channel read/write head design provides a high data transfer rate.

Extensive error detection and correction make the data integrity of the DLT cartridge tape subsystem comparable to that of magnetic disks. Other advanced data integrity features include a custom 64-bit CRC on each 2 Kbytes of data on media; a powerful custom Reed Solomon ECC, end-to-end EDC on data (onto media and back) as well as parity checking on data cache memory. These features combine to produce undetected errors of less than 1 in 10 (27) bits and unrecovered read errors of less than 1 in 10 (17) bits.

Extensive diagnostic and troubleshooting features include serial EIA-422 ports on the subsystem and controllers for off-line troubleshooting and POST (power on self-test) error reporting, embedded diagnostic and self-test software, and LEDs for indication of operating and fault information. Tape composition, rugged cartridge design, and gentle tape handling of the DLT cartridge tape subsystems result in a durable medium that can be used for over 200,000 tape-head passes.

The TZ87 DLT cartridge tape drive uses the CompacTape III cartridge, which contains 335 meters (1100 feet) of half-inch-wide metal powder (MP) tape. MP tape is a durable medium, thus providing longer media life than many other tapes. TZ87 tape drives offer TZ85/TZ86 read and write compatibility, and TZ30/TK50/TK70 read compatibility. TZ87N tape drives offer TZ87, TZ86 and TZ85 read and write compatibility only.

The TZ88 is read/write compatible with the TZ85, TZ86, TZ87 and TZ88. The TZ88 uses CompacTape IV or CompacTape III media.

Features

- SCSI interface (TZ devices)
- Extensive embedded diagnostic/self-test software
- Four LEDs and audio indicators of subsystem status on front panel

TZ88 Features

- Up to 40 Gbytes capacity per cartridge (compressed 2:1)
- Tabletop enclosure or 5.25-inch StorageWorks carrier
- Read/write compatible with TZ85, TZ86, TZ87, TZ88

TZ87 Features

- Up to 20 Gbytes capacity per cartridge (compressed 2:1)
- Tabletop enclosure, system embedded, or 5.25-inch StorageWorks enclosure
- Read/write compatibility with TZ85/TZ86
- TZ30/TK50/TK70 read compatibility

TZ87N Features

- Up to 20 Gbytes capacity per cartridge (compressed 2:1)
- Tabletop enclosure or 5.25-inch StorageWorks carrier
- Read/write compatible with TZ85/TZ86 only

StorageWorks TZ87/TZ88 DLT Cartridge Tape Drives *(continued)*

Software Support

Most common tape functionality, such as COPY, MOUNT, INIT, BACKUP, TAR, and DUMP will function normally on OpenVMS V5.5-2 or later or ULTRIX V4.2 or later for SCSI-based drives.

The TZ87/877 are also supported on Novell NetWare versions 3.11, 3.12, and 4.01 with Panlindrome's Network Archivist 3.0 and Network Archivist 3.0 SMS software.

The TZ88 is supported on OpenVMS V6.2 and Digital UNIX V3.2 systems.

Note: See system ordering menus for specific variants and quantities supported.

TZ87- JF	TZ87 cartridge tape drive for VAX 4000 BA4xx enclosure and R400X/B400X expansion pedestals; field installed
TZ87-TA	TZ87 cartridge tape drive in tabletop enclosure for SCSI-based systems. Requires external SCSI cable.
TZ87-VA	TZ87 cartridge tape drive in 5.25-inch StorageWorks carrier
TZ87N-TA	TZ87N cartridge tape drive in tabletop enclosure for SCSI-based systems. TZ85/86/87 read/write compatible only. Requires external SCSI cable.
TZ87N-VA	TZ87N cartridge tape drive in StorageWorks carrier, TZ85/86 read/write compatible only
TZ88N-TA	TZ88N half-inch cartridge tape drive in tabletop enclosure. TZ85, TZ86, TZ87, TZ88 read-write compatible. Includes media and documentation
TZ88N-VA	TZ88N half-inch cartridge tape drive in StorageWorks 5.25-inch carrier, TZ85, TZ86, TZ87, TZ88 read-write compatible. Includes media and documentation.

Note: Cables, media, and power cords for the Tx800 family are described in the next section.

StorageWorks TZ877/TZ875 Magazine Tape Subsystems

DLT magazine tape subsystems—TZ877 or TZ875— combine the DLT cartridge tape drive and an automatic cartridge loader to provide highly reliable unattended backup for SCSI systems. Five or seven cartridges are inserted into the removable magazine. An internal, elevator-like mechanism moves to each of the storage slots to load and unload cartridges. The TZ877 subsystem can back up as much as 140 Gbytes in three shifts (24 hours) without operator intervention.

DLT magazine tape subsystems are offered in full-rack enclosure for inclusion in the BA100 storage array pedestals and the integrated storage array systems.

TZ877 Features

- Incorporates the 20 Gbyte TZ87/TZ87N cartridge tape drives
- Maximum capacity: up to seven cartridges for up to 140 Gbyte unattended backup
- TZ30/TK50/TK70 read compatibility (except for TZ87N, TZ877-NA/NE)
- TZ87 read/write compatibility (TZ857, TZ867, TZ875, TZ877)
- Available in pedestal enclosure (SZ107)
- Available in tabletop enclosure (TZ875-TA or TZ875-NT)
- Available for inclusion in storage arrays (TZ877-AE, NE)

Software Support

The TZ87, TZ875, TZ877, TZ87N, TZ875N, and TZ877N are supported on OpenVMS V5.5-2, ULTRIX 4.2A, Digital UNIX V2, and OpenVMS Alpha V1.5. In addition, the TZ86 and TZ87 are supported in Microsoft Windows NT V3.5.

Upgrades

The TZ877-UG/UN packages include the appropriate variant of the Tx86 or TZ87 drive, which will be exchanged in the field for the Tx85 drive that is contained in an existing Tx857 tape subsystem. Return of the existing Tx85 cartridge tape drive is required.

Note: TZ877 upgrades will upgrade Tx857/867 to SCSI TZ877. Only loaders with revisions EO3 or greater can utilize this upgrade package. The rev level is posted on the side of the read chassis, near the regulatory label.

TZ877

TZ877-AE/AF	SCSI 140 GB (formatted) cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mounting brackets and cables, 120/240 V
TZ877-NE/NF	SCSI 140 GB (formatted) cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mounting brackets and cable, 120/240 V. Tz85 and TZ86 read/write compatible only.
SZ107-AA/AB	SCSI 140 GB (formatted) cartridge loader tape subsystem in pedestal enclosure, 120/240 V

TZ875

TZ875-TA	SCSI 100 GB (formatted) tabletop five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read compatible with TK50/TK70/TZ30/TZ85/TZ86 formats. Read/write compatible with TZ85/TZ86.
TZ875-NT	SCSI 100 GB (formatted) tabletop five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read/write compatible with the TZ85/TZ86.
TZ875-AE	SCSI 100 GB (formatted) rackmount five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read compatible with TK50/TK70/TZ30/TZ85/TZ86 formats. Read/write compatible with TZ85/TZ86.
TZ875-NE	SCSI 100 GB (formatted) rackmount five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read/write compatible with the TZ85/TZ86.

StorageWorks TZ877/TZ875 Magazine Tape Subsystems *(continued)*

SCSI Cables

BC09D-12	DECsystem 5900/ DECsystem 5000	3.6-m (12-ft) SCSI cable, Champ/SCSI-2
BC06P-2F	MicroVAX 3100 10E, 20E, 30, 40, and 80	76.2-cm (2.5-ft) SCSI cable, TLZ04, RRD40, TZ85
BC06P-06	MicroVAX 3100 10E, 20E, 30, 40, and 80	1.8-m (6-ft) SCSI cable, TLZ04/RRD40/TZ85
BC06P-09	MicroVAX 3100 10E, 20E, 30, 40, and 80	2.7-m (9-ft) SCSI cable, TLZ04/RRD40/TZ85

Media

TK85K-01	Single tape cartridge for Tx800 cartridge tape subsystems
TK85K-07	Seven tape cartridges for Tx800 cartridge tape subsystems
TK85K-A0	1008 tape cartridges for Tx800 cartridge tape subsystems
TK85-HC	Head cleaning cartridge for Tx800 cartridge tape subsystems
TK85-M	Seven-cartridge magazine for Tx800 magazine tape subsystems
THXKD-01	Single tape cartridge for TZ88 tape drives

Power Cords

The following power cords are required for supporting the Tx800 tabletop option. Choose one for each 220/240 V option ordered. 120 V power cord included with Tx800 tabletop option unless another power cord is specified.

BN19H-2E	Australia/New Zealand
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Configuration Notes

The TZ87/TZ875/TZ877 are supported with restrictions in OpenVMS V5.5-2 and ULTRIX V4.3.

StorageWorks TZ887/TZ885 DLT Magazine Tape Subsystems

DLT magazine tape subsystems—TZ887 or TZ885— combine DLT cartridge tape drive and an automatic cartridge loader to provide highly reliable unattended backup for SCSI systems. Five or seven cartridges are inserted into the removable magazine. An internal, elevator-like mechanism moves to each of the storage slots to load and unload cartridges.

DLT magazine tape subsystems are offered in full-rack enclosure for inclusion in the BA100 storage array pedestals and the integrated storage array systems.

TZ887 Features

- Incorporates the 40 Gbyte TZ88N cartridge tape drives
- Maximum capacity: up to seven cartridges for up to 280 Gbyte unattended backup
- TZ88 read/write compatibility (TZ857, TZ867, TZ875, TZ877, TZ885, TZ887)
- Available in pedestal enclosure (SZ107) and tabletop enclosure (TZ885-NT)
- Available for inclusion in storage arrays (TZ887-NE)

Software Support

TZ88, TZ885 and TZ887 are supported on OpenVMS V6.2, Digital UNIX V3.2

Upgrades

TZ887-UN package includes appropriate variant of TZ88 drive, which will be exchanged in the field for Tx85 drive contained in an existing Tx857 tape subsystem.

Note: TZ887 upgrades will upgrade Tx857/867 to SCSI TZ887. Only loaders with revisions EO3 or greater can use this upgrade package. The revision level is posted on side of read chassis, near regulatory label.

TZ887

TZ887-NE/NF	140/180 GB cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mounting brackets and cable, 120/240 V. TZ85 and TZ86 read/write compatible only.

TZ885

TZ885-NT	SCSI 200 GB tabletop five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read/write compatible with the TZ85/TZ86.
TZ885-NE	SCSI 200 GB rackmount five cartridge loader tape subsystem. Includes magazine, five data cartridges, power cord, and documentation. 110/220 power selectable. Read/write compatible with the TZ85/TZ86.

SCSI Cables

BC19J-xx	DECsystem 3000
BC06P-xx	DECsystem 4000
BN23G-02	DECsystem 7000, 1000

Media

TK85-HC	Head cleaning cartridge for Tx800 cartridge tape subsystems
TK85-M	Seven-cartridge magazine for Tx800 magazine tape subsystems
THXKD-01	Single tape cartridge for TZ88 tape drives
TK87-MA	Single tape cartridge for TZ88 tape drives

StorageWorks TZ887/TZ885 DLT Magazine Tape Subsystems *(continued)*

Power Cords

Power cords required for Tx800 tabletop option. Choose one for each 220/240 V option ordered. 120 V power cord included with Tx800 tabletop option unless another power cord is specified.

BN19H-2E	Australia/New Zealand
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Specifications

Performance	**TZ87/TZ88**
Data transfer rate (formatted)	2.5 MB/second
Read/write speed	150 in./s
Data Organization	
Recording format	128-track serial serpentine variable block
Recording density	62,500 bits/inch (TZ87); 82,000 bits/inch (TZ88)
Recording method	MFM, bit serial data
Track density	256 tracks per inch
Read-write head	Two-channel ferrite, w/MIG
Supported Interface	
SCSI-2	TZ87, TZ88, TZ877, TZ887, SZ107

TZ87

Physical Characteristics	**Drive Only**	**With Bezel**	**Total**
Width	14.5 cm (5.7 in.)	14.9 cm (5.87 in.)	14.9 cm(5.8 in.)
Height	11.3 cm (4.5 in.)	8.6 cm (3.4 in.)	11.3 cm (4.5 in.)
Length (from back of bezel)	22.9 cm (9.0 in.)	1.5 cm (0.6 in.)	24.4 cm (9.6 in.)
Weight	2.27 kg (5 lb)	3.2 kg (7 lb)	
Power Requirements			
Voltage	+5 V, +12 V, dc only		
Power consumption	27 watts maximum, 25 watts typical		
Dissipation (maximum watts x 3.41)	192 Btu's		
Line type	Molex 5129-4A		

StorageWorks DLT Tape Specifications *(continued)*

TZ87/TZ88 Tabletop

Physical Characteristics	
Height	14.52 cm (5.72 in.)
Width	23.49 cm (9.25 in.)
Length	33.22 cm (13.08 in.)
Weight (box only)	4.6 kg (10.1 lb)
Weight (box with drive)	7.7 kg (16.9 lb)
Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	27 watts maximum, 25 watts typical
Dissipation (maximum watts x 3.41)	192 BTUs
Line type	Single-phase AC, NEMA#515, IEC#320

TZ877/TZ887

Physical Characteristics	
Height	2.65 cm (10.42 in.)
Width	22.2 cm (8.74 in.)
Length	68.6 cm (27.0 in.)
Weight	25 kg (55 lb)
Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	83.5 watts maximum, 82 watts typical
Dissipation (maximum watts x 3.41)	285 Btu's
Line type	Single-phase, ac, NEMA#515, IEC#320

SZ107

Physical Characteristics	
Height	68.6 cm (27 in.)
Width	45.7 (18 in.)
Length	86.4 cm (34 in.)
Weight (box only)	72.7 cm (160 lb)
Weight (box with Tx857)	102.2 kg (225 lb)
Weight (box with Tx857 and Sx72)	111.8 kg (246 lb)
Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	113 watts maximum, 82 watts typical
Dissipation (maximum watts x 3.41)	285 Btu's
Line type	Single-phase ac, NEMA #515, IEC #320

StorageWorks DLT Tape Specifications *(continued)*

Cartridge

Physical Characteristics	TK85K	THXKD
Width	10.5 cm (4.15 in.)	10.5 cm (4.15 in.)
Height	2.54 cm (1.0 in.)	2.54 cm (1.0 in.)
Length	11.3 cm (4.165 in.)	11.3 cm (4.165 in.)
Weight	7.7 ounces	7.85 ounces
Tape	0.53-mil thick, 0.5-inch metal powder	0.53-mil thick, 0.5-inch metal powder
Length	1186 feet of usable tape	1,780 feet of usable tape
Cartridge	Digital-designed CompacTape III	Quantum
Durability, magazine	10,000 insertions	10,000 insertions
Durability, cartridge	20,000 passes	20,000 passes
Compatibility	TK50-K (TZ30, TK50), TK52-K (TK70)and TK85K	TK85, THXKD

Magazine

Physical Characteristics	
Width	13.25 cm (5.217 in.)
Height	21.89 cm (8.622 in.)
Length	11.8 cm (4.646 in.)
Weight (empty)	0.59 cm (1.3 lb)
Weight (fully loaded)	2.04 cm (4.5 lb)

TZ875/TZ885

Physical Characteristics	Tabletop	Rackmount
Width	30.0 cm (11.8 in.)	29.5 cm (11.6 in.)
Height	41.4 cm (16.3 in.)	41.4 cm (16.3 in.)
Length	26.7 cm (10.5 in.)	25.4 cm (16.2 in.)
Weight	15.9 kg (35 lb.)	12.27 kg (27 lb.)
Power		
Voltage	100 to 240 VAC	
Power consumption (W)	100 (Max.); 40 (Typical)	

StorageWorks TLZ09 DAT Tape Drive and TLZ7L Autoloader

TLZ09 is a DDS-2 DAT tape drive for backup, archiving, and data interchange applications. Based on the DDS-2 standard, the TLZ09 provides up to 8 Gbytes of unattended backup capability with a sustained transfer rate of up to 1,550 Kbytes/per second. It is up to 90% faster that other DDS-2 DAT drives. It is offered as an embedded device, in a 3.5-inch or 5.25-inch, half-height form factor, as a StorageWorks System Building Block or as a tabletop model. It is read and write compatible with media used in TLZ04, TLZ06, TLZ07 tape drives and TLZ6L and TLZ7L tape loaders and other DDS, DDS-DC and DDS-2 compliant tape drives.

The TLZ7L is a DDS-2 compliant, 4-mm DAT loader that provides up to 96 Gbytes of unattended backup and archiving capability with a transfer rate of up to 810 KB per second. It is ideal for unattended backup of workstations and servers. It provides up to 32 Gbytes of unattended capacity with its standard 4-cartridge magazine and up to 96 Gbytes with its optional 12-cartridge magazine. The TLZ7L is also read-write compatible with the media used in the TLZ6L loaders, and TLZ04, TLZ06, TLZ07 and TLZ09 drives.

Both TLZ09 and TLZ7L are third-generation DAT drives with hardware data compression and read-after-write verification to provide reliable data recording on 60, 90 or 120 meter data cassettes. The Digital Data Storage (DDS) recording format implements 10 distinct error-handling techniques, including three levels of error correction code (ECC) to ensure superlative data reliability.

The 8 Gbyte tape capacity of the TLZ09 tape drive and TLZ7L tape autoloader is achieved by a combination of 120-meter cassette and typical 2x data compression. These features, combined with Digital Data Storage recording formats (DDS-DC), ensure interchangability as capacity increases. DDS-2 labeled media is required to ensure the highest data integrity during read/write operations.

Both TLZ09 and TLZ7L implement the DDS-2 media recognition system which identifies a striped tape leader on data-grade tapes. The system eliminates performance and service issues related to inadvertent use of audio-grade media cartridges.

Data compression is software selectable on the TLZ09 and TLZ7L. It can be turned off to read and write to 60 or 90 meter DAT tapes for interchange with the TLZ04 or TLZ06 tape drives. However, it is important to remember that data compressed and recorded on 60 meter DAT cassettes cannot be read by the TLZ04 drive. The TLZ04 will **not** handle 90 or 120 meter DAT cartridges, and the TLZ06 will **not** handle 120 meter DAT cartridges.

Features TLZ09 DAT tape drive

- Fast back up. 775/1550-Kbyte/s transfer rate. Up to 90% faster than comparable products
- Up to 8 gigabytes capacity per cassette
- Read and write compatible with TLZ04, TLZ06, TLZ07, TLZ6L and TLZ7L
- Industry-standard DDS, DDS-DC and DDS-2 formats for industry-wide data interchange
- Compatible with Digital UNIX, VMS-Alpha, VMS VAX, Windows NT and StorageWorks solutions

Features TLZ7L DAT tape loader

- Up to 32 megabytes unattended backup capacity standard. Up to 96 gigabytes with optional 12 cartridge magazine.
- Fast backup 810-Kbyte/s transfer rate (with data compression) for an unattended backup rate of 1.5 Gbyte/hour
- Read and write compatible with TLZ04, TLZ06, TLZ07, TLZ09, and TLZ6L
- Industry-standard DDS, DDS-DC and DDS-2 formats for industry-wide data interchange

Benefits

- High Unattended Backup Capacity: The DDS-2 format provides a native unattended capacity of 4 Gbytes, and compressed capacity of 8 Gbytes, providing an effective match for many of today's servers. The TLZ7L provides a native, unattended capacity of 32 Gbytes, and compressed capacity of up to 96 Gbytes with the optional TLZ6L-12 magazine.
- First Generation Read/Write Compatibility: The TLZ09 and TLZ7L can read and write DDS, DDS-DC and DDS-2 media ensuring investment protection as well as data interchange with other DDS drives.
- Multiple Packaging Options: The TLZ09 and TLZ7L are available in system-installed, tabletop, and StorageWorks versions to fit the customer's packaging requirements.
- Media Quality Checking: The TLZ07 implements DDS-2 media recognition system, eliminating performance and service issues related to inadvertent use of audio-grade media cartridges.

StorageWorks TLZ09 DAT Tape Drive and TLZ7L Autoloader *(continued)*

Operating System Support TLZ09

- OpenVMS VAX V5.5-2, V5.5-2H4, V6.0, V6.1 (requires MK driver enhancement kit (QA-MT1AA-Up.6.1)
- OpenVMS Alpha V6.2
- Digital UNIX V3.2
- Windows NT v3.51 (with service pack 5), V4.0

Operating System Support TLZ7L

- OpenVMS VAX V5.5-2, V5.5-2H4, V6.0, V6.1 [requires MK driver enhancement kit (QA-MT1AA-Up.6.1)]
- OpenVMS Alpha V1.5 and V6.1 [requires MK driver enhancement kit (QA-MT1AA-Up.6.1)]
- Digital UNIX V2.0
- Windows NT support requires third party application (Seagate Backup Exec, etc.)

POLYCENTER Support TLZ7L

- Storage Library System V2.5
- Hierarchical Storage Management V1.1
- NetWorker Save and Restore V3.0
- Archive Backup V1.0
- Sequential Media File System V1.0

Storage Controllers Support

See controller Software Product Description for controller support information

Note: See system ordering menus for specific variants and quantities supported. One media and cleaning cartridge included with all models.

