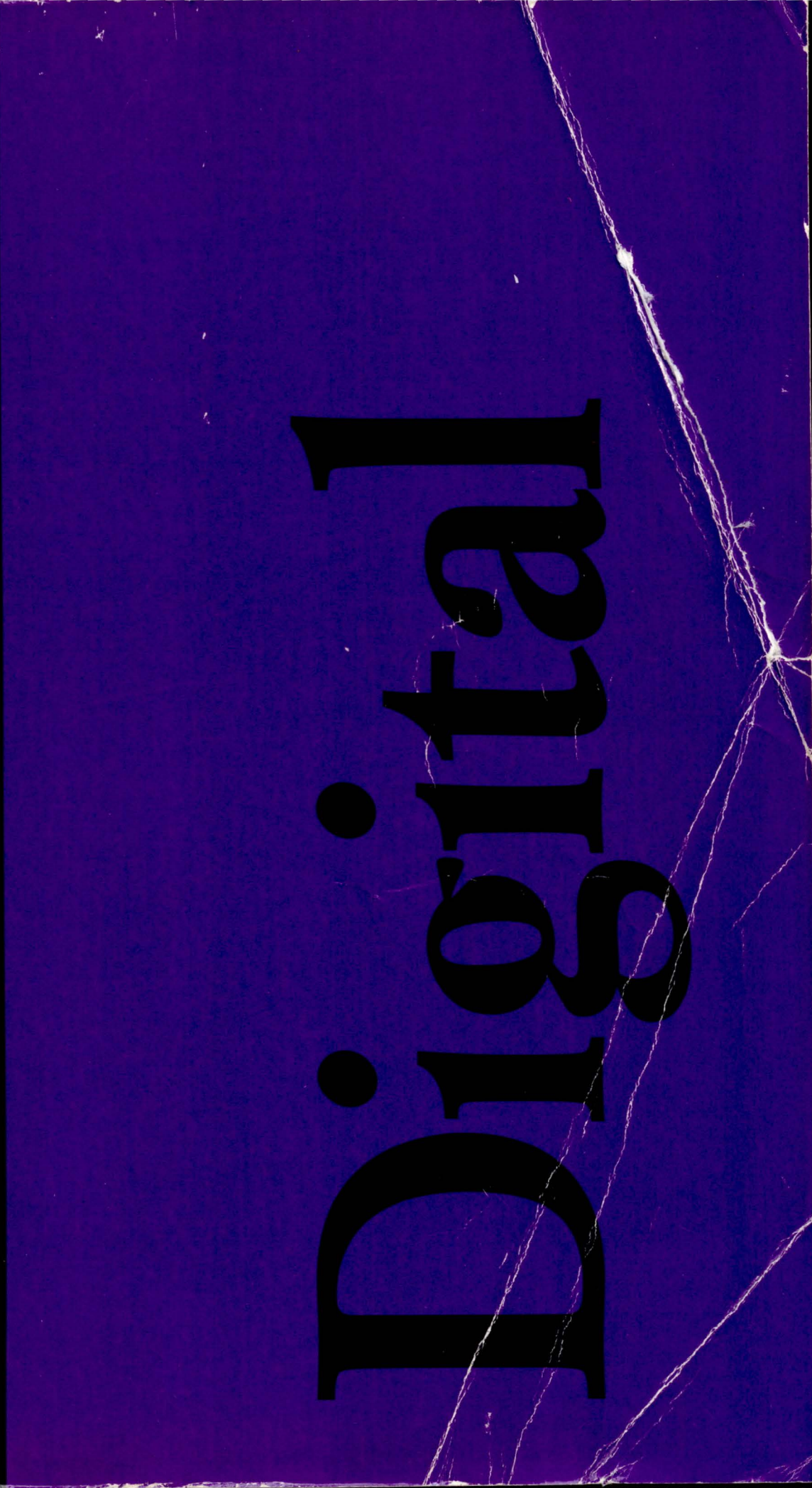
ystems and
Options Catalog

January 1995

Digital



Highlights of what's new in this catalog...

Chapter 1
AlphaStation 200 4/166 and 4/233 Desktop Workstations
AlphaStation 400 4/233 Mini Tower Workstations
AlphaServer 1000 4/200 Systems
AlphaServer 1000 4/200 Rackmount and Cabinet Systems
AlphaServer 2000 4/200 Systems
AlphaServer 2100 4/200 and 4/275 Systems
AlphaServer 2100 4/200 and 4/275 Rackmount Systems
AlphaServer 2100 4/200 and 4/275 Cabinet Systems

Chapter 4
ADVANTAGE-UPGRADES

Chapter 5
DEC FDDIcontroller/EISA
DEC FDDIcontroller/PCI
Digital HiNote and HiNote Ultra Notebook Computers
Digital CELEBRIS Personal Computers
Rackmountable Slide Shelf Assembly for DECpc MT, MTE, XL Systems

Chapter 6
POLYCENTER Console Manager

Chapter 7
DECwanrouter 90 Multiprotocol Router
RoamAbout Wireless-to-Wired Access Point
DECswitch 900EE—6-port Ethernet Switch
DECswitch 900EF—7-port Ethernet to FDDI Switch
PEswitch 900TX—6-port full speed Ethernet to FDDI Switch
ChannelWorks—Ethernet Over Cable TV

Chapter 8
StorageWorks Deskside Cabinet
StorageWorks HSD30 Array Controller
StorageWorks HSZ40 Array Subsystems
KFMSB XMI to DSSI Disk/Tape Adapter
KZPAA PCI-to-SCSI Host Bus Adapter
KZTSA TURBOchannel to SCSI-2 Adapter
TLZ07 4-mm DAT Tape Drive (SCSI)

Chapter 9
DEClaser 3500 (LN14)
DECwriter 110i (LJ110)
DECwriter 65 (LA65)

Chapter 10
Prestige 3000

Note to European Customers:
Some part numbers and system variants may differ in Europe. Please consult your local Digital sales representative for further information.

Note: If you have questions, comments, or suggestions about this catalog, please send mail via Internet to decsoc@bxb.mts.dec.com or via ALL-IN-1 to decsoc@bxb.

Digital believes the information in this publication is accurate as of its publication date; such information is subject to change \without notice. Digital is not responsible for any inadvertent errors.

Digital Equipment Corporation makes no representation that the interconnection of its mass-storage products with products of other manufacturers will not infringe on existing or future patent rights. Nor do the descriptions contained herein imply the granting of licenses to make, use, or sell equipment constructed or configured in accordance herewith.

Digital Storage Architecture (DSA) mass-storage products manufactured by Digital Equipment Corporation are designed to work with host computers and other DSA mass-storage products designed by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility or liability if the host computers, controllers, mass-storage servers, tape, software, diagnostics, or disk products of another manufacturer are used with DSA products.

The software described in this document is furnished under license and may be used or copied only in accordance with the terms of such license.

The following are trademarks of Digital Equipment Corporation: ACMS, ADVANTAGE-NETWORKS, ALL-IN-I, Alpha AXP, AXP, applicationDEC, BASEstar, BI, Bookreader, CDA, CDD, CDD/Plus, CDD/Administrator, CDD/Repository, CI, ClusterWide, CompacTape, Companion, DATATRIEVE, DBMS, DDCMP, DDI, DEBET, DEC, DEC ACCESSWORKS, DEC Ada, DEC EtherWORKS, DEC FUSE, DEC GKS, DEC MAILworks, DEC Network Save and Restore, DEC PHIGS, DEC VTX, DEC VUIT, DECalc, DECalc-PLUS, DECalert, DECaudio, DECbridge, DECchip, DECconcentrator, DECconnect, DECdesign, DECdirect, DECdx, DECfonts, DECforms, DECgraph, DECimage, DECintact, DEClaser, DECmate, DECmcc, DECmessageQ, DECmux, DECNA, DECnet, DECnet-DOS, DECNIS, DECnet/E, DECnsr, DECO, DEComni, DECpacketprobe, DECpage, DECpc, DECperformance, DECpresent, DECprint, DECquery, DECrouter, DECSA, DECscan, DECscheduler, DECserver, DECslide, DECspell, DECstation, DECsystem, DECtalk, DECtp, DECtrace, DECvideo, DECvoice. DECvoiceBuilder, DECwindows, DECwrite, DELNI, DELUA, DEMPR, DEPCA, DEQNA, DHB32, DSRVB-AA, DSI, DTIF, DX, EDCS, EDT, Ether\WORKS, eXcursion, FMS, HSC, HSC40, HSC50, HSC60, HSC70, HSC90, HUBwatch, IAS, InstantSQL, KDA, KDM, KI, KLESI, KXJ11, LA, LA50, LA75 Companion, LA324, LASTport, LAT, LATprint, LN01, LN03 PLUS, LN03, LP27, LPV11-SA, LQP02, LVP16, LXY, MAILworks, MD300, MD400, MD410, MI, Micro/RSX, MicroVAX, MicroVAX I, MicroVAX II, MicroVMS, MOBILIZER, MSCP, MUXserver, NAS, NETsupport, Open Advantage, OpenVMS, PAS, PATHWORKS, PDP, PDP-11, PowerFrame, PrintServer, PROBEwatch, Q-bus, RA, RC, Rdb/VMS, Recover-A11, ReGIS, RQD, RQDX, RQDX3, RRD42, RRD50, RSTS, RSTS/E, RSX, RSX-11M, RSX-11M-PLUS, RT, rtVAX, RVC, RX, RX2, RX33, RX50, RZ, SA, SBI, SDI, Scholar, SQL Multimedia, SSU, STI, StorageServer, StorageServer 100, StorageWorks, TA, TE, ThinWire, TK, TM, TMSCP, TQK, TQK50, TS, TS05, TU, TURBOchannel, UDA, ULTRIX Disk Shadowing, ULTRIX, UNIBUS, VAX, VAX 6000, VAX 9000, VAX APL, VAX Ada, VAX BASIC, VAX C, VAX CDD, VAX COBOL GENERATOR, VAX COBOL, VAX DATATRIEVE, VAX DBMS, VAX DIBOL, VAX DOCUMENT, VAX DSM, VAX ETHERnim, VAX FMS, VAX FORTRAN, VAX GKS, VAX LISP, VAX LMS/SM, VAx MACRO, VAX MAILGATE, VAX Notes, VAX OPS5, VAX Pascal, VAX RALLY, VAX RMS, VAX Rdb/VMS, VAX Volume Shadowing, VAX SCAN, VAX SPM, VAX Supercomputer, VAX TEAMDATA, VAX VALU, VAX Xway, VAX-11/750, VAX-11/780, VAXBI, VAXcluster, VAXELN, VAXft, VAXlab,VAXmail, VAXmate, VAXserver, VAXset, VAXshare, VAXsimPLUS, VAXstation, VAXstation 4000 VLC, VELOCITOR, VIDA, VMS, VR150, VR160, VT, VT100,VT1000, VT300, VT320, VT330, VTX 2000, WPS, WPS-8, WPS-PLUS, XUI, and the Digital logo.

20/20 and VIVID are trademarks of Access Technology, Inc. Adobe, Display PostScript, and PostScript are registered trademarks of Adobe Systems Inc. Alis is a registered trademark of Applix, Inc. Apple, LocalTalk, AppleShare, AppleTalk, HyperCard, HyperTalk, LaserWriter, Mac, Macintosh, MacTCP, MacTerminal, and the Apple Logo are registered trademarks of Apple Computer, Inc. dBASE, dBASE III, dBASE III PLUS, dBASE IV, and Ashton-Tate are registered trademarks of Ashton-Tate Corporation. AT&T, Datakit, System V, and Touch-Tone are trademarks of American Telephone & Telegraph Company. AUDIOkit is a trademark and AUDIOtechns is a registered trademark of AUDIOtechs, Inc. AVS is a trademark of Stardent Computer Corporation. BASIC is a registered trademark of Trustees of Dartmouth College D.B.A. Dartmouth College. Bell is a trademark of Bell Telephone Companies. BITNET is a trademark of the Corporation for Research and Educational Networking (CREN). CADRA-III, CADRA-RASTER, CADRA-VIEW, CADRA3D, and ADT are trademarks of ADRA Systems, Inc. CalComp is a registered trademark of California Computer Products Corporation. ccMail is a registered trademark of ccMail, Inc. CG is a registered trademark of Compugraphic Corporation. Chipcom is a registered trademark and Ethermodem is a trademark of Chipcom Corporation. COMPAQ and Deskpro are registered trademarks of COMPAQ Computer Corporation. CorrecText and Roget's II: The New Thesaurus are trademarks of Houghton Mifflin Company. CRAY, UNICOS and CRAY Y.MP are trademarks of Cray Research, Inc. Data General is a trademark of Data General Colporation. Data Products is a registered trademark of Data Products Corporation. Diamondtron is a registered trademark of Mitsubishi Electronics America, Inc. Domain and Apollo are registered trademarks of Apollo Computer, Inc., a subsidiary of Hewlett-Packard Company. Elite is a trademark of Seagate Technology. FailSafe is a trademark of Micro Techonology. FastPath is a registered trademark of Kinetin, Inc. FUSION is a registered trademark of Network Research Corporation. Futurebus and Futurebus+ are trademarks of Force Computers GMBH, Fed. Rep. of Germany. KAP is a trademark of Kuck and Associates. KEYpak is a registered trademark of Keyword Office Technologies, Ltd. Hayes is a registered trademark of Hayes Microcomputer Products, Inc. Helvetica is a registered trademark of Allied Corporation. Hewlett-Packard, LaserJet, HP, and HP-GL are registered trademarks of Hewlett-Packard Company. IBM, MicroChannel, NetViewProPrinter are registered trademarks and AS/400, Application System/400, DB2, DISOSS, OfficeVision, Operating System/400, OS/2, OS/400, PS/2, PROFS, SNA, SNADS, and VU/SP are trademarks of International Business Machines Corporation, ITC Avant Garde Gothic, ITC Bookman, ITC Lubalin Graph, ITC Souvenir, ITC Zapf Chancery, and ITC Zapf Dingbats are registered trademarks of International Typeface Corporation. Intel and Xpress are trademarks of Intel Corporation. Interleaf is a registered trademark of Interleaf, Inc. Jnet is a registered trademark of Joiner Associates, Inc. LaserView Windows is a trademark of LaserData, Inc. Looking Glass Professional and VISIX are registered trademarks of VISIX Software, Inc. 1-2.j, DIF, Lotus, and VisiCalc are registered trademarks of Lotus Development Corporation. Lucid and Lucid Common Lisp are trademarks of Lucid, Inc. MCI and MCI Mail are registered trademarks of MCI Communications Corporation, MICOM and Micro 800/X.25 Concentrator Pad are trademarks of MICOM Systems, Inc. Microcom is a trademark of Microcom, Inc. Microsoft, MS, MS-DOS, MULTIPLAN, and XENIX are registered trademarks and Windows is a trademark of Microsoft Corporation. MUMPS is a registered trademark of Massachusetts General Hospital, NetBIOS is a trademark of Micro Computer Systems, Inc, NetWare and Novell are registered trademarks of Novell, Inc. NEXPERT is a registered trademark of Neuron Data, Inc. Objectivity is a trademark of Objectivity, Inc. ON-TAP is a trademark of Integrated Software Design, Inc. Olivetti is a registered trademark of Ing. C. Olivetti. Easy*SQL and ORACLE is a registered trademark of Oracle Corporation. OSF, OSF/I, and OSF/Motif are registered trademarks of Open Software Foundation, Inc. PageMaker is a registered trademark of Aldus Corporation. PAGER is a trademark of Datalogin, Inc. PANTONE MATCHING SYSTEM is a trademark of Pantone, Inc. Phoenix is a trademark of Advanced Technology, Inc. PICK is a trademark of Pick Systems, Inc. Plexiglas is a registered trademark of Rohm & Haas Company. Prestoserve is a registered trademark of Legato Systems, Inc. Proteon is a trademark of Proteon Associates, Inc. Quintus Prolog is a trademark of Quintus Computer Systems, Inc. Ryan McFarland is a trademark of Ryan McFarland Corporation, SCO is a trademark of Santa Cruz Operations, Inc. Scribe is a registered trademark of Scribe Systems, Inc. SIMM is a trademark of Wang Laboratories, Inc, StorageTek is a registered trademark of Storage Technology Corporation. Sun, SPARC, SunOS, and NFS are resistered trademarks and SPARCstation is a trademark of Sun Microsystems, Inc. SuperCalc is a registered trademark of Computer Associates International, Inc. Teflon is a trademark of E. I. Du Pont de Nemours & Company. Tek, TEK4014, TEK4125 and TEKTRONIX are registered trademarks of Tektronix, Inc. Trinitron is a registered trademark of Sony Corporation. Uniplex is a trademark of Uniplex, Inc. UND(is a registered trademark of UNIX System Laboratories, Inc. Ventura Publisher is a trademark of Ventura Software, Inc. Vitalink and TransLAN are registered trademarks of Vitalink Communications Corp. Wavefront's Personal Visualizer is a trademark of Wavefront Technologies, Inc. WingZ is a registered trademark of Informix Software, Inc. WIN/TCP is a trademark of the Wollongong Group. WordPerfect is a trademark of WordPerfect Corporation. WordStar is a registered trademark of MicroPro International Corporation. 3Com, 3+ and EtherLink are registered trademarks of 3Com Corporation.

Copyright © 1994 by Digital Equipment Corporation, All Rights Reserved.

Chapter 1—Alpha AXP Systems

Alpha AXP Systems Comparison Chart 2

DECpc AXP 150 Deskside PC 4

DEC 2000 Model 300 AXP Servers 10
DEC 2000 Model 300 AXP Server Diagram 16
DEC 2000 Model 300 AXP Server Specifications 17

DEC 3000 Model 300X/LX AXP Desktop Workstations 18
DEC 3000 Model 300X/LX AXP Desktop Workstation Diagram 27
DEC 3000 Model 300X/LX AXP Desktop Workstation Specifications 28

DEC 3000 Model 600/700 AXP Desktop Workstations 29
DEC 3000 Model 600/700 AXP Desktop Workstation Diagrams 41
DEC 3000 Model 600/700 AXP Desktop Workstation Specifications 42

DEC 3000 Model 900 AXP Deskside Workstations 43
DEC 3000 Model 900 AXP Deskside Workstation Diagrams 54
DEC 3000 Model 900 AXP Deskside Workstation Specifications 55

Rackmountable DEC 3000 AXP Workstations and Servers 56
Rackmountable DEC 3000 AXP Workstation and Server Specifications 59

AlphaStation 200 4/166 and 4/233 Desktop Workstations 60
AlphaStation 200 4/166 and 4/233 Desktop Workstation Diagrams 69
AlphaStation 200 4/166 and 4/233 Desktop Workstation Specifications 70

AlphaStation 400 4/233 Mini Tower Workstations 71
AlphaStation 400 4/233 Mini Tower Workstation Diagrams 80
AlphaStation 400 4/233 Mini Tower Workstation Specifications 81

AlphaServer 1000 4/200 Systems 82
AlphaServer 1000 4/200 System Diagrams 91
AlphaServer 1000 4/200 System Specifications 92

AlphaServer 1000 4/200 Rackmount and Cabinet Systems 94
AlphaServer 1000 4/200 Rackmount and Cabinet System Diagram 97
AlphaServer 1000 4/200 Rackmount and Cabinet System Specifications 98

AlphaServer 2000 4/200 Systems 100
AlphaServer 2000 4/200 EISA Bus IRQ Address Table 123
AlphaServer 2000 4/200 Storage Diagrams 124
AlphaServer 2000 4/200 System Specifications 127

AlphaServer 2100 4/200 and 4/275 Systems 129
AlphaServer 2100 4/200 and 4/275 EISA Bus IRQ Address Table 154
AlphaServer 2100 4/200 and 4/275 System Diagrams 155
AlphaServer 2100 4/200 and 4/275 Storage Diagrams 156
AlphaServer 2100 4/200 and 4/275 System Specifications 160

AlphaServer 2100 4/200 and 4/275 Rackmount Systems 163
AlphaServer 2100 4/200 and 4/275 EISA Bus IRQ Address Table 174
AlphaServer 2100 4/200 and 4/275 Rackmount System Diagrams 175
AlphaServer 2100 4/200 and 4/275 Rackmount System Specifications 176

AlphaServer 2100 4/200 and 4/275 Cabinet Systems 177
AlphaServer 2100 4/200 and 4/275 EISA Bus IRQ Address Table 188
AlphaServer 2100 4/200 and 4/275 Cabinet System Diagrams 189
AlphaServer 2100 4/200 and 4/275 Cabinet System Specifications 190

DEC 4000 Model 700 AXP Distributed/Departmental Servers 192
DEC 4000 Model 700 AXP Pedestal Server Diagrams 209
DEC 4000 Model 700 AXP Rackmount Server Diagrams 210
DEC 4000 Model 700 AXP Pedestal Server Specifications 211
DEC 4000 Model 700 AXP Rackmount Server Specifications 213

DEC 7000 Model 700 AXP Enterprise Servers 215
DEC 7000 Model 700 AXP System Diagrams 226
DEC 7000 Model 700 AXP System Specifications 227
Rackmount DEC 7000 AXP System Diagram 232
Rackmount DEC 7000 AXP System Specifications 233

Chapter 2—VAX Systems

VAX Systems Comparison Chart 236

VAXstation 4000 VLC Systems 238
VAXstation 4000 VLC System Diagram 243
VAXstation 4000 VLC System Specifications 244
VAXstation 4000 VLC Monitor Specifications 245

VAXstation 4000 Model 60 Systems 246

VAXstation 4000 Model 90A Systems 253
VAXstation 4000 Model 60 and 90A System Diagrams 260
VAXstation 4000 Model 60 and 90A System Specifications 261
VAXstation 4000 Model 60 and 90A Monitor Specifications 262

MicroVAX 3100 Systems and Servers 263
MicroVAX 3100 System Diagrams 271
MicroVAX 3100 System Specifications 272

VAX 4000 Model 105A Systems and Servers 275
VAX 4000 Model 105A System Diagrams 284
VAX 4000 Model 105A System Specifications 285

VAX 4000 Models 505A/705A Systems and Servers 286
VAX 4000 Models 505A/705A System Diagrams 294
VAX 4000 Models 505A/705A System Specifications 296
VAX 4000 Expansion Pedestals (R400X/B400X) 298

Rack-Mountable VAX 4000 Model 105A Systems 300
Rack-Mountable VAX 4000 Model 105A System Diagrams 302
Rack-Mountable VAX 4000 Model 105A System Specifications 303

Rack-Mountable VAX 4000 Model 505A/705A Systems 304
Rack-Mountable VAX 4000 Model 505A/705A System Diagrams 306
Rack-Mountable VAX 4000 Model 505A/705A System Specifications 307

VAX 7000 Model 700 Enterprise Servers 308
VAX 7000 Model 700 Enterprise Server Diagrams 319
VAX 7000 Model 700 Enterprise Server Specifications 320
Rackmount VAX 7000 Enterprise Servers 321
Rackmount VAX 7000 Enterprise Server Diagram 325
Rackmount VAX 7000 Enterprise Server Specifications 326

Chapter 3—DECstations/DECsystems

DECstations/DECsystem Comparison Chart 328

DECstation 5000 Model 133 Workstations 329

DECstation 5000 Model 240 Workstations 336
DECstation 5000 (Model 133 and 240) System Diagrams 344
DECstation 5000 (Model 133 and 240) System Specifications 345

DECsystem 5000 Model 240 Servers 346

Chapter 4—ADVANTAGE UPGRADES

ADVANTAGE-UPGRADE Program 354

VAX, DECsystem, Alpha AXP to Alpha AXP ADVANTAGE-UPGRADES ... 356

VAX to VAX ADVANTAGE-UPGRADES 373

Chapter 5—Personal Computing

Network Personal Computing 384
PATHWORKS PC Networks 385
PATHWORKS Client Software 387
PATHWORKS for DOS and Windows (LAN Manager and NetWare) 387
PATHWORKS for DOS (NetWare Coexistence) 389
PATHWORKS X.25 (DOS and Windows) 390
PATHWORKS ISDN (DOS) 391
PATHWORKS for Windows NT (Client) 392
PATHWORKS for OS/2 (Client) 393
PATHWORKS for TCP/IP (OS/2) 394
PATHWORKS for Macintosh 395
PATHWORKS Server Software 397
PATHWORKS for OpenVMS (LAN Manager) 398
PATHWORKS Desktop Backup 399
PATHWORKS for OpenVMS (NetWare) 399
PATHWORKS for OpenVMS (Macintosh) 401
PATHWORKS for DEC OSF/1 AXP (LAN Manager) 402
PATHWORKS for ULTRIX 403
Pacer for ULTRIX 403
PATHWORKS for SCO UNIX 404
PATHWORKS for Windows NT 405
PATHWORKS for OS/2 406
Personal Computer Mail Solutions 407
DEC MAILworks for PCs 407
DEC MAILworks Server 407
TeamLinks Mail for Microsoft Windows 408
LAN-Base Applications 409
Conferencing for Windows 409
eXcursion for Windows 410

PC Networking Hardware
EtherWORKS Comparison Chart 412
EtherWORKS Network Interface Cards 413
DEC FDDIcontroller/EISA 414
DEC FDDIcontroller/PCI 415
Token Ring Cards 416
ProNet Family 416
DEC TRNcontroller 100 417
EtherWORKS Router/DECnet 418

DECpc Personal Computers 420
DECpc Personal Computers Comparison Chart 421
Digital HiNote and HiNote Ultra Notebook Computers 424
Digital CELEBRIS Personal Computers 428
DECpc 4xx MT Personal Computers 432
DECpc 4xx MTE Personal Computers 436
DECpc XL Personal Computers 440
DECpc System Diagrams 443
Rackmountable Slide Shelf Assembly for DECpc MT, MTE, XL Systems 444

Chapter 6—High Availability and High Performance Products

OpenVMS Cluster Systems Configurations Details 446
OpenVMS Cluster System Diagrams 450
Configuration Rules for CI OpenVMS Cluster Systems 452
Configuration Rules for LAN-Based OpenVMS Cluster Systems 452
Configuration Rules for DSSI OpenVMS Cluster Systems 455

AdvantageCluster Compute Servers 465

DECsafe Available Server 468
DECsafe Available Server Diagrams 471

POLYCENTER Console Manager 473

OpenVMS Cluster Options 477

Chapter 7—Networks, Communications, and Cables

Network Interface Cards and Adapters for VAX/DECsystems/Alpha AXP ... 480
VAX/DECsystems LAN Communications Controllers Summary Chart 480
DEC LANcontroller 400 (DEMNA—XMI-to-Ethernet) 480
DEC LANcontroller 200 (DEBNI—VAXBI-to-Ethernet) 481
DESQA Controller (Q-bus-to-Ethernet) 481
DEC TRNcontroller 100 (DEQRA—Q-bus-to-Token Ring) 482
DEC FDDIcontroller/FUTUREBUS+ 483
DEC FDDIcontroller 400 Controller (DEMFA—XMI-to-FDDI) 484
DEC FDDIcontroller/TURBOchannel (DEFTA) 485

Hubs, Hub Management, and LAN Monitoring Products 486
DEChub 900 Multiswitch Family 486
DEChub ONE—Ethernet Single-slot Hub 487
DEChub 90 (Ethernet) 487
DECagent 90 488
HUBwatch Management Software 489
DECpacketprobe 90 and PROBEwatch 491

Network Access and Communications Servers 493
802.3/Ethernet Network Access Server Selection Guide 494
DECserver 90TL Telnet/LAT Terminal Server 495
DECserver 90M Terminal Server 497
DECserver 90L+ Terminal Server 499
DECserver 900TM—32-Port Network Access Server 501
DECserver 700 8/16-Port Network Access Server 502
LATprint ThinWire Ethernet Interface 504
MUXserver 90/320/380 DECmux 300 Remote Terminal Server 505
DEC Commserver 100/150 Network Access Servers 507

Repeaters, Bridges, Routers, and Brouters 511
Multiprotocol Router/Bridge Comparison Chart 511
DECNIS 600 Multiprotocol Router/Bridge 512
DECNIS 500 Multiprotocol Router/Bridge 518
DECbrouter 90—Multiprotocol Bridge/Router 520
DECwanrouter 90 Multiprotocol Router 521
DEC WANrouter 250 8-Port Multiprotocol Router 522
Digital Ethernet Multiport Office Network Repeater 523
DECrepeater 900TM—32-Port 10BaseT Repeater 523
DECrepeater 90FS 524
DECrepeater 900FP 525
DECrepeater 900GM 525
DECrepeater 90C/DECrepeater 90T 526
DECrepeater 90FL 527
DECrepeater 90FA 527
DECbridge 90FL 528
DECbridge 90 529
RoamAbout Wireless-to-Wired Access Point 530
DECrepeater 900SL 531
DECrepeater 900TL 531

Switches 532
DECswitch 900EE—6-port Ethernet Switch 532
DECswitch 900EF—7-port Ethernet to FDDI Switch 532
PEswitch 900TX—6-port full speed Ethernet to FDDI Switch 533
GIGAswitch/FDDI Networking Switch 534

Concentrators and Multistation Access Units 538
DECconcentrator 900MX FDDI Concentrator 538
DECmau 900TL 538
DELNI (Digital Ethernet Local Network Interconnect) 539

ChannelWorks 540
Ethernet Over Cable TV 540

Transceivers/Media Access Units 541
H4005 Transceiver (Ethernet) 541
Twisted-Pair Media Access Unit 541
ThinWire Media Access Unit 541
Fiber Media Access Unit 542

Internetworking Products 543
DEC SNA Domain Gateway for Channel Transport (-CT) 543

Host-Based Communications Controllers 545
CX Asynchronous Communications Controllers (Q-bus) 545
DSV11 Synchronous Controller (Q-bus) 545
DEC WANcontroller 720 Synchronous Controller (TURBOchannel) 547
DMB32 Multifunction Controller (VAXBI) 547
DRB32 Parallel Interface (VAXBI) 548
DRQ3B Parallel Interface (Q-bus) 550
DRV1J Parallel Interface (Q-bus) 551
DRV11 and DRV1W Interface (Q-bus) 551

Modems 552
DECmodem V32 552
DSU/CSU (Data Service Unit/Channel Service Unit) 552
DECfax Mail for OpenVMS 553

DECvoice and DECtalk Speech Synthesizers 554
DECvoice 554
DECtalk Speech Synthesizers (Voice) 559

OPEN DECconnect Products and Cables 561
Cables 561
MMJ Accessories 566
Communications 567
EIA-423 Open DECconnect Communications Interfaces 567
Fiber Optics 569
Storage Devices 569
PC Products 569
Terminals and Printers 570

Chapter 8—Storage Devices

Digital Storage Solutions 572
StorageWorks Architecture and Products 572
Digital Storage Architecture 573
Standard Interconnect Series Family (SDI/STI) 573
Digital Storage System Interconnect (DSSI) 574
Small Computer System Interface (SCSI) 574

Comparison Charts 575
Storage Array Cabinet Capacity and Performance Comparison Chart 575
SCSI Disk Drive Comparison Chart 576
Tape Selection Chart 577
Tape Comparison Chart 578
Flexible/Optical Media Specifications 580

StorageWorks Family Modular Storage Expansion 581
StorageWorks Building Blocks Shelf/Deskside Expansion 582
StorageWorks Deskside Cabinet 585
StorageWorks Departmental Cabinet 588
StorageWorks Data Center Cabinet 590
StorageWorks HSD05 Array Controller 591
StorageWorks HSD30 Array Controller 593
StorageWorks SCSI Signal Converter 595
StorageWorks HSJ-Series Array Subsystems 597
StorageWorks HSZ40 Array Subsystems 599
InfoServer for StorageWorks 601
Desktop Expansion Unit—BA353 Family 602

Expansion Boxes 605
SZ12 Expansion Boxes 605

Storage Controllers/Adapters 607
KDM70 XMI Disk/Tape Controller (SDI/STI) 607
KFMSA XMI Disk/Tape Adapter (DSSI) 608
KFMSB XMI to DSSI Disk/Tape Adapter 610
KZMSA XMI Storage Adapter (SCSI) 611
KFQSA Q-bus Storage Adapter (DSSI) 612
KZQSA Q-bus Storage Adapter 613
KZPAA PCI-to-SCSI Host Bus Adapter 613
KZTSA TURBOchannel to SCSI-2 Adapter 614
VELOCITOR Storage Subsystems 615

RAID Storage Subsystems 617
StorageWorks RAID Array 110 617
StorageWorks RAID Array 210 Subsystem 620
DECraid+ Rackmount Storage Subsystems 623

Storage I/O Servers 627
HSC Intelligent I/O Servers 627
HSC Rack-Mountable Subsystems 632

Storage Arrays 633
DECarray 300 Family (SDI/DSSI) 633
SA900 DECarray (SDI) 635
SF400 DECarray (DSSI) 636