TLZ09-DB	8 GB 4 mm DAT tabletop tape drive with 3-foot SCSI cable (17-04356-01)for 50 pin HD host SCSI port. Supported on AlphaServers 8400,8200,4100,4000,2100,2100A,2000,1000,400, AlphaStations 600,400,255,250,200,DEC4000-700/600, VAXstation 4000-60/96/98
TLZ09-DC	8 GB 4 mm DAT tabletop tape drive with 3 ft SCSI cable and adapter for 68 HD host SCSI port Supported on AlphaStation 500
TLZ09-DD	8 GB 4 mm DAT tabletop tape drive with 3-foot (17-04370-01) cable for 50 pin LD host SCSI adapter. Supported on VAX 4000 systems, MicroVAX 3100-30/40/80/85/90/96, and DEC 3000 systems.
TLZ09-HF	8 GB 4 mm Internal DAT tape drive. Supported on MicroVAX 3100, VAXstation 4000-60/90/96, VAX 4000 106A (5.25" 068 Gray)
TLZ09-LG	8 GB 4 mm Internal DAT tape drive. Supported on AlphaServer 8400, 8200, 2100, 2000 (5.25" 068 gray)
TLZ09-LK	8 GB 4 mm Internal DAT tape drive. Supported on AlphaServer 4100,4000, VAX 4000-108, MicroVAX 3100-88/98 (5.25" white)
TLZ09-VA	8 GB 4 mm DAT tape drive with snap-in carrier for StorageWorks BA350, BA356 and SW300 Supported on AlphaServer 8400,8200,4100,4000,2100,2000, VAX 4000-108
SWXTA-CT	8 GB 4 mm DAT tabletop tape drive. Supported by StorageWorks RA210,230,310,410,450, ESA-2

TLZ7L Tape Loader

TLZ7L-DA	32 GB, 4 mm tabletop DAT autoloader for AlphaServers and AlphaStations, MicroVAX II, MicroVAX 3100 and DEC 3000 systems and StorageWorks. Includes four cartridge magazine, five data cartridges, cleaning cartridge and 3-ft SCSI (BC19J-03) cable. Supported on AlphaServer 2000/2100,4100/4000 systems (requires BC09D-03 cable)
TLZ7L-GA	32 GB, 4 mm DAT tabletop loader with 6 foot (BC06P-06) cable for VAX 4000 systems
TLZ7L-LG	32 GB, 4 mm DAT internal loader.
TLZ7L-VA	32 GB, 4 mm DAT Loader with snap-in StorageWorks carrier for StorageWorks BA350, BA356, SW300, AlphaServer 8400, 8200, 4100,4000,2100,2100A,2000

StorageWorks TLZ09 DAT Tape Drive and TLZ7L Autoloader *(continued)*

Media

TLZ04-HA	Cleaning cartridge for TLZ04, TLZ06, TLZ07,TLZ09
TLZ04-CB	Five-pack of 60-m data cartridges for TLZ04, TLZ06, TLZ07,TLZ09
TLZ06-CB	Five-pack of 90-m data cartridges for TLZ04, TLZ06, TLZ07,TLZ09
TLZ07-CA	Single 120-m data cartridge for TLZ07,TLZ09
TLZ07-CB	Five-pack of 120-m data cartridges for TLZ07,TLZ09

KZQSA Adapter (required for the following systems)

KZQSA-AA	Adapter for BA23 MicroVAX II systems
KZQSA-BA	Adapter for BA123 MicroVAX II systems
KZQSA-SA/SF	TLZ07 adapter for BA200/BA400 MicroVAX 3000 and VAX 4000 systems; factory/field installed

Power Cords (240 V devices require a country-specific power cord)

BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18U-2E	Israel

Specifications

	TLZ09	**TLZ7L**
Capacity (formatted)	8 GB (120m tape)	8 GB (120m tape)
Buffer Size	1 MB	1 MB
Transfer Rate	775/1550 KBs sustained	405/810 KBs sustained
Format and Compatibility		
Recording Format	DDS-2 (120m tape)	DDS-2 (120m tape)
Write/Read	DDS-1 (90/60m tape)	DDS-1 (90/60m tape)

Physical Characteristics TLZ09 Tape Drive

TLZ09	**3.5-inch Embedded**	**5.25-inch Embedded**	**Tabletop**
Height	4.1 cm (1.6 in.)	4.1 cm (1.6 in.)	52 cm (2.1 in.)
Width	10.1 cm (4.0 in.)	14.6 cm (5.7 in.)	16 cm (6.3 in.)
Depth	146 cm (5.8 in.)	146 cm (5.8 in.)	30 cm (11.8 in.)
Weight	0.7 kg (1.5 lb)	0.9 kg (2.0 lb)	2.2 kg (4.9 lb)

Physical Characteristics TLZ7L Tape Loader

Note: When DDS-media is used, TLZ7L tape loader defaults to DDS-1 format and operation

TLZ7L	**5.25-inch Embedded**	**Tabletop**
Width	14.9 cm (5.87 in.)	23.5 cm (9.25 in.)
Depth	22.2 cm (8.75 in.)	33.0 cm (13.0 in.)
Weight	2.7 kg(6.0 lb.)	6.8 kg (15.0)

StorageWorks TKZ9E 8 mm Helical Scan Tape Drive

The TKZ9E is an industry-standard 8 mm helical scan tape drive which supports 2.3, 5.0, 7.0, 10.0 and 14.0 GB modes. Push buttons on front panel allow user to select a range of densities and compression modes, to ensure compatibility with previous Digital 8 mm tape drives, such as the TKZ08, TLZ08, TKZ09, TKZ15, and Exabyte EXB8200/8500/8505-based tape drives.

The display panel, with two numeric/alphanumeric LED displays and eleven LED indicators, provides valuable operator information on the quality of the tape being used, how much tape is left on cartridge, and whether loaded tape cartridge was written in compressed mode. Both tabletop and StorageWorks system building block variants are available.

Features

- Backward tape compatibility with 8 mm helical scan tape drives
- Storage capacity: 7 GB (14 GB compressed, 2:1 typical)
- Supports 112 meter and extended-length (164 meter) tapes
- Interface: SCSI-2, Single ended, narrow
- Sustained data rate: 500 (1000 compressed) Kbytes-per-second
- Configuration part number suffixes are: -TA for tabletop and -VA for StorageWorks variants
- Comprehensive display panel: 2 numeric/alphanumeric LED displays and 11 LED indicators
- Auto ranging power supply (-TA variant)

Benefits

- Data interchange with older 8 mm tape drives such as TKZ08, TLZ08, TKZ09, TKZ15
- Standard IDRC data compression and extended length tape provide maximum capacity-per-cartridge for backup
- Push button density and compression selection allows various densities to be written independently of host operating system
- High-speed search capability improves system and user productivity
- Drive electronics continuously monitor and adjust compression ratio to determine whether capacity and throughput are working at maximum efficiency
- Powerful onboard error correcting code, automatic read-after-write verification, and write error recovery without host intervention, provide unsurpassed data integrity
- Built-in one megabyte buffer provides increased read/write performance

Operating System Support

- Digital UNIX, V3.2 minimum
- OpenVMS V5.5-2 minimum for OpenVMS VAX systems
- OpenVMS V6.2 minimum for OpenVMS Alpha systems

Connectivity

- Most native single-ended SCSI ports
- PMAZC TurboChannel/SCSI adapter
- KZPAA PCI/SCSI adapter
- KZPSA PCI/SCSI adapter
- PB2HA EISA/SCSI adapter
- DWZZA differential to single-ended converter
- KZQSA Qbus/SCSI adapter
- KZMSA XMI/SCSI adapter
- AlphaServer 8200 and 8400 with KFTIA adapter

TKZ9E 8 mm Tape Drives

TKZ9E-TA	8 mm Tape Drive, SCSI, (8200/8500/8505-compatible), tabletop Unit, 120V AC Power Cord, and SCSI Terminator, with One Cleaning Cartridge, Two Blank 112-meter Tapes, and User Documentation (1)
TKZ9E-VA	8 mm Tape Drive, SCSI, (8200/8500/8505-compatible), StorageWorks System Building Block, with One Cleaning Cartridge, Two Blank 112-meter Tapes, and User Documentation
TKZ8X-CB	Five, 112-meter, 8 mm Tape Cartridges

StorageWorks TKZ9E 8 mm Helical Scan Tape Drive *(continued)*

SCSI Cabling

The TKZ9E-TA, tabletop variant uses a 50-pin low density, bail lock "champ" SCSI connector. SCSI cables must be order separately.

Power Cords

Note: The -TA tabletop variant includes a 120 V power cord. Select country specific power cord for all other voltages.

BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18U-2E	Israel

Specifications

Drive Specification	
Physical block size	1024 data bytes +400 ECC bytes
Data Buffering	1 MB speed matching buffer
Transfer Rate	500 KB/second to 75 MB/second
Track Density	1640 tracks/inch (8500/8505)
Track Width	.025 mm (.001 inch)
Power	+5 VDC, +12 VDC/15 Watts typical

Physical Characteristics

TKZ9E	**StorageWorks**	**Tabletop**
Width	15.2 cm (6.00 in.)	14.6 cm (5.75 in.)
Depth	21.8 cm (8.60 in.)	20.3 cm (8.00 in.)
Height	11.4 cm (4.50 in.)	8.3 cm (3.25 in.)

TKZ60/TKZ61/TKZ62 Tape Drive Family

The TKZ60 family consists of IBM compatible tape drives with a SCSI 2 interface that can be connected to most Digital native SCSI ports and SCSI controllers.

TKZ60 series consists of IBM 3480/3490 compatible tape drives. TKZ60 series is TA90/91 compatible, available in rackmountable and tabletop configurations. A 19" RETMA mounting kit is available for rackmountable drive. Mounting kits for StorageWorks SW500/800 are not available. TKZ60 series is designed for customers who require sporadic data interchange on IBM tape media.

TKZ61 series consists of IBM 3480/3490 compatible tape drives with integrated 10-cartridge loader. TKZ61 series is TA90/91 compatible and available in rackmountable, pedestal and tabletop configurations. Drive includes 19" RETMA cabinet mounting hardware. StorageWorks SW500/800 mounting kits are available. TKZ61 series is designed for customers who perform backups on IBM tape media and have significant IBM tape interchange requirements.

TKZ62 series consists of IBM 3480/3490/3490E compatible tape drives with integrated 10-cartridge loader. TKZ62 series is TA90/91/92 compatible and available in rackmountable, pedestal and tabletop configurations. Drive includes 19" RETMA cabinet mounting hardware. StorageWorks SW500/800 mounting kits are available. The TKZ62 series is designed for customers who perform backups on IBM tape media, have significant IBM tape interchange requirements, and need increased capacity per cartridge provided by the inclusion of 3490E 36-track capability. TKZ62 tape drive is unique in that it is the only IBM 3490E compatible tape drive that can read AND write in 3480/3490 18-track mode.

TKZ60 Features

- TA90/91 read/write compatible
- Up to 400 MB per cartridge
- Single cartridge load only
- 1.5 MB/Sec max transfer rate
- IBM IDRC data compression
- Single Ended and Fast Narrow Differential SCSI variants
- Autoranging power supply

TKZ61 Features

- TA90/91 read/write compatible
- Up to 400 MB per cartridge
- 10-cartridge integrated loader
- 3.0 MB/Sec max transfer rate
- IBM IDRC data compression
- Single Ended and Fast Narrow Differential SCSI variants
- Autoranging power supply

TKZ62 Features

- TA90/91/92 read/write compatible
- Up to 2.4 GB per cartridge
- 10-cartridge integrated loader
- 3.0 MB/Sec max transfer rate
- IBM IDRC data compression
- Single Ended and Fast Narrow Differential SCSI variants
- Autoranging power supply

Prerequisite Hardware

- AlphaServer 8400 with XMI bus
- KZPAA and KZPSA controllers for PCI based systems
- HSJxx controllers for CI clusters
- HSD05 and HSD10 controllers for DSSI connections
- KZQSA adapter for Q-bus MicroVAX and VAX 4000 systems
- PMAZC Turbochannel/SCSI adapter
- PB2HA EISA/SCSI adapter
- AlphaServer 8200 and 8400 with KFTIA adapter

Prerequisite Software

- TKZ60 series requires minimum of OpenVMS VAX V5.4-1, OpenVMS Alpha V1.0, RISC Ultrix V4.2A with CAM and Digital UNIX V1.2
- TKZ60 requires HSOF firmware V2.0 minimum. TKZ61/62 requires HSOF firmware V2.7 minimum
- POLYCENTER NetWorker Save and Restore on Digital UNIX as of V2.2B
- TKZ61/62 series drives require minimum of OpenVMS VAX V5.5-2, OpenVMS Alpha V6.1, Digital UNIX V2.0
- TKZ60/61/62 support on Alpha Windows NT requires V3.5 minimum and layered software, QB-4STAA-SA

SW500/800 Mounting Kits

TKZ6R-S1	Mounting kit for one TKZ61/62 drive in SW500/800 cabinet. Includes 1-drive bezel and mounting hardware
TKZ6R-S2	Mounting kit for two TKZ61/62 drives in SW500/800 cabinet. Includes 2-drive bezel and mounting hardware
TKZ6R-S3	Mounting kit for three TKZ61/62 drives in SW500/800 cabinet. Includes 3-drive bezel and mounting hardware

TKZ60/TKZ61,TKZ62 Tape Drive Family *(continued)*

Metric Cab Mounting Kit

TKZ6R-M1	Mounting kit for one TKZ61/62 drive in metric dimensioned cabinet. Includes 1-drive bezel and mounting hardware

TKZ6x

TKZ60-EA	Rackmountable 3480/3490 compatible tape drive with IDRC data compression, manual loading, single ended SCSI, 120/240V. Includes one cleaning cartridge, one data cartridge, 120V power cord, and documentation. Requires TK60R-AA rackmount kit for 19" RETMA cabinets. One kit mounts up to two TKZ60 drives
TKZ60-FA	Same as TKZ60-EA except for tabletop single-ended SCSI
TKZ60-GA	Same as TKZ60-EA except for rackmount differential SCSI
TKZ60-HA	Same as TKZ60-FA except for tabletop differential SCSI
TKZ61-AA	Rackmountable, 3480/3490 compatible tape drive with IDRC data compression, integrated 10 cartridge loader, single ended SCSI, 120/240V. Includes one cleaning cartridge, one data cartridge, cabinet slide kit, 120V power cord, and documentation
TKZ61-AB	Same as TKZ61-AA except for pedestal single-ended SCSI
TKZ61-AC	Same as TKZ61-AA except for tabletop single-ended SCSI
TKZ61-AD	Same as TKZ61-AA except for rackmount differential SCSI
TKZ61-AE	Same as TKZ61-AB except for pedestal differential SCSI
TKZ61-AF	Same as TKZ61-AC except for tabletop differential SCSI
TKZ62-AA	Rackmountable, 3480/3490/3490E compatible tape drive with IDRC data compression, integrated 10 cartridge loader, single ended SCSI, 120/240V. Includes one cleaning cartridge, one data cartridge, cabinet slide kit, 120V power cord, and documentation.
TKZ62-AB	Same as TKZ62-AA except for pedestal single-ended SCSI
TKZ62-AC	Same as TKZ62-AA except for tabletop single-ended SCSI
TKZ62-AD	Same as TKZ62-AA except for rackmount differential SCSI
TKZ62-AE	Same as TKZ62-AB except for pedestal differential SCSI
TKZ62-AF	Same as TKZ62-AC except for tabletop differential SCSI
TK60U-AB	Upgrades early non-compression TKZ60 drives to IDRC data compression. Note: Only TKZ60 drives built after May, 1993 may be upgraded. Manufacture date can be found on TKZ60 serial number label
TK60R-AA	Mounting kit for up to two TKZ60 drives in a 19" RETMA cabinet
TK60K-BA	Box of four, 5-slot, magazines to hold data cartridges for early TKZ60 drives with front mounted loader mechanisms
TK60K-BB	Box of four, 10-slot, magazines to hold data cartridges for early TKZ60 drives with front mounted loader mechanisms

Media and Cleaning Cartridge

TA90K-30	IBM compatible 18-track data cartridge, quantity 30 (thirty)
TKZ6K-30	IBM compatible 36-track data cartridge, quantity 30 (thirty)
TA90K-HC	Cleaning cartridge

TKZ60/TKZ61/TKZ62 Tape Drive Family *(continued)*

SCSI Cables and Power Cords

TKZ60 tape family, both single ended and fast wide differential SCSI variants, use a 50-pin, low density, bail lock "Champ" SCSI connector. SCSI cables must be ordered separately.

All TKZ60 family tape drives include a 120 volt power cord. Select country specific power cord for all other voltages.

BN19H-2E	Australia/New Zealand
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19A-2E	U.K./Ireland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Specifications

Tabletop Unit	**TKZ60**	**TKZ61/62**
Height	11.74 cm (7.4 in.)	17.71 cm (6.97 in.)
Width	21.72 cm (9.2 in.)	43.19 cm (17.0 in.)
Depth	59.98 cm (22.4 in.)	61.10 cm (24.05 in.)
Weight	11.34 kg (25 lb)	27.22 kg (60 lb.)
Power Consumption	150 W/hr	150 W/hr

Note: For additional information reference TKZ60 Family Data Sheet, EC-F6205-36.

TSZ07 Reel to Reel Tape Device

The TSZ07 is a dual-density 1600/6250-bit/inch magnetic tape drive that can be connected to most SCSI controllers and adapters to provide industry standard 9-track data interchange. For systems with a VAXBI bus a TSB07-xx variant is available that includes a VAXBI/SCSI adapter for ease of ordering.

The TSZ07 is available in a standard 48.3-cm (19") rackmount form, in a tabletop version, or top mounted in a 110 cm (43.3") cabinet which includes an H7600-type power controller and provides 55.9 cm (26") of cabinet expansion space.

Features

- Recording density 6250 bits/inch (GCR), 1600 bits/inch (phase encoded)
- Formatted capacity @ 6250 bits/inch 140 MB *(2400-foot reel), @ 1600 bits/inch 40 MB (2400-foot reel)
- Read/write speed 2.54 meters/second (100 inches/second maximum)
- Maximum rewind speed 5.1 meters/second (200 inches/second)
- Maximum data transfer rate 625 KB/second
- Maximum SCSI transfer rate 4 MB/second (synchronous)
- Automatic loading and threading
- 8 character alphanumeric front panel display
- 1 MB cache memory
- Front loading with low profile 22.2 cm (8.75-inch) height
- Auto ranging power supply
- Low acoustic noise level
- Single ended and fast narrow differential SCSI

Prerequisite Hardware

- KZPAA and KZPSA for PCI based systems
- AlphaServer 8400 with XMI bus
- HSJxx for CI clusters
- HSD05 and HSD10 for DSSI connection
- KZQSA for Q-bus systems
- PMAZC Turbochannel/SCSI adapter
- PB2HA EISA/SCSI adapter
- AlphaServer 8200 and 8400 with KFTIA adapter

Software

- HSOF V1.2 or later.
- TSZ07 requires OpenVMS V5.4-1 or higher, Digital UNIX V2.0 or higher. Support for Alpha systems running Windows NT requires V3.5 and layered software QB-4STAA-SA.
- TSB07 requires OpenVMS V5.3 or higher. Note VAX 87xx/88xx requires minimum of OpenVMS V5.4-3.

TSZ07 variants for direct connection to SCSI external ports and controllers

TSZ07-AA	1600/6250 bit/inch single-ended SCSI rackmountable 9-track magtape, requires country kit
TSZ07-BA	1600/6250 bit/inch single-ended SCSI 9-track magtape mounted in H9A11 cabinet, includes 9-foot (2.7 meter) external BC06P-09 SCSI cable, tape drive to power controller ac power cord, and power controller with appropriate ac power cord attached. Some countries may require a country specific ac power plug.
TSZ07-BB	Same as -BA except 240V power controller
TSZ07-CA	1600/6250 bit/inch single-ended SCSI tabletop 9-track magtape, requires country kit

TSZ07 variants for connection to VAXBI bus

TSB07-AA	Differential SCSI rackmountable magtape; includes VAXBI adapter, 40-inch (1 meter) internal cable, I/O bulkhead with connector, and 25-foot (7.6 meter) BC13N-25 SCSI cable, requires country kit
TSB07-BA	Differential SCSI magtape rackmounted in 40-inch (1 meter) cabinet; includes VAXBI adapter, 40-inch (1 meter) internal cable, I/O bulkhead with connector, and 25-foot (7.6 meter) BC13N-25 SCSI cable, tape drive to power controller ac power cord, and power controller with appropriate ac power cord attached. Some countries may require a country specific ac power plug.
TSB07-BB	Same as -BA except 240V power controller, requires two country specific power cords
TSB07-CA	Differential SCSI tabletop magtape; includes VAXBI adapter, 40-inch (1 meter) internal cable, I/O bulkhead with connector, and 25-foot (7.6 meter) BC13N-25 SCSI cable, requires country kit

TSZ07 Reel to Reel Tape Device *(continued)*

- To daisychain more than one TSZ07 on a VAXBI system, order one TSB07 above and one TSZ07 differential SCSI model below

TSZ07-DA	Differential SCSI rackmountable 9-track magtape, requires country kit
TSZ07-EA	Differential SCSI 9-track magtape in H9642 cabinet, includes 9-foot (2.7 meter) external BN06P-09 SCSI cable, tape drive to power controller ac power cord, and power controller with appropriate ac power cord attached. Some countries may require a country specific ac power plug.
TSZ07-EB	Same as above except 240V power controller, requires two country specific power cords
TSZ07-FA	Differential SCSI tabletop 9-track magtape, requires country kit

Country kits

- TSZ07-AA, -CA, -DA, -FA, and TSB07-AA, -CA require a country kit which includes an ac power cord, two 6-foot (1.8 meter) SCSI cables (BC06P-06), hardware documentation, tape head cleaning kit, and 2400-foot (731.5 meter) reel of blank magnetic tape.

TSZK7-AA	U.S., Canada, Mexico
TSZK7-AD	Denmark
TSZK7-AE	U.K., Ireland
TSZK7-AG	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, and Sweden
TSZK7-AI	Italy
TSZK7-AJ	Japan
TSZK7-AK	Switzerland
TSZK7-AT	Israel
TSZK7-AZ	Australia, New Zealand
TSZK7-AJ	India

SCSI Cabling

Both the TSZ07 single ended and differential SCSI variants use a 50-pin, low density, bail lock "Champ" SCSI connector.

SW800 Mounting Kits

- TSZ07-AA and -DA variants can be mounted in StorageWorks SW800 cabinet. Up to two TSZ07 drives can be mounted in cabinet, drives must be mounted in top most positions **only**

TSZ7R-S1	Mounting kit for mounting one TSZ07 magtape in SW800 cabinet. Includes replacement SW800 front door, one drive bezel, inch to metric adapter brackets, and mounting hardware
TSZ7R-S2	Mounting kit for mounting two TSZ07 magtapes in SW800 cabinet. Includes replacement SW800 front door, two drive bezel, inch to metric adapter brackets, and mounting hardware

Specifications

Physical Characteristics	TSZ07-AA and -DA	TSZ07-Bx, -Ex, and TSB07-Bx	TSZ07-CA, -FA
Height	22.8 cm (9.0 inch)	110 cm (43.31 inch)	26.9 cm (10.6 inch)
Width	43.2 cm (17.0 inch)	60 cm (23.62 inch)	50.8 cm (20.0 inch)
Depth	63.5 cm (25.0 inch)	86 cm (33.86 inch)	68.6 cm (27.0 inch)
Weight	30.9 kg (66.0 lb.)	115.9 kg (255 lb.)	43.2 kg (95.0 lb.)

StorageWorks TZK11 Quarter-Inch Cartridge (QIC) Tape Drive

The TZK11 tape drive utilizes the QIC-2 GB format in an quarter-inch cartridge streaming tape drive, available as a 5.25-inch, half-height form factor embedded or standalone tabletop device. The TZK11 supports a variety of capacities and densities depending on the cartridge type used, as illustrated in the following table. The high available capacity and transfer rate make this drive suited to backup as well as data interchange.

Cartridge	System	Capacity	Format	Read	Write
DC9250	Digital UNIX, OpenVMS	Up to 2.5 GB	QIC-2 GB	X	X
DC9000 (Magnus 2.0)	Digital UNIX, OpenVMS	Up to 2.0 GB	QIC-2 GB	X	X
DC9000 (Magnus 1.2)	Digital UNIX, OpenVMS	Up to 1.2 GB	QIC-1 GB	X	X
DC9000 (Magnus 1.0)	Digital UNIX, OpenVMS	Up to 1.0 GB	QIC-1 GB	X	X
DC6525	Digital UNIX, OpenVMS	Up to 525 MB	QIC 525	X	X
DC6320	Digital UNIX, OpenVMS	Up to 320 MB	QIC 320	X	X
DC6150 or DC600XTD	Digital UNIX	Up to 150 MB	QIC 150	X	X
DC6150 or DC600XTD	Digital UNIX	Up to 120 MB	QIC 120	X	X
DC600A	Digital UNIX	Up to 60 MB	QIC 24	X	

Features

- Up to 2.0 Gbytes (formatted) tape capacity
- 300-Kbyte/second transfer rate
- 5.25-inch half-height form factor
- Embedded and tabletop models
- Read/write speed: Variable
- Supported interface: SCSI-2
- Supported in Digital UNIX, OpenVMS V5.5-2, OpenVMS Alpha V1.5, and SCO UNIX

TZK11-DA	TZK11 tabletop, including 3-ft SCSI cable and terminator
TZK11- HG	TZK11 for MicroVAX 3100 Model 30/40/80/90 systems; field installed
TZK11-MF	TZK11 for DEC 3000 Model 400/500/600/800 systems
TZK11-VA	TZK11 for StorageWorks BA356 modular storage shelf
TZK11-VU	TZK11 for StorageWorks BA356 modular storage shelf, second drive

Note: One data cartridge and one cleaning cartridge included in all models; also available in the BA353 desktop expansion box.

Media and Cleaning Cartridge

TZK1X-CG	Single 2.5 GB QIC media cartridge (DC9250)
TZK1X-CH	5-pack, 2.5 GB QIC media cartridges (DC9250)
TZK1X-CE	Single 2.0 GB QIC media cartridge (DC9200)
TZK1X-CF	5-pack, 2.0 GB QIC media cartridges (DC9200)
TZK1X-CD	5-pack, 525 MB QIC media cartridges (DC6525)
TZK1X-CB	5-pack, 320 MB QIC media cartridges (DC6320)
TZK1X-HA	TZK10/TZK11 cleaning cartridge

Note: Digital branded media is recommended.

Specifications

Embedded	
Height	15.0 cm (5.9 in.)
Width	4.4 cm (1.75 in.)
Depth	21.8 cm (8.6 in.)
Weight	1.1 kg (2.4 lb)

FLEXIBLE/OPTICAL MEDIA SPECIFICATIONS CHART

Option #	Media Type	Capacity MB (Note 1)	Tape Length (Note 2)	Form Factor (Note 3)	Shelf Life (Note 4)	Coercivity (Oe) (Note 5)	Durability (Passes) (Note 6)	Type Mat. (Note 7)	Environmental Conditions Storage (Note 8)	Archival (Note 9)	Operating (Note 10)
RX02K-10	SDSS	0.512	N/A	8	20*	300	3,500,000	GFO	10-51/8-80		10-51/8-80
RX33K-10	HDDS	1.2	N/A	5.25	20*	650	4,000,000	CGFO	10-51/8-80		10-51/8-80
RX50K-10	HDDS	0.409	N/A	5.25	20*	300	3,000,000	GFO	10-51/8-80		10-51/8-80
RX23K-FM	HDDS	1.44	N/A	3.5	20*	725	4,000,000	CGFO	4-53/8-90		10-60/8-80
RX26K-10	EDDS	2.8	N/A	3.5	20*	750	4,000,000	BF	4-53/8-90		10-51/20-80
RV6XP-AA	WORM	6552	N/A	12	100	N/A	100,000	SSBT	-20-60/5-90		5-50/5-80
RWX1K-01	M/O	594	N/A	5.25	30*	N/A	40,000	TIC	-10-55/10-90	-10-55/10-90*	5-55/10-80
RWX5K-01	M/O	1200	N/A	5.25	30*	N/A	40,000	TIC	-10-55/10-90	-10-55/10-90*	5-55/10-80
RWX5K-02	WORM	1200	N/A	5.25	30*	N/A	40,000	TIC	-10-55/10-90	-10-55/10-90*	5-55/10-80
RWX6K-01	M/O	2300	N/A	5.25	30*	N/A	100,000	TbFeCo	-10-55/3-90	-10-55/3-90*	5-55/3-85
RWX6K-03	M/O	2600	N/A	5.25	30*	N/A	100,000	TbFeCo	-10-55/3-90	-10-55/3-90*	5-55/3-85
TUN24-SL	REEL	145	2400	10.25	20*	350	40,000	GFO	5-48/20-80	5-32/20-80	16-32/20-80
TUN24-AL	REEL	145	2400	10.25	20*	350	40,000	GFO	5-48/20-80	5-32/20-80	16-32/20-80
TU58-K	DC100A	0.262	140	3.5	5	310	5,000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TK25-K	DC600A	60	600	5.25	10*	310	5,000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TZK2X-CB	DC2120	120	307.5	3.5	10*	550	5,000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TZK2X-CD	QIC-WIDE	2300	420	3.5	10*	1800	5,000	MP++	-5-45/20-80	15-45/30-70	5-57/20-80
PC4XT-BA	DC6150	150	620	5.25	10*	550	5,000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TZK1X-CB	DC6320	320	620	5.25	10*	550	5, 000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TZK1X-CD	DC6525	525	1020	5.25	10*	550	5,000	CGFO	-40-45/20-80	-40-45/20-80	5-45/20-80
TZK1X-CF	DC9200	2000	950	5.25	10*	900	5,000	CGFO	-5-45/20-80	-5-45/20-80	5-57/20-80
TZK1X-CH	DC9250	2500	1200	5.25	10*	900	5,000	CGFO	-5-45/10-80	-5-45/20-80	5-57/20-80
TLZ04-CB	DAT-60M	1300	196.9	2.9	10	1540	2,000	MP	5-32/20-60		5-45/20-80
TLZ06-CB	DAT-90M	2000	295.3	2.9	10	1540	2,000	MP	5-32/20-60		5-45/20-80
TLZ07-CB	DAT-120M	4000	393.7	2.9	10	1700	2,000	MP+	5-32/20-60		5-45/20-80
TKZ8X-CB	8 mm	5000	367.5	3.7	30*	1540	1,500	MP	5-32/40-60		5-45/20-80
TKZ6K-30	3490E	800	1100	4.3	15*	520	40,000	CD	5-32/5-80		16-32/20-80
TA90K-30	3480	200	541	4.3	15*	520	40,000	CD	5-32/5-80		16-32/20-80
TK50-K	CT-I	95	600	4.2	20*	350	20,000	GFO	5-45/20-80	5-45/20-80	10-40/20-80
TK52-K	CT-II	296	600	4.2	20*	350	20,000	GFO	5-45/20-80	5-45/20-80	10-40/20-80
TK85K-01	CT-III	10,000	1167	4.2	20*	1540	500,000	MP	16-32/20-80	18-28/40-60	10-40/20-80
THXKD-01	CT-IV	20,000	1765	4.2	30*	1850	500,000	MP+	16-32/20-80	18-28/40-60	10-40/20-80

* Data in all items above denoted with "*" indicate information obtained from sources other than Digital Equipment Corporation, American National Standards Institute, or manufacturer's specifications. Information is intended for general reference only and is subject to change without notice. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

Notes:

1 Maximum formatted capacity per unit in highest density qualified Digital drive application without compression.
2 Minimum length of recording area in feet.
3 Diameter, width or other commonly referenced form factor dimension in inches, as applicable for device type.
4 Minimum in years, provided item is stored as recommended in product documentation. Stated as "pre-recorded/post recorded (archival)" where distinction is made.
5 Nominal value as measured in oersteds.
6 Minimum number of passes—parameter is variously defined within the industry and may not be comparable between product types. Some general definitions are as follows:
(1) for diskettes - wear resistance in number of revolutions as defined in product-specific documentation.
(2) for optical devices - load/unload, spin/up down cycles.
(3) for tape products - number of tape-head or test passes as defined in product-specific documentation.
7 Magnetic recording material, where: GFO = gamma ferric oxide, MP = metal particulate, CD = chromium dioxide, BF = barium ferrite,
CGFO = cobalt-doped gamma ferric oxide, TA = tellurium alloy, TIC = magnetic alloy of terbium, iron and cobalt,
SSBT = alloy of antimony, selenium, bismuth, tellurium.
8 Maximum temperature/humidity range in C/%RH, non-condensing.
9 Maximum temperature/humidity range in C/%RH, non-condensing; if field is blank, refer to "storage" figures.
10 Maximum temperature/humidity range in C/%RH, non-condensing.
11 Note: RX23K-FM floppies are DOS preformatted.

Storage Library System V2.6

The Storage Library System (SPD 29.67) continues to deliver on the need to cost effectively manage the time consuming and difficult task of backing up data on OpenVMS platforms. Storage Library System V2.6 introduces support for OpenVMS V6.2 on both the VAX and Alpha platforms. Now Storage Library System for OpenVMS can be installed on standalone or on mixed OpenVMS VAX and Alpha clusters. This enables the migration from pure VAX to mixed VAX and Alpha environments, taking advantage of Alpha performance, while preserving expertise gained with Storage Library System on VAX systems. Storage Library System V2.6 also supports Tx8x7 magazine loader devices in either random slot or sequential slot selection mode. Also included in Storage Library System for OpenVMS is the follow-on product, POLYCENTER Archive/Backup for OpenVMS V1.1 for VAX and Alpha systems. These products both use the same Storage Library System licenses.

Storage Library System supports

- OpenVMS V5.5-2 through V6.2 for VAX platforms
- OpenVMS V6.1 through V6.2 for OpenVMS Alpha platforms
- Both standalone systems and mixed OpenVMS VAX and Alpha clusters
- Tx8x7 tape loader as random slot or sequential stacker
- User-based file restoration that improves productivity and lowers system management costs
- Increased data integrity and security by ensuring that backups occur automatically per policy and copies of vital corporate data are maintained.

Storage Library System V6.2 users are required to have at least one Storage Library System server license in their network. Client licenses are called SLS REMOTE. Storage Library System also supports the StorageTek ACS 4400 silo. The Storage Library System ACS license is used for this purpose.

Product services for SLS REMOTE and SLS ACS are included in SLS product service, and SLS REMOTE and SLS ACS media and documentation kits are included in the SLS kits.

Ordering Information

Storage Library System (SLS)

QL-0L7A*-AA	Software License
QL-0L7A*-RA	Update License
QT-0L7A*-L9	Product Service
QA-0L7AA-H*	Media and Documentation Kit
QA-0L7AA-GZ	Documentation Kit

Storage Library System (SLS Remote) for OpenVMS VAX

QL-YE8A*-AA	Software License
QL-YE8A*-RA	Update License

Storage Library System ACS (SLS ACS) for OpenVMS VAX

QL-MW1A*-AA	Software License
QL-MW1A*-RA	Update License

Storage Library System (SLS) for OpenVMS Alpha

QL-0YPA*-AA	Software License
QL-0YPA*-RA	Update License
QT-0YPA*-L9	Product Service
QA-0YPAA-H*	Media and Documentation Kit
QA-0YPAA-GZ	Documentation Kit

Storage Library System REMOTE (SLS REMOTE) for OpenVMS Alpha

QL-0YQA*-AA	Software License
QL-0YQA*-RA	Update License

Storage Library System ACS (SLS ACS) for OpenVMS Alpha

QL-0YRA*-AA	Software License
QL-0YRA*-RA	Update License

POLYCENTER Archive/Backup for OpenVMS V1.1

In today's information economy, protecting essential data requires reliable and regular backups. POLYCENTER Archive/Backup for OpenVMS (SPD 48.16) ensures against data loss by managing the entire backup and archiving process, automatically. This powerful software also archives corporate data for long-term audit, regulatory, and other requirements.

Backup can be an expensive and error prone component of system administration. POLYCENTER Archive/ Backup has a graphical user interface (GUI) to ease and automate many backup tasks, such as scheduling and media management. The software's Motif(R) graphical user interface makes it easy to manage archive and backup policies and find files, volumes, and databases that have been backed up or archived. To support a wide variety of users, POLYCENTER Archive/Backup provides easy-to-use Major Functions buttons as well as a more comprehensive window called ABS$GUI.

POLYCENTER Archive/ Backup represents a new approach to backup on OpenVMS systems. Its architecture allows for the incorporation of additional backup engines to accommodate new heterogeneous systems in the future. POLYCENTER Archive/Backup client/server capabilities extend high performance backup and archiving out of the glass house and into departmental and desktop systems. In short, POLYCENTER Archive/Backup provides the backup and business continuation capabilities users require—whether the backup requirements are workgroup, departmental, or enterprise-wide.

Benefits

- Provides centralized backup and archiving, and reduces or potentially eliminates the need for operations staff at remote, distributed sites. It can perform client backup and archiving operations between disks and tape drives located on different systems within a DECnet network.
- POLYCENTER Archive/Backup's client/server approach to backup management is the key to its flexibility. The server component manages overall backup policy and provides media and device management for all POLYCENTER Archive/Backup systems. The server also maintains a catalog of all files and objects that have been backed up or archived, and maintains node-specific scheduling and cataloging information. Servers provide media and device management services for servers and clients.
- Remote Device Facility (RDF) allows a tape on a server node to be accessed from other client nodes across the DECnet network for backups and archives. RDF servers are located on systems that have tape drives attached or that can access drives through the OpenVMS TMSCP server. RDF clients provide the communications interface between applications reading or writing data to a tape drive and the RDF servers.
- Policy mechanisms lets users take the fullest advantage of its flexible design. Even with all this flexibility, the out-of-the-box default configuration makes POLYCENTER Archive/Backup easy to install and configure. And extensive security mechanisms ensure that only authorized personnel can create and access policies.
- Utilizes POLYCENTER Scheduler for advanced and complex scheduling of backup and archive operations. Complex schedules such as "weekly full, daily incremental" are generated automatically, eliminating many of the tedious daily operations tasks.
- Maintains on-line information about backed up and archived files, disk volumes, and databases. This facility is particularly useful during the file restorations, which often occur in high-stress situations. With POLYCENTER Archive/ Backup users can quickly retrieve files or restore disk volumes—without having to know the names of the tape volumes on which the data was saved. When restoring a file, POLYCENTER Archive/ Backup directly positions at the start of the file within the save set using cataloged location information.
- Media and Device Management Services (MDMS) is the critical component that helps reduce human error and improve productivity. MDMS maintenance of volume retention period, availability status, location, and scheduling dates when volumes are to move offsite and return. Media allocation control with MDMS is based on user-defined media pools. Pooling is a powerful concept that lets you tailor backup operations to individual sites.

POLYCENTER Archive Backup V1.1 is included in the Storage Library System (SLS) V 2.6 media and documentation kit. POLYCENTER Archive Backup V1.1 uses SLS licenses, and no separate license is required. POLYCENTER Archive Backup V1.1 and SLS V2.6 can run concurrently on the same system, allowing existing SLS users to get a feel for the new features and operator interface of POLYCENTER Archive/Backup.

Supported Media and Devices

See the PAB V1.1 SPD for CPU, memory, device and configuration requirements.

Layered Products

OpenVMS V6.1 and V6.2 for VAX or Alpha systems

DECnet Phase IV for OpenVMS VAX or Alpha (for client/server backups)

POLYCENTER Scheduler is bundled in with the POLYCENTER Archive/Backup kit

Rdb V5.1 or V6.0 for VAX or Oracle Rdb V6.0 for Alpha

POLYCENTER Archive/Backup for OpenVMS VAX *(continued)*

Ordering Information

PAB is included with the respective Storage Library System for OpenVMS kits. Media and documentation kits are ordered separately. Ordering information is listed in the following table.

PAB for OpenVMS VAX Server: On Storage Library System (SLS) kit

QL-0L7A*-AA	Software License
QL-0L7A*-RA	Update License
QT-0L7A*-L9	Product Service
QA-0L7AA-H*	Media and Documentation Kit
QA-0L7AA-GZ	Documentation Kit

PAB for OpenVMS VAX Client: On Storage Library System (SLS Remote) for OpenVMS VAX kit

QL-YE8A*-AA	Software License
QL-YE8A*-RA	Update License

PAB for OpenVMS VAX ACS license: Same as Storage Library System ACS (SLS ACS) for OpenVMS VAX license

QL-MW1A*-AA	Software License
QL-MW1A*-RA	Update License

PAB for OpenVMS Alpha Server: On Storage Library System (SLS) for OpenVMS Alpha kit

QL-0YPA*-AA	Software License
QL-0YPA*-RA	Update License
QT-0YPA*-L9	Product Service
QA-0YPAA-H*	Media and Documentation Kit
QA-0YPAA-GZ	Documentation Kit

PAB for OpenVMS Alpha Client: On Storage Library System REMOTE (SLS REMOTE) for OpenVMS Alpha kit

QL-0YQA*-AA	Software License
QL-0YQA*-RA	Update License

PAB for OpenVMS Alpha ACS licenses: Same as Storage Library System ACS (SLS ACS) for OpenVMS Alpha license

QL-0YRA*-AA	Software License
QL-0YRA*-RA	Update License

POLYCENTER Save Set Manager V1.1 for OpenVMS

The POLYCENTER Save Set Manager V1.1 for OpenVMS (SPD 62.64) is a layered software product that reduces operational time during VMSBackup activities by providing off-line save set validation, copy, and merge functions.

The amount of data users must back up is growing exponentially. At the same time, global business needs are shrinking the available time many users have to perform their backups. Digital's user surveys have consistently shown a high need for products that help users deal with the "shrinking backup window." Users with aging, low capacity media need tools to transfer their backup data onto modern, high capacity, high integrity media — and remove the aging systems and devices required to support the old media.

Highlights

- Up to 50 percent reduction in time spent on backup/restore operations without compromising data integrity
- Transfer of backup save sets between tape drive technologies
- Reduction in downtime for an OpenVMS backup/restore operation

Benefits

- Reduction of operational time spent on on-line backup and restore without compromising data integrity.
- Selective manipulation of save set contents and attributes.
- Transfer of backup save sets between tape drive technologies.
- Copy of backup save sets from one tape or disk drive to another tape or disk drive while maintaining data integrity.
- Reduced downtime for a backup/restore operation.
- Ability to monitor degradation of archived save sets.

Technical Data

There are three separate and distinct functions in the POLYCENTER Save Set Manager V1.1 for OpenVMS software.

- **Save Set Validate**—validates the internal consistency of a specified save set offline and reports any exceptions back to the user. This function allows users who currently use the /verify option on VMSBackup to perform verifications offline rather than inside their critical backup window.
- **Save Set Copy**—provides the ability to duplicate a specified save set with the addition or deletion of CRC or XOR blocks in the output save set. It allows users to create multiple copies of backup save sets (for example, one nearline copy and one copy for fire storage) without having to run VMS backup multiple times. Users can backup their save set without XOR or CRC (both of which are compute intensive) and use save set copy to add the data protection and redundancy features offline, outside the backup window. It also allows users to relocate save sets from older tapes or tape technologies to newer ones.
- **Save Set Merge**—provides the ability to merge incremental save sets with other incremental or full save sets, reducing the frequency of full backup operations. This function can result in a major reduction in system downtime for backup operations by replacing full backup operations in the critical backup window with incremental backup operations in the backup window, followed by a save set merge outside that window. Use of this function reduces the number of incremental save sets that must be restored to effect a full volume restore.

Ordering Information

POLYCENTER Save Set Manager for OpenVMS VAX

VAX Systems	Alpha Systems	Description
QL-2YCA9-AA	QL-2YBA9-AA	Traditional License
QL-2YCA9-RA	QL-2YBA9-RA	Traditional Update License
QL-2YCA9-LA	QL-2YBA9-LA	90 Day Loan
QL-2YCA9-LB	QL-2YBA9-LB	30 Day Loan
QL-2YCA9-LD	QL-2YBA9-LD	60 Day Loan
QL-2YCA9-LG	QL-2YBA9-LG	180 Day Loan
QA-2YCAA-H5		TK50 Kit
QA-2YCAA-HM		Magtape Kit
QA-2YCAA-GZ	QA-2YBAA-GZ	Documentation Kit

StorageWorks Desktop Backup/Archiver

StorageWorks Desktop Backup/Archiver (SPD 41.55) is the next generation of client/server backup management tools for OpenVMS based PATHWORKS LANs. The product provides easy-to-use backup, restore, and archive facilities that cost effectively enable end users, system managers, and LAN administrators to utilize backup devices already resident on OpenVMS VAX and Alpha servers. StorageWorks Desktop Backup/Archiver incorporates the previously available PATHWORKS Desktop Backup; migration options provide an easy upgrade to increased functionality and enhanced client support.

Operating system commands to recover lost files rely on a file's state for recovery with no guarantee of success. The only sure means of protecting all the critical data on a PATHWORKS LAN is through StorageWorks Desktop Backup/Archiver.

The cost per seat for this protection in a typical PATHWORKS LAN is substantially lower than purchasing individual or even shared tape drives and backup software.

Benefits

- Lower cost, more efficient data management. "Set and Forget" setup relieves system managers of the day-to-day tasks associated with desktop system backup.
- Increased end user productivity. Automated backup and client based file retrieval capabilities allow users to restore data quickly and easily without relying on desktop operating system capabilities that depend upon a file's state for recovery.
- Quicker disaster recovery. Ensuring that all data on the LAN is backed up facilitates a fast recovery from an accident or disaster.
- Backup and restore services for DOS, Windows, and Macintosh clients to OpenVMS servers

Few automated tools for backup exist in the OpenVMS PATHWORKS market. In addition to the simple alternatives outlined above, users can choose LANUtil from Vector Networks, Ltd. A recent Digital News and Review article (reprints available, see resources section below) compared LANutil to PATHWORKS Desktop Backup (StorageWorks Desktop Backup/Archiver predecessor) and rated it superior to LANUtil in performance and price. POLYCENTER NetWorker Save and Restore software offers client/server backup of popular PC (including PATHWORKS) and UNIX systems to Digital UNIX servers.

Licensing

StorageWorks Desktop Backup/Archiver implements a client/server licensing mechanism that accommodates a variety of desktop systems and also provides attractive pricing for users with smaller PATHWORKS LANs.

Both clients and servers must be licensed. To support a variety of clients, StorageWorks Desktop Backup/Archiver implements a "Universal Client License," which allows a specified number of clients, each running a supported operating system, to utilize the server. Supported universal clients include MS-DOS V3.3 or later, Windows V3.0 or later, and Macintosh System 6 or System 7. Macintosh systems can use either DECnet or AppleTalk transports when used with OpenVMS VAX servers. Macintosh clients can function only with the DECnet transport when used with OpenVMS Alpha servers.

New users should purchase a starter kit that includes 15 Universal client licenses and the appropriate required server license. The starter kit allows up to 15 clients, each running a supported client operating system, to utilize the server. Users with more than 15 clients can purchase additional universal client licenses in the appropriate quantity, listed by part number above.

Current PATHWORKS Desktop Backup users have a server license plus an MS-DOS client license that allows up to 250 MS-DOS or Windows clients to use the server's facilities. Those with service contract(s) will receive the appropriate update(s). Users without service contracts can purchase the license for the latest server that will continue to recognize their current MS-DOS/Windows clients as well as the new Universal client license.

Ordering Information

QB-3AYAA-AA	StorageWorks Desktop Backup/Archiver Starter Kit. Includes OpenVMS VAX server license, TK50 distribution media, documentation, 15 universal client license.
QB-3AYAB-AA	StorageWorks Desktop Backup/Archiver Starter Kit. Includes OpenVMS VAX server license, 9-track magnetic tape distribution, media, documentation, 15 universal client license
QB-3AYAC-AA	StorageWorks Desktop Backup/Archiver Starter Kit. Includes OpenVMS Alpha server license, CD distribution media, documentation, 15 universal client license
QA-MR1AB-GZ	Documentation Kit

StorageWorks Desktop Backup/Archiver *(continued)*

Additional Universal Client Licenses Concurrent/Incremental License

QL-388AL-3D	25 Universal Clients
QL-388AL-3E	50 Universal Clients
QL-388AL-3F	100 Universal Clients
QL-388AL-3G	150 Universal Clients
QL-388AL-3H	250 Universal Clients
QL-388AL-3J	500 Universal Clients

Migration License from PATHWORKS DOS/Windows License to Universal Client License

QL-38AAL-3D	50 Clients
QL-38AAL-3E	100 Clients
QL-38AAL-3F	150 Clients
QL-38AAL-3G	250 Clients
QL-38AAL-3H	500 Clients

Server Licenses

QL-MR1A9-AA	StorageWorks Desktop Backup OpenVMS VAX Server License
QL-387A9-AA	StorageWorks Desktop Backup OpenVMS Alpha Server License

POLYCENTER NetWorker Save and Restore V3.2 for Digital UNIX

POLYCENTER NetWorker Save and Restore V3.2 software for Digital UNIX Alpha systems (SPD 50.98.05) provides online, automated backup for multivendor systems in networked TCP/IP environments. V3.2 adds many new functions, such as clientside archiving; a new graphical user interface for easier use; concurrent recovery for more efficiency; performance improvements; recovery by savesets; barcode label support; data set clones; and new clients including Windows NT for Intel, Windows TCP/IP, and a PATHWORKS Windows client.