Storage Array Building Blocks 638
SF36 Storage Array Building Blocks (DSSI) 638

Disk Devices 639
ESE50 Solid State Disk 639
EF5x Solid State Disk 641
EZ5x Solid State Disk 644
RF36 Integrated Storage Element (DSSI) 647
RZ-Series Disk Drives (SCSI) 649
RX33 Flexible Diskette Drive (SCSI) 651
RX26 Flexible Diskette Drive (SCSI) 652
RX23 Flexible Diskette Drive (SCSI) 652

Network Storage Servers 653
InfoServer 1000 Network Storage Servers 653

Optical Devices 658
StorageServer 100 Optical Storage System 658
StorageWorks RW500 Optical Library Family 660

CD-ROM Devices 663

Tape Devices (Cartridge Subsystems) 665
Digital Linear Tape (Tx800 Family) 665
DLT Family of Magazine Tape Subsystems 668
TL820 DLT Automated Tape Library 674
TA92 Cartridge Tape Subsystem 676

Tape Devices 677
StorageTek 4400 ACS Automated Tape Library 677
Wolfcreek Automated 3480/3490 Tape Library from StorageTek 678
Digital's Automated Storage Library 679
TKZ60 Cartridge Tape Drive 679
TLZ06 4-mm DAT Tape Drive (SCSI) 682
TLZ6L 4-mm DAT Tape Autoloader 684
TLZ07 4-mm DATE Tape Drive (SCSI) 685
TKZ15 and TKZ09 8-mm Helical Scan Tape Drives (SCSI) 689
TZK10 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI) 691
TZK11 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI) 692

Tape Devices (Reel-to-Reel) 693
TSZ07 Magnetic Tape Drive (SCSI) 693

Chapter 9—Terminals, Scanners, Printers

Comparison Charts 698
Video Terminals Comparison Chart 698
Nonimpact Printers Comparison Chart 700
Impact Printers Comparison Chart 702

X Terminals and Video Terminals 704
VXT 2000/2000+ X Terminals 704
VT510 Single-Session Text Terminals 713
VT420 Text Terminal 716
VT420 with PCTerm Text Terminal 722
VT340+ Graphics Terminal 725
DECtouch Input Device 727
2D and 3D Programmable Peripherals for CAD/CAM/CAE 728

Scanners 729
MD30C Color Scanner 729
MD410 Document Image Scanner 731
MD400 Document Image Scanner 733

Printers Introduction 734

Nonimpact Printers—Electrophotographic 735
KODAK 1392 Printer 735
XEROX Production Print Systems 737

Nonimpact Printers—Laser 739
PrintServer Printers 739
PrintServer 32 742
PrintServer 17/600 743
PrintServer Software 744
PrintServer Specifications 744
DEClaser 1800 (LN11) 747
DEClaser 3500 (LN14) 749
DEClaser 5100 (LN09) 751

Nonimpact Printers—Thermal 753
DECcolorwriter 1000 (LF02) 753

Nonimpact Printers—Ink-Jet 755
DECmultiJET 1500 (LJ18P) 755
DECwriter 500i (LJ500i) 756
DECwriter 110i (LJ110i) 757

Impact Printers—Dot Matrix 758
LA70 Personal Printer 758
LA75 Plus Companion Printer 760
DECwriter 65 (LA65) 762
DECwriter 95 Dot Matrix PC Printer 763
DECwriter 195 (LA195) 765
LA310 MultiPrinter 766
LA424 MultiPrinter 768
LA600 MultiPrinter 770
Desktop Printer Cable and Adapter Guide 771

Impact Printers—Line Matrix 772
LG06 Line-Matrix Printer 772
LG12 Line Printer 775

Printer Software 778
DECprint Supervisor for OpenVMS (DCS) 778
DECprint Supervisor for KODAK Printers (KPS) for OpenVMS VAX V1.0 780
PrintServer Software 781
DEC Image Print-PLUS Software 782
Distributed Queuing Service 783
DECprint Utility for PostScript to Sixel Printing for VMS 784
DECfonts Typeface Collection for VMS and ULTRIX 785
SoftFont 786
VAX Vertical Forms Printing 786
Documentation and Publication Management 787
ON-TAP—Bar Code Printing Software 787
JetForm Software 788

Chapter 10—Environmental Products

Environmental Products Summary Chart 792

UPS Systems Overview 792

Environmental Products Software 793
Environmental Products Software Matrix 793
Remote Environmental Monitoring Software (REMS) 793
PowerMon Software 794
PowerChute PLUS Software 794
OnliNet and OnliSafe for Personal, Prestige, and PUPS Plus On-line Systems 794
Software Order Chart for UPS Systems 794

UPS System Configuration Guidelines 796

On-line Desktop/Office Systems—PUPS 802
UPS Comparison Chart 802
PUPS On-line Personal Systems Specifications 805
Smart-UPS Specifications 807
Back-UPS Specifications 808

Office/Data Center Line Interactive Systems—Matrix UPS 809
Matrix UPS Specifications 811

Office/Data Center On-line Systems—Prestige Model 3000 UPS Systems 812
Office/Data Center On-line Systems—Prestige Model 3000 Specifications 815

Office/Data Center On-line Systems—Powerware PLUS UPS Systems 816
Personal Series PLUS UPS Specifications (3.6–18 kVA) 818
Personal Series PLUS UPS Specifications (24 and 36 kVA) 821

Data Center Systems—HA4000 3-phase UPS 822
Distribution Cabinet Output Configuration Chart 825
Hardwire Output Configuration Chart 826
Battery Options Chart 827

Distribution, Environmental Monitoring, and TVSS 829
Modular Power Distribution/Conditioning Distribution (PDM/CDM) 829
Environmental Monitoring System (EMSII) 831
Transient Voltage Surge Suppressors 833

Receptacle Reference Chart 836

Chapter 11—Network Application Support and Services

Network Application Support (NAS) 838
NAS Packages At A Glance 840

Services 846
Services from Digital 846
Leasing Services 850
Information Services 851
Digital Reference Service 852

Index 853

Chapter 1
Alpha AXP Systems

Alpha AXP Systems Comparison Chart

DECpc AXP 150 Deskside PC

DEC 2000 Model 300 AXP Server

DEC 3000 Model 300X/LX AXP Desktop Workstations

DEC 3000 Model 600/700 AXP Desktop Workstations

DEC 3000 Model 900 AXP Deskside Workstations

Rackmountable DEC 3000 AXP Workstations and Servers

AlphaStation 200 4/166 and 4/233 Desktop Workstations

AlphaStation 400 4/233 Mini Tower Workstations

AlphaServer 1000 4/200 Systems

AlphaServer 1000 4/200 Rackmount and Cabinet Systems

AlphaServer 2000 4/200 Systems

AlphaServer 2100 4/200 and 4/275 Systems

AlphaServer 2100 4/200 and 4/275 Rackmount Systems

AlphaServer 2100 4/200 and 4/275 Cabinet Systems

DEC 4000 Model 700 AXP Distributed/Departmental Servers

DEC 7000 Model 700 AXP Enterprise Servers

Alpha AXP Workstations Comparison Chart

System	DEC 3000 Model 300X/300LX AXP Workstations		DEC 3000 Model 700 AXP Workstations	DEC 3000 Model 900 AXP Workstations	AlphaStation 200 4/166 and 4/233 Desktop Workstations		AlphaStation 400 4/233 Mini-Tower Workstations
CPU Features							
CPU/Clock Speed	300X: 175 MHz 300LX: 125 MHz		225 MHz	275 MHz	4/166: 166 MHz 4/233: 233 MHz		233 MHz
Cache Size (On Chip/On Board)	8 KB I-cache, 8 KB D-cache/256 KB		16 KB I-cache, 16 KB D-cache/2 MB	16 KB I-cache, 16 KB D-cache/2 MB	4/166: 8 KB I-cache, 8 KB D-cache/512 KB 4/233: 16 KB I-cache, 16 KB D-cache/512 KB		16 KB I-cache, 16 KB D-cache/512 KB
Performance[1]	**300X**	**300LX**			**4/166**	**4/233**	
TPS							
SPECint92	90.3	68.4	162.6	189.3	116.1	157.7	157.7
SPECfp92	101.9	77.7	230.6	264.1	134.8	183.9	183.9
SPECrate_int92	2,121	1,634	3,944	4,702	2,778	3,619	3,619
SPECrate_fp92	2,417	1,841	5,482	6,293	3,160	4,415	4,415
LINPACK 1000 x 1000	80.1	62.9	163.8	192.6	93.8	122.0	122.0
I/O Features							
Maximum Memory	256 MB		512 MB	1 GB	192 MB		192 MB
Maximum Disk (In Cabinet/Total)	4.2 GB/71.1 GB		4.2 GB/77.6 GB	8.4 GB/170GB	3.15 GB/29.4 GB		8.4 GB/29.4 GB
Maximum I/O Bandwidth	50 MB/s		100 MB/s	100 MB/s	132 MB/s		132 MB/s
I/O Support	2-slot TURBOchannel, 1 SCSI-2, 4 Fast SCSI-2, Ethernet, FDDI, ISDN[2], Prestoserve		3-slot TURBOchannel, 6 Fast SCSI-2, Ethernet, FDDI, ISDN[2], Prestoserve, VME	6-slot TURBOchannel, 12 Fast SCSI-2, Ethernet, FDDI, ISDN[2], Prestoserve, VME	2 PCI/ISA slots, 1 ISA slot, SCSI-2, Ethernet, FDDI[2], VME[2], Token Ring[2]		2 PCI slots, 3 ISA slots, 1 PCI/ISA slot, Fast SCSI-2, Ethernet, FDDI[2], VME[2], Prestoserve[2], Token Ring[2]
Graphics/Multimedia	Voice-quality Audio, HX, ZLS-Es, ZLX-L1, J300		Voice-quality Audio, ZLS-Es, ZLX-L1, ZLX-M2, J300	Voice-quality Audio, ZLS-Es, ZLX-L1, ZLX-M2, J300	Windows Sound System Compatible Audio, ZLXp-Es, DEC864		16-bit audio, ZLXp-Es, DEC864
High Availability and High Performance Features							
OpenVMS Cluster	Ethernet, FDDI		Ethernet, FDDI	Ethernet, FDDI	Ethernet, FDDI[2]		Ethernet, FDDI[2]
AdvantageCluster (DEC OSF/1 AXP)	Ethernet, FDDI		Ethernet, FDDI	Ethernet, FDDI	Ethernet, FDDI[2]		Ethernet, FDDI[2]
High Availability Features Supported	Disk Shadowing, POLYCENTER Advanced File System		Disk Shadowing, POLYCENTER Advanced File System, DECsafe Available Server[2]	Disk Shadowing, POLYCENTER Advanced File System, DECsafe Available Server[2]	Disk Shadowing, POLYCENTER Advanced File System		Disk Shadowing, POLYCENTER Advanced File System
Software Features							
Operating Systems	DEC OSF/1 AXP, OpenVMS AXP		DEC OSF/1 AXP, OpenVMS AXP	DEC OSF/1 AXP, OpenVMS AXP	DEC OSF/1 AXP, OpenVMS AXP Windows NT		DEC OSF/1 AXP, OpenVMS AXP Windows NT

[1] Performance may vary depending on configuration, application, and operating environment.

[2] Available with upcoming software or hardware release.

Note: Features may differ between operating environments. Digital believes the information in this table is accurate as of their publication date; such information is subject to change without notice. Digital is not responsible for any inadvertent errors.

Alpha AXP Servers Comparison Chart

System	DEC 2000 Models 300 and 500 AXP Servers	AlphaServer 1000 4/200 Workgroup Servers	AlphaServer 2000 4/200 Workgroup Servers	AlphaServer 2100 4/200 and 4/275 Departmental Servers		DEC 7000 Model 700 AXP Enterprise Servers
CPU Features						
Number of Processors	1	1	Up to 2	Up to 4		Up to 6
CPU/Clock Speed	150 MHz	200 MHz	190 MHz	4/200: 190 MHz 4/275: 275 MHz		275 MHz
Cache Size (On Chip/On Board)	8 KB I-cache, 8 KB D-cache/512 KB	8 KB I-cache, 8 KB D-cache/2 MB	8 KB I-cache, 8 KB D-cache/1 MB per processor	4/200: 8 KB I-cache, 8 KB D-cache/1 MB per processor 4/275: 16 KB I-cache, 16 KB D-cache/4 MB per processor		16 KB I-cache, 16 KB D-cache/4 MB per processor
Performance[1]				**4/200**	**4/275**	
TPS	110	up to 285	up to 400	up to 660	up to 850	up to 1,350
SPECint92	80.9	135.8	131.8	131.8	200.1	200.5
SPECfp92	112.7	177.0	160.5	161.0	291.1	292.6
SPECrate_int92	1,930	3,136	up to 6,178	up to 11,892	up to 15,470	up to 24,735
SPECrate_fp92	2,655	4,230	up to 7,296	up to 13,025	up to 25,997	up to 40,104
LINPACK 1000 x 1000	90.3	147.4	up to 208.6	up to 358.1	up to 642.7	up to 961.7
I/O Features						
Maximum Memory	256 MB	512 MB	640 MB	2 GB		14 GB
Maximum Disk (In Cabinet/Total)	300: 8.4 GB/58.8 GB 500: 24 GB/54.6 GB	14 GB/168 GB	16 GB/200 GB	32 GB/200 GB		58.8 GB/>10 TB
Maximum I/O Bandwidth	33 MB/s	132 MB/s	132 MB/s	132 MB/s		400 MB/s
I/O Support	6-slot EISA, 4 SCSI-2, Ethernet, 2 asynchronous serial ports with full modem control, 1 parallel port	2 PCI slots, 7 EISA slots, 1 PCI/EISA slot, Fast SCSI-2, FWD SCSI[2], RAID, Ethernet, DSSI, FDDI, Token Ring, Prestoserve[2], Synchronous Communications	3 PCI slots, 7 EISA slots, Fast SCSI-2, FWD SCSI[2], RAID, Ethernet, DSSI, FDDI, Token Ring, Prestoserve, Synchronous Communications	3 PCI slots, 8 EISA slots, Fast SCSI-2, FWD SCSI[2], RAID, Ethernet, DSSI, FDDI, Token Ring, Prestoserve, Synchronous Communications		4 12-slot XMI, 9-slot Futurebus+, 10 CI, 24 DSSI, 32 Fast SCSI-2, FWD SCSI[2], RAID, 16 Ethernet, 8 FDDI, 12 SDI, Prestoserve, IPI[2]
High Availability and High Performance Features						
OpenVMS Cluster	Ethernet	Ethernet, DSSI, FDDI	Ethernet, DSSI, FDDI	Ethernet, DSSI, FDDI		Ethernet, DSSI, FDDI, CI
AdvantageCluster (DEC OSF/1 AXP)		Yes	Yes	Yes		Yes
High Availability Features Supported	Disk Shadowing, POLYCENTER Advanced File System, Dual Power Supply in Model 500	Auto Restart, Thermal Management, Redundant Power System, RAID, Disk Hot Swap, ECC Cache, ECC Memory, UPS, POLYCENTER Advanced File System, DECsafe Available Server[2]	Auto Restart, Thermal Management, Redundant Power System, RAID, Disk Hot Swap, ECC Cache, ECC Memory, UPS, POLYCENTER Advanced File System, DECsafe Available Server[2]	Auto Restart, Thermal Management, Redundant Power System, RAID, Disk Hot Swap, ECC Cache, ECC Memory, UPS, POLYCENTER Advanced File System, DECsafe Available Server[2]		Redundant Power System, Uninterruptible Power System, Integrated Power Conditioning, ECC Memory, RAID (levels 0, 1, 0+1, 5), POLYCENTER Advanced File System, DECsafe Available Server
Software Features						
Operating Systems	DEC OSF/1 AXP, OpenVMS AXP, Windows NT	DEC OSF/1 AXP, OpenVMS AXP Windows NT	DEC OSF/1 AXP, OpenVMS AXP Windows NT	DEC OSF/1 AXP, OpenVMS AXP Windows NT		DEC OSF/1 AXP, OpenVMS AXP

[1] Performance may vary depending on configuration, application, and operating environment.

[2] Available with upcoming software or hardware release.

Note: Features may differ between operating environments. Digital believes the information in this table is accurate as of their publication date; such information is subject to change without notice. Digital is not responsible for any inadvertent errors.



DECpc AXP 150 Deskside PC

Product Description

The DECpc AXP 150 personal computer is the fastest PC in the world. It offers the popular Windows NT computing environment and access to tens of thousands of applications. With the Alpha AXP processor at the heart of the system, users get power associated with high-performance workstations at PC prices. The DECpc AXP 150 PC combines the best aspects of PC and workstation computing.