The archive functionality of V3.2 leverages the user's existing investment in and the strength of the NetWorker product. The NetWorker archive server option, an extension to the existing NetWorker backup server, allows file archiving and retrieval services. Through a simple point-and-click interface, users can archive their data, annotate the archive set, select archive options, and receive automatic notification of archive completion.

Additionally, NetWorker V3.2 provides support for DECsafe Available Server Environment (ASE product) and the storage associated with ASE services. With the new Save Set Consolidation feature, incremental backups can be consolidated into a new full backup reducing further the amount of time it takes to do backups.

Highlights

- Has become an even more powerful tool for automating multivendor backup operations
- Includes ASE Cluster client support
- Adds Save Set Consolidation to further reduce backup times

Benefits

Backup operations are critical and can be cumbersome. With NetWorker, backup operations are easy to complete, quick, and reliable. V3.2 ensures consistent, reliable data protection for the entire network. Most users want one automated tool to solve their backup needs. Continuing to meet this need and others, NetWorker V3.2 provides:

- Support for DECsafe Available Server Environment (ASE product) and the storage associated with ASE services
- Consolidates incremental backups to a new full level backup with save set consolidation
- Conservation of online storage while protecting critical corporate data with the new archiving functionality.
- More client platform support with Windows NT/Intel systems, and Windows TCP/IP, and Macintosh client support.
- Improved data protection with saveset cloning, which allows the user to make multiple copies of the backup data.
- Broadened storage device support to meet growing needs, including DLT and StorageWorks Tape Library TL820.
- Quicker and easier data recovery with parallel recovery, which allows multiple recoveries to be performed in parallel from the same media.
- More automation with support for bar code labeling.
- Faster, better, and easier to use graphical user interface; NetWorker now has distinct and separate interfaces for end users versus system administrators.

Ordering Information

To add archiving functionality to an existing NetWorker environment, users must upgrade the NetWorker backup license to V3.2. Also, they must add the NetWorker Archive Server Add-on License and Client Licenses for each archive client; and upgrade the NetWorker media and documentation client kits to obtain the archive client software and documentation.

Users who are new to NetWorker and desire both archive and backup functionality need to order the NetWorker Server License , a Jukebox License, the Archive Server Add-on License, and Client Licenses for each client (either backup and/or archive). NetWorker media and documentation client kits are available for UNIX, PC, Windows NT, and NetWare clients.

Users who need both the Windows NT Advanced Server client and Desktop client should order the NetWorker media and documentation kit for Windows NT clients. If only the Windows NT Desktop client is needed, it is available in the Networker media and documentation kit for PC clients.

Each client connection is licensed. For example, if there are 10 backup clients and each will also archive data, then 20 client licenses are required.

POLYCENTER NetWorker Save and Restore V3.2 for Digital UNIX *(continued)*

POLYCENTER NetWorker Save and Restore V3.2 (Server and Client Licenses)

QL-2ALA*-AA	Digital UNIX Server License
QA-2ALAA-GZ	Documentation for Digital UNIX Server
QL-3P2A*-AA	Archive Server Add-on License (1)
QL-XYXAL-3B	UNIX Client License
QL-069AL-3B	PC Client License
QL-4UPAM-3B	NetWorker Workgroup Cluster Client License
QL-YUNAM-3B	NetWorker Departmental Cluster Client License
QL-YUMAM-3B	NetWorker Enterprise Cluster Client License
QL-YULA9-AA	NetWorker Save Set Consolidation License

POLYCENTER NetWorker Save and Restore V3.2 (Jukebox Licenses)

QL-04UAL-3B	Jukebox License Tier 1 (2)
QL-04VAL-3B	Jukebox License Tier 2 (2)
QL-04WAL-3B	Jukebox License Tier 3 (2)

POLYCENTER NetWorker Save and Restore V3.2 (Client Kits)

QA-XYXAA-HW	Media and Documentation Kit for UNIX Clients
QA-XYXAB-HW	Media and Documentation Kit for PC Clients
QA-XYXAC-HW	Media and Documentation Kit for NetWare Clients
QA-XYXAD-HC	Media and Documentation Kit for Windows NT/Intel Clients

(1) The NetWorker Archive Server Add-on License requires that QL-2AL**-AA be installed first.
(2) Tiers are based on the capacity of the storage device. Refer to SPD 50.98.05 for classification of media devices within Tiers 1, 2, and 3.

Services

Software product services are available for server, jukebox, and client software.

POLYCENTER Hierarchical Storage Management for OpenVMS

POLYCENTER Hierarchical Storage Management for OpenVMS, a layered software product, extends the OpenVMS file system to allow efficient management of infrequently accessed or dormant data. Hierarchical Storage Management is a policy-driven application that automatically moves dormant data from online (primary) storage to less expensive nearline or offline "shelved" storage. Data is returned when a shelved file is accessed or a scheduled event occurs, such as the automatic unshelving of a file used at the same time each month.

POLYCENTER Hierarchical Storage Management (SPD 46.38) is designed for maximum ease-of-use and system management flexibility. Users of Hierarchical Storage Management for OpenVMS maintain an online view of their files and use standard directory and file access mechanisms regardless of the file's physical location. Flexible policy-setting capabilities for system managers and end users increase automation and significantly improve the manageability of users' computing resources.

Benefits

- Patterns of data utilization in typical OpenVMS environments show that 80 percent of all disk requests are for only 20 percent of the data resident on the system. The other 80 percent of system resident data is dormant. Typical patterns of utilization show that access to this data is minimal 30 or more days after creation, yet it continues to reside on relatively expensive online media. As the amount of online storage increases in response to this phenomenon, the cost of storing infrequently accessed data grows, particularly as disk installations exceed 30 Gbytes or more.
- Traditional strategies, based on operator-attended backup with file restoration on demand, lower costs but negatively impact user productivity and application availability by increasing waiting time for data. Additionally, attended operations can increase data reliability and security risks. Hierarchical Storage Management allows users to lower storage costs and improve performance while maintaining complete data integrity and security—by employing automatic file migration with lower-cost nearline and offline devices, such as optical jukeboxes, tape loaders, and automated tape libraries.
- POLYCENTER Hierarchical Storage Management for OpenVMS software lowers system management costs by:
  - Reducing time spent dealing with disk occupancy issues such as device full exceptions and disk quota exceeded situations.
  - Providing scheduling flexibility and customization to more effectively meet specific site requirements.
  - Automatically executing system manager and/or user policy that is initially established and then essentially "forgotten."
  - Minimizing user training and application modification due to its transparency, ease of use, and file system integration.

Another key benefit is that POLYCENTER Hierarchical Storage Management for OpenVMS software eliminates the unnecessary backup of previously backed-up shelved files, improving overall backup performance. Through its unique integration with the OpenVMS BACKUP utility, only shelved files that have been modified are backed up. Since non-modified shelved files have already been backed up, backup windows can be significantly decreased without compromising disaster recovery.

Ordering Information

- Requires OpenVMS V6.1 or V6.2.

QP-03PAA-01	Base License for Mixed Clusters
QL-0NXA9-AA	Base License for VAX Clusters
QL-3J1A9-AA	Base License for Alpha Clusters
QL-2AWAA-3B	Concurrent Use License - 20 Gbytes
QL-2AWAA-3G	Concurrent Use License - 500 Gbytes
QL-2AWAA-3H	Concurrent Use License - 999 Terabytes
QP-03TAA-01	140 Gbyte Capacity Package
QP-03TAA-02	280 Gbyte Capacity Package
QP-03TAA-03	1 Terabyte Capacity Package
QA-0NXAA-GZ	Documentation Kit

Note: Media and documentation kits are purchased separately.

POLYCENTER Hierarchical Storage Management for Digital UNIX

POLYCENTER HSM for Digital UNIX software provides the automatic, unattended, transparent movement of files from magnetic disk storage, to near online read-write optical platters, and back again. Fully customizable, system administrators can determine when and which files to move to less expensive optical media. These operations are transparent to users and to the applications. POLYCENTER HSM provides access to gigabytes and terabytes of online storage per Alpha server at a fraction of the cost of magnetic disk

POLYCENTER Hierarchical Storage Management (HSM) software solution for Digital UNIX allows users to augment magnetic disk storage with read-write optical platters at less than half the cost of magnetic disk

The RW500 series of optical libraries/jukeboxes from Digital are supported individually, or in combinations. These jukeboxes support single and double density drives and platters.

Digital UNIX V2.0, Open SCSI CAM for Digital UNIX*, and POLYCENTER Advanced File System*

* These products are contained on layered products CD-ROM V2.0 for Digital UNIX. The POLYCENTER HSM traditional license grants the right to unlimited use of the SCSI CAM for Digital UNIX. POLYCENTER Advanced File System is licensed with Digital UNIX.

Each HSM solution requires one traditional license per Digital UNIX Server. Each 20GB of optical storage requires one concurrent/capacity license. Packages of licenses are offered for easy, more cost effective ordering.

Ordering Information

POLYCENTER Hierarchical Storage Management for Digital UNIX

QA-0QKAA-GZ	Documentation kit
QL-0QKA9-AA	Traditional License
QL-0QKA9-RA	Traditional Update License
QL-22GAM-3B	Concurrent License (20 GB)
QL-22GAM-5B	Concurrent Update License
QP-00UAA-01	(1) Trad, (4) Concurrent
QP-00UAA-02	(1) Trad, (6) Concurrent
QP-00UAA-03	(1) Trad, (9) Concurrent
QP-00UAA-04	(1) Trad, (18) Concurrent
QP-00UAA-05	(1) Trad, (27) Concurrent
QP-00UAA-06	(1) Trad, (36) Concurrent
QT-0QKA9-I9	Installation
QT-22GA9-I9	Installation
QT-0QKAA-E8	MDDS
QT-0QKA9-L9	LPS

POLYCENTER File Optimizer V2.1A for OpenVMS

The POLYCENTER File Optimizer V2.1A for OpenVMS systems is a layered software product that reduces file fragmentation through scheduled defragmentation jobs. Digital's solution for file fragmentation offers the highest possible data integrity. The POLYCENTER File Optimizer also provides a file placement capability that allows the system administrator to place files on disk in an order that optimizes the performance of the most frequently accessed files. Users are continuing to experience tremendous growth in the amount of data they need to manage on drives. The OpenVMS file system uses available disk space efficiently, causing files to be fragmented as they are written to nearly full disks. System performance can be negatively impacted by fragmented files, so users need a tool that assures data integrity and reduces file fragmentation to obtain and maintain optimal disk performance.

The volume index file, INDEXF.SYS, can become fragmented, slowing down operations for all users. A capability in V2.1A allows users to defragment the volume index file with a new offline utility.

POLYCENTER File Optimizer V2.1A for OpenVMS systems makes it easier for users to establish and manage their defragmentation processes through an enhanced graphical user interface (GUI). The enhanced user interface provides more lists to ease defragmentation selection criteria, a keyboard mapping utility that allows operators to assign functions to keys as well as the mouse, and enhancements to the monitor window allowing the POLYCENTER File Optimizer to dynamically locate files according to user specified criteria.

POLYCENTER File Optimizer V2.1A uses an RMS database to store policy and configuration information, eliminating the need for an Oracle Rdb Runtime License to defragment OpenVMS systems. In configurations tested to date, RMS increased performance of POLYCENTER File Optimizer.

POLYCENTER File Optimize V2.1A protects your investment by maintaining all the features of previous versions, including support for VAX and Alpha systems, hot file placement, and unsurpassed data protection.

Benefits

- Data integrity—Ensures absolute data integrity through the use of the OpenVMS MOVEFILE primitive, which allows the safe movement of files on a disk.
- Enhanced system management productivity—Provides "set and forget" policy (once set, function occurs automatically) and automated, event-based scheduling, thus reducing the amount of time spent on these activities. An enhanced user interface reduces the probability of operations errors and the time it takes to do many operations.
- Reduced backup and operator time—Defragmentation of files improves the performance of backup operations; using this product requires less operator time and system resources.
- Better performing disks—Defragmentation of files improves application response time and allows higher disk utilization. The new offline defragmentation utility for INDEXF.SYS provides a safe way to defragment this important file.
- Need for an Oracle Rdb Runtime License eliminated—Allows users without Oracle Rdb software to take advantage of the powerful POLYCENTER File Optimizer V2.1A capabilities.
- New tiered pricing—Makes V2.1A more affordable than ever to a broader range of users—the new pricing is especially attractive for users of desktop and workgroup solutions.

Ordering Information (see SPD 55.85 for details)

- Software prerequisite is OpenVMS VAX V.5 to V6.2, or OpenVMS Alpha V6.1 and V6.2.

VAX Systems	Alpha Systems	Software
QL-GJ8AB-AA	**QL-2GNAE-AA**	Workgroup License
QL-GJ8A2-AA	**QL-2GNAG-AA**	Departmental License
QL-GJ8A5-AA	**QL-2GNAQ-AA**	Enterprise License
QL-GJ8A9-L*	**QL-2GNA9-L***	Software License Loan
QA-GJ8AA-H5		Media and Documentation, TK50
QA-GJ8AA-HM		Media and Documentation, magtape
QA-VWJ8A-A8	**QA-03XAA-H8**	Software Product Library on CD-ROM
QA-GJ8AA-GZ	**QA-2GNAA-GZ**	Documentation Kit only

POLYCENTER Sequential Media Filesystem for OpenVMS V1.2

POLYCENTER Sequential Media Filesystem for OpenVMS VAX V1.2 (SPD 46.40), a layered software product, lets users and applications manipulate tape files using the same interface currently used to manipulate files on magnetic disk. POLYCENTER Sequential Media Filesystem manages data stored on tape, allowing users and applications to browse an online catalog of tape contents without mounting the tape. OpenVMS utilities, such as COPY and DIRECTORY, work seamlessly with this product. Applications that use RMS sequential access or OpenVMS high level language sequential input-output routines can read and write directly to files on tape. The import feature allows users to create an online catalog of existing tape files. Once cataloged, file directory information can be manipulated as if the files were on disk.

V1.2 of the product introduces support for OpenVMS V6.2 on VAX and Alpha platforms, additional user friendly messages and controls, and no longer requires a prerequisite third party commercial database product.

POLYCENTER Sequential Media Filesystem is designed for maximum ease of use and system management flexibility. POLYCENTER Sequential Media Filesystem for OpenVMS users maintains an online view of files and uses standard directory and sequential file access mechanisms. It uses the Media Device Management Services shared with Storage Library System V2.6 or POLYCENTER Archive/Backup for OpenVMS V1.1 to provide automatic selection, loading, and mounting of the appropriate tape into an available tape device. This capability allows POLYCENTER Sequential Media Filesystem V1.1 and Storage Library System V2.6 or POLYCENTER Archive/Backup for OpenVMS V1.1 to share devices and use common media cataloging and management. POLYCENTER Hierarchical Storage Management also shares this same media management capability, allowing all three applications to share high capacity devices such as the TL series of DLT libraries.

Highlights

- Allows applications to access sequential files on tape easily
- Online index allows browsing of tape contents without mounting tape
- Import feature allow users to catalog existing tape files
- Sophisticated media management automates tape handling

Benefits

- Information systems managers face an obstinate problem—skyrocketing operations and storage costs due to increasing amounts of data stored online. POLYCENTER Sequential Media Filesystem allows users with large files to directly access these files on tape, without the need for more expensive and limited capacity magnetic media. Typical data sets that can be effectively stored and accessed through POLYCENTER Sequential Media Filesystem include:
- Large experimental data files from high energy physics experiments, seismic exploration data, and telemetry data.
- Traditional mainframe batch applications, such as payroll, inventory management reporting, and batch oriented production system updates.
- Document processing applications that include large PostScript and other multimedia data files.
- Historical data repository systems for information such as genealogical data.
- Multiple backup copies of database backups that are too expensive to keep on magnetic disk.

Technical Data

See SPD for prerequisite software version information. The product requires specific versions of OpenVMS VAX or Alpha, Rdb Runtime, and Media and Device Management Services for OpenVMS software. POLYCENTER Sequential Media Filesystem supports all devices listed with Media and Device Management Services except remote devices. For a complete listing of supported systems, tape, and robotic devices, refer to SPD 46.40.

Ordering Information

POLYCENTER Sequential Media Filesystem for OpenVMS Alpha

QL-2AYAE-AA	Traditional Workgroup License
QL-2AYAE-RA	Traditional Workgroup Update License
QL-2AYAG-AA	Traditional Departmental License
QL-2AYAG-RA	Traditional Departmental Update License
QL-2AYAQ-AA	Traditional Enterprise License
QL-2AYAQ-RA	Traditional Enterprise Update License

POLYCENTER Sequential Media Filesystem for OpenVMS V1.2 *(continued)*

POLYCENTER Sequential Media Filesystem for OpenVMS VAX

QL-2AXAB-AA	Traditional Workgroup License
QL-2AXAB-RA	Traditional Workgroup Update License
QL-2AXA2-AA	Traditional Departmental License
QL-2AXA2-RA	Traditional Departmental Update License
QL-2AXA5-AA	Traditional Enterprise License
QL-2AXA5-RA	Traditional Enterprise Update License

Product License Loan

QL-2A*A9-LA	90 Day Loan
QL-2A*A9-LB	30 Day Loan
QL-2A*A9-LD	60 Day Loan
QL-2A*A9-LG	180 Day Loan

Media and Documentation

QA-2AXAA-H5	TK50 Kit
QA-2AXAA-HM	Magtape Kit
QA-2AXAB-GZ	VAX Documentation Kit
QA-2AYAB-GZ	Alpha Documentation Kit

StorageWorks RAID Software V2.2 for OpenVMS Systems

StorageWorks RAID Software V2.2 for OpenVMS provides striping (RAID Level 0), and Striping with Parity, (RAID Level 5) and disk partitioning. V2.2 supports OpenVMS VAX and Alpha platforms, supports up to 64 partitions per array, supports up to 32 physical disks per array, and supports up to 20 nodes in OpenVMS clusters.

Highlights

- OpenVMS Alpha V1.5, V6.1 and V6.2 users are now able to use all product capabilities available to OpenVMS VAX users.
- Large disk arrays are now easier to manage with enhanced partitioning capability.
- Special limited-time offer allows POLYCENTER Striping for OpenVMS VAX users to gain benefits of StorageWorks RAID software at a reduced price.

Benefits

Using existing hardware, StorageWorks RAID software enables users to boost system I/O performance through the load balancing effects of disk striping, or gain the higher data availability provided by Striping with Parity (RAID level 5). Additionally, as total storage capacity grows, the ability to partition arrays into conveniently manageable amounts of storage becomes increasingly important. The new version also makes it easy to configure RAID 0+1 solutions when used with OpenVMS Volume Shadowing software, an optional and separately orderable product.

Since StorageWorks RAID software adds the benefits of RAID technology without requiring the purchase of additional hardware, users can extend RAID capability to disks that would not otherwise be RAID capable, such as older disks, directly attached SCSI disks, disks attached via HSD05 DSSI array controllers, and arrays consisting of more than one type of disk.

Migration Information from POLYCENTER Striping for OpenVMS VAX

StorageWorks RAID Software is the replacement product for POLYCENTER Striping for OpenVMS VAX. Any user with a valid POLYCENTER Striping license will be licensed automatically to run the striping (RAID Level 0) portion of StorageWorks RAID Software. Digital also offers an upgrade from POLYCENTER Striping on VAX to the full capabilities of StorageWorks RAID Software on VAX for half price.

Ordering Information (see SPD 46.49 for details)

Software prerequisite is OpenVMS VAX V5.5 to V6.2 or OpenVMS Alpha V1.5, V6.1 and V6.2.

VAX Systems	Alpha Systems	Software
QL-0MHAB-AA	**QL-2YFAE-AA**	Workgroup License
QL-0MHA2-AA	**QL-2YFAG-AA**	Departmental License
QL-0MHA5-AA	**QL-2YFAQ-AA**	Enterprise License
QL-0MHA9-L*	**QL-2YFA9-L***	Software License Loan
QL-0MGAA-3B	**QL-0MGAA-3B**	Concurrent Use License
QA-0MGAA-H5		Media and Documentation Kit, TK50
QA-0MGAA-HM		Media and Documentation Kit, magtape
QA-0MGAA-GZ	**QA-0MGAA-GZ**	Documentation Kit only

Migration Options from POLYCENTER Striping for OpenVMS VAX	
QL-3AXAB-AA	Striping to RAID Software/Workgroup
QL-3AXA2-AA	Striping to RAID Software/Departmental
QL-3AXA5-AA	Striping to RAID Software/Enterprise

Media Robot Utility V1.0

Media Robot Utility (MRU) is a multiplatform software utility that provides direct access control for Digital's DLT (Digital Linear Tape), and 4mm (DAT) and TL8xx libraries. It provides the ability for users to load a cartridge from a selected robot slot into a specified robot drive.

The following commands are supported:

Load:	Moves a cartridge from a slot to a drive.
Unload:	Moves a cartridge from a drive to a slot.
Inject:	Moves a cartridge from a port to a slot.
Eject:	Moves a cartridge from a slot to a port.
Show:	Displays information.
Help:	Displays information on the commands.

A command line interface is provided for Digital UNIX and OpenVMS.

Benefits

With MRU's command line interface, users can select which slot to load a cartridge from, unload the cartridge and display information about the loader without leaving their office. The MRU is extremely useful when setting up a library or loader. With the "Inject" command, a user can move cartridges into the library and specify which slot to put the cartridge in. Using the MRU commands can help diagnose problems as well.

Ordering Information (see SPD 64.44 for details)

Software prerequisites: OpenVMS VAX V5.5 to V6.2, OpenVMS Alpha V6.1 and V6.2, Digital UNIX V1.3 to V3.2C

QM-50TAA-AA	Media Robot Utility License
QB-50TAA-SA	Media Robot Utility License with Media and Documentation

Nonimpact Printers Comparison Chart

	Printserver 32 *Plus* (LPS32)	PrintServer 17/600 (LPS17)	KODAK 1392	XEROX Production Print Systems**
Technology	Laser	Laser	Electrophotographic	Electrophotographic
Speed (max. 8.5 x 11-in. pages/min)	32—Simplex and duplex	17—Simplex 15—Duplex	Up to 92 impressions/minute	Up to 135 ppm
Recommended Impressions/mo. (max)	Up to 200,000	Up to 70,000	1,000,000	Up to 2,500,000
Number of Colors	1	1	1	1-2
Paper Type	Cutsheet, labels (special stock required), transparencies, envelopes	Cutsheet, labels (special stock required), transparencies, envelopes	Cutsheet	Cutsheet
Paper Thickness (max)	18–24 lb	18–24 lb	Upper supply: 16 lb bond - 110 lb index Lower supply: simplex 16 - 32 lb; duplex 16 - 28 lb	16-110 lb
Multipart Forms	No	No	No	No
Paper Sizes	7.5 x 10.5 in, 8.5 x 11 in, 8.5 x 14 in, 11 x 17 in, 297 x 420 mm 210 x 297 mm 257 x 364 mm 182 x 257 mm 148 x 210 mm	7.5 x 10.5 in, 8.5 x 11 in, 8.5 x 14 in, 210 x 297 mm 257 x 364 mm	8.5 x 10 in, 8.5 x 11 in, 8.5 x 14 in, 21.0 x 29.7 cm, 25.7 x 36.4 cm	8 x 10 in, 8.5 x 11 in, 8.5 x 14 in, 14 x 17 in
Resident Fonts	43 PostScript Type 1, 5 bitmapped fonts	43 PostScript,		
Optional Fonts	Downloadable	Downloadable	Downloadable	Downloadable
Characters/inch	*	*	*	4 - 30 cpm horizontal
Lines/inch	*	*	*	3 - 18
Graphics Protocols **Line Printer Emulation optional**	PostScript, HP PCL5, DDIF, ANSI/Sixel, ReGIS, TEKTRONIX 4010/4014, ASCII text, IBM Proprinter, CCITT Groups 3 and 4	PostScript Level 2, HP PCL4, DDIF, ANSI/Sixel, ReGIS, TEKTRONIX 4010/4014, ASCII text, IBM Proprinter, CCITT Groups 3 and 4		Xerox
Resolution (Dots per inch)	300 x 300, DEC Image Resolution Enhancement	600 x 600	300 x 300	600 x 600 or 300 x 300
Bar codes	Yes, through ANSI translator and application software	Yes, through ANSI translator and application software		Yes and OCR
Interfaces	Ethernet –DECnet, TCP/IP, Token Ring , AS/400 (PrintGate only)	Ethernet –DECnet, TCP/IP	Ethernet, TCP/IP	DDCMP for OpenVMS VAX, Ethernet/DECnet, Ethernet/XNS, 3rd party
IBM PC- Compatible	Yes, with optional software	Yes, with optional software		
RAM (standard)	16MB to 32MB max	16 MB standard; 32 MB maximum		
Noise Level	<65 dBA	<50 dBA	81 dBA (operating) 65 dBA (standby)	
Dimensions W x D x H	36.9w x 27.2 in.d x 29.6 h 937w x 752d x 752h	17.9 x 22.4 x 19 in 45.4 x 59 x 48.3 cm	31 x 58 x 41 in. 78.7 x 147.3 x 104.1 cm	
Weight	350 lb (155 kg) w/out paper	98 lb (44.5 kg)	1,100 lb (499.0 kg)	
Operating Temperature	500 F to 900 F	100°C - 320°C		
Operating Humidity	20 - 80%	20 - 80%		
Maximum Current	12A @ 100/120V	12A @ 110V		

* Varies depending on fonts used.

** See ordering information for specifics on each model.

Nonimpact Printers Comparison Chart *(continued)*

	LN17/LN17ps	DEClaser 3500	ColorWriter LSR 2000
Technology	Laser	Laser	Electrophotographic laser
Speed (max. 8.5 x 11-in. pages/minute)	17	12	12 (monochrome) 3 (color)
Recommended Impressions/month (max)	Up to 50,000	Up to 20,000	Up to 20,000
Number of Colors	1	1	unlimited
Paper Type	Cutsheet, labels, transparencies, envelopes	Cutsheet, recycled paper, transparencies, labels, envelopes	Plain paper, transparencies
Paper Thickness (max)	16–28 lb Postcard 50 lb	16-24 lb	16-28 lb
Multipart Forms	No	No	No
Paper Sizes	8.5 x 11 in, 8.5 x 14 in, 7.5 x 10.5, 8.3 x 11.7, 10.5 x 7.5	Letter, legal, universal, A4	Letter, legal, A4, A5
Resident Fonts	35 PostSript Type 1 (LN17ps) only 35 Intellifonts 10 TrueType, 1 PCL bitmap	35 Adobe PostScript, 13 Intellifonts, 5 Bitmapped	39 Adobe PostScript Type 1
Optional Fonts	Downloadable	Downloadable	Downloadable or font cartridges
Characters/inch	*	*	*
Lines/inch	*	*	*
Graphics Protocols	LN17/LN17ps - Bidirectional parallel, LN17ps - Ethernet Network Interface card supporting TCP/IP, IPX/SPX for Novell Netware, EtherTalk and LAT Optional - Serial , LocalTalk Network Interface Card	Postscript, PCL	PostScript Level 2
Resolution (Dots per inch)	600 x 600 or 1200 x 600	600 x 600	600 x 600
Bar codes	Yes	Yes, through ANSI translator or downloaded	No
Interfaces	Bi-directional Parallel, LocalTalk, Serial, TCP/IP, IPX/SPX, Ethertalk, LAT	Bi-directional Parallel, LocalTalk, Serial, TCP/IP, IPX/SPX, Ethertalk, LAT	Centronics Parallel, Ethernet, SCSI
IBM PC- Compatible	Yes		Yes
RAM (standard)	LN17 - 1 MB LN17S - 5 MB Upgradeable to 64 MB	3 MB (upgradable to 19 MB) Adobe Memory Booster Technology	16 or 32 MB (standard) Expandable to 48 MB
Noise Level	50 dBA (operating) 35 dBA (standby)	< 50 dBA (operating) 37 dBA (idle)	<49 dBA
Dimensions W x D x H	11.6 in x 16.3 in x 17.4 in 294mm x 442 mm x 418 mm	10.5 x 14.4 x 16 in	21.3 x 22.8 x 18.1 in 540 x 580 x 460 mm
Weight	40.91lbs (18.6 kg)	28.8 lbs	110 lb (50 kg)
Operating Temperature	40 to 95 F/5°-35°C	32 to 122 F/0 to 50 C	15°-35°C
Operating Humidity	15%-85%	5 to 8%	20%-80%
Maximum Current	8A (110V)		9.5A (100-120V)

* Varies depending on fonts used.

Impact Printers Comparison Chart

	LA30N Companion Printer	LA30W Companion Printer	LA400 MultiPrinter	LA600 MultiPrinter
Technology	Dot-matrix, 24-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire
Speed	333 cps (high-speed draft) 300 cps (draft) 200 cps (correspondence) 100 cps (LQ)	333 cps (high-speed draft) 300 cps (draft) 200 cps (correspondence) 100 cps (LQ)	400 cps (draft) 133 (LQ)	600 ch/s (draft) 300 ch/s (NLQ) 150 ch/s (LQ)
Recommended impressions/month (max)	3,500	3,500	10,000	20,000
Number of Colors	7 (optional)	7 (optional)	7 (optional)	7 (optional)
Paper type	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes
Paper thickness (Maximum)	0.014 in. (0.035 cm)	0.014 in. (0.035 cm)	.025 in. (.64mm)	.025 in. (.64mm)
Multipart forms	1–5	1–5	1-6	1-6
Width of output	4.0-10.5 in. (10.2-26.7 cm)	4.0-16.5 in. (10.2-42.0 cm)	3-17.5 in. (7.6-44.6 cm)	4-15.8 in
Resident fonts	8 bar code 7 typeface	8 bar code 7 typeface	10 bar code 9 typeface	11
OCR-A/B	OCR-A/B	OCR-A/B	OCR-A/B	OCR-A/B
Characters Per inch	10, 12, 13-2, 15, 16-5, 17, 18, 20	10, 12, 13-2, 15, 16-5, 17, 18, 20	10, 12, 15, 17.1, 18	10, 12, 15, 17, 18
Lines per inch	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	3, 4, 6, 8, 12	2, 3, 4, 6, 8
Graphics Protocols	ANSI/(PPL2), IBM Proprinter, X24E, Epson ESC/P2	ANSI/(PPL2), IBM Proprinter, X24E, Epson ESC/P2	ANSI/sixel IBM XL24E Epson EJC/P2	ANSI/sixel, IBM Proprinter, X24E Epson LQ 2550
Resolution (Dots per inch)	360 H x 360 V	360 H x 360 V	360 H x360 V	360 H x360 V
Bar codes	Yes, through optional ON-TAP software, POSTNET support	Yes, through optional ON-TAP software, POSTNET support	10 resident bar codes including POSTNET	10 resident bar codes including POSTNET
Interfaces	EIA-423[1], Parallel[2]	EIA-423[1], Parallel[2]	EIA 423 Parallel BiTronics	20 Centronics Parallel, Serial RS-232
IBM PC- Compatible	Yes (IBM Proprinter 24E emulation)	Yes (IBM Proprinter 24E emulation)	Yes (IBM Proprinter 24E emulation)	Yes
Baud rate	200–9,600	200–9,600	600-38,400	600-19,200
Buffer size	2 KB, 8 KB, 10 K, 32K or 64K	2 KB, 8 KB, 10 K, 32K or 64K	32 KB	47 KB
Noise level	55 dBA (average)	55 dBA (average)	56 dBA	53 dBA
Dimensions W x D x H	17 x 13 x 5.2 in 432 x 330 x 132 mm	22.4 x 13 x 5.2 in 570 x 330 x 132 mm	26.1x 14.9 x 12.2 in 665 x 380 x 310 mm	25 x 16.3 x 10.7 in 62.5 x 40.7 x 26.7 cm
Weight	16.5 lb (7.5 kg)	18.7 lb (8.5 kg)	39.6 lb (18 kg)	50 lb (22.7 kg)
Ribbon/ink Technology	Nylon cartridge optional color	Nylon cartridge optional color	Nylon cartridge optional color	Nylon cartridge optional color

1 EIA-232D compatible with optional adapter
2 PC Centronics type

Impact Printers Comparison Chart *(continued)*

	LG04*plus*/LGL4*plus*	LG08*plus*/LGL8*plus*	LG12*plus*
Technology	Line-matrix	Line-matrix	Line-matrix
Speed	475 lpm (draft) 360 lpm (data processing) 190 lpm (NLQ)	800 lpm (draft) 600 lpm (data processing) 300 lpm (NLQ)	1,200 lpm (draft) 900 lpm (data processing) 450 lpm (NLQ)
Recommended Impressions/month (max)	Unlimited	Unlimited	Unlimited
Number of colors	1	1	1
Paper type	Fanfold, labels cardstock, multipart forms (1–6)	Fanfold, labels cardstock, multipart forms (1–6)	Fanfold, labels cardstock, multipart forms (1–6)
Paper thickness (Maximum)	0.025 in. (0.06 cm)	0.025 in. (0.06 cm)	0.025 in. (0.06 cm)
Multipart forms	1–6	1-6	1–6
Width of output	3-17 in (7.62-43.18 cm)	3-17 in (7.62-43.18 cm)	3-17 in (7.62-43.18 cm)
Resident fonts	5	5	5
OCR-A/B	OCR-A/B	OCR-A/B	OCR-A/B
Characters Per inch	5, 10, 12, 13.3, 15, 16.7	5, 10, 12, 13.3, 15, 16.7	5, 10, 12, 13.3, 15, 16.7
Lines per inch	6, 8, 10	6, 8, 10	6, 8, 10
Graphics Protocols	ANSI/Sixel, Epson ESC P, IBM ProPrinter III, optional IGP/PGL/ or IGP/VGL	ANSI/Sixel, Epson ESC P, IBM ProPrinter III, optional IGP/PGL/ or IGP/VGL	ANSI/Sixel, Epson ESC P, IBM ProPrinter III, optional IGP/PGL/ or IGP/VGL
Resolution	180 H x 96 V	180 H x 96 V	180 H x 96 V
Bar codes	Code 39, Extended Code 39, Interleaved 2 of 5, Code II, Codabar A, B, C, D, UPC-A, UPC-E, Postenet, EAN 8, EAN 13, and Code 128	Code 39, Extended Code 39, Interleaved 2 of 5, Code II, Codabar A, B, C, D, UPC-A, UPC-E, Postenet, EAN 8, EAN 13, and Code 128	Code 39, Extended Code 39, Interleaved 2 of 5, Code II, Codabar A, B, C, D, UPC-A, UPC-E, Postenet, EAN 8, EAN 13, and Code 128
Interfaces	IEEE-P1284 or Centronics or Dataproducts; RS232 or RS422	IEEE-P1284 or Centronics or Dataproducts; RS232 or RS422	IEEE-P1284 or Centronics or Dataproducts; RS232 or RS422
IBM PC- Compatible	Yes, through IBM Proprinter emulation	Yes, through IBM Proprinter emulation	Yes, through IBM Proprinter emulation
Baud rate	300–115 K	300–115 K	300–115 K
Buffer size	1 K	1 K	1 K
Noise level	52 dBA/60 dBA	52 dBA/62 dBA	52 dBA
Dimensions H x W x D	42.3 x 27 x 28.5 in/35.0 x 24.6 x 20.7 in 107.4 x 69.8 x 72.4 cm/89 x 62.5 x 53.6 cm	42.3 x 27 x 28.5 in/35.0 x 24.6 x 20.7 in 107.4 x 69.8 x 72.4 cm/89 x 62.5 x 53.6 cm	42.3 x 27 x 28.5 in/35.0 x 24.6 x 20.7 in 107.4 x 69.8 x 72.4 cm/89 x 62.5 x 53.6 cm
Weight (shipping)	285 lb (129.3 kg)/115 lb (52.2 kg)	285 lb (129.3 kg)/115 lb (52.2 kg)	285 lb (129.3 kg)/115 lb (52.2 kg)
Ribbon/ink Technology	Nylon reel-to-reel 20 M characters	Nylon reel-to-reel 20 M characters	Nylon reel-to-reel 20 M characters

1 EIA-232D compatible with optional adapter
2 PC Centronics type

PrintServer 32 *Plus*

The PrintServer 32 *Plus* is a high-volume, large workgroup or data center printer designed to be managed from the desktop. This powerful printer provides shared printing facilities for DECnet, TCP/IP Ethernet networks. It is intended to serve departments that print up to 200,000 pages per month.

The PrintServer 32 *Plus* prints up to 32 impressions, or 2000 lines per minute, single-sided (simplex) or double-sided (duplex). It can print many complex print jobs, such as complicated graphics, forms, multifont text reports, and simple mail messages.

Large input and output trays are available for the PrintServer 32 *Plus*. 3000-sheet input and output trays allow for less frequent loading and unloading of paper. A MailBox allows for pre-sorting of individual and group print jobs, and provides locked trays for confidential material.

The PrintServer 32 *Plus* is connected directly to Ethernet networks, and uses PCL and PostScript by Adobe Systems, Inc.

Order Number	Description
LPS32-L*	PrintServer 32 *Plus* simplex, 1500-input, 1500-output
LPS32-M*	PrintServer 32 *Plus* simplex, 3500-input, 1500-output
LPS32-NA/NC/NJ/NZ	PrintServer 32 *Plus* duplex, 1500-input, 1500-output
LPS32-PA/PC/PJ/PZ	PrintServer 32 *Plus* duplex, 3500-input, 1500-output
LPS32-RA/RC/RJ/RZ	PrintServer 32 *Plus* duplex, 3500-input, 4500-output

* Denotes: **A** = U.S. and Mexico; **B** = Belgium, France, Germany, and Holland; **C** = Canada; **D** = Denmark; **E** = England and Ireland; **F** = Finland, Norway, Portugal, Sweden; **I** = Italy; **J** = Japan; **K** = Switzerland; **S** = Spain; **T** = Israel; **Z** = Australia and New Zealand

Accessories and Supplies	
LPS1X-UE	4MB Memory
LPS1X-UF	8MB Memory
LPS3X-DA	PrintServer 32 *Plus* duplex upgrade kit
LPS3X-FA/FC	20-bin MailBox with two locking trays (110/220 V)
LPS3X-BB	3000-sheet input tray
LPS3X-EA/EC	3000-sheet output stacker (110/220 V)
LPS3X-FD	Security tray for LPS32 MailBox
LN01X-AB	A size paper, 8.5 x 11.0 in., 5000 sheets (letter)
LN03X-AJ	A size transparencies, 8.5 x 11.0 in., 50 sheets
LPSXX-PA	B size paper, 11.0 x 17.0 in., 250 sheets
LPS4X-BA	Small paper cassette
LPS4X-BB	Large paper cassette
H9850-TA	Laser labels (30/sheet, 100 sheets/box)
H9850-TB	Laser labels (21/sheet, 100 sheets/box)
LPS3X-AA	Toner kit (30,000 pages)
LPS3X-AC	Drum and supplies kit (100,000 pages)
LPSXX-AD	Maintenance kit (60,000 pages)
LPS3X-LP	Bulk supplies kit (300,000 pages)

For PrintServer Software information, see PrintServer Software section.

Note: PrintServer 32 *Plus* specifications follow the PrintServer 17/600 ordering information.

PrintServer 17/600

The PrintServer 17/600 offers the power, openness, and functionality of Digital's PrintServer family in an economical, desktop-sized package. It is best suited for medium-size workgroups supporting 10-30 users.

With a resolution of 600 dpi, the PrintServer 17/600 is a rugged printer with a 17-page-per-minute print engine and a powerful controller which virtually assure printing at engine speed. The PrintServer 17/600 prints on a variety of media, including envelopes; it prints one-sided and two-sided (with optional duplex upgrade); and its 70,000-page-per-month duty cycle easily handles the printing needs of a medium-sized department.

PrintServer 17/600—simplex, 1000-input, 500-output, with ThinWire/thick wire Ethernet interface card

Order Number	Country
LPS17-DA	U.S., Canada, Mexico
LPS17-DB	Belgium
LPS17-DD	Denmark
LPS17-DE	England/Ireland
LPS17-DG	Germany
LPS17-DH	Holland
LPS17-DI	Italy
LPS17-DP	France
LPS17-DS	Spain
LPS17-DT	Israel
LPS17-DZ	Australia/New Zealand
LPS17-FB	Switzerland
LPS17-FC	Sweden, Finland, Norway, Portugal
Accessories and Supplies	
LPS1X-UE	4 MB Memory
LPSiX-UF	8 MB Memory
LPS1X-AA	PrintServer 17/600 toner cartridge
LPS1X-AB/AC	PrintServer 17/600 customer maintenance kit, 110V/
LPS1X-UB	PrintServer 17/600 duplex upgrade kit (requires 12 Mbytes total RAM)
LPS1X-B*/D*	PrintServer 17/600 1500-sheet input feeder, A size, 110V/220V
LPS1X-TP	PrintServer 17/600 ThinWire/twisted pair Ethernet interface card
LPS1X-LT	PrintServer 17/600 letter size cassette
LPS1X-LA	PrintServer 17/600 legal size cassette
LPS1X-LB	PrintServer 17/600 A4 size cassette
LPS1X-LE	PrintServer 17/600 Executive size cassette
LPS1X-GA/GB	PrintServer 17/600 3000 sheet stacker (110/220 V)
PrintServer Software	
QL-0V9A9-AA	PrintServer Software traditional license
QL-0V9A9-RA	PrintServer Software update license
QA-0V9AA-H[1]	PrintServer Software for OpenVMS[2]
QA-0V9AB-H[1]	PrintServer Software for ULTRIX[3]
QA-0V9AC-H[1]	PrintServer Software for SunOS
QA-0V9AD-H[1]	PrintServer Software for HP-UX
QA-0V9AE-H[1]	PrintServer Software for IBM AIX
QA-0V9AG-H[1]	PrintServer Software for NetWare
QA-0V9AH-H[1]	PrintServer Software for Windows 95 and Windows NT
QA-0V9AJ-H[1]	PrintServer Software for Digital UNIX
QA-0V9AK-H[1]	PrintServer Software for Solaris
QA-0V9AQ-H[1]	PrintServer Software for Silicon Graphics IRIX
QT-0V9xx-xx	PrintServer Software Services

1 denotes M = magtape, 8 = CD-ROM, 5 = TK50, P = QIC, P = DAT, C = 3.5-inch diskette, 7 = 5.25-inch diskette
2 Supporting host only. For Print Client software for OpenVMS, refer to DECprint Supervisor (DCPS) for OpenVMS.
3 Supporting host only. For Print Client for ULTRIX, refer to ULTRIX operating system.

PrintServer 32 *Plus*/PrintServer 17/600 Specifications

Product Type

Nonimpact printers with Digital-developed data controllers, Ethernet interface, PostScript interpreter by Adobe Systems, Inc.

Prerequisite Software

- DECnet/OSI Phase IV or TCP/IP
  OpenVMS systems: OpenVMS V5.3 (or greater)
  ULTRIX systems: V4.0 (or greater)

Maximum Print Speed*

- **PrintServer 32 *Plus*:** 32 pages-per-minute with 8.5-x 11-inch or A4 paper
- **PrintServer 17/600:** 17 pages-per-minute with 8.5-x 11-inch or A4 paper, simplex

Image Resolution

- **PrintServer 32 *Plus*:** 300 x 300 dpi for text, graphics, and images; DECimage resolution enhancement
- **PrintServer 17/600:** 600 x 600 dpi for text, graphics, and images; DECimage resolution enhancement

Paper Handling

- **PrintServer Plus 32 *Plus*:**
  - Three cutsheet input trays: 1500 total sheet capacity of 20 lb (75 g/m^2) paper
  - Primary input tray: 1000
  - Two primary cutsheet output trays: 1500 total sheet capacity of 20 lb (75 g/m^2) paper
  - Side output tray for media such as transparencies and specified label stock; PrintServer 32 *Plus* has optional 20-bin MailBox 3000 sheet capacity input and output trays
- **PrintServer 17/600:**
  - Two cutsheet input trays: 1000 total sheet capacity of 20 lb (75 g/m^2) paper
  - One cutsheet output tray: 500 total sheet capacity of 20 lb (75 g/m^2) paper
  - Optional 1500 sheet input tray, 3000 sheet output tray

Paper

Minimum 18 lb (67.5 g/m^2); maximum 24 lb (90 g/m^2). Minimum 20 lb (75 g/m^2) paper weight is recommended for duplex printing to ensure maximum readability and paper feeding reliability. Predrilled paper is supported.

- **Recommended Moisture Content**: 4%–6%
- **Environmental Requirements:** For maximum print quality and paper feeding reliability, paper should be stored, unopened, in the same environment as the printer for at least 24 hours before use.
- **Transparencies:** Polyester film with a basic thickness 0.004 inch (+-0.0004 inch) with both sides coated to receive toner
- **Label Stock:** As specified by label manufacturers for laser printers and plain paper copiers

Standard Typefaces

- Courier (fixed pitch) with bold, oblique, and bold oblique
- Times with bold, italic, and bold italic
- Helvetica with bold, oblique, and bold oblique
- Symbol/Math
- ITC Avant Garde Gothic Book with Book oblique, demi, and demi-oblique
- New Century Schoolbook with bold, italic, and bold italic
- ITC Lubalin Graph Book with Book oblique, demi, and demi-oblique
- ITC Souvenir demi, demi italic, light, and light italic
- Palatino with roman, bold, italic, bold italic
- ITC Bookman with light, demi, light italic, demi italic
- ITC Zapf Chancery with medium italic
- ITC Zapf Dingbats

* Print speed is a function that is dependent on several characteristics: paper size, amount of text and number of font changes, quality of application-generated PostScript code, and graphics complexities.

PrintServer 32 *Plus*/PrintServer 17/600 Specifications *(continued)*

Physical Characteristics

	PrintServer 32 *Plus*	**PrintServer 17/600**
Height	126 cm (49.6 in.)	48.3 cm (19.0 in.)
Width	93.5 cm (36.8 in.)	45.4 cm (17.9 in.)
Depth	69 cm (27.2 in.)	57 cm (24.4 in.)
Weight	157 kg (345 lb)	44 kg (98 lb)
Power Requirements		
Voltage	100–120 V; 50–60 Hz (North America, Japan) 220–240 V; 50 Hz (International)	100–115 V; 50–60 Hz (North America, Japan) 220–240 V; 50 Hz (International)
Current ac amps (maximum)	12 A (North America, Japan) 7 A (International)	9.9 A (North America, Japan) 4.8 A (International)
Heat Dissipation (continuous printing)	< 5000 Btu/hr	< 2850 Btu/hr
Operating Environment		
Temperature	10° to 32° C (50° to 90° F)	10° to 32° C (50° to 90° F)
Relative humidity	Operating: 20% to 80% humidity (noncondensing)	
Recommended humidity	45% ±10%	
Altitude	Up to 2000 meters (6500 feet)	Up to 2500 meters (8300 feet)

LN17 and LN17ps Network Printers

The LN17 and LN17ps are 17ppm network laser printers designed for heterogeneous support in industry standard network environments. With a resolution of 1200 x 600 dpi, they offer high quality output in both text and graphics. Two models are available; the LN17 supports PCL5e and the LN17ps supports PCL5e, Adobe PostScript Level 2 and also includes a Network Interface Card, all standard.