The DECpc AXP 150 PC uses the DECchip 21064 processor running at 150 MHz. A high-performance EISA I/O bus, running at 33 Mbytes/second, provides expansion for EISA, ISA, or SCSI controllers, high-resolution graphics, and networking options. Memory can be increased up to 256 Mbytes to allow compute-intensive applications to run without memory limitations. The 512 Kbytes cache increases system performance by storing recently accessed information in faster SRAM. The system supports five internal storage bays to provide flexibility in configuring a system with diskette, tape, compact disk, and hard drives. Additional external expansion is supported on an optional EISA-based SCSI controller, providing maximum storage of up to 58.8 Gbytes.

The Windows NT operating system from Microsoft provides the same familiar Windows user interface available with the DOS operating system. It runs most DOS Windows 16-bit and all 32-bit applications without modification. Designed for the PC power user, Windows NT provides new levels of scalability and security.

Any DECpc AXP 150 personal computer running Windows NT, supports multiple operating systems; OpenVMS AXP and DEC OSF/1 AXP operating system licenses and software media can be ordered separately.

The DECpc AXP 150 PC is also an excellent server. A combination of a powerful CPU, extensive expansion capabilities, and the Windows NT Advanced Server software make it an ideal server for PC workgroup computing. Windows NT Advanced Server software provides superb server capabilities for client/server computing on any network, including Microsoft LAN Manager and Novell NetWare. Battery backup can be added easily through the Windows NT menu and via a standard serial port connection.

Step 1—Systems

Select system. 120 V Packaged Systems include power cord and U.S. keyboard. Select country-specific power cord and keyboard for all other systems.

- Options ordered with Packaged systems will not be factory installed. Options ordered with packaged systems will be shipped outside the system box.
- Options ordered with Base systems will be factory installed unless specified as SPARES.

DECpc AXP 150 System includes

- DECchip 21064/150-MHz CPU with 512-Kbyte cache
- BA55 tower base system enclosure
- 16, 32, or 64 Mbytes of memory (Packaged Systems only)
- Six EISA/ISA expansion slots
- SVGA graphics adapter (Packaged Systems only)
- EISA based SCSI controller
- 2.88-Mbyte diskette drive
- Four additional storage bays
- Two serial ports, one parallel port
- Three-button mouse with 3-meter (10-foot) cable
- U.S. keyboard, 120 V (Packaged Systems only)
- 1.8-meter (6-foot) power cord, 120 V (Packaged Systems only)
- 3-meter (10-foot) video cable
- Windows NT operating system license, shrinkwrapped software package with media and documentation on CD-ROM
- 254-watt power supply
- User documentation
- Three-year warranty: one year on-site, two years return-to-factory

Packaged Systems

Order Number	Operating System	Memory	Monitor	Graphics 1024 x 768	RZ25L 535 MB	RZ26L 1.05 GB	RRD43 CD-ROM	Ethernet
PB220-BA/BB/BC	Windows NT	32 MB	17-inch color	#9 GXE	535 MB		600 MB	DE422
PB224-BA/BB/BC	Windows NT	16 MB	14-inch color	#9 GXE	535 MB			
PB224-BD	Windows NT	16 MB	Required	#9 GXE	535 MB			
PB230-AA/AB/AC	Windows NTAS	64 MB	14-inch color	#9 GXE		1.05 GB	600 MB	DE422
Base Systems—require memory option, graphics option, monitor, power cord, and keyboard								
PB22A-BE	Windows NT	Required	Required	Required	Optional	Optional	Optional	Optional

Step 2—Monitors and Video Adapters (Required for Base System)

Systems include video cable; monitors include country-specific power cord.

PCXBV-PC	15-inch SVGA color monitor, LE, 1024 x 768 resolution
PCXAV-EC/ED	17-inch color monitor, MPR2, LE, Digital Control, 1280 x 1024 resolution, 72 Hz
VRC21-HA/H4	21-inch Diamondtron color monitor, MPR2, LE, Digital Control, 1280 x 1024 resolution, 72 Hz

Select video adapter for Base System.

PB2GA-AA	Qvision SVGA+ EISA 8-bit video adapter (1024 x 768 resolution)
PB2GA-CA	Number Nine GXE high-performance ISA 8-bit video adapter (1024 x 768, 1280 x 1024 resolution)
PB2GA-EA	Matrox MGAI ISA 24-plane video adapter (1280 x 1024 resolution)

Step 3—Memory (Required for Base System)

System supports two memory banks (4 SIMMs per bank) for 256-Mbyte system maximum. Memory bank **must** contain four identical SIMMs (4 x 4-Mbyte, 4 x 16-Mbyte or 4 x 32-Mbyte). Banks in system support combined SIMMS, e.g., 4 x 4-Mbyte in one bank plus 4 x 16-or 4 x 32-Mbytes in second bank. Recommended memory for optimal performance is 32 Mbytes. **Note:** 32 Mbytes are at maximum memory capacity; removal of existing SIMMs is required to upgrade memory.

Memory Configurations:	
16-Mbyte = one bank	4 x 4-Mbyte SIMMs
32-Mbyte = one bank	4 x 8-Mbyte SIMMs
32-Mbyte = two banks	8 x 4-Mbyte SIMMs
48-Mbyte = two banks	4 x 4-Mbyte SIMMs plus 4 x 8-Mbyte SIMMs
64-Mbyte = one bank	4 x 16-Mbyte SIMMs
64-Mbyte = two banks	8 x 8-Mbyte SIMMs
80-Mbyte = one bank one bank	4 x 4-Mbyte SIMMs plus 4 x 16-Mbyte SIMMs
96-Mbyte = two banks	4 x 16-Mbyte SIMMs plus 4 x 8-Mbyte SIMMs
128-Mbyte = two banks	8 x 16-Mbyte SIMMs
128-Mbyte = one bank	4 x 32-Mbyte SIMMs
144-Mbyte = one bank one bank	4 x 4-Mbyte SIMMs plus 4 x 32-Mbyte SIMMS
192-Mbyte = one bank one bank	4 x 16-Mbyte SIMMs plus 4 x 32-Mbyte SIMMs
256-Mbyte = two banks	8 x 32-Mbyte SIMMs

PB2MA-BD	16 Mbytes (4 x 4-Mbyte, 70-ns, 36-bit SIMMs)
PC77M-AB*	16 Mbytes (2 x 8-Mbyte, 70-ns, 36-bit SIMMs)
PB2MA-BF	64 Mbytes (4 x 16-Mbyte, 70-ns, 36-bit SIMMs)
PC77M-AD*	64 Mbytes (2 x 32-Mbyte, 70-ns, 36-bit SIMMs)

* Two PC77M-AB/AD module sets (4 SIMMs) must be installed to fill four SIMM slots in one bank.

Step 4—Storage

Select storage devices as required.

System SCSI controller supports maximum of seven devices (four internal, three external). An optional SCSI controller supports maximum of seven additional external SCSI devices; maximum three additional SCSI controllers supported for a system total of four.

Step 4a—Internal Storage

Systems enclosure supports five half-height devices.

- Slot 1 supports one 2.88-Mbyte 3.5-inch diskette drive (included in all systems).
- Slot 5 supports one 3.5-inch half-height hard disk drive.
- Slots 2, 3, and 4 support 3.5-inch hard disk drives and 5.25-inch removable media devices (CD-ROM, DAT, and QIC tape).

Step 4a—Internal Storage *(continued)*

Removable Devices

PCXCR-AD	600-Mbyte RRD43 5.25-inch half-height CD-ROM drive
PCXCR-AE	600-Mbyte RRD44 5.25-inch half-height CD-ROM drive
PB2TA-BA	525-Mbyte TZK10 5.25-inch half-height QIC tape drive
PB2TA-CA	2-Gbyte TZK11 5.25-inch half-height QIC tape drive
PB2TA-AA	4.0-Gbyte TLZ06 5.25-inch half-height digital audio tape (DAT) drive
TLZ07-LG	8.0-Gbyte TLZ07 5.25-inch half-height digital audio tape (DAT) drive

Hard Disk Drives

PB2RA-EA	535-Mbyte RZ25L 3.5-inch half-height disk drive
PB2RA-GA	1.05-Gbyte RZ26L 3.5-inch half-height disk drive
PB2RA-FA	2.1-Gbyte RZ28 3.5-inch half-height disk drive

Step 4b—External Storage

System SCSI controller supports seven devices; three additional SCSI controllers are supported. Additional SCSI controller(s) are recommended for external storage devices. Select SCSI controller if more external storage is required.

PB2HA-SA	High-performance EISA-based SCSI controller with high-density 50-pin small straight connector (maximum three per system)
SWXCR-EA	Single channel EISA SCSI RAID controller, non-boot (external RAID only, maximum two per system)
SWXCR-EB	Three channel EISA SCSI RAID controller, non-boot (external RAID only, maximum two per system)

Storageworks Deskside Expansion Unit (BA350)

BA350 deskside expansion unit supports a maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices. Requires SCSI cable (BN21H-xx). 240 V systems require country-specific power cord.

BA350-KA	StorageWorks deskside pedestal expansion unit with BA350-SA basic shelf, universal ac power supply, pedestal mounting kit, and 120 V power cord.

SCSI devices may be purchased separately and are customer installable. The following SCSI devices are supported in StorageWorks deskside pedestal.

RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive
RZ26L-VA	1.05-Gbyte 3.5-inch half-height disk drive
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive
TLZ06-VA	4.0-Gbyte 3.5-inch half-height 4-mm DAT tape drive
RRD43-VA	600-Mbyte 5.25-inch half height compact disk drive
RRD43-VU	600-Mbyte compact disk drive; can be added to RRD43-VB or TZK10-VA for total of two drives in one 5.25-inch slot
TZK11-VA	2.0-Gbyte 5.25-inch half-height QIC tape drive

BA353 Modular Desktop Storage Expansion

See Chapter 8, *Storage Devices*, for ordering information.

Single Drive Tabletop Expansion (Require SCSI (BC09D-xx) Cable)

RRD43-FA	600-Mbyte compact disk drive
RRD44-FA	600-Mbyte compact disk drive
TLZ06-FA	4.0-Gbyte 4-mm Digital Audio Tape (DAT) drive
PCXAT-AE	2.0-Gbyte TZK11 5.25-inch half-height QIC tape drive

Step 5—Networks and Communications

Select Communication/Ethernet options if required. One parallel/serial port adapter supported per system.

PCXBF-AA	Data modem
PCXCF-AA	FAXmodem-9600 baud
PCXDF-AA	FAXmodem 14.4/9.6
PB2CA-AA	Ethernet Adapter (DE422)
DEFEA-AA	Single channel EISA FDDI controller (SAS)
DEFEA-DA	Dual channel EISA FDDI controller (DAS)
DEFEA-UA	Single channel EISA FDDI-UTP controller (SAS)
BC29P-10	Cable for external modem connection to serial port

Step 6—Printers with Windows NT Drivers

DECmultiJET 1000, DECmultiJET 2000, DEClaser 1152, DEClaser 2100 Plus, DEClaser 2150 Plus, DEClaser 220 Plus, DEClaser 2250 Plus, DEClaser 3200, LA310, LA75S Plus, and LA70.

Step 7—Software

Note: Windows NT V3.5 and NT Server V3.5 cannot be factory installed. Operating system distribution is via CD-ROM only. Customers must have access to a CD-ROM device in order to install the operating system.

OpenVMS AXP and DEC OSF/1 AXP licenses and operating systems can be added to any DECpc AXP 150 personal computer. Order operating system licenses for OpenVMS AXP and DEC OSF/1 AXP; order media and documentation separately. **Note:** Each operating system requires a separate 1.05-Gbyte (RZ26)disk; see Step 4.

DEC OSF/1 AXP

QL-MT4AE-6C	DEC OSF/1 AXP base license
QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation

OpenVMS AXP

QL-MT1AE-6C	OpenVMS AXP base license
QA-MT1AH-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

Windows NT Advanced Server

QB-23CAA-SB	Windows NT Advanced Server license, media, and documentation

Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

DECnet Licenses

QL-MTJAE-AA	DECnet end-system license for DEC OSF/1 AXP
QL-MTKAE-AA	DECnet extended function license for DEC OSF/1 AXP
QL-MTFAE-AA	DECnet end-system license for OpenVMS AXP
QL-MTGAE-AA	DECnet extended function license for OpenVMS AXP
QL-MTHAE-AA	DECnet end-system to extended function upgrade license for OpenVMS AXP

Step 7—Software *(continued)*

DECwindows Motif

QL-MV4AE-AA	DECwindows Motif license for OpenVMS AXP

Step 8—Power Cords and Keyboards

Power cord—not required for 120 V packaged systems

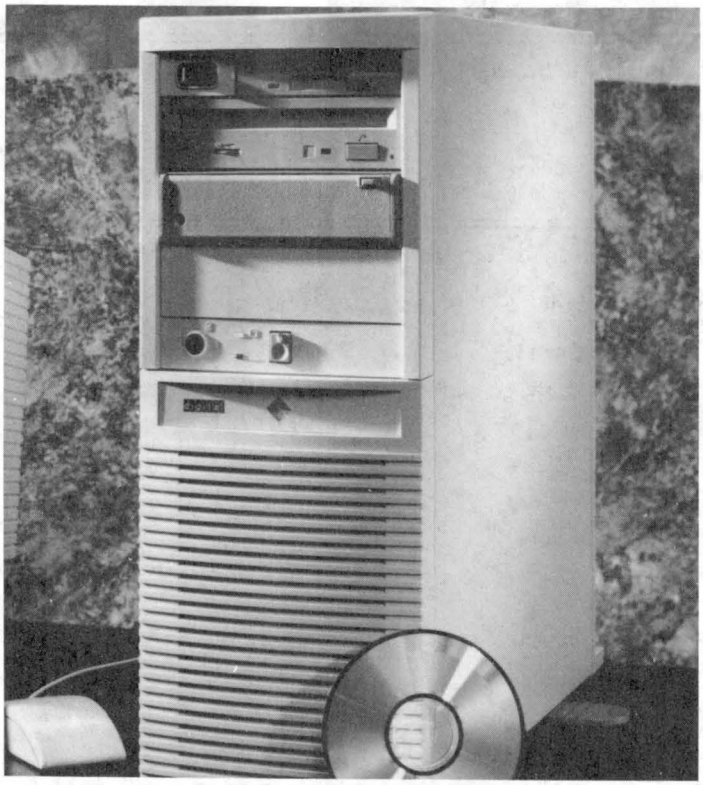
BN26J-1K*	U.S., Canada, Japan—120 V
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19K-2E	Denmark
BN18L-2E	Israel
BN19Z-2E	Italy
BN24T-2E	Switzerland
BN19A-2E	U.K., Ireland

Keyboard—not required for 120 V packaged systems

PCXAL-FA*	U.K., U.S. (International)
PCXAL-FB	Belgium
PCXAL-FD	Denmark
PCXAL-FP	France
PCXAL-FG	Germany
PCXAL-FN	Norway
PCXAL-FV	Portugal
PCXAL-LH	Greece
PCXAL-FS	Spain
PCXAL-FE	U.K., Ireland
PCXAL-FK	Switzerland (French)
PCXAL-FI	Italy

* Included in 120 V packaged systems.

DEC 2000 Model 300 AXP Server



DEC 2000 Model 300 AXP Server

Product Description

The DEC 2000 Model 300 AXP system uses the power of the DECchip 21064 AXP, 64-bit microprocessor in an entry-level deskside package that offers a high-performance, inexpensive, reliable platform for application development.

The Model 300 AXP server is the entry point in the family of server products. Designed for distributed and replicated sites, it is ideal for use as a LAN server with multivendor integration capabilities based on PATHWORKS and NAS products. Model 300 solves the business problem of integrating existing diverse desktop devices and offers a strong, reliable and secure, open standard, operating system with a wide range of application support. As a database server, file server, or PC LAN server, it delivers ease of use, leadership technology, and world-class performance on an affordable platform.

The deskside enclosure supports a maximum of 256 Mbytes of memory, six EISA slots for SCSI, Ethernet, and communication options. Systems include a diskette drive and bays for four additional removable media devices (compact disk, DAT, and QIC tape) and hard disk drives, providing maximum storage of up to 58.8 Gbytes.

The Model 300 AXP supports OpenVMS AXP, DEC OSF/1 AXP, and Windows NT. The OpenVMS AXP operating system is designed specifically to protect software and training investment, while the DEC OSF/1 AXP operating system makes an ideal entry-level server for the UNIX market. OpenVMS AXP, DEC OSF/1 AXP, and Windows NT licenses and operating systems can be added to create a universal platform server.

Existing OpenVMS VAX users who need to develop applications for OpenVMS AXP on Alpha systems are provided with an low-cost platform upon which to build their solutions.

Step 1—Systems

Select system. Packaged Servers include 120 V power cord; order keyboard separately. Select country-specific power cord and keyboard for all other systems from Step 8. Select user licenses if required, from Step 7.