Features

- Fast—17 page per minute print speed handles print jobs quickly and efficiently for 10-30 user workgroups from any application producing reports, memos, presentations, and spreadsheets.
- Superior network connectivity provided through simultaneous active bi-directional parallel, LocalTalk, and Network Interface Card (supporting TCP/IP, IPX/SPX, EtherTalk, and LAT).
- Small footprint for easy placement on any desktop; options fit inside or on top so footprint is the same with or without options.
- Adobe PostScript Level 2 and PCL5e ensure compatibility with applications in mixed platform environments.
- Lockable mailbox option provides security for confidential documents.
- 1200 x 600 dpi, high quality printing in minimum memory configuration.

Order Number	Description
LN17-A*	LN17 PCL5e, bi-di parallel interface
LN17N-A*	LN17 PCL5e, PostScript, bi-di parallel, Network Interface card
LN17X-DA	Duplex
LN17X-HD	Internal Hard Disk
LN17X-PS	Adobe PostScript Level 2 Kit
LN17X-NW	Ethernet Network Interface card
LN17X-AT	LocalTalk Network Interface card
LNXXM-AA	4MB SIMM
LNXXM-AC	16MB SIMM
LNXXM-AD	32MB SIMM
LN17X-TA	500-Sheet universal deck
LN17X-TB	500-Sheet universal tray
LN17X-TE	75-Envelope feeder
LN17X-TS*	500-Sheet offset catch tray
LN17X-TM*	10-Bin locking mailbox/collator
LN17X-TC	250-Sheet universal tray
LN17X-AA	Toner Cartridge (approx. 10,000 sheets)
LN17X-AC	Maintenance Kit (approx. 200,000 sheets

* Cannot be simultaneously configured

Specifications

Speed	17 ppm
Processors	Intel 960 JD50 25 MHz external bus/50 MHz internal bus, Intel 82961 KD coprocessor
Resolution	600 x 600 dpi, 1200 x 600 dpi, TrueRes enhanced 600 dpi and Toner Saver mode
Duty cycle	Up to 50,000 pages per month
Memory	LN17 2 MB (upgradeable to 64 MB) LN17ps 6 MB (upgradeable to 64 MB)
Protocols/ interfaces	LN17: Bidirectional parallel LN17ps: Bidirectional parallel, Ethernet Network Interface card supporting TCP/IP, IPX/SPX for Novell NetWare, EtherTalk, and LAT
Optional	Serial, LocalTalk Network Interface card
Languages	LN17: PCL5e LN17ps: PCL5e and Adobe PostScript Level 2
Duplex	Optional
Fonts	39 Adobe PostScript Type 1 (LN17ps only) 35 Intellifonts, 10 TrueType, 1 PCL bitmap

LN17 and LN17ps Network Printers *(continued)*

Specifications *(continued)*

Paper Handling	(1) 100-sheet front tray (1) 250-sheet input tray (2) 500-sheet input trays (optional) (1) 250-sheet output tray (1) 500-sheet offset catch tray (optional) (1) Locking Mailbox/Collator (optional) (1) 75-envelope feeder (optional)
Paper types/sizes	Letter, Legal, Executive, A4, B5, Transparency, Envelope, Postcard
Paper weights	16-28 lb., postcard (50 lb.)
Noise	Operating: 50 dBA, Standby: 35.0 dBA
Power	90-132V/50Hz +/- -3%, 60Hz +/- -3%, 580w max,
Requirements	15w sleep (US/Japan) 198-264V/50Hz +/- -3%, 670w max, 15w sleep (Europe)
Temperature	40 to 95 degrees F/5 ot 35 degrees C, 15% to 85% relative humidity
Warranty	1 year on-site
Weight	Base machine - 16.1kg / 33 lbs (unpacked)
Dimensions	Base machine - 11.2" x 15.3" x 15.7" (284mm x 424mm x 399mm)

DEClaser 3500

The DEClaser 3500 offers support for more business-class features than any other printer. Its laser technology with true 600 dpi resolution and resolution enhancement produces crisp, clean output with smooth gradations and crisp black text.

The DEClaser 3500 is an ideal printing solution for small workgroups (2-10 users) in networked offices. Optional interface cards provide compatibility with PC, Macintosh, UNIX, and other propular networking topologies.

Features

- 12 ppm print speed
- 600 dpi resolution with resolution enhancement for sharper output
- DECimage software enhances sharpness and enables 256 gray levels
- 3 MB of RAM (upgradeable to 19MB
- 53 resident fonts (35 Adobe PostScript Type 1, 13 TrueType, 5 Bitmap)
- 350-sheet input tray (total capacity upgradeable to 800 sheets)
- Switches automatically between Adobe PostScript Level 2 and HP-PCL5
- FAX capable for sending and receiving FAXes on plain paper

PC Environments	Macintosh Environments	Networked Environments	ANSI Environments	Country
LN14P-AD	**LN14M-AD**	**LN14N-AD**	**LN14A-AD**	Denmark
LN14P-AE	**LN14M-AE**	**LN14N-AE**	**LN14A-AE**	UK/Ireland
LN14P-AI	**LN14M-AI**	**LN14N-AI**	**LN14A-AI**	Italy
LN14P-AS	**LN14M-AS**	**LN14N-AS**	**LN14A-AS**	Spain
LN14P-AT	**LN14M-AT**	**LN14N-AT**	**LN14A-AT**	Israel
LN14P-AZ	**LN14M-AZ**	**LN14N-AZ**	**LN14A-AZ**	Australia/New Zealand
LN14P-CA	**LN14M-CA**	**LN14N-CA**	**LN14A-CA**	U.S./Japan
LN14P-CB	**LN14M-CB**	**LN14N-CB**	**LN14A-CB**	Switzerland
LN14P-CC	**LN14M-CC**	**LN14N-CC**	**LN14A-CC**	Sweden, Finland, Norway, Portugal
LN14P-CD	**LN14M-CD**	**LN14N-CD**	**LN14A-CD**	Belgium, France, Holland Germany

Options, Accessories, and Supplies	
LN141X-AA	Toner cartridge (4,500 page life)
LN14X-UD	4 MB memory SIMM
LN14X-UE	8 MB memory SIMM
LN14X-SI	Serial Interface
LN14X-AT	LocalTalk Interface
LN14X-NW	NIC (TCP/IP, IPX/SPX, Ethertalk, LAT)
LN14X-FX	PostScript FAX for North America
LN14X-XF	PostScript FAX for Singapore
LN14X-XG	PostScript FAX for Germany
LN14X-XH	PostScript FAX for Holland
LN14X-XP	PostScript FAX for France
LN14X-ZA	PostScript FAX for UK/Ireland/Hong Kong
LN14X-ZB	PostScript FAX for Australia
LN14X-ZD	PostScript FAX for Denmark
LN14X-FB	2 MB Programmable Font Module
LN14X-TL	250 Sheet Legal Tray
LN14X-TU	250 Sheet Universal Tray
LN14X-TA	500 Sheet A4 Tray
LN14X-TC	500 Sheet Letter Tray
LN14X-TF	500 Sheet Letter Feeder
LN14X-TG	500 Sheet A4 Feeder
LN14X-TE	30 Sheet Power Envelope Feeder
LNCPB-AE	ANSI Box UK/Ireland/AS
LNCPB-AZ	ANSI Box Australia/New Zealand
LNCPB-CA	ANSI Box U.S./Japan

DECcolorwriter 1000

The DECcolorwriter 1000 desktop, thermal wax transfer printer prints on plain paper, thermal wax transfer paper, and transparencies. It prints two pages per minute in color, four pages per minute in black and white, and can generate 16.7 million shades of highly saturated colors.

Best suited as a networked printer, the DECcolorwriter 1000 can also be used as a standalone device. It is designed for PC, Macintosh, and workstation environments, and is ideal for desktop publishing, presentation, and pre-press applications. All printer drivers are shipped with the printer.

The DECcolorwriter 1000 includes Adobe PostScript Level 2, HP-PCL 5, and HP-GL printer protocols for a wide selection of software application support. It also supports OpenVMS, ULTRIX, SCO, Windows NT, Windows 3.1, and OS/2 operating platforms.

The DECcolorwriter 1000 simulates the PANTONE color matching system when used with PANTONE certified software. Internal color adjustments such as TEK color and CIE assist the user in matching the color of their display to the expected printed output.

Features

- 300-by 600-dpi; 2 ppm in full color; 4 ppm in black and white
- Prints on plain paper (with LF02X-KC laser paper ribbon), thermal wax paper and transparencies
- Optional networking printer server allows network connections to: Apple EtherTalk, TCP/IP, LAT, Novell
- Automatic port and emulation sensing
- Internal color adjustments with an "On Screen Previewer" for WYSIWYG output
- PANTONE color simulations for industry-certified color output
- Resident AppleTalk, serial, and parallel communication interfaces
- Supports DCPS for OpenVMS, OS/2, UNIX, SCO, Windows NT, Windows V 3.1
- Supports Silicon Graphics, IBM, SUN, VAX, Macintosh, and HP Workstations
- Supports many PC/non-PC applications that output in PostScript or PCL 5
- Up to 8 MB of memory
- Up to 39 Adobe PostScript fonts
- Optional second input tray; total input capacity of 200 sheets
- Supports A, A4 media sizes
- Conforms to EPA "Energy Star" standards for energy conservation

Order Number	Country or Region
LF02-CA	North America
LF02-CB	Switzerland
LF02-CC	Central Europe
LF02-AE	U.K.
LF02-AI	Italy
LF02-AT	Israel
LF02-AZ	Australia/New Zealand
Accessories and Supplies	
LF02X-KA	LF02 black thermal transfer ribbon 1/box (880 pages)
LF02X-KB	LF02 3-color thermal transfer ribbon 1/box (342 pages)
LF02X-KC	LF02 3-color laser paper ribbon 1/box (214 pages)
LF02X-TA	LF02 lower input tray assembly with perforated letter size tray, 100 sheets
LF02X-TC	LF02 perforated paper tray letter size, 100 sheets
LF02X-TE	LF02 paper tray letter size, 100 sheets
LF02X-JA	LF02 perforated thermal transfer paper, letter size 8.5 x 12.3 inches (1000 sheets)
LF02X-JC	LF02 perforated laser paper, letter size 8.5 x 12.3 inches(500 sheets)
LF02X-JE	LF02 perforated thermal overhead transparencies, letter size8.5 x 12.3 inches (50 sheets)
LF02X-PF	PostScript font SIMM with 22 fonts

Note: Customers requiring the H8571-E MMJ adapter must order it separately.

DECcolorwriter 1000 *(continued)*

Specifications

Physical Characteristics		
Height	27.9 cm (11.0 in.)	
Width	34.0 cm (13.4 in.)	
Depth	44.4 cm (17.5 in.)	
Weight	18.1 kg (40 lb) printer only	
	23.6 kg (53 lb) printer with lower tray assembly	
Power Requirements		
Voltage	100/120 V	220/240V
Frequency	50–60 Hz	50–60 Hz
Current ac Amps (maximum)	4.0	2.0
Operating Environment		
Temperature	15° –35° C	
Relative humidity	20% to 80%	

Colorwriter LSR 2000+

The Digital Colorwriter LSR 2000+ represents the peak of standard in continuous tone color laser technology. Equipped with an EFI Fiery Xje controller, combined with Digital's well-known product reliability and support, the Colorwriter LSR 2000 provides top-performance and photographic-quality for large complex, text, graphics, and image files.

Features

- 3 ppm color, 12 ppm mono; fast output for short production runs
- 100 MHz Fiery Driven XJE CPU; optimum performance for large, complex, image intensive files
- 600 dpi resolution offers sharper text and image appearance
- Pantone-certified EFICOLOR, Kodak precision, and ICC color matching provide compatibility with industry standards for color management systems
- Adobe PostScript Level 2 for industry-standard software compatibility
- Memory compression capability requires less RAM to print high-quality output; eliminates costly upgrades

The Colorwriter LSR 2000+ includes one each CMYK toner cartridge, OPC drum, silicon oil bottle, toner waste bottle, documentation set, supported drivers, color matching utilities, color matching tables, power cord, and warranty.

Order Number	Country or Region
LNC01-BD/FD	Denmark
LNC01-BE/FE	United Kingdom, Ireland
LNC01-BG/FG	Germany
LNC01-DC/HC	Holland
LNC01-BI/FI	Italy
LNC01-BP/FP	France
LNC01-BS/FS	Spain
LNC01-BT/FT	Israel
LNC01-BZ/FZ	Australia, New Zealand
LNC01-DA/HA	North America
LNC01-BK/FK (Fr)	Switzerland
LNCO1-BL/FL (Ger)	
LNC01-CC	Central Europe
Accessories & Supplies	
LNC1X-CD	16MB memory upgrade kit w/PCK
LNCIX-CE	32MB memory upgrade kit w/PCK
LNC1X-AA	Black toner cartridge (4000 pages @ 5% coverage)
LNC1X-AB	Cyan toner cartridge (4000 pages @ 5% coverage)
LNC1X-AC	Magenta toner cartridge (4000 pages @ 5% coverage)
LNC1X-AD	Yellow toner cartridge (4000 pages @ 5% coverage)
LNC1X-AE	OPC drum (5,000 - 30,000 pages)*
LNC1X-AF	Silicon oil bottle (10, 000 pages)
LNC1X-TA	Optional paper feeder (250 sheet additional capacity; includes universal tray)
LNC1X-TB	Universal paper tray (for use as extra tray)
LNC1X-AG	Box of 50 transparencies (letter size)
LNC1X-AH	Box of 50 transparencies (A4 size)
DECXM-AA/KGR	Ethernet AUI-to-ThinWire media access unit

Note: For additional ordering information and availability of international variants, contact an authorized Digital reseller or sales representative.

* OPC drum life is an estimate only and will be highly dependent upon the mix of color images and black only images being printed. The frequency of the auto calibration and the amount of continuous versus intermittent printing that occurs will also contribute to the overall drum life.

Colorwriter LSR 2000+ *(continued)*

Specifications

Technology	Electrophotographic laser True 4-color process (cyan, magenta, yellow and black)
Controller/processor speed	EFI Fiery XJe/100 MHz
Print Speed	3 ppm color, 12 ppm monochrome
Print Resolution	600 x 600 dpi
Color Quality	Continuous tone output (256 color levels per pixel)
Language	Adobe PostScript Level 2
Color Management	ColorSync 2.0 compatible Windows 95 ICM compatible Kodak Precision compatible Adobe Postscript Level 2 device independent color matching EFICOLOR and ICC color management profiles Solid color simulations through Pantone-certified EFICOLOR
Printer Drivers (included in box)	Macintosh Windows 3.1 Windows 95 Windows NT UNIX[1] OpenVMS[2]
Connectivity	Autosensing ports: Adobe IntelliSelect Centronics Parallel Ethernet (RJ45 and AUI built-in, BNC optional) Simultaneous auto-switching protocols: EtherTalk, TCP/IP, Novell Netware IPX
Memory	16 MB or 32 MB standard, 48 MB maximum
Internal Hard Disk	341 MB
Resident Fonts	39 Adobe Type I typefaces
Media Types	Plain paper, 60-105 g/m2 bond (16-28lbs), transparencies
Paper Size	Letter (8.5 x 11 in.) Legal (8.5 x 14 in.) A4 (210 x 297 mm) B5 (257 x 182 mm)
Printing Area	Border width of non-imageable area: top 10.0mm, bottom 5.0mm, left 5.0mm, right 5.0mm (Letter, Legal, A4, B5)
Paper Input	Standard 350 sheets (100 sheet multipurpose feeder & 250 sheet universal tray) Optional 250 sheet tray (increases input to 600 sheets total)
Paper Output	100 sheets face down or 20 sheets faceup
Duty Cycle	Up to 20,000 pages per month
Weight	Approx. 50 kg, 110 lb. (printer without paper)
Dimensions	540W x 580D x 460H mm (21.3W x 22.8D x 18.1H inches)
Warranty	One year on-site warranty Extended service offerings are also available

1 PPDs for supporting applications.
2 Requires Pathworks for Macintosh to run AppleTalk with Open DCPS or DEC TCP/IP services for OpenVMS for TCP/IP (LPR).

LA30N Companion Printer

A third-generation dot-matrix printer, the LA30N represents the latest technology, offering rapid printing speed, flexibility, and dependability. A proven performer in multiple environments, the LA30N is ideal for use in a wide range of industries from banking and pharmaceuticals to healthcare, education and government.

The LA30N companion printer meets varied printing and paper handling requirements, and has the flexibility to work with most personal computers, terminals and workstations -- in either a personal or shared environment.

Features

- Supports DEC ANSI, IBM Proprinter and Epson ESC/P2 emulations
- Flexible paper handling with push/pull tractor and rear or bottom paper feed
- Fast—up to 330 cps in draft mode and high quality—100 cps letter quality
- Optional color kit allows for preparation of professional documents and graphics
- Rugged—8000 hour MTBF
- Serial and parallel interfaces standard
- 7 resident typeface fonts and 8 resident barcode fonts
- 2 user selectable macro configurations
- Up to 5 part forms

Oder Number	Country or Region
LA30N-CA	North America, Japan
LA30N-AD	Denmark
LA30N-AE	United Kingdon, Ireland
LA30N-AG	Germany
LA30N-AI	Italy
LA30N-AP	France
LA30N-AS	Spain
LA30N-AT	Israel
LA30N-AZ	Australia, New Zealand
LA30N-CB	Switzerland
LA30N-CC	Central Europe
Accessories and Supplies	
LA30R-KA	LA30N black ribbon
LA30R-KC	LA30N color ribbon
LA30R-PH	LA30N printhead
LA30R-CK	LA30N color kit
PCXXA-PC	LA30N platen cleaner
Connectivity Options	
LNXXD-AA	LATprint Thin Wire Ethernet Interface
BC19M-10	Parallel Interface Cable for PCs (10 ft)
BC19M-06	Parallel Interface Cable for PCs (6 ft)
H8571-J	9-pin PC type-to-MMJ Adapter
H8575-A	25-pin Female-to-MMJ Adapter
H8575-B	9-pin Female-to-MMJ Adapter
H8575-D	25-pin Female-to-MMJ Adapter
H8671-A	MMJ-to-25-pin Male Adapter (connects to existing RS-232 25-pin cables
H8673-AA	20mA Active Host Mate-n-Lock-to-EIA-423 DECconnect MMJ Passive Converter
H8673-AB	20mA Active Host RJ11-(6-pin)-to-EIA-423 DECconnect MMJ Passive converter
H8673-AC	20mA Active Host DB25-to-EIA-423 DECconnect MMJ Passive converter

LA30N Companion Printer *(continued)*

Specifications

Physical Characteristics			
Height	132mm (5.1 in.)		
Width	432mm (22.4 in.)		
Depth	330mm (13 in.)		
Weight	8.5 kg. (18.7 lb.)		
Power Requirements			
Voltage/frequency	100 to 120 VAC +/- 10%; 50/60 Hz 200 to 240 VAC -10%, +6%, 50/60 Hz		
Power consumption	Average: 120 VA; maximum: 240 VA		
Operating environment	5 to 38 degrees C (-4 to 140 degrees F), 10% to 95% RH (no condensation)		
Hardware Characteristics			
Interfaces	Centronics Parallel and DEC423 serial, RS232 compatible		
Noise level	Average 55 dBA		
Print Speed		@ 10 cpi	@ 12 cpi
	Letter quality	100 cps	120 cps
	Correspondence	200 cps	240 cps
	Draft quality	300 cps	360 cps
	High-speed	333 cps	400 cps
Resolution	Letter quality	360 x 180 dpi	
	Correspondence	180 x 180 dpi	
	Draft quality	120 x 180 dpi	
	High-speed draft	90 x 180 dpi	
	Graphics	360 x 360 dpi	

LA30W Companion Printer

A third-generation wide carriage dot-matrix printer, the LA30W represents the latest technology, offering rapid printing speed, flexibility, and dependability. A proven performer in multiple environments, the LA30W is ideal for use in a wide range of industries from banking and pharmaceuticals to healthcare, education and government.

The LA30W companion printer meets varied printing and paper handling requirements, and has the flexibility to work with most personal computers, terminals and workstations -- in either a personal or shared environment.

Features

- Supports DEC ANSI, IBM Proprinter and Epson ESC/P2 emulations
- Flexible, wide carriage paper handling with push/pull tractor and rear or bottom paper feed
- Fast—up to 330 cps in draft mode and high quality—100 cps letter quality
- Optional color kit allows for preparation of professional documents and graphics
- Rugged—8000 hour MTBF
- Serial and parallel interfaces standard
- 7 resident typeface fonts and 8 resident barcode fonts
- 2 user selectable macro configurations
- Up to 5 part forms

Oder Number	Country or Region
LA30W-CA	North America, Japan
LA30W-AD	Denmark
LA30W-AE	United Kingdon, Ireland
LA30W-AG	Germany
LA30W-AI	Italy
LA30W-AP	France
LA30W-AS	Spain
LA30W-AT	Israel
LA30W-AZ	Australia, New Zealand
LA30W-CB	Switzerland
LA30W-CC	Central Europe
Accessories and Supplies	
LA30R-KA	LA30W black ribbon
LA30R-KC	LA30W color ribbon
LA30R-PH	LA30W printhead
LA30R-CK	LA30W color kit
PCXXA-PC	LA30W platen cleaner
Connectivity Options	
LNXXD-AA	LATprint Thin Wire Ethernet Interface
BC19M-10	Parallel Interface Cable for PCs (10 ft)
BC19M-06	Parallel Interface Cable for PCs (6 ft)
H8571-J	9-pin PC type-to-MMJ Adapter
H8575-A	25-pin Female-to-MMJ Adapter
H8575-B	9-pin Female-to-MMJ Adapter
H8575-D	25-pin Female-to-MMJ Adapter
H8671-A	MMJ-to-25-pin Male Adapter (connects to existing RS-232 25-pin cables
H8673-AA	20mA Active Host Mate-n-Lock-to-EIA-423 DECconnect MMJ Passive Converter
H8673-AB	20mA Active Host RJ11-(6-pin)-to-EIA-423 DECconnect MMJ Passive converter
H8673-AC	20mA Active Host DB25-to-EIA-423 DECconnect MMJ Passive converter

LA30W Companion Printer *(continued)*

Specifications

Physical Characteristics			
Height	132mm (5.2 in.)		
Width	570mm (22.4 in.)		
Depth	330mm (13 in.)		
Weight	8.5 kg. (18.7 lb.)		
Power Requirements			
Voltage/frequency	100 to 120 VAC +/- 10%; 50/60 Hz 200 to 240 VAC -10%, +6%, 50/60 Hz		
Power consumption	Average: 120 VA; maximum: 240 VA		
Operating environment	5 to 38 degrees C (-4 to 140 degrees F), 10% to 95% RH (no condensation)		
Hardware Characteristics			
Interfaces	Centronics Parallel and DEC423 serial, RS232 compatible		
Noise level	Average 55 dBA		
Print Speed		@ 10 cpi	@ 12 cpi
	Letter quality	100 cps	120 cps
	Correspondence	200 cps	240 cps
	Draft quality	300 cps	360 cps
	High-speed	333 cps	400 cps
Resolution	Letter quality	360 x 180 dpi	
	Correspondence	180 x 180 dpi	
	Draft quality	120 x 180 dpi	
	High-speed draft	90 x 180 dpi	
	Graphics	360 x 360 dpi	

LA400 MultiPrinter

The LA400 MultiPrinter is a high-resolution, wide-carriage, receive-only, impact, dot-matrix printer. It is well suited for various environments from the factory floor to the desktop to the data center. The LA400 MultiPrinter incorporates a 24-wire printhead.

It is a heavy-duty forms printer designed for average usage of up to 10,000 pages per month. The LA400 MultiPrinter is also designed for the IBM personal computer environment with its built-in IBM Proprinter XL24 emulation mode and parallel interface. The LA400 MultiPrinter's paper and forms handling capabilities make it ideal for a variety of applications. For users who need spreadsheet and simple color output, the LA400 MultiPrinter offers a wide carriage and multi-color printing capability.

The rugged modular design of the LA400 MultiPrinter makes it very reliable for high-volume printing in areas such as online transaction processing, engineering and science, financial services, insurance, and banking.

Features

- 400 ch/s draft printing speed (burst); 133 ch/s letter-quality printing speed (burst)
- Prints in black or optional color ink using snap-in ribbon cartridges
- Compatibility with Digital and IBM Proprinter applications through Digital and IBM protocols
- 10 resident bar codes
- Wide carriage enables printing 17.5-inch (44.6-centimeter)wide paper
- Optional second push or pull tractor
- Automatic gap control (AGC)
- Equipped with built-in serial (DEC-423) and parallel (Centronics) interfaces
- Handles up to six-part forms as well as envelopes and labels
- Superior paper handling such as document-on-demand, autoload, autopark, and automatic paper path sensing
- 400 million character print head life
- Four user-defined macro settings

Order Number	Country or Region
LA400-CA	U.S., Canada, Mexico, South America
LA400-AB	Belgium
LA400-AD	Denmark
LA400-AE	U.K., Ireland
LA400-AG	Germany, Austria
LA400-AH	Holland
LA400-AI	Italy
LA400-AS	Spain
LA400-AT	Israel
LA400-AZ	Australia, New Zealand
LA400-AP	France
LA400-AK (Fr) **LA400-AL (Gr)**	Switzerland
LA400-CC	Central Europe

LA400 MultiPrinter *(continued)*

Accessories and Supplies	
LA40R-KA	LA400 black ribbon
LA40R-KC	LA400 color ribbon
LA40X-CK	LA400 color motor
LA40X-PT	Additonal push tractor
LA40X-PL	Pull tractor
LA40X-PS	Printer stand

Cables and Adapters	
H8673-AA	20 mA active host Mate-N-Lok-to-EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6-pin) to EIA-423 DECconnect MMJ passive converter
BC19M-10	IBM/Centronics parallel cable
H8575-A	25-pin female-to-MMJ adapter
H8575-B	9-pin male-to-MMJ adapter (DEC)
H8571-C	25-pin cable-to-MMJ adapter
H8571-D	25-pin male-to-MMJ adapter (modem)
H8571-J	9-pin PC-type-to-MMJ adapter

Specifications

Physical Characteristics	
Height	31.0 cm (12.2 in.)
Width	66.5 cm (26.1 in.)
Depth	38.0 cm (14.9 in.)
Weight	18 kg (39.6 lb)

Operating Environment	
Temperature	10° to 40° C (50° to 104° F) (operating)
Relative humidity	10% to 90% (operating)
Altitude	2400 meters (8000 feet) maximum (operating)

LA600 MultiPrinter

The LA600 MultiPrinter dot matrix printer offers capabilities approaching those of a high-quality, high-volume network line printer for a fraction of the price.

The LA600 includes Digital's popular DECansi (PPL2) protocol, ensuring LA210, LA310, and LA424 compatibility. It also offers other popular printer emulations such as IBM ProPrinter XL24, Epson LQ2550/1060 and Philips GP emulation for Digital's European customers. The LA600 MultiPrinter can serve PCs, workstations, PC LANs, and Ethernet or TCP/IP networks.

The LA600 MultiPrinter is an ideal workgroup printer for financial industry professionals using spreadsheet and business graphics applications. Its multipart-form printing capability makes it the most cost-effective high volume dot matrix printing solution for environments such as service, retail, insurance, government, and data processing.

Features

- Low-cost dot matrix printing at line printer speed (300 lpm)
- Five different paper paths: continuous paper, single cutsheet, multipart forms, envelopes, card stock
- Rugged, 400M-character life, 24-wire printhead for maximum reliability and superior print quality
- Flat Bed printing technology with Automatic Gap Control (AGC) for precise, bi-directional, jam-free printing
- Prints up to 6-part forms
- Wide, 136-column carriage designed for spreadsheets
- Built-in serial and parallel interfaces
- Prints in color with optional color kit

Low 53 dBA noise level Order Number	Country Region
LA600-CA	North America, 120 V
LJ600-AD	Denmark, 220 V
LA600-AE	U.K., Ireland, 240 V
LA600-AI	Italy, 220 V
LA600-AK	Switzerland, 220 V
LA600-AT	Israel, 220 V
LA600-AZ	Australia, New Zealand, 240 V
LA600-CB	Central Europe, 220 V
Accessories and Supplies	
LA60R-KA	LA600 ribbon cartridge, black (x6)
LA60R-KC	LA600 color ribbon cartridge
LA60X-CK	Color option motor (order color ribbons separately)
LA60X-MC	128K memory card
LA60X-PS	Printer stand
LA60X-SF	Automatic sheet feeder (cutsheet)
LA60X-SG	Automatic sheet feeder (multipart and envelopes)

LG04*plus*/LGL4*plus*, LG08*plus*/LGL8*plus*, and LG12*plus* Printers

Third-generation LG*plus* printers have been updated. The LG04*plus*/LGL4*plus*, the lowest volume printers of the series, now generate output at 475 lines-per-minute. The LG08*plus*/LGL8*plus* is the medium-volume printers at 800 lines-per-minute; the LG12*plus* is the high-speed model at 1,200 lines-per-minute. The series offers a variety of emulations, including ANSI, IBM, ProPrinter, LP, LG, Epson, and P-Series protocols. The LG*plus* series also offers several optional installed emulation programs, Magnum Code V (VGL) and Printronix Graphics Language (PGL), that create a true open systems family of printers.

The LG*plus* printers maintain heavy duty cycles. They are flexible enough to accommodate bills of lading, invoice printing, bar codes and labels using POSTNET, multipart forms (up to six parts) and graphics. The LG*plus* series has a model to match any high speed, high throughput needs.

Features

- High speed printing at a low cost
- Lower cost pedestal mounted 475 and 800 pin versions
- Multi-part forms printing
- Supports 13 bar code symbologies and POSTNET
- Upgradeable - affordable migration from 475 lpm, to 800 or 1200 lpm
- Flexible connectivity - both Dataproducts and Centronics parallel interfaces are standard
- LAN connectivity via the RapidPrint 200, an optional Ethernet interface device supporting TCP/IP, LAT and Novell network protocols
- Precise accuracy of dot placement (.002") vertical registration) due to updated shuttle design
- High throughput mixed text and graphics - third generation ANSI code
- Supports virtually all line printer software applications—only printers capable of ANSI and PGL or VGL emulations
- Software backward compatible with existing LG series printers - LG04/06/12

LG04*plus*/LGL4*plus* Line Printer	
LG04-/LGL4-****	475 Lines per minute
LG04P-/LGL4P-****	With Printronix Graphics Language (PGL) installed
LG04V-/LGL4V-****	With Magnum Code V Graphics Language (VGL) installed
LG08*plus*/LGL8*plus* Line Printer	
LG08-/LGL8-****	800 Lines per minute
LG08P-/LGL8P-****	With Printronix Graphics Language (PGL) installed
LG08V-/LGL8V-****	With Magnum Code V Graphics Language (VGL) installed
LG12*plus* Line Printer	
LG12-**	1200 Lines per minute.
LG12P-**	With Printronix Graphics Language (PGL) installed
LG12V-**	With Magnum Code V Graphics Language (VGL) installed
Upgrade Kits	
LGSUP-AA	Upgrade from LG04*plus* to LG08*plus (pedestal and cabinet versions)*
LGSUP-AB	Upgrade from LG08*plus* to LG12*plus (cabinet versions only)*
LGSUP-AC	Upgrade from LG04*plus* to LG12*plus (cabinet versions only)*
LGXXV-UV	VGL Upgrade Kit
LGXXP-UP	PGL Upgrade Kit
Supplies and Options	
LGXXR-SR	60-yard Ribbon (black) (LGplus and LGLplus)
LGXXR-LR	100-yard Ribbon (black) (LGplus only)
BC19M-10	PC Parallel cable
H8575-E	MMJ Adapter (RS232)
H8585-AE	MMJ Adapter (EIA422)
DSTPP-AA	RapidPrint 200
DSTRO-CA	RapidPrint 500 (twisted pair)
DSTRP-DA	RapidPrint 500 (thin wire)

**** Country kits**			
AA = U.S. and Japan	**AE** = U.K., Ireland and Asia	**AS** = Spain	**BS** = Mexico
AC = Canada	**AI** = Italy	**AT** = Israel	**CB** = Switzerland
AD = Denmark	**AP** = France	**AZ** = Australia and New Zealand	**CC** = Central Europe

DECprint Supervisor for OpenVMS (DCPS)

SPD: 44.15
UPI: 09*

DECprint Supervisor (DCPS) for OpenVMS, delivers PostScript printing to the OpenVMS environment for both Digital and third-party printers. It drives and controls Digital's PrintServer and DEClaser PostScript printers along with several third-party PostScript printers, such as Hewlett- Packard LaserJets and Apple LaserWriters. DCPS is a layered product used with systems running OpenVMS V5.5 or greater.

Note: DCPS is offered in three packages: DCPS-Base, DCPS-Open, DCPS-Plus. See chart for highlights of each package. Refer to the SPD for detailed information.

Features

- Offers full support for all Digital PostScript printers and selected third-party PostScript printers.
- Automatically detects the printer language (data protocol) of files and converts them to PostScript.
- Automatically detects PostScript appended to a text data stream (ASCII, DEC ANSI (PPL3), PCL, Proprinter) and lets a job begin with text printing, then switch to PostScript if it is encountered.
- Provides "lay-up" which prints multiple logical page images on one side of a sheet of paper (number-up or N-up), or offsets page images for appropriate margins when binding or hole punching.
- Supports printing in a heterogeneous environment of OpenVMS and PCs networked via PATHWORKS. Printing can be performed from a variety of systems including MS-DOS, MS-Windows, OS/2 and Macintosh desktops, as well as from all OpenVMS applications and environments. Also supports printing via TCP/IP services for OpenVMS.

DCPS Packages

- **DCPS-Base** drives Digital PostScript printers and supports their features (tray selection, two-sided, etc.). DCPS-Base prints PostScript and DEC ANSI (PPL3). **Note:** The OpenVMS license includes the right to operate DCPS-Base.
- **DCPS-Open** drives selected third-party PostScript printers (such as LaserJet and LaserWriter printers from Hewlett-Packard and Apple, respectively) and supports their device-specific features while printing PostScript and DEC ANSI (PPL3). (Currently supported printers listed in the DCPS SPD.)
- **DCPS-Plus** includes advanced features such as Automatic Data Type Detection and Translation, number-up (N-up), lay-up and a full range of translators for the most common printing languages, in addition to the DEC ANSI translator of DCPS-Base. Features are supported on both Digital and third-party PostScript printers.

QL-09FA*-AA	DCPS-Open for OpenVMS VAX (traditional license)
QL-09LA*-AA	DCPS-Plus for OpenVMS VAX (traditional license)
QL-09KA*-AA	DCPS-Open for OpenVMS Alpha(traditional license)
QL-09MA*-AA	DCPS-Plus for OpenVMS Alpha (traditional license)
QA-09NAA-H*	DCPS media and documentation
QA-09NAA-GZ	DCPS documentation

Note: For listed features, DCPS licenses must be ordered separately. These are traditional CPU licenses which support clusterwide printing via queues on licensed CPU.

DECprint Supervisor for OpenVMS (DCPS) *(continued)*

DCPS Features for DCPS-Base, DCPS-Open, and DCPS-Plus

	Base	Open	Plus
Digital Printer Support			
Input tray	X		
Output tray	X		
Sides	X		
Non-Digital Printer Support			
Input tray		X	
Output tray		X	
Sides		X	
Automatic Datatype Detection			X
Printing Languages (Data Types)			
PostScript	X	X	
ASCII	X	X	
DEC PPL3 ANSI	X	X	
PCL Level 4			X
Proprinter XL24E			X
DDIF Bitonal Image			X
ReGIS			X
TEKTRONIX 4010/4014			X
Number-Up			X
Layup Definition			X
Page Orientation	X	X	
Sheet Count (Fast Copies)			X
Messages to user	X	X	
Page Size (Logical)			X
Sheet Size (Physical)	X	X	
Page Limit			X
/SETUP	X	X	
ANSI Printing Features FONTS USED	X	X	
Tab	X	X	
/HEADER	X	X	
/SPACE	X	X	
/FEED	X	X	
/FORM	X	X	
Margins			
Form Length/Width			
Wrap/Truncate			
Page Setup			
Setup			
/COPIES	X	X	
/PASSALL	X	X	
/NOTIFY	X	X	
PostScript Tools	X	X	

DECprint Supervisor for Xerox Printers for OpenVMS Alpha

SPD: 54.74
UPI: 3QO

DECprint Supervisor for Xerox Printers (DSX) for OpenVMS Alpha is a layered software product that runs on OpenVMS Alpha systems and provides access to Xerox Laser Printing Systems (LPS). DSX provides the interface between Xerox printers and the OpenVMS printing and queuing system. DSX uses the OpenVMS PRINT command, with which OpenVMS customers are familiar.

DSX software provides access to the advanced functions and high-speed printing that Xerox LPS printers are known for. The DSX software is well suited for printing high-speed, high quality cut sheet documents as well as complex documents with a mix of text, graphics and images

DSX supports four data streams: ASCII text, Line Conditioned Data Stream (LCDS), Metacode (in 512-byte blocks), and Image.

Features

DSX software supports the following:

- The DCL PRINT command and qualifiers
- Simplex and duplex printing
- Portrait and landscape printing
- Highlight color on printers so equipped
- Page imposition (number up) of up to four page images per sheet
- Offset stacking of print sets
- Forms
- JDLs, JDEs, and DJDEs from the command line or through device control library and the DEFINE/FORM command
- Communication through a shared disk on a dedicated SCSI channel providing high-speed transfer (5 MB per sec) of print jobs to the printer and printing at the rated speed of the Xerox LPS printer
- Downloading of printer resources from the OpenVMS system to the printer using the Management and Diagnostic utility
- Uploading printer resources from the printer to the OpenVMS system using the Management and Diagnostic utility for the purposes of modifying or backing up the resources.

Xerox Printers Supported:

- 4250/MRP black and white printer with XDDI software
- 4850 highlight color printer, release 5.0
- 4090 black and white printer model 3 with XDDI software
- 4890 highlight color printer, release 5.0
- 4135 black and white printer, release 3.6s
- 4635 black and white printer, release 3.0

QL-3Q0AA-3B	Software License
QA-3Q0AB-H8	Software Media (CD-ROM):
QA-3Q0AA-GZ	Software Documentation:
QT-3Q0A*-**	Software Product Services

* Denotes variant fields. For additional information on available services, refer to the appropriate price book.

PrintServer Software

SPD: 48.09
UPI: 0V9

A PrintServer printer includes hardware and licensed software. The PrintServer Software delivers PCL and Adobe PostScript printing and handles all the print management and network communication functions for PrintServers in HP-UX, IBM AIX, NetWare, Windows 95 and Windows NT, OpenVMS, Digital UNIX, Solaris, Silicon Graphics IRIX, SunOS and ULTRIX operating environments. Macintosh printing support is provided through PATHWORKS and third-party products. PrintServer Software has two discrete components—supporting host and print client.

Supporting Host Software

The Supporting Host Software provides management functions and file services which the system manager uses to control the PrintServer system. It also downloads the PostScript and PCL interpreters to the PrintServer system.

Client Software

Any system that sends a print job directly to a PrintServer system is called a "client," and runs the Print Client component of the PrintServer Software. The client software includes a print supervisor that processes requests from designated print queues; software translators that convert non-PostScript files into PostScript language; software that handles communication between the host and the PrintServer over the network; and support for accounting services. This software supports the loading of soft fonts, soft forms, and other PostScript "resources" as a permanent memory-resident printing feature. There is no limit to the number of clients that can share a PrintServer system.

Features

- Simultaneous support for TCP/IP, DECnet and protocols. Many types of systems can share the same Print- Server system via TCP/IP, DECnet Ethernet, and networks.
- Support for one-and two-sided printing, portrait and landscape page orientation, multiple page images per side (number up), and margin alteration. These features enable customized placement of the document pages on paper. Centralized job accounting provides system managers with summaries of PrintServer system use, tracking usage and costs for each print job.
- System managers can control who is allowed to print to a PrintServer printer.
- Automatic datatype detection and translation from non-PostScript files to PostScript.
- Translators for ANSI, ASCII, ReGIS, Tektronix, PCL, DDIF Bitonal (CCITT G3 and G4), Proprinter.
- PostScript error messages and notification of job status are automatically sent to the user.
- Automatic loading of soft fonts, forms, logos, and other PostScript resources as permanent printer resources, so the most frequently used items will always be there, always ready.
- PRInt Status Manager (PRISM) provides monitoring and management of PrintServer printers. Console functions show jobs currently queued, status of Internet subsystem, display of PrintServer configuration, aborting of specific jobs, creation of new accounting and event log files, and printer's supplies (paper and toner) status.

QL-0V9A9-AA	PrintServer Software Traditional License
QL-0V9A9-RA	PrintServer Software Update License
QA-0V9AA-H[1]	PrintServer Software for OpenVMS VAX and OpenVMS Alpha[2]
QA-0V9AB-H[1]	PrintServer Software for ULTRIX (VAX and RISC)[2]
QA-0V9AC-H[1]	PrintServer Software for SunOS
QA-0V9AD-H[1]	PrintServer Software for HP-UX
QA-0V9AE-H[1]	PrintServer Software for IBM AIX
QA-0V9AG-H[1]	PrintServer Software for NetWare
QA-0V9AH-H[1]	PrintServer Software for Windows 95 amd Windows NT
QA-0V9AJ-H[*]	PrintServer Software for Digital UNIX
QA-0V9AK-H[1]	PrintServer Software for Solaris
QA-0V9AQ-H[1]	PrintServer Software for Silicon Graphics IRIX
QT-0V9xx-**	PrintServer Software Services

1 denotes M = magtape, 8 = CD-ROM, 5 = TK50, P = QIC, P = DAT, C = 3.5-inch diskette, 7 = 5.25-inch diskette

2 Supporting Host only. For Print Client software for OpenVMS, refer to DECprint Supervisor (DCPS) for OpenVMS. For ULTRIX, refer to ULTRIX operating system.

Distributed Queuing Service

SPD: 28.80
UPI: VEN (VAX), 0HP (Alpha)

Distributed Queuing Service (DQS) allows OpenVMS users on any node in a DECnet network to use any OpenVMS printer anywhere in the network, as easily as they use a printer directly connected to their own computer. Running on both VAX and Alpha platforms, DQS is compatible with the user's local print commands, and requires no rewriting of applications.

DQS moves jobs from a queue on one system to a queue on another, and also manipulates jobs in the remote queue. DQS supports all OpenVMS printer types, and permits users and applications to address remote printers as they access local printers. It also supports user-written print symbionts for third-party printers and plotters.

Features

- Provides fast, high-performance access to any printer anywhere in the OpenVMS DECnet network—both VAX and Alpha.
- Supports wide area and local area networks.
- Distributes reports to geographically distributed sites
- Is fully compatible with standard OpenVMS print commands and qualifiers.
- Protects investment; requires no user training and no rewriting of application software.
- Enhances flexibility of network configuration.
- Provides security by enabling managers to control which systems may have access to which printers.

VAX Distributed Queuing Service

QL-VENA*-AA	Single-user license
QA-VENAA-H5	TK50
QA-VENAA-HM	9-track magtape
QA-VENAA-GZ	Documentation

DEC Distributed Queuing Service (DQS)

QL-0HPA*-AA	Single-user license
QA-0HPAA-GZ	Software documentation

Digital NAS Packages

Digital NAS Client/Server Packages deliver middleware software products for the integration of applications and data in a distributed multi-platform environment. They deliver to the customer the de jure and de facto public standards-based Application Programming Interfaces (APIs) and component software to make client/server computing possible.

The Digital NAS Packages simplify the process of acquiring and maintaining client/server software with a single license, distribution kit, service and update contract from Digital. These Packages are offered as standalone products as well as in complete hardware/software systems.

Digital NAS Client 150

The Digital NAS Client 150 provides base client software services; choice of network transports, Graphical User Interface (GUI), print and file sharing, object technology, clustering, and message queuing which allow the integration of data and applications in a distributed, multi-platform client/server environment.

Digital NAS Base Server 200

The Digital NAS Base Server 200 provides the following client and server services; choice of network transports, Graphical User Interface (GUI), storage management, remote software distribution, object technology, and message queuing which allow the integration of data and applications in a distributed, multi-platform Client/Server environment.

Digital NAS Client 250

Extends the Digital NAS Client 150 base environment with database, system management, forms interface, and enhanced printing services.

Digital NAS Server 300

Extends the Digital NAS Base Server 200 with the following services; database, system management, forms interface, clusters, mail server, and enhanced printing.

Digital NAS Production Server 400

Extends the Digital NAS Server 300 with services to enhance the reliability and availability of applications, data and systems for business critical environments such as transaction processing.

All Digital NAS Client/Server Packages provide the following customer benefits:

- Simplified ordering—Each Client/Server package has one part number, installation procedure, discounted price and service contract. This reduces the time, effort and cost of selecting base enabling client/server software.
- Open Client/Server Environment—Digital NAS Packages combine general purpose middleware services and transport software to enable distributed multi-platform client/server computing. Customers can protect their investments by more fully integrating applications and data in a changing, yet standards-based Client/Server environment.
- Line item software products—Digital NAS Client/Server Packages are sold as line item software products, and can be included in complete hardware/software systems. The Digital NAS Client 150 or 250 ships with OpenVMS VAX, OpenVMS Alpha and Digital UNIX workstations, while Digital NAS Base Server 200 ships with server systems.

Digital NAS Packages—by Platform

Digital NAS Packages	OpenVMS VAX	OpenVMS Alpha	Digital UNIX
Digital NAS Client 150	X	X	X
Digital NAS Base Server 200	X	X	X
Digital NAS Client 250	X	X	X
Digital NAS Server 300	X	X	X
Digital NAS Production Server 400	X	X	

For a complete listing of order numbers, SPD numbers, contents of packages and platforms supported, refer to the "Digital NAS Packages at a Glance" charts on the following pages.