- Packaged DEC OSF/1 AXP systems include graphics adapter; order monitor from Step 2.
- Options ordered with Packaged systems will not be factory installed. Options ordered with packaged systems will be shipped outside the system box.
- Options ordered with Base Servers will be factory installed unless specified as SPARES.
- DEC OSF/1 AXP and OpenVMS servers support console terminal or video adapter and monitor.

DEC 2000 Model 300 AXP Packaged and Base Servers include

- DECchip 21064/150-MHz CPU with 512-Kbyte cache
- BA55 tower base system enclosure
- 32, 64, or 128 Mbytes of memory
- Six EISA slots
- Graphics adapter 1024 x 768 (DEC OSF/1 AXP Packaged Systems only)
- EISA-based Ethernet adapter (twisted pair/ThinWire)
- EISA based SCSI controller with diskette controller
- 2.88-Mbyte diskette drive
- Four additional storage bays
- Two EIA-232 asynchronous serial ports, one parallel port
- Three-button mouse with 3-meter (10-foot) cable
- 1.8-meter (6-foot) power cord, 120 V (Packaged Systems only)
- 3-meter (10-foot) video cable
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- OpenVMS AXP base license (with POSIX) and NAS 200 **or** DEC OSF/1 AXP two-user base license, OSF/Motif, TCP/IP, and NAS 200
- User documentation
- Factory-installed software (FIS)*
- One-year on-site warranty

* FIS is not a substitute for software media and documentation; see Step 7.

Packaged Servers

Order Number	Operating System	Memory	Hard Disk Drive	CD-ROM Drive
PB221-EA†	DEC OSF/1 AXP	32 Mbytes	1.05 Gbytes	600 Mbytes
PB222-EA†	DEC OSF/1 AXP	64 Mbytes	1.05 Gbytes	600 Mbytes
PB224-CA†	OpenVMS AXP	32 Mbytes	1.05 Gbytes	600 Mbytes
PB223-CA*	OpenVMS AXP	128 Mbytes	2 x 1.05 Gbytes	600 Mbytes
Base Servers				
PB22C-DF†	DEC OSF/1 AXP	32 Mbytes		
PB22C-EF†	DEC OSF/1 AXP	64 Mbytes		
PB22B-BA†	OpenVMS AXP	32 Mbytes		
PB22B-CA†	OpenVMS AXP	64 Mbytes		

† System includes NAS 200.
* System includes NAS 300.

Step 2—Monitors and Video Adapter

Video adapter included in Packaged DEC OSF/1 servers. Video adapter and monitor are required for Windows NT Advanced Servers. OpenVMS AXP and DEC OSF/1 AXP systems support console terminal or video adapter and monitor.

PB2GA-AA Qvision SVGA+ EISA 8-bit video adapter (1024 x 768 resolution)

Systems include video cable; monitors include power cord.

PCXBV-PC 15-inch SVGA color monitor, LE, 1024 x 768 resolution

PCXAV-EC/ED 17-inch color monitor, MPR2, LE, Digital Control, 1280 x 1024 resolution, 72 Hz

VRC21-HA/H4 21-inch Diamondtron color monitor, MPR2, LE, Digital Control, 1280 x 1024 resolution, 72 Hz

Step 3—Memory

System supports two memory banks (4 SIMMs per bank) for 256-Mbyte system maximum. Memory bank **must** contain four identical SIMMs (4 x 4-Mbyte, 4 x 16-Mbyte or 4 x 32-Mbyte). Banks in system support combined SIMMS, e.g., 4 x 4-Mbyte in one bank plus 4 x 16-or 4 x 32-Mbytes in second bank. Recommended memory for optimal performance is 32 Mbytes. **Note:**32 Mbytes are at maximum memory capacity; removal of existing SIMMs is required to upgrade memory.

PB2MA-BD	16 Mbytes parity only (4 x 4-Mbytes, 70-ns SIMM) module set
PB2MA-BF	64 Mbytes parity only (4 x 16-Mbytes, 70-ns SIMM) module set
PC77M-AB*	16 Mbytes (2 x 8 Mbyte, 70-ns, 36-bit SIMMs)
PC77M-AD*	64 Mbytes (2 x 32-Mbyte, 70-ns, 36-bit SIMMs)

* Two PC77M-AB/AD module sets (4 SIMMs) must be installed to fill four SIMM slots in one bank.

Step 4—Storage

Select storage devices as required.

- Systems ordered with one 1.05-Gbyte RZ26L hard disk drive include factory-installed software.
- SCSI controller supports maximum of seven devices (four internal, three external). An optional SCSI controller supports maximum of seven additional external SCSI devices. Servers support three additional SCSI controllers for maximum of four controllers per system.
- Software distribution is only available on CD-ROM.

Step 4a—Internal Storage

Systems enclosure supports five half-height devices.

- Slot 1 supports one 2.88-Mbyte 3.5-inch diskette drive (included in all servers).
- Slot 5 supports one 3.5-inch half-height hard disk drive.
- Slots 2, 3, and 4 support 3.5-inch hard disk drives and 5.25-inch removable media devices (CD-ROM, DAT, and QIC tape).

Removable Devices

Packaged and Base systems include one 2.88-Mbyte diskette drive. Packaged systems also include one compact disk reader.

PCXCR-AD	600-Mbyte RRD43 5.25-inch half-height CD-ROM drive
PCXCR-AE	600-Mbyte RRD44 5.25-inch half-height CD-ROM drive
PB2TA-BA	525-Mbyte TZK10 5.25-inch half-height QIC tape drive
PB2TA-CA	2-Gbyte TZK11 5.25-inch half-height QIC tape drive
PB2TA-AA	4.0-Gbyte TLZ06 5.25-inch half-height digital audio tape (DAT) drive
TLZ07-LG	8.0-Gbyte TLZ07 5.25-inch half-height digital audio tape (DAT) drive

Hard Disk Drives

PB2RA-EA	535-Mbyte RZ25L 3.5-inch half-height disk drive
PB2RA-GA	1.05-Gbyte RZ26L 3.5-inch half-height disk drive
PB2RA-FA	2.1-Gbyte RZ28 3.5-inch half-height disk drive

Step 4b—External Storage

Systems include EISA-based SCSI controller (supports maximum five internal and two external devices). Additional SCSI controller(s) are recommended for external storage devices; three additional SCSI controllers are supported per system.

SCSI Controller Option

PB2HA-SA	High-performance EISA-based SCSI controller with high-density 50-pin small straight connector
SWXCR-EA	Single channel EISA SCSI RAID controller, non-boot (external RAID only, maximum two per system)
SWXCR-EB	Three channel EISA SCSI RAID controller, non-boot (external RAID only, maximum two per system)

BA350 Modular Storage Pedestal

BA350 modular storage pedestal supports a maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices; includes 120 V power cord. Requires SCSI cable (BN21H-xx).

BA350-KA	Modular storage pedestal includes BA350-SA basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord.

SCSI devices may be purchased separately and are customer installable. The following SCSI devices are supported in BA350 modular storage shelf.

RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive
RZ26L-VA	1.05-Gbyte 3.5-inch half-height disk drive
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive
TLZ06-VA	4.0-Gbyte 3.5-inch half-height 4-mm DAT tape drive
RRD43-VA	600-Mbyte 5.25-inch half height compact disk drive
RRD43-VU	600-Mbyte compact disk drive; can be added to RRD43-VB or TZK10-VA for total of two drives in one 5.25-inch slot
TZK11-VA	2.0-Gbyte 5.25-inch half-height QIC tape drive

BA353 Modular Desktop Storage Expansion

See Chapter 8, *Storage Devices*, for ordering information.

Single Drive Tabletop Expansion (Require SCSI (BC09D-xx) Cable)

RRD43-FA	600-Mbyte compact disk drive
RRD44-FA	600-Mbyte compact disk drive
TLZ06-FA	4.0-Gbyte 4-mm Digital Audio Tape (DAT) drive
PCXAT-AE	2.0-Gbyte TZK11 5.25-inch half-height QIC tape drive

Step 5—Networks and Communications

Select additional Ethernet adapter if required. A maximum of two Ethernet adapters are supported per system. See Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for more information.

PB2CA-AA	Ethernet Adapter (DE422)
DNSES-AA	EISA Synchronous Communications option (X.25 compatible, DEC OSF/1 and OpenVMS AXP only)
DEFEA-AA	Single channel EISA FDDI controller (SAS)
DEFEA-DA	Dual channel EISA FDDI controller (DAS)
DEFEA-UA	Single channel EISA FDDI-UTP controller (SAS)
BC29P-10	Cable for external modem connection to serial port

Step 6—Printers with Windows NT Drivers

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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 7—Software

Software is required for first system on site. Order media (CD-ROM) and documentation. Select user licenses as required.

DEC 2000 Model 300 AXP Servers support multiple operating systems: OpenVMS AXP, DEC OSF/1 AXP, and Windows NT. Select additional operating system licenses and media if required.

Note: DEC 2000 Model 300 Servers with Windows NT Advanced Server license and media require keyboard, mouse, video adapter and monitor

Software Processor Code = E

Windows NT

QB-0QRAA-SB	Windows NT operating system license and software media
QB-23CAA-SB	Windows NT Advanced Server license, media, and documentation

DEC OSF/1 AXP Licenses

QL-MT4AE-6C	DEC OSF/1 AXP base license
QL-MT7A9-BB	DEC OSF/1 AXP 1-user license
QL-MT7A9-BC	DEC OSF/1 AXP 2-user license
QL-MT7A9-BD	DEC OSF/1 AXP 4-user license
QL-MT7A9-BE	DEC OSF/1 AXP 8-user license
QL-MT7A9-BF	DEC OSF/1 AXP 16-user license
QL-MT7AE-AA	DEC OSF/1 AXP unlimited user license
QL-MT6AE-AA	DEC OSF/1 AXP server extension license
QL-MT5AE-AA	DEC OSF/1 AXP C developer's extension license
QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation

Note: Media and documentation is recommended for the first system on site.

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a OpenVMS Cluster. **Note:** OpenVMS AXP Distributed Interactive User Licenses are architecture specific, and **cannot** be shared across a mixed OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AE-AA	OpenVMS AXP unlimited user license

Step 7—Software *(continued)*

OpenVMS AXP Media and Documentation

QA-MT1AH-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

Note: Media and documentation recommended for first system on site.

Layered Products CD-ROM

QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

NAS 300 Advance Kit

NAS 300 advance kit media available on layered products CD-ROM.

DECnet Licenses

QL-MTJAE-AA	DECnet end-system license for DEC OSF/1 AXP
QL-MTKAE-AA	DECnet extended function license for DEC OSF/1 AXP
QL-MTFAE-AA	DECnet end-system license for OpenVMS AXP
QL-MTGAE-AA	DECnet extended function license for OpenVMS AXP
QL-MTHAE-AA	DECnet end-system to extended function upgrade license for OpenVMS AXP

DECwindows Motif

QL-MV4AE-AA	DECwindows Motif license for OpenVMS AXP

Step 8—Power Cords and Keyboards

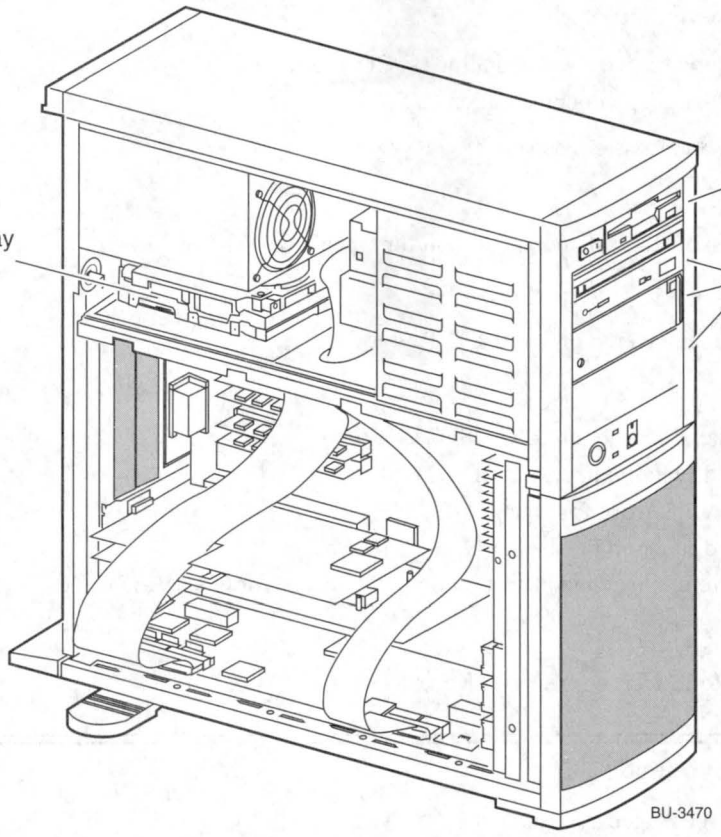
Power cord—not required for 120 V packaged systems

BN26J-1K*	U.S., Canada, Japan—120 V
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19K-2E	Denmark
BN18L-2E	Israel
BN19Z-2E	Italy
BN24T-2E	Switzerland
BN19A-2E	U.K., Ireland

Keyboard—not required for 120 V packaged systems

PCXAL-FA	U.K., U.S. (International)
PCXAL-FB	Belgium
PCXAL-FD	Denmark
PCXAL-FP	France
PCXAL-FG	Germany
PCXAL-FN	Norway
PCXAL-FV	Portugal
PCXAL-LH	Greece
PCXAL-FS	Spain
PCXAL-FE	U.K., Ireland
PCXAL-FK	Switzerland (French)
PCXAL-FI	Italy

* Included in 120 V packaged systems.


Rear Disk Drive Bay
(Accepts 3.5-inch
disk drives)
Front Diskette Drive Bay
(Accepts 3.5-inch
diskette drives)
Front 5.25-inch Drive Bays
(Accepts 5.25-inch removable
media devices or 3.5-inch
disk drive devices)
BU-3470

Specifications

Physical Characteristics	
Height	47.0 cm (18.3 in.)
Width	17.8 cm (7.0 in.)
Depth	46.5 cm (18.3 in.)
Weight	18.2 Kg (40.0 lb)
Power Requirements	
Line voltage	120/240 V auto-sensing
Frequency	Single phase
Maximum power consumption	254 W
Environmental Class	FCC Class B, VDE Class B
Operating Environment	
Temperature	10°–40° C (50°–104° F)
Relative humidity	10%–90% noncondensing



DEC 3000 Model 300X/300LX AXP Desktop Workstations

Product Description

The DEC 3000 Model 300X/300LX AXP is a low-cost workstation designed for demanding applications such as 2D CAD, CASE, software development, and technical publishing as well as new and emerging technologies, such as multimedia.

DEC 3000 Model 300X/300LX AXP Base System features include two TURBOchannel slots and integral high-resolution (1280 x 1024) graphics and on-board audio and ISDN. The DEC 3000 Model 300X AXP system uses a 175-MHz CPU with performance of 100 SPECfp92 and 84 SPECint92. The DEC 3000 Model 300LX AXP system uses a 125-MHz CPU with performance of 75 SPECfp92 and 63 SPECint92.

The system enclosure supports up to 256 Mbytes of memory, and includes brackets for two internal devices (3.5-inch hard disk drives or one 3.5-inch hard disk and one diskette drive). Integral SCSI-2 controller supports two internal drives and up to five external devices via a 50-pin high-density SCSI connector. The system enclosure does not support an internal CD-ROM or tape drive. An optional Dual SCSI-2 controller offers one 10-Mbyte/s Fast SCSI-2 channel and one 5-Mbytes/s SCSI-2 channel for external storage expansion.

The open TURBOchannel I/O bus, with over 200 options available from Digital and third-party vendors, provides multiscreen capabilities, additional SCSI, Ethernet, FDDI, 3D graphics, and multimedia support.

The Ethernet connection is a 10BaseT interface. Adapters are available to convert the 10BaseT interface to AUI or ThinWire. A TURBOchannel slot may be used to connect FDDI or AUI.

The DEC 3000 Model 300X/300LX AXP workstation offers performance through design. It uses 64-bit Alpha AXP technology with the DECchip 21064 RISC microprocessor to ensure an unprecedented level of integration and compatibility across the entire platform of Alpha AXP systems.

Step 1—Systems

Select system. 120 V Packaged Systems include power cord and U.S. keyboard; order country-specific power cord and keyboard for all other systems. Select software from Step 11, if necessary.

- Options ordered with Packaged Systems will be shipped outside the system enclosure. No additions or substitutions can be made to a Packaged System.
- Options ordered with Base Systems will be factory installed unless specified as SPARES.

DEC 3000 Model 300X/300LX Desktop Systems include

- DECchip 21064
  - Model 300X: 175-MHz CPU with 256-Kbyte secondary cache
  - Model 300LX: 125-MHz CPU with 256-Kbyte secondary cache
- TURBOchannel I/O interconnect—two slots total
- Integral 8-plane 2D graphics (HX), 1280 x 1024, 72-Hz monitors
- 32 or 64 Mbytes of memory
- 10BaseT (twisted pair) Ethernet port and cable
- Integral SCSI-2 controller with Direct Memory Access
- Systems ordered with RZ25L or RZ26L disk include factory-installed software (FIS)*
- EIA-232 serial line (synchronous/asynchronous) with full modem control
- ISDN port
- Audio in/out, audio headset
- U.S. keyboard, 120 V Packaged Systems only
- Three-button mouse
- 1.8-meter (6-foot) power cord, 120 V Packaged Systems only
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- DEC OSF/1 AXP two-user base workstation license, DEC Open3D license, DEC PHIGS Runtime license, DECspin audio license, Multimedia Services license, NAS 250, and DECwindows Motif, **or** OpenVMS AXP base license, one-user workstation license, DEC Open3D license, DEC PHIGS Runtime license, NAS 250 with DECwindows Motif

* FIS is not a substitute for software media and documentation; see Step 11.

Order Number	Operating System	Memory	Monitor C = Color	Graphics	TURBO-channel Slots Available	RZ25L = 535 MB RZ26L = 1.05 GB
Model 300X Packaged Systems						
PE321-CD/CE	DEC OSF/1 AXP	32 Mbytes	21-in. C VRC21	HX 8-plane	2	1.05 GB
PE321-DA/DB	DEC OSF/1 AXP	32 Mbytes	21-in. C VRC21	ZLX-E1	1	1.05 GB
PE321-PD/PE	OpenVMS AXP	32 Mbytes	21-in. C VRC21	HX 8-plane	2	1.05 GB
PE321-RA/RB	OpenVMS AXP	32 Mbytes	21-in. C VRC21	ZLX-E1	1	1.05 GB
Model 300X Base Systems (Require country-specific power cord, keyboard, and monitor)						
PE320-CA	DEC OSF/1 AXP	32 Mbytes	Required	HX 8-plane	2	
PE320-DA	DEC OSF/1 AXP	64 Mbytes	Required	HX 8-plane	2	
PE320-PA	OpenVMS AXP	32 Mbytes	Required	HX 8-plane	2	
PE320-RA	OpenVMS AXP	64 Mbytes	Required	HX 8-plane	2	
Model 300LX Packaged Systems						
PE32B-BA/BB	DEC OSF/1 AXP	32 Mbytes	17-in. C VRT17	HX 8-plane	2	535 MB
PE32B-CA/CB	DEC OSF/1 AXP	32 Mbytes	21-in. C VRC21	HX 8-plane	2	1.05 GB
PE32B-NA/NB	OpenVMS AXP	32 Mbytes	17-in. C VRT17	HX 8-plane	2	535 MB
PE32B-PA/PB	OpenVMS AXP	32 Mbytes	21-in. C VRC21	HX 8-plane	2	1.05 GB

Note: xD, xA = 120/240 V Northern Hemisphere, xE, xB = 240 V Southern Hemisphere

Step 1a—AdvantageCluster Compute Server (ACCS) Model 1000

The AdvantageCluster Compute Server Model 1000 is an entry level parallel compute server with a 4-node DEC 3000 Model 300X AXP cluster using Ethernet interconnect and parallel run-time environment.

For more information on AdvantageClusters, see Chapter 6, *High Performance and High Availability Products*.

ACCS Model 1000 includes

- Four Rackmounted DEC 3000 Model 300X AXP systems
- 32 Mbytes of memory per system
- DECserver 90M
- Ethernet network interconnect
- 42-inch cabinet

CT-FR330-04 ACCS Model 1000

For more information on AdvantageClusters, see Chapter 6, *High Performance and High Availability Products*.

Step 2—Monitors (Required for Model 300X Base Systems)

Integral HX graphics support 72-Hz monitors only.

VR319-DA/D4 19-inch monochrome, 1280 x 1024, 72-Hz refresh rate

VRT17-HA/H4 17-inch color, MPR2, LE, Digital Control, 1280 x 1024, 72-Hz refresh rate

VRC21-HA/H4 21-inch Diamondtron color, MPR2, LE, Digital Control, 1280 x 1024 resolution, 72 Hz refresh rate

Step 3—Memory

Systems include 32 or 64 Mbytes of memory. Systems with 32 Mbytes of memory support two additional memory module sets. Systems with 64 Mbytes of memory support three additional memory module sets.

Maximum system memory of 256 Mbytes is achieved by selecting a 64-Mbyte Base System and adding three additional MS16-DA memory module sets.

MS16-BA 16-Mbyte module sets (2 x 8-Mbyte, 4-Mbit, 70-ns DRAM module)

MS16-DA 64-Mbyte module sets (2 x 32-Mbyte, 4-Mbit, 70-ns DRAM module)

Step 4—Storage

Select storage devices as required.

- An RZ25L, RZ26L, or RZ28 disk drive is recommended as a system or data/swap device.
- DEC OSF/1 AXP systems require one system disk; OpenVMS AXP systems can be networked configurations with supported page/swap functions.
- Recommended minimum configurations for standalone systems are: one RZ26L = 1.05 Gbyte or two RZ25Ls = 1.07 Gbyte.
- Software media is only available on CD-ROM. Media and documentation is recommended for first system on site.
- SCSI-2 controller supports two internal drives and a maximum of five external SCSI drives; an optional Dual-SCSI TURBOchannel option card supports maximum of 14 additional external SCSI devices.

Step 4a—Internal Storage

- System supports two internal storage devices.
- Slot 1 supports one removable media device (RX26) or one hard disk drive (RZ25L, RZ26L, RZ28).
- Slot 2 supports one hard disk drive (RZ25L, RZ26L, RZ28).

Note: The DEC 3000 Model 300X/300LX AXP does not support internal CD-ROM or tape drives; see Step 4b for external CD-ROM and tape options.

Removable Media Device

RX26-FB 2.8-Mbyte 3.5-inch diskette drive

Step 4a—Internal Storage *(continued)*

Hard Disk Drives

RZ25L-EP*	535-Mbyte 3.5-inch half-height disk drive
RZ26L-EP*	1.05-Gbyte 3.5-inch half-height disk drive
RZ28-EP*	2.1-Gbyte 3.5-inch half-height disk drive

* Disks ordered with Base Systems include factory-installed software (FIS).

Step 4b—External Storage

Systems support maximum of five external devices on SCSI-2 controller; select Dual-SCSI-2 TURBOchannel option if more are required.

Dual-SCSI TURBOchannel Option Card

PMAZC-AA	Dual-SCSI-2 option card with one 10-Mbyte/s Fast SCSI-2 channel and one 5-Mbytes/s SCSI-2 channel (supports 14 additional external SCSI devices); requires one TURBOchannel slot

SCSI cabling recommendations for 10-Mbyte/second Fast SCSI-2 and 5-Mbyte/second SCSI-2:

- Maximum cable length for 10-Mbyte/second Fast SCSI-2 = 3 meters (10 feet)
- Maximum cable length for 5-Mbyte/second, SCSI-2 = 4 meters (13 feet)
- Include internal cabling in expansion box when calculating maximum bus length. Digital expansion boxes include approximately 1 meter of internal SCSI cable. **Note:** Internal SCSI cable calculations do not need to be considered in these calculations.
- Devices that operate in Fast SCSI-2 mode include: RZ25L, RZ26L, RZ28.

Single Drive Expansion

RRD43-FA	600-Mbyte 5.25-inch half-height dual-speed compact disk drive, requires SCSI cable (BC09D-06)
TKZ60-BA	3480/TA90-compatible cartridge tape drive
TKZ09-BA	5.0-Gbyte 5.25-inch 8-mm cartridge tape drive
TLZ07-DA	8.0-Gbyte 3.5-inch half-height 4-mm DAT drive, requires SCSI cable (BC09D-06)
TSZ07-CA	1600/6250-bit/inch 9-track reel-to-reel tape drive
TZK11-DA	2.0-Gbyte quarter-inch cartridge QIC tape drive
TZ85-TA	2.6-Gbyte 5.25-inch cartridge tape subsystem
TZ86-TA	6.0-Gbyte 5.25-inch cartridge tape subsystem; requires SCSI cable

Storageworks Desktop Expansion Box (BA353)

BA353 supports three 3.5-inch half-height or two 3.5-inch half-height and one 5.25-inch half-height drive. 120 V expansion boxes include power cord; order power cord for 240 V variants. Order SCSI cable (BN21H-xx) separately.

BA353-AA	StorageWorks desktop expansion box
BA353-AE	StorageWorks desktop expansion box with one RRD43 5.25-inch half-height dual-speed CD-ROM drive
BA353-AH	StorageWorks desktop expansion box with one TZ30 5.25-inch half-height tape drive

SCSI devices may be purchased separately and are customer installable. The following SCSI devices are supported in BA353 desktop expansion box.

RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive
RZ26L-VA	1.0-Gbyte 3.5-inch half-height disk drive
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive
TLZ06-VA	4.0-Gbyte 3.5-inch half-height 4-mm DAT drive

Refer to Chapter 8, *Storage Devices*, for additional external storage; StorageWorks deskside expansion box (BA353) configurations.

Step 4c—TcE Expansion Box

TURBOchannel Extender (TcE) box supports TURBOchannel extender and three half-height storage devices (one removable media device and two hard disk drives). TcE includes base connector card and cable, SCSI cable, and 120 V power cord.

- TcE supports one dual-or triple-width TURBOchannel graphics card, leaving second slot in system available for other TURBOchannel options.
- TcE supports one TURBOchannel option card.
- TcE can be daisychained with other external storage devices but must be last device in chain.
- TcE connected to 240 V systems require country-specific power cord.
- SCSI devices may be purchased separately and are customer installable.

PMCTE-AA TcE, no options, no disks

Step 5—TURBOchannel Graphics Options

To configure a 3D graphics system, select a TURBOchannel graphics option.

- One 3D graphics option is supported per system.
- Monitor cables included with each graphics option.
- HX+ graphics cards in TURBOchannel Extender (TcE) require one system TURBOchannel slot. TcE supports one dual- or triple-width TURBOchannel graphics card, leaving second slot in system available for other TURBOchannel options. See Step 4c for additional information.

Order Number Factory/Field Installed	Graphics Options	TURBOchannel Slots Required	Compatible Monitors	Hz
PMAGD-AA	ZLX-E1 8-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2-Mpixels graphics memory	1	17-in. C VRT17-HA/H4 21-in. C VRC21-HA/H4	72 72
PMAGD-BA*	ZLX-E2 24-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2-Mpixels graphics memory	1		
PMAGD-CA*	ZLX-E3 24-plane 2D/3D color graphics accelerator, 24-bit Z-Buffer, 1280 x 1024, 72 Hz, 4-Mpixels graphics memory	1		
PMAGC-AA	ZLX-M1 24-plane, 3D graphics accelerator, Double buffered Z-Buffer, 1 rendering processor, 4-Mpixels graphics memory	2		
PMAGC-AT	ZLX-M1 24-plane 3D color graphics accelerator installed in TcE Expansion Box	1		
PMAGC-BA	ZLX-M2 24-plane 3D graphics accelerator, Double-buffered Z-Buffer, 2 rendering processors, 4-Mpixels graphics memory	3		
PMAGC-BT	ZLX-M2 24-plane 3D color graphics accelerator installed in TcE Expansion Box	1		
PMAGC-DA†	ZLX-L1 24-plane 3D TURBOchannel color graphics accelerator, 24-bit image, 24-bit double buffer, 4-Mpixels graphics memory	2		

* Supported on systems running DEC Open3D V2.4 or later.
† DEC OSF/1 AXP systems only.

Step 5b—Multi-Screen TURBOchannel Graphics Options

To build a multi-screen system, add TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 12.

- Add graphics card for each additional monitor provided there are free TURBOchannel slots.
  - Systems support two HX+ option cards plus integral HX graphics.
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables included with each graphics option.

Order Number Factory/Field Installed	Graphics Options	TURBOchannel Slots Required	Compatible Monitors	Hz
PMAGD-AA	HX+ ZLX-E1 8-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2-Mpixels graphics memory		17-in. C VRT17-HA/H4 21-in. C VRC21-HA/H4	72 72
PMAGD-BA*	HX+ ZLX-E2 24-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2-Mpixels graphics memory	1		
PMAGD-CA*	HX+ ZLX-E3 24-plane, 2D/3D color graphics accelerator, 24-bit Z-Buffer, 1280 x 1024, 72 Hz, 4-Mpixels graphics memory	1		

* Supported on systems running DEC Open3D V2.4 or later.

Step 6—TURBOchannel Multimedia Option (DEC OSF/1 AXP Systems Only) (Field Installable)

Systems running DEC OSF/1 AXP include license for Multimedia Services. See Step 11 for ordering information on Multimedia Services Runtime documentation kit and Multimedia Services development kit license and documentation.

Sound and Motion (J300)—Requires one TURBOchannel slot

- Audio/video single-slot TURBOchannel option that works with ANY graphics option
- Features include:
  - NTSC, PAL, SECAM full motion video input
  - NTSC, PAL video output
  - JPEG compression and decompression
- 4–48 kHz audio (including CD-quality)
- Supported by Multimedia Services for DEC OSF/1 AXP and Multimedia Services development kit for DEC OSF/1 AXP

Note: Simultaneous audio and video from the J300 is not supported. The J300 supports video with base system audio or audio only.

AV300-AA* Sound and motion (J300)

* Supported on DEC OSF/1 AXP systems only.

Step 7—TURBOchannel Options

Each option requires one TURBOchannel slot.

DEFTA-FA DEC FDDIcontroller/TURBOchannel (fiber optic)

PMAD-AA/AB AUI (thick wire) Ethernet TURBOchannel option card

DEFTA-AA DEC FDDIcontroller/TURBOchannel; TURBOchannel-to-FDDI adapter SAS (single attachment station), fiber (DEC OSF/1 AXP systems only)

DEFTA-DA DEC FDDIcontroller/TURBOchannel; TURBOchannel-to-FDDI adapter DAS (dual attachment station), fiber (DEC OSF/1 AXP systems only)

DEFTA-UA DEC FDDIcontroller/TURBOchannel; TURBOchannel-to-FDDI adapter SAS (single attachment station), copper (DEC OSF/1 AXP systems only)

DJ-30APS-AA Prestoserve option (TURBOchannel-based NVRAM card, documentation license, DEC OSF/1 AXP systems only)

Step 8—Networking Adapters and Miscellaneous Cables (Field Installable)

System module includes 10BaseT (twisted pair) connection.

DETTR-AA/AB	10BaseT to 10Base2 (UTP to ThinWire) single port adapter/repeater, 120/240 V
DETTR-BA/BB	10BaseT to AUI (UTP to thick wire) single port adapter/repeater, 120/240 V (120 V DETTR options include U.S. power cord; 240 V options require country-specific power cord; see Step 12.)

Note: Multi-port repeaters are supported (DETMR-xx and DEMON-xx). See Chapter 7, *Networks, Communications, and Cables*, for more information.

Cables

BN26K-xx	Twisted pair cable (included with system)
BC09D-xx	SCSI cable, small connector to large connector (for tabletop CD-ROM and tape drives)
BN21H-xx	SCSI cable, small connector to small connector (system box and TURBOchannel Dual-SCSI-2 adapter to BA353 modular storage expansion)

Step 9—Optional Input/Output Devices

Tablet can be used in place of the mouse. Audio headset (input/output capability) uses the MJ audio connector.

VSXXX-AB*	28- x 28-cm (11-x 11-inch) tablet with a two-button stylus and a four-button puck
VSXXX-JA	Audio headset

* Not supported on multi-screen systems.

Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSX10-AA/A3†	Combination Lighted Programmable Function Keyboard (LPFK)and Programmable Function Dials (PFD) package, 120/240 V
VSX20-AA/A3†	Lighted Programmable Function Keyboard (LPFK) package, 120/240V
VSX30-AA/A3†	Programmable Function Dials (PFD) package, 120/240 V

† Supported on 3D graphics systems only

Step 10—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information. Model 300X/300LX has one 25-pin D-subconnector on rear of system enclosure. Port may be used as a printer port or an alternate console port.

Step 11—Software

Select user licenses and additional software as required. Media and documentation are recommended for the first system on site.