Digital NAS Packages At A Glance

Digital NAS Product	License and/or Media	Contents Service/Component Product	UPI's	Standards Supported
Digital NAS Client 150		**Presentation Services**		
V8.0 for **OpenVMS VAX**	L&M	** DECwindows Motif for OpenVMS VAX	XA1	X-Windows Motif, PEX
Workstations		**Communication and Control Services**		
	L&M	ObjectBroker for OpenVMS VAX Run-Time Only	XKB	OMG/CORBA
QL-36PA*-**	L&M	DECmessageQ for OpenVMS VAX Run-Time Only Option	GHV	
SPD 62.99		**Network Transports**		
	L&M	DECnet/OSI for OpenVMS VAX End System	D04	OSI
Target:	L&1	DECnet-VAX End Node	D04	
Delivers base client services to	L&M	DEC TCP/IP Client for OpenVMS	GL7	TCP/IP, NFS
workstations to match the Digital		**Operating System Specific**		
NAS Base Server 200 and is	L&1	VMScluster Client	3MS	
included with most workstations		(DCE Runtine Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Base Server 200		**Presentation Services**		
V8.0 for **OpenVMS VAX** Systems	L&M	** DECwindows Motif for OpenVMS	XA1	X-Windows Motif, PEX
		Printing Services		
QL-MC1A*-**	1&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Base	09N	
SPD 36.86	L&M	DECprint Supervisor (DSPS) for OpenVMS VAX, Open	09F	ISO SPDL
	L&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Plus	09L	ISO/ECMA DPA
	4&M	PrintServer Software for OpenVMS	0V9	Postscript
		Communication and Control Services		
	L&M	ObjectBroker for OpenVMS VAX Run-Time Only	XKB	OMG/CORBA
	L&M	DECmessageQ for OpenVMS VAX Run-Time Only Option	GHV	
		Management Services		
	L&3	POLYCENTER Software Distribution for OpenVMS VAX (Client)	B14	
		Network Transport		
	L&M	*** DECnet/OSI for OpenVMS VAX End System	D04	OSI
Target:	L&1	DECnet-VAX End Node	D04	
Provides the base client/server	2&M	PATHWORKS for OpenVMS (Macintosh)	YPC	Appletalk
services to match the Digital NAS	2&M	PATHWORKS for OpenVMS (LAN Manager)	A93	LAN Manager
Client 150 and is bundled with most	2&M	PATHWORKS for OpenVMS (Netware)	OEN	IPX
server systems	L&M	DEC TCP/IP Services for OpenVMS VAX	VHR	TCP/IP, NFS
		Operating System Specific		
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Client 250		**Presentation Services**		
V8.0 for **OpenVMS VAX**	L&M	DECforms for OpenVMS VAX Run-Time Only System	VNS	FIMS
Workstations	L&M	** DECwindows Motif for OpenVMS VAX	XA1	X-Windows Motif, PEX
		Printing Services		
QL-XVDA*-**	1&M	DECprint Supervisor (DCPS) for OpenVMS, Base	09N	ISO SPDL
SPD 36.89	L&M	DECprint Supervisor (DCPS) for OpenVMS, Plus	09L	ISO/ECMA DPA
	L&M	DEC Distributed Queuing Services for OpenVMS	VEN	Postscript
		Communication and Control Services		
	L&M	ObjectBroker for OpenVMS VAX Run-Time Only	XKB	OMG/CORBA
Target:	L&M	DECmessageQ for OpenVMS VAX Run-Time Only Option	GHV	
Extends the Digital NAS Client 150	L&M	Reliable Transaction Router for OpenVMS VAX (Client)	XNL	
including additional services to		**Management Services**		
match the Digital NAS Server 300	L&M	POLYCENTER Performance Data Collector for OpenVMS	GX1	
	L&3	POLYCENTER Software Distribution for OpenVMS VAX, (Client)	B14	
Upgrades:		**Network Transport**		
Digital NAS 150-250	L&M	*** DECnet/OSI for OpenVMS VAX End System	D04	OSI
Upgrade	L&1	DECnet-VAX End Node	D04	
QL-37NA*-**	L&M	DEC TCP/IP Services for OpenVMS	VHR	TCP/IP, NFS
		Operating System Specific		
	L&1	VAXcluster Software for OpenVMS VAX	VBR	
	1&M	POSIX for OpenVMS	GXX	POSIX
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		

Digital NAS Packages At A Glance *(continued)*

Digital NAS Product	License and/or Media	Contents Service/Component Product	UPI's	Standards Supported
Digital NAS Server 300		**Presentation Services**		
V8.0 for **OpenVMS VAX** Systems	L&M	DECforms for OpenVMS Run-Time Only System	VNS	FIMS
QL-MC2A*-**	L&M	** DECwindows Motif for OpenVMS	XA1	X-Windows Motif, PEX
SPD 36.85		**Printing Services**		
	1&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Base	09N	ISO/SPDL
	L&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Plus	09L	ISO/ECMA DPA
	L&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Open	09F	Postscript
	L&M	DEC Distributed Queuing Service for OpenVMS	VEN	Postscript
	4&M	PrintServer Software for OpenVMS		
		Communication and Control Services		
	L&M	MAILworks Server for OpenVMS	YCZ	X400, XAPI
	L&M	ObjectBroker for OpenVMS VAX Run-Time Only	XKB	OMG/CORBA
	L&M	DECmessageQ for OpenVMS VAX Run-Time Only Option	GHV	
	L&M	Reliable Transaction Router for OpenVMS (Client)	XNL	
Target:		**Management Services**		
Management focused server which	L&M	POLYCENTER Performance Advisor for OpenVMS	GX2	MSL; CMP; SNMP
extends the Digital NAS Base	L&M	POLYCENTER Performance Data Collector for OpenVMS	GX1	
Server 200 to match the Digital	L&3	POLYCENTER Software Distribution for OpenVMS VAX, (Client)	B14	
NAS Client 250	L&M	POLYCENTER Software Distribution (Server)	B13	
UPGRADES		**Network Transports**		
Digital NAS 250 to 300	L&M	*** DECnet/OSI for OpenVMS VAX Extended Function	D05	OSI
Upgrade	L&1	DECnet for OpenVMS VAX Full Function	D05	
QL-29PA*-**	2&M	PATHWORKS for OpenVMS (Macintosh)	YPC	Appletalk
	2&M	PATHWORKS for OpenVMS (LAN Manager)	A93	LAN Manager
Digital NAS 200 to 300	2&M	PATHWORKS for OpenVMS (Netware)	OEN	IPX
Upgrade	L&M	DEC TCP/IP Services for OpenVMS VAX	VHR	TCP/IP, NFS
QL-MC3A*-**		**Operating System Specific**		
	L&1	VAXcluster Software for OpenVMS VAX	VBR	
	1&M	POSIX for OpenVMS (DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)	GXX	POSIX
Digital NAS Production Server 400		**Presentation Services**		
V8.0 for **OpenVMS VAX** Systems	L&M	DECforms for OpenVMS VAX-Time Only System	VNS	RMS
	L&M	** DECwindows Motif for OpenVMS VAX	XA1	X-Windows Motif, PEX
QL-MC5A*-**		**Printing Services**		
SPD 40.63	1&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Base	09N	ISO SPDL
	L&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Plus	09L	ISO/ECMA DPA
	L&M	DECprint Supervisor (DCPS) for OpenVMS VAX, Open	09F	Postscript
	L&M	DEC Distributed Queuing Service for OpenVMS	VEN	
	4&M	PrintServer Software for VMS	0V9	
Target:		**Communication and Control Services**		
Extends Digital NAS Server 300	L&M	MAILworks Server for OpenVMS	YCZ	X400, XAPI
with services to enhance reliability	L&M	ObjectBroker for OpenVMS VAX Run-Time Only	XKB	OMG/CORBA
and availability of applications,	L&M	DECmessageQ for OpenVMS VAX Run-Time Only Option	GHV	
data, and systems for business	L&M	ACMS for OpenVMS	076	MIA, STDL
critical environments such as	L&M	Reliable Transaction Router for OpenVMS VAX, Full Function	XNK	
transaction processing.	L&M	Reliable Transaction Router for OpenVMS VAX, Client	XNL	
		Management Services		
UPGRADES	L&M	POLYCENTER Performance Advisor for OpenVMS	GX2	MSL, CMIP, SNM
Digital NAS 200 to 400 upgrade	L&M	POLYCENTER Performance Data Collector for OpenVMS	GX1	
QL-MKRA*-**	L&M	POLYCENTER Software Distribution for OpenVMS Client	B14	
	L&3	POLYCENTER Software Distribution (Server)	B13	
Digital NAS 300 to 400 upgrade				
QL-MC4A*-**				

Digital NAS Packages At A Glance (continued)

Digital NAS Product	License and/or Media	Contents Service/Component Product	UPI's	Standards Supported
Digital NAS Production Server 400		**Network Transport**		
V8.0 for **OpenVMS VAX** Systems	L&M	*** DECnet/OSI for OpenVMS VAX Extended Function	D05	OSI
(continued)	L&1	DECnet-for OpenVMS VAX Full Function	D05	
	2&M	PATHWORKS for OpenVMS (Macintosh)	YPC	Appletalk
QL-MC5A*-**	2&M	PATHWORKS for OpenVMS (LAN Manager)	A93	LAN Manager
SPD 40.63	2&M	PATHWORKS for OpenVMS (Netware)	OEN	IPX
	L&M	DEC TCP/IP Services for OpenVMS VAX	VHR	TCP/IP;NFS
		Operating System Specific		
	L&1	VAXcluster Software for OpenVMS VAX	VBR	
	1&M	POSIX for OpenVMS VAX	GXX	POSIX
	L&1	RMS Journaling for OpenVMS VAX	VDV	
	L&1	Volume Shadowing for OpenVMS VAX	AB2	
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Client 150		**Presentation Services**		
V8.0 for **OpenVMS Alpha** Workstations	L&M	** DECwindows Motif for OpenVMS Alpha	MV4	X-Windows Motif, PEX
		Communication and Control Services		
	L&M	ObjectBroker for OpenVMS Alpha Run-Time Only	06V	OMG/CORBA
QL-36NA*-**	L&M	DECmessageQ for OpenVMS Alpha Run-Time Only Option	0HK	
SPD 62.98		**Network Transport**		
	L&1	DECnet for OpenVMS Alpha End System	MTF	
Target:	L&M	DECnet/OSI for OpenVMS Alpha End Node	MTF	OSI
Delivers base client services to	L&M	DEC TCP/IP Client for OpenVMS Alpha	0M2	TCP/IP, NFS
workstations to match the Digital		**Operating System Specific**		
NAS Base Server 200 and is	L&1	VMScluster Client	3MR	
included with most workstations		(DCE Runtine Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS 200 Base Server		**Presentation Services**		
V8.0 for **OpenVMS Alpha** Systems	L&M	** DECwindows Motif for OpenVMS Alpha	MV4	X-Windows Motif, PEX
		Printing Services		
QL-23EA*-**	1&M	DECprint Supervisor (DSPS) for OpenVMS Alpha Base	09N	ISO SPDL
SPD 44.57	L&M	DECprint Supervisor (DSPS) for OpenVMS Alpha Plus	09M	ISO/ECMA DPA
	L&M	DECprint Supervisor (DSPS) for OpenVMS Alpha Open	09K	Postscript
	4&M	PrintServer Software for OpenVMS	0V9	
		Communication and Control Services		
Target:	L&M	ObjectBroker for OpenVMS Alpha Run-Time Only	06V	OMG/CORBA
Provides base client/server services	L&M	DECmessageQ for OpenVMS Alpha Run-Time Only Option	0HK	
to match the Digital NAS Client		**Management Services**		
150 and is bundled with most server	L&3	POLYCENTER Software Distribution for OpenVMS	0EF	
systems		Alpha Client		
		Network Transport		
	L&1	DECnet for OpenVMS Alpha End System	MTF	OSI
	L&M	DECnet/OSI for OpenVMS Alpha End Node	MTF	LAN Manager
	2&M	PATHWORKS for OpenVMS (LAN Manager)	A93	
	2&M	PATHWORKS for OpenVMS (Netware)	A93	
	2&M	PATHWORKS for OpenVMS (Mackintosh)	YPC	TCP/IP, NFS
	L&M	DEC TCP/IP Services for OpenVMS Alpha	0LX	
		Operating System Specific		
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Client 250		**Presentation Services**		
V8.0 for **OpenVMS Alpha**	L&M	DECforms for OpenVMS Alpha Run-Time Only System	0J9	FIMS
Workstations	L&M	** DECwindows Motif for OpenVMS Alpha	MV4	X-Windows Motif, PEX
		Printing Services		
QL-XVEA*-**	1&M	DECprint Supervisor (DSPS) for OpenVMS Alpha Base	09N	ISO SPDL
SPD 44.57	L&M	DECprint Supervisor (DSPS) for OpenVMS Alpha Plus	09M	ISO/ECMA DPA, Postscript
	L&M	DEC Distributed Queuing Service for OpenVMS	0HP	
Target:		**Communication and Control Services**		
Extends Digital NAS Client 150	L&M	ObjectBroker for OpenVMS Alpha Run-Time Only	06V	OMG/CORBA
including additional services to	L&M	DECmessageQ for OpenVMS Alpha Run-Time Only Option	0HK	
match the Digital NAS Server 300	L&M	Reliable Transaction Router for OpenVMS Alpha Client	2AR	

Digital NAS Packages At A Glance *(continued)*

Digital NAS Product	License and/or Media	Contents Service/Component product	UPI's	Standards Supported
Digital NAS Client 250		**Management Services**		
V8.0 for **OpenVMS Alpha**	L&3	POLYCENTER Software Distribution for OpenVMS Alpha Client	OEF	
Workstations	L&M	POLYCENTER Performance Data Collector for OpenVMS	29M	
(continued)		**Network Transport**		
	L&1	DECnet for OpenVMS Alpha End System	MTF	
QL-XVEA*-**	L&M	DECnet/OSI for OpenVMS Alpha End Node	MTF	OSI
SPD 44.57	L&M	DEC TCP/IP Services for OpenVMS Alpha	0M2	TCP/IP, NFS
		Operating System Specific		
	L&1	VAXcluster Software for OpenVMS Alpha	MUZ	
	1&M	POSIX for OpenVMS	0KF	POSIX
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Server 300		**Presentation Services**		
V8.0 for **OpenVMS Alpha** Systems	L&M	DECforms for OpenVMS Alpha Run-Time Only System	0J9	FIMS
	L&M	** DECwindows Motif for OpenVMS Alpha	MV4	X-Windows Motif, PEX
QL-XV9A*-**		**Printing Services**		
SPD 44.55	1&M	DECprint Supervisor for OpenVMS Alpha Base	09N	ISO/SPDL
	L&M	DECprint Supervisor for OpenVMS Alpha Plus	09M	ISO/ECMA DPA
	L&M	DECprint Supervisor for OpenVMS Alpha Open	09K	Postscript
	L&M	DEC Distributed Queuing Service for OpenVMS	0HP	
	4&M	PrintServer Software for OpenVMS	0V9	
		Communication and Control Services		
	L&M	DEC MAILworks Server for OpenVMS	3NG	
Target:	L&M	ObjectBroker for OpenVMS Alpha Run-Time Only	06V	OMG/COBRA
Management focused server which	L&M	DECmessageQ for OpenVMS Alpha Run-Time Only Options	0HK	
extends Digital NAS Base Server	L&M	Reliable Transaction Router for OpenVMS Alpha Client	2AR	
200 to match Digital NAS Client		**Management Services**		
250	L&3	POLYCENTER Software Distribution (Client)	0EF	
	L&M	POLYCENTER Software Distribution (Server)	2Q5	
	L&M	POLYCENTER Performance Advisor	29N	
	L&M	POLYCENTER Performance Data Collection	29M	
UPGRADES		**Network Transport**		
	L&1	DECnet for OpenVMS Alpha Extended Function	MTG	
Digital NAS 250 tp 300 Upgrade	L&M	DECnet/OSI for OpenVMS Alpha Extended Function	MTG	OSI
QL-29QA*-**	2&M	PATHWORKS for VMS (LAN Manager)	A93	LAN Manager
	2&M	PATHWORKS for VMS (Netware)	A93	
Digital NAS 200 to 300 Upgrade	2&M	PATHWORKS for VMS (Macintosh)	YPC	
QL-29SA*-**	L&M	DEC TCP/IP Services for OpenVMS Alpha	0LX	TCP/IP, NFS
		Operating System Specific		
	L&1	VMScluster Software for OpenVMS Alpha	MUZ	
	1&M	POSIX for OpenVMS	0KF	POSIX
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Production Server 400		**Presentation Services**		
V8.0 for **OpenVMS Alpha** Systems	L&M	DECforms for OpenVMS Alpha Run-Time Only System	0J9	FIMS
QL-23RA*-**	L&M	** DECwindows Motif for OpenVMS Alpha	MV4	X-Windows Motif, PEX
SPD 44.56		**Printing Services**		
	1&M	DECprint Supervisor for OpenVMS Alpha Base	09N	ISO SPDL;
	L&M	DECprint Supervisor for OpenVMS, Plus	09M	ISO/ECMA DPA;
Target:	L&M	DECprint Supervisor for OpenVMS, Open	09K	Postscript
Extends Digital NAS Server 300	L&M	DEC Distributed Queuing Service (DQS)	0HP	
with services to enhance reliability	4&M	PrintServer Software	0V9	
and availability of applications,		**Communication and Control Services**		
data, and systems for business	L&M	MAILworks Server for OpenVMS	3NG	
critical environments such as	L&M	ObjectBroker for OpenVMS Alpha Run-Time Only	06V	OMG/CORBA
transaction processing	L&M	DECmessageQ for OpenVMS Alpha Run-Time Only Option	0HK	
	L&M	ACMS for OpenVMS Run-time System	2Q1	MIA, STDL
	L&M	Reliable Transaction Router for OpenVMS (Full Function)	2AQ	
	L&M	Reliable Transaction Router for OpenVMS Alpha Client	2AR	

NAS Packages At A Glance *(continued)*

Digital NAS Product	License and/or Media	Contents Service/Component product	UPI's	Standards Supported
Digital NAS Production Server 400		**Management Services**		
V8.0 for **OpenVMS Alpha**	L&3	POLYCENTER Software Distribution for OpenVMS Alpha Client	0EF	
Systems	L&M	POLYCENTER Software Distribution for OpenVMS Alpha Server	2Q5	
(continued)	L&M	POLYCENTER Performance Data Collector for OpenVMS	29M	
	L&M	POLYCENTER Performance Advisor for OpenVMS	29N	
QL-23RA*-**		**Network Transport**		
SPD 44.56	L&1	DECnet for OpenVMS Alpha Extended Function	MTG	
	L&M	DECnet/OSI for OpenVMS Alpha Extended Function	MTG	OSI
	2&M	PATHWORKS for VMS (LAN Manager)	A93	LAN Manager
UPGRADES	2&M	PATHWORKS for VMS (Netware)	A93	
	2&M	PATHWORKS for VMS (Macintosh)	YPC	
Digital NAS 200 to 400 Upgrade	L&M	DEC TCP/IP Services for OpenVMS Alpha	0LX	TCP/IP, NFS
QL-29TA*-**		**Operating System Specific**		
	L&1	VAXcluster Software for OpenVMS Alpha	MUZ	
Digital NAS 300 to 400 Upgrade	1&M	POSIX for OpenVMS Alpha	0KF	POSIX
QL-29UA*-**	L&1	Volume Shadowing for OpenVMS	2A1	
	L&1	RMS Journaling for OpenVMS Alpha	0VH	
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
Digital NAS Client 150		**Communication and Control Services**		
V8.0 for **Digital UNIX Alpha**	L&M	Digital DCE runtime Services for Digital UNIX	01M	OSF DCE
Systems	L&M	ObjectBroker	0TT	OMG/CORBA
	L&M	DECmessageQ for Digital UNIX	2W8	
QL-36MA*-**		**Operating System Specific**		
SPD 62.97		(MOTIF, NFS, TCP/IP, CDA in base O/S)		
Target:				
Delivers base client service to workstations to match the Digital NAS Base Server 200 and is included with most workstations				
Digital NAS Base Server 200		**Printing Services**		
V8.0 for **Digital UNIX Alpha**	4&M	PrintServer Software	0V9	
Systems		**Communication and Control Services**		
QL-306A*-**	L&M	Digital DCE runtime Services for Digital UNIX	01M	OSF DCE
SPD 62.73	L&M	ObjectBroker	0TT	OMG/COBRA
	L&M	DECmessageQ for Digital UNIX	2W8	
		Management Services		
Target:	L&M	POLYCENTER Network Save and Restore for UNIX Alpha (Server)	2AL	
Provides base client/server services	L&M	POLYCENTER Advanced File System Utilities	0EG	
to match Digital NAS Client 150		**Network Transport**		
and is bundled with most server	2&M	PATHWORKS for Digital UNIX	054	
systems		**Operating System Specific**		
	L&1	Logical Storage Manager	2GV	
	L&1	Digital UNIX Server Extensions	MT6	
		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		
Digital NAS Client 250		**Communications and Control Services**		
V8.0 for **Digital UNIX Alpha**	L&M	Digital DCE runtime Services for Digital UNIX	01M	OSF DCE
Systems	L&4	ObjectBroker	0TT	OMG/COBRA
	L&M	DECmessageQ for Digital UNIX	2W8	
QL-06PA*-**		**Management Services**		
SPD 44.38	L&M	POLYCENTER Scheduler Agent	0M0	
	L&M	POLYCENTER Advanced File System Utilities	0EG	
Target:		**Network Transport**		
Extends Digital NAS Client 150	L&M	DECnet OSI for Digital UNIX End System	MTJ	OSI
including additional services to		**Operating System Specific**		
match Digital NAS Server 300		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		
UPGRADES				
Digital NAS 150 to 250 Upgrade				
QL-37LA*-**				

NAS Packages At A Glance *(continued)*

Digital NAS Product	License and/or Media	Contents Service/Component product	UPI's	Standards Supported
Digital NAS Base Server 300		**Printing Services**		
V8.0 for **Digital UNIX Alpha**	4&M	PrintServer Software	0V9	
Systems		**Communications and Control Services**		
	L&M	Digital DCE runtime Services for Digital UNIX	01M	OSF DCE
QL-06RA*-**	L&M	ObjectBroker	0TT	OMG/COBRA
SPD 44/30	L&M	DECmessageQ for Digital UNIX	2W8	
		Management Services		
	L&M	POLYCENTER Scheduler Agent	0M0	
Target:	L&M	POLYCENTER Network Save and Restore for	2AL	
Management focused server		UNIX Alpha (Server)		
which extends Digital NAS Base	L&M	POLYCENTER Adv. File System Utilities	0EG	
Server 200 to match Digital NAS		**Network Services**		
Client 250	L&M	DECnet/OSI for Digital UNIX Alpha Extended Function	MTK	OSI
	2&M	PATHWORKS for Digital UNIX	054l	
UPGRADES		**Operating System Specific**		
	L&1	Logical Storage Manager	2GV	
Digital NAS to 300 Upgrade	L&1	Digital UNIX Server Extensions	MT6	
QL-309A*-**		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		
Digital NAS 250 to 300 Upgrade				
QL-29RA*-**				

* Media is available either with Digital NAS Package or through consolidated distribution services
** Motif includes a number of local language variants. See SPD or Installation Guide for full list
*** DECnet/OSI supersedes DECnet-VAX Extensions
**** ObjectBroker (New name for ACA Services starting with V2.5. ACA available until V2.5)

Notes:

1 Provided with OpenVMS.
2 PATHWORKS is licensed separately on a per client basis or with concurrent use server licenses, not provided with Digital NAS.
3 The client software binaries must be downline loaded from an OpenVMS system running the POLYCENTER Software Distribution Server.
4 Licensed with the appropriate DEC printer. Previously DEC PrintServer supporting Host for VMS.

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