Software Processor Code = E

DEC OSF/1 AXP User Licenses

DEC OSF/1 AXP Distributed Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7A9-BB	DEC OSF/1 Distributed Interactive 1-user license
QL-MT7A9-BC	DEC OSF/1 Distributed Interactive 2-user license
QL-MT7A9-BD	DEC OSF/1 Distributed Interactive 4-user license
QL-MT7A9-BE	DEC OSF/1 Distributed Interactive 8-user license
QL-MT7A9-BF	DEC OSF/1 Distributed Interactive 16-user license
QL-MT7A9-BG	DEC OSF/1 Distributed Interactive 32-user license

Step 11—Software *(continued)*

QL-MT7A9-BH DEC OSF/1 Distributed Interactive 64-user license
QL-MT7AA-BR DEC OSF/1 Distributed Interactive 128-user license
QL-MT7AB-BR DEC OSF/1 Distributed Interactive 256-user license

QL-MT5AE-AA DEC OSF/1 AXP C developer's extension license

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8 DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ DEC OSF/1 AXP full hardcopy documentation
QA-MT5AA-GZ DEC OSF/1 AXP developer's extension hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture specific, and **cannot** be shared across a mixed OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR OpenVMS AXP Distributed Interactive 256-user license

OpenVMS AXP Media and Documentation

QA-MT1AA-H8 OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ OpenVMS AXP extended hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

QA-03XAA-H8 Layered products media and documentation for OpenVMS AXP

NAS 250 Advance Kit

NAS 250 advance kit is included with system. Media available on layered products CD-ROM.

DEC PHIGS Runtime and DEC Open3D Licenses

DEC PHIGS Runtime License and DEC Open3D License are included with all systems. Media available on layered software CD-ROM.

QL-0KBAA-2B OpenVMS DEC PHIGS Development license
QL-0A8AM-2B DEC OSF/1 AXP DEC PHIGS Development license

Step 11—Software *(continued)*

Multimedia Services for DEC OSF/1 AXP

Model 300 workstations running DEC OSF/1 AXP include license for Multimedia Services for DEC OSF/1 AXP. Media available on layered products CD-ROM. Order Multimedia Services Runtime documentation kit and Multimedia Services Development kit license and documentation separately.

QA-20YAA-GZ Multimedia Services Runtime documentation
QL-20ZAE-AA Multimedia Services Development kit license
QA-20ZAA-GZ Multimedia Services Development kit documentation

DEC SoftPC

DEC SoftPC, an optional layered product, allows a DEC 3000 AXP workstation running DEC OSF/1 AXP to run MS-DOS programs with no added hardware. DEC SoftPC with an installed Windows 3.1 kit also runs Windows applications. Media available on layered products CD-ROM.

QL-0HSAM-3B DEC SoftPC license for DEC OSF/1 AXP

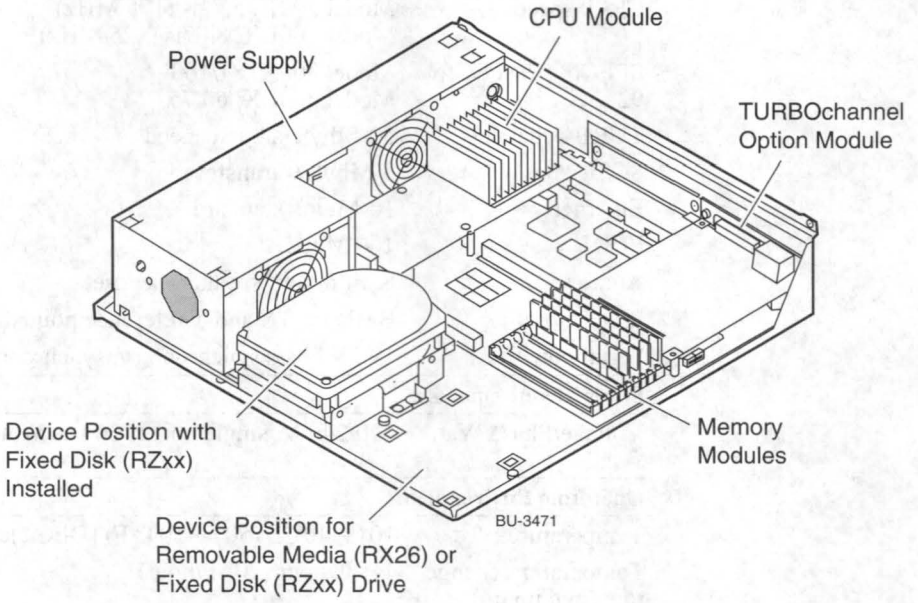
Step 12—Power Cords and Keyboards (Not Required for 120 V Packaged Systems)

Power Cord	Standard Keyboard	UNIX Keyboard	Country	Language
BN26J-1K	**LK401-AA**	**LK421-AA**	U.S.	English
BN19C-2E	**LK401-AG**	**LK421-AA**	Austria	German/Austrian
BN19C-2E	**LK401-AB**	**LK421-AA**	Belgium	Flemish
BN19K-2E	**LK401-AD**	**LK421-AA**	Denmark	Danish
BN19C-2E	**LK401-AF**	**LK421-AA**	Finland	Suomi
BN19C-2E	**LK401-AP**	**LK421-AA**	France	French
BN19C-2E	**LK401-AH**	**LK421-AA**	Holland	Dutch
BN19U-2E	**LK401-AT**	**LK421-AA**	Israel	Hebrew
BN19Z-2E	**LK401-AI**	**LK421-AA**	Italy	Italian
BN26J-1K	**LK401-AJ**	**LK421-AJ**	Japan	Katakana
BN19C-2E	**LK401-AN**	**LK421-AA**	Norway	Norwegian
BN19C-2E	**LK401-AV**	**LK421-AA**	Portugal	Portuguese
BN19C-2E	**LK401-AS**	**LK421-AA**	Spain	Spanish
BN19C-2E	**LK401-AM**	**LK421-AA**	Sweden	Swedish
BN19E-2E	**LK401-AK**	**LK421-AA**	Switzerland	French
BN19E-2E	**LK401-AL**	**LK421-AA**	Switzerland	German
BN19A-2E	**LK401-AA**	**LK421-AA**	U.K./Ireland	English
BN19H-2E	**LK401-AA**	**LK421-AA**	Australia/N.Z.	English
BN26J-1K	**LK401-AQ**	**LK421-AA**	Canada	English
BN19W-1K	**LK401-AC**	**LK421-AA**	Canada	French
BN19S-2E	**LK401-AC**	**LK421-AA**	India	English

Step 13—Environmental Power Products

Select environmental power products if required. Refer to *Chapter 10, Environmental Products*, and to *Digital's Environmental Power Products Catalog*.

DEC 3000 Model 300X/300LX AXP Desktop Workstation Diagram



DEC 3000 Model 300X/300LX AXP Desktop Workstation Specifications

Specifications

CPU	DECchip 21064 RISC microprocessor
Clock speed	Model 300X: 5.7 ns (175 MHz) Model 300LX: 8.0 ns (125 MHz)
SPECint92/SPECfp 92	Model 300X: 84/100 Model 300LX: 63/75
TURBOchannel	50-Mbyte/s burst speed
SCSI-2 bus	5-Mbyte/s transfer rate
Ethernet	10-Mbit/s standard
FDDI	100 Mbits
Audio	8-bit in/out, speaker, headset
ISDN	Basic rate, S and T reference points
Serial port	19.2K bits/s synchronous/asynchronous
Power Requirements	
Voltage/Phase/Watts	120/240 V, single phase, 260 ac Watts
Operating Environment	
Temperature	10° – 40° C (50° – 104° F) [DEC class B]
Temperature change rate (maximum)	11° C/hour (20° F/hour)
Relative humidity Maximum wet bulb Minimum dew point	 28° C (82° F) 2° C (36° F)
Maximum operating altitude	2000 m (6562 ft) @ 36° C (97° F)
Physical Characteristics	
Height	9.6 cm (3.8 in.) (including feet)
Width	40.6 cm (16.0 in.)
Depth	43.9 (17.3 in.)
Weight	8.2 kg (18 lb) (diskless)
Input Devices	
Keyboard LK401	105 sculptured keys, 20 special-function keys
Mouse output	Three buttons, 200 pulses per inch
Graphics tablet	27.9 x 27.9 cm (11 x 11-inches)
Lighted Programmable	32 individually programmable
Function Keyboard (LPFK)	Function keys in 4-6-6-6-6-4 array
Programmable Function Dials (PFD)	Eight individually programmable function dials with 360-degree rotation (256-bit resolution) arranged in two vertical rows of four dials



DEC 3000 Model 600 and 700 AXP Desktop Workstations

Product Description

Optimized for today's application developer, the DEC 3000 Model 600 and 700 AXP workstations set the pace for data analysis, CAD/CAM, and large volume commercial applications. The DEC 3000 Model 600 AXP workstation features a 175 MHz CPU providing 114 SPECint92 and 162 SPECfp92 performance. The DEC 3000 Model 700 AXP workstation offers the most performance of any desktop workstation for customers who need the absolute *best* on their desktop. The Model 700 features a 225-MHz CPU providing 163 SPECint92 and 231 SPECfp92 performance—42% more performance than the Model 600.

The open TURBOchannel I/O bus provides three option slots that can be used for network expansion and graphics options, including 2D graphics accelerators, 3D Z-buffered graphics, and multi-screen graphics systems.

The desktop enclosure supports a maximum of 512 Mbytes of memory, and includes brackets for two fixed disk drives and one removable media device. Seven additional external storage drives are supported via a second integral Fast SCSI-2 controller. Fast SCSI-2 TURBOchannel option cards support 14 additional external devices.

For communication and networking needs, the system is equipped with thick wire and 10BaseT Ethernet connectors; an EIA-232 serial port, an ISDN port and a printer/console port. An optional TURBOchannel FDDI controller is available. The system provides a 100-Mbyte-per-second I/O bus, all of this in an enclosure that fits comfortably on a desk.

The DEC 3000 Model 600 and 700 AXP workstations offer a choice of operating systems: DEC OSF/1 AXP or OpenVMS AXP. And Digital's unparalleled investment protection program provides a cost-effective upgrade path for users of older workstations who are ready to make the move to Alpha AXP systems.

Step 1—Systems

Select system. 120 V Packaged systems include power cord and U.S. keyboard. 120 V Base systems include power cord; keyboard must be ordered separately. 240 V systems require country-specific power cord and keyboard. Software media and documentation is recommended for first system on site. Select software from Step 10 if required.

- Options ordered with Packaged systems will be shipped outside the system enclosure. No additions can be made to a Packaged system.
- Options ordered with Base systems will be factory installed unless specified as **spares**. Minimum operating system software required for DEC OSF/1 AXP systems:
  - Model 600 AXP systems require DEC OSF/1 AXP V1.3A or later
  - Model 700 AXP systems require DEC OSF/1 AXP V2.0
- Minimum operating system software required for OpenVMS AXP systesms:
  - Model 600 AXP systems require OpenVMS AXP V1.5-1H1 or V6.0 or later
  - Model 700 AXP systems require OpenVMS AXP V6.1 or later
- Packaged and Base systems ordered with a disk include factory-installed software (FIS). FIS includes the latest version of operating system, DEC Open3D, cluster and networking software.

Desktop Systems include

- DECchip
  - Model 600 = DECchip 210641 175-MHz CPU with 2-Mbyte secondary cache
  - Model 700 = DECchip 21064A 225-MHz CPU with 2-Mbyte secondary cache
- TURBOchannel I/O interconnect—three slots total
- 32 (Model 600 only), 64, 128, or 256 Mbytes of memory
- Thick wire Ethernet (AUI) connector and 10BaseT (twisted pair) connector
- Two Fast SCSI-2 controllers (one internal/one external) with Direct Memory Access
- EIA-232 serial communication (synchronous/asynchronous) port
- ISDN port
- Printer/console port
- Audio in/out
- Audio headset
- Monitor (Packaged systems only).
- U.S. keyboard, 120 V Packaged systems only. Base systems must order a keyboard.
- Three-button mouse
- 1.8-meter (6-foot) power cord, 120 V systems
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- DEC OSF/1 AXP 2-user base license, DEC Open3D license DEC PHIGS runtime license, MME runtime license, DECspin audio license, NAS 250 license **or** OpenVMS AXP base license, OpenVMS AXP 1-user license, DEC Open3D license, DEC PHIGS runtime license, NAS 250 license
- English-language user documentation

Packaged Systems

Order Number	Operating System	Memory	Monitor	Graphics		Available TURBOchannel Slots	RZ25L=535 MB* RZ26L=1.05 GB* RRD43=600 MB
Model 700 Packaged Systems—225MHz CPU							
PE441-BA†	DEC OSF/1 AXP	64 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB
PE441-CA†	DEC OSF/1 AXP	64 Mbytes	21-in. C VRC21	ZLX-M2	24-plane 3D	0	1.05 GB/600 MB
PE441-MA†	OpenVMS AXP	64 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB
PE441-NA†	OpenVMS AXP	64 Mbytes	21-in. C VRC21	ZLX-M2	24-plane 3D	0	1.05 GB/600 MB
Model 600 Packaged Systems—175 MHz CPU							
PE421-AC/AD	DEC OSF/1 AXP	32 Mbytes	17-in. C VRT17	ZLX-E1	8-plane 2D/3D	2	535 MB
PE421-BC/BD	DEC OSF/1 AXP	32 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB
PE421-CC/CD	DEC OSF/1 AXP	64 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB
PE421-LC/LD	OpenVMS AXP	32 Mbytes	17-in. C VRT17	ZLX-E1	8-plane 2D/3D	2	535 MB
PE421-MC/MD	OpenVMS AXP	32 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB
PE421-NC/ND	OpenVMS AXP	64 Mbytes	21-in. C VRC21	ZLX-E1	8-plane 2D/3D	2	1.05 GB/600 MB

*Internal disk includes factory-installed software (FIS). FIS is not a substitute for software media and documentation; see Step 10.

†Model 700 AXP packaged systems ship with appropriate monitor according to geography

Note: xC = 120 V, 240 V Northern Hemisphere; xD = 240 V Southern Hemisphere

Step 1—Systems *(continued)*

Base Systems–All Base systems require keyboard, graphics option, and monitor

120 V Base systems include power cord; order country-specific power cord for 240 V use

Order Number	Operating System	Memory	Monitor	Graphics	Available TURBOchannel Slots
Model 700 Base Systems—225 MHz CPU					
PE440-CA	DEC OSF/1 AXP	64 Mbytes	Required	Required	3
PE440-DA	DEC OSF/1 AXP	128 Mbytes	Required	Required	3
PE440-EA	DEC OSF/1 AXP	256 Mbytes	Required	Required	3
PE440-NA	OpenVMS AXP	64 Mbytes	Required	Required	3
PE440-PA	OpenVMS AXP	128 Mbytes	Required	Required	3
PE440-RA	OpenVMS AXP	256 Mbytes	Required	Required	3
Model 600 Base Systems—175 MHz CPU					
PE420-AA	DEC OSF/1 AXP	32 Mbytes	Required	Required	3
PE420-CA	DEC OSF/1 AXP	64 Mbytes	Required	Required	3
PE420-EA	DEC OSF/1 AXP	128 Mbytes	Required	Required	3
PE420-GA	DEC OSF/1 AXP	256 Mbytes	Required	Required	3
PE420-BA	OpenVMS AXP	32 Mbytes	Required	Required	3
PE420-DA	OpenVMS AXP	64 Mbytes	Required	Required	3
PE420-FA	OpenVMS AXP	128 Mbytes	Required	Required	3
PE420-HA	OpenVMS AXP	256 Mbytes	Required	Required	3

Note: Systems ordered with one factory-installed internal disk drive include factory-installed software (FIS). FIS is not a substitute for software media and documentation.

Step 2—Memory

Systems support two memory options; 512 Mbytes maximum per system. Memory modules can be mixed.

MS15-BA	16-Mbyte ECC memory (8 x 2-Mbyte 1-Mbit 80-ns DRAM)
MS15-CA	32-Mbyte ECC memory (8 x 4-Mbyte 4-Mbit 80-ns DRAM)
MS15-DA	64-Mbyte ECC memory (8 x 8-Mbyte 4-Mbit 80-ns DRAM)
MS15-EA	128-Mbyte ECC memory (8 x 16-Mbyte 16-Mbit 70-ns DRAM)
MS15-FA	256-Mbyte ECC memory (8 x 32-Mbyte 16-Mbit 70-ns DRAM)

Note: 512 Mbytes of memory can only be obtained by starting with a 256-Mbyte system (there are two memory option slots).

Step 2a—Memory Trade-in for Upgrade Systems

Many Model 600 AXP systems include 32 Mbytes of memory. To configure 64-Mbyte, 128-Mbyte, or 256-Mbyte systems without losing a memory slot for future expansion, select memory upgrade.

MS15-UE*	32 to 64-Mbyte ECC memory upgrade
MS15-UF*	32 to 128-Mbyte ECC memory upgrade
MS15-UG*	32 to 256-Mbyte ECC memory upgrade
MS15-UH†	64 to 256-Mbyte ECC memory upgrade

* Requires return of original 32-Mbyte (MS15-CA) memory
† Requires return of original 64-Mbyte (MS15-DA) memory

Step 3—Storage

Select storage devices if required.

- An RZ25L, RZ26L, or RZ28 disk drive is recommended as a system or data/swap device.
- Recommended configurations for standalone systems are: one RZ28, one RZ26L, or two RZ25Ls.
- DEC OSF/1 AXP systems require one system disk; OpenVMS AXP systems can be networked configurations with supported page/swap functions
- Internal Fast SCSI-2 controller supports three internal devices; external Fast SCSI-2 controller supports a maximum of seven external SCSI devices. Select SCSI-2 TURBOchannel option cards if additional external storage is required. Maximum of two SCSI-2 TURBOchannel option cards supported per system
- See Step 3c for SCSI cabling information.

Step 3a—Internal Storage

- System supports three internal storage devices.
- Slot 1 supports one removable media device (RX26, RRD43, TLZ06, TLZ07, TZK11, TZ30).
- Slots 2 and 3 support hard disk drives (RZ25L, RZ26L, RZ28).

Some systems include RRD43 600-Mbyte CD-ROM drive. Select one removable media device if system does not include a CD-ROM. Software distribution is only available on CD-ROM.

Removable media devices

RX26-FH	2.8-Mbyte 3.5-inch diskette drive (requires 5.25 half-height bay)
RRD43-HM	600-Mbyte 5.25-inch half-height CD-ROM drive
TLZ06-MF	4.0-Gbyte 5.25-inch half-height 4-mm DAT drive
TLZ07-MF	8.0-Gbyte 5.25-inch half-height 4-mm DAT drive
TZK11-MF	2.0-Gbyte 5.25-inch half-height QIC tape drive

Hard disk drives

RZ25L-EJ	535-Mbyte 3.5-inch half-height disk drive
RZ26L-EJ	1.0-Gbyte 3.5-inch half-height disk drive
RZ28-EJ	2.1-Gbyte 3.5-inch half-height disk drive

Note: Systems ordered with one RZ25L, RZ26L, or RZ28 include factory-installed software (FIS).

Step 3b—External Storage

Systems support seven external devices on integral external Fast SCSI-2 controller. Select SCSI-2 TURBOchannel option card if more are required. Maximum of two SCSI-2 TURBOchannel option cards supported per system.

- Dual Fast SCSI-2 option card supports 14 additional external devices
- Fast Wide Differential SCSI-2 option cards support 7 additional external devices

Dual Fast SCSI-2 TURBOchannel Option Card

PMAZC-AA Dual Fast SCSI-2 Option Card—requires one TURBOchannel slot

Fast Wide Differential SCSI-2 TURBOchannel Option Card

- 16-bit-wide SCSI bus supports 8-and 16-bit devices
- Over 1200 I/Os per second throughput
- Supported with HSZ10 and HSZ40
- Supports up to seven SCSI devices
- Customer installable

KZTSA-AA* Fast Wide Differential SCSI-2 Option Card—requires one TURBOchannel slot

*KZTSA-AA can be connected to StorageWorks products using a DWZZA adapter. See, Chapter 8, *Storage Devices*, for ordering information.

Step 3b—External Storage *(continued)*

Single-Drive Expansion

RRD43-FA	600-Mbyte 5.25-inch half-height compact disk drive
TKZ09-BA*	5-Gbyte 5.25-inch 8-mm cartridge tape drive
TKZ60-BA*	3480/TA90-compatible cartridge tape drive
TLZ06-DA	4.0-Gbyte 5.25-inch half-height 4-mm DAT tape drive
TLZ07-DA	8.0-Gbyte 5.25-inch half-height 4-mm DAT tape drive
TSZ07-CA*	140-Mbyte 1600/6250 BPI reel to reel tape drive
TZK11-DA	2.0-Gbyte 5.25-inch half-height QIC tape drive
TZ85-TA	2.6-Gbyte 5.25-inch cartridge tape subsystem
TZ86-TA	6.0-Gbyte 5.25-inch cartridge tape subsystem, requires SCSI cable
SZ100-AA†#	SZ100 includes seven TZ85 (2.6-Gbyte) cartridge tapes and loader; requires SCSI cable
SZ106-AA†#	SZ106 includes seven TZ86 (6.0-Gbyte) cartridge tapes and loader; requires SCSI cable

*Model 700 supported under OpenVMS AXP V6.1 or later.
†OpenVMS AXP support only.
#Not currently available on Model 700.
Note: Storage devices include 120 V power cord. See Chapter 8, *Storage Devices*, for 240 V power cord and SCSI cable ordering information.

StorageWorks Expansion Units (BA350 and BA353)

- BA350 Deskside Expansion Unit supports maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices
- BA353 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
- BA350 and BA353 Expansion units include 120 V power cord, order country specific power cord for 240 V use.
- Order SCSI cable separately; (BC09D-xx system box to BA350/BA353, or BN21H-xx when SCSI-2 TURBOchannel option card installed).

StorageWorks BA350 Deskside Expansion Unit

BA350-KB	StorageWorks deskside expansion unit includes: BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and North American power cord

StorageWorks BA353 Desktop Expansion Box

BA353-AA	StorageWorks desktop expansion box
BA353-AE	StorageWorks desktop expansion box with one RRD43 5.25-inch half-height CD-ROM drive
BA353-AJ	StorageWorks desktop expansion box with TZK11 2.0-Gbyte 5.25-inch half-height QIC tape drive

Supported SCSI devices

SCSI devices may be purchased separately and are customer installable.

		BA353	BA350
RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive	X	X
RZ26L-VA	1.0-Gbyte 3.5-inch half-height disk drive	X	X
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive	X	X
RZ28B-VA	2.1-Gbyte 3.5-inch half-height disk drive	X	X
RZ73-VA	2.0-Gbyte 5.25-inch full-height disk drive		X
RZ74-VA	3.57-Gbyte 5.25-inch full-height disk drive		X
RRD43-VA	600-Mbyte 5.25-inch half-height compact disk drive		X
RRD43-VU*	600-Mbyte 5.25-inch half-height compact disk drive		X
TZK11-VA	2.0-Gbyte 5.25-inch half-height QIC tape drive		X
TZ86-VA	6.0-Gbyte 5.25-inch cartridge tape drive		X
TZ87-VA	2.0-Gbyte 5.25-inch cartridge tape drive		X

* 600-Mbyte CD-ROM drive can be added to RRD43-VA or TZK11-VA for a total of two 5.25-inch drives in one carrier.

Step 3b—External Storage *(continued)*

Country-specific 2.5-meter power cord—required for BA350/BA353 expansion units

BN26J-1K	U.S., Japan, Canada
BN19H-2E	Australia, New Zealand
BN19C-2E	Austria, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain, Belgium
BN19A-2E	U.K., Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Refer to, Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations.

TURBOchannel Extender (TcE) Expansion Box

Note: Contact Digital Services before attaching existing TcE box to Model 600 or 700 AXP systems.

TcE expansion box supports TURBOchannel extender and three half-height devices: one half-height removable media device and two half-height hard disk drives. TcE includes base connector card and cable, SCSI cable, and 120 V power cord.

- TcE supports one dual- or triple-width TURBOchannel graphics card, leaving two slots in the system available for other TURBOchannel options.
- TcE level D03 (or greater) required.
- TcE supports one TURBOchannel option card.
- System supports maximum of three TcE boxes (one per TURBOchannel slot)
- TcE can be daisychained with other external storage devices but must be last device in chain.
- TcE connected to 240 V systems require a country-specific power cord

PMTCE-AA	TcE, no options, no disks

VELOCITOR Storage Subsystems* (DEC OSF/1 AXP Systems Only)

TURBOchannel-based IPI (Intelligent Peripheral Interface) disk subsystem supports up to eight drives on a single controller. Requires one TURBOchannel slot (maximum of three). Supports controller-based striping or shadowing.

2L-RIT01-AA*	3-Gbyte disk drive in tabletop enclosure, 1.5-foot cable, documentation
2L-RIT02-AA*	6-Gbyte (two 3-Gbyte disk drives) in tabletop enclosure, 1.5-foot cable, documentation
2L-RITCL-BA*	TURBOchannel to IPI controller, DEC OSF/1 AXP driver, 10-foot cable, documentation

*Not currently available on Model 700.
See Chapter 8, *Storage Devices*, for further ordering information.

Step 3c—SCSI Cables and Cabling Information

SCSI cabling recommendations:

- Maximum cable length for SCSI-2 (5 Mbytes/second) = 4 meters (13 feet)
- Maximum cable length for Fast SCSI-2 (10 Mbytes/second) = 3 meters (10 feet)
- Maximum cable length for FWD SCSI-2 (20 Mbytes/second) = 25 meters
- Include the internal cabling in the expansion box when calculating maximum bus length. Digital expansion boxes include approximately 1 meter of internal SCSI cable. **Note:** Internal SCSI cable calculations for Models 600 and 700 AXP systems does not need to be considered in these calculations.
- Devices that operate in Fast SCSI-2 mode include: RZ25L, RZ26L, RZ28, RZ73

Step 3c—SCSI Cables and Cabling Information *(continued)*

SCSI Cables

BC19J-xx	SCSI large 50-pin connector to large 50-pin connector (system box to SZ03, SZ12)
BC09D-06	SCSI large 50-pin connector to small 50-pin connector (system box to BA35x)
BN21H-xx	SCSI small 50-pin connector to small 50-pin connector (Dual-SCSI-2 TURBOchannel option to BA353/BA350)
BN21K-xx	SCSI 68-pin connector to 68-pin connector (FWD SCSI-2 TURBOchannel option to KZTSA to BA353/BA350)

Step 3d—Floor Stand

BA47X-AA	Vertical floor stand. Holds one system box; additional stands may be attached for TcE boxes.

Step 4—TURBOchannel Graphics Options and Monitors–required for Base Systems

- Base systems require a graphics option and monitor.
- ZLX-E1, -M1, and -M2 graphics options require specific versions of DEC Open3D software media:
  - Model 600 DEC OSF/1 AXP systems require DEC Open3D V2.1 or higher
  - Model 700 DEC OSF/1 AXP systems require DEC Open3D V2.3
  - Model 600 Open VMS AXP systems require DEC Open3D V1.1 or higher
  - Model 700 Open VMS AXP systems require DEC Open3D V2.4
- ZLX-E2 and -E3 graphics options require DEC Open3D V2.4 software media for all Model 600 and 700 AXP systems.
- ZLX-L1 graphics options require DEC Open3D V2.4 or later, and DEC OSF/1 AXP V3.0 or later.
- One 3D graphics option supported per system.
- Graphics cards installed in TURBOchannel Extender (TcE) box require one TURBOchannel slot. Remaining two TURBOchannel slots are available for other TURBOchannel options. See Step 3b for additional information.
- Monitor cables are included with each graphics option.

Order Number		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGD-AA	ZLX-E1	8-plane 2D/3D TURBOchannel color graphics accelerator, 1280 x 1024, 72 Hz, 2 Mpixels graphics memory	1	17-inch C VRT17-HA/H4 21-inch C VRC21-HA/H4	72 72
PMAGD-BA	ZLX-E2	24-plane 2D/3D TURBOchannel color graphics accelerator, 1280 x 1024, 72 Hz 2 Mpixels graphics memory	1		
PMAGD-CA	ZLX-E3	24-plane 2D/3D TURBOchannel color graphics accelerator, 24-bit Z-Buffer 1280 x 1024, 72 Hz 4 Mpixels graphics memory	1		
PMAGC-AA	ZLX-M1	24-plane 3D TURBOchannel color graphics accelerator, Double buffered, Z-Buffer 1 rendering processor 4 Mpixels graphics memory	2		
PMAGC-AT	ZLX-M1	ZLX-M1 24-plane 3D TURBOchannel color graphics accelerator installed in TcE expansion box	1		
PMAGC-BA	ZLX-M2	24-plane 3D TURBOchannel color graphics accelerator, double buffered, 24-bit Z-Buffer 2 rendering processor 8 Mpixels graphics memory	3		
PMAGC-BT	ZLX-M2	ZLX-M2 24-plane 3D TURBOchannel color graphics accelerator installed in TcE expansion box	1		
PMAGC-DA	ZLX-L1	ZLX-L1 24-plane 3D TURBOchannel color graphics accelerator, 24-bit image, 24-bit double buffer, 4-Mpixels graphics memory	2		

Step 4a—Multi-Screen TURBOchannel Graphics Options (Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 11.

- Add graphics card for each additional monitor provided there are free TURBOchannel slots. Three monitors are supported per system.
- DEC OSF/1 AXP and OpenVMS AXP systems support maximum of three ZLX-Ex option cards with three monitors.
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables included with each graphics option.
- TcE graphics options can be used with multiple monitors.

Order Number		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGD-AA	ZLX-E1	8-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2 Mpixels graphics memory	1	17-inch C VRT17-HA/H4 21-inch C VRC21-HA/H4	72 72
PMAGD-BA*	ZLX-E2	24-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz 2 Mpixels graphics memory	1		
PMAGD-CA*	ZLX-E3	24-plane 2D/3D color graphics accelerator 24-bit Z-Buffer, 1280 x 1024, 72 Hz 4 Mpixels graphics memory	1		

* Supported on systems running DEC Open3D V2.4 only

Step 5—TURBOchannel Multimedia Options–DEC OSF/1 AXP Systems Only (Field Installable)

Workstations running DEC OSF/1 AXP include a license for Multimedia Services. See Step 10 for ordering information on Multimedia Services Runtime documentation kit and Multimedia Services development kit license and documentation.

Sound and Motion (J300)—requires one TURBOchannel slot

- Audio/video single-slot TURBOchannel option that works with ANY graphics option
- Features include:
  - NTSC, PAL, SECAM full motion video input
  - NTSC, PAL video output
  - JPEG compression and decompression
  - 4–48 kHz audio (including CD-quality)
- Supported by Multimedia Services for DEC OSF/1 AXP and Multimedia Service development kit for DEC OSF/1 AXP

AV300-AA* Sound and motion J300

* DEC OSF/1 AXP systems only.

Step 6—TURBOchannel Communications Options (Field Installable)

Each option requires one TURBOchannel slot.

		Maximum Per System*
PMAD-AA/AB	Thick wire Ethernet TURBOchannel option card	2
DEFTA-FA	DEC FDDIcontroller/TURBOchannel (fiber-optic)	2
DEFTA-AA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter SAS (single attachment station), fiber	2
DEFTA-DA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter DAS (dual attachment station), fiber	2
DEFTA-UA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter SAS (single attachment station), copper	2
DETRA-AA	DEC TRNcontroller 700; TURBOchannel-to-Token-Ring adapter	2
DJ-30APS-AA	Prestoserve option card (DEC OSF/1 AXP systems only)	1

*Assumes ZLX-E1 graphics in one TURBOchannel slot and no other TURBOchannel option installed.
†OpenVMS AXP LAVc support not currently available.

Step 7—Networking Adapters (Field Installable)

Systems include thick wire Ethernet (AUI) connector and 10BaseT (twisted pair) connector. A ThinWire adapter is available separately. Right-angle Ethernet cables are not supported.

DECXM-AA ThinWire Ethernet station adapter

Select desired length of cable to connect ThinWire adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx Thick wire 802.3/Ethernet cable (-xx refers to length in meters: -02/-05 meters)

BNE3H-xx Thick wire transceiver cable with straight connector–PVC (-xx refers to length in meters: -05/-10/-20/-40 meters)

BNE3L-xx Thick wire transceiver cable with straight connector–Teflon (-xx refers to length in meters: -05/-10/-20/-40 meters)

BN26L-xx 10BaseT (twisted pair) cable (-xx refers to length meters)

BC16M-xx ThinWire Ethernet cable (-xx refers to length in feet: -06/-15/-30 feet)

Step 8—Optional Input/Output Devices

Tablet can be used in place of the mouse. Audio headset (input/output capability) uses the MJ audio connector.

VSXXX-AB* 28-x 28-cm (11-x 11-in.) tablet with a 2-button stylus and a 4-button puck

VSXXX-JA Audio headset (included with all systems)

Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSX10-AA/A3† Combination Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) package, 120/240 V

VSX20-AA/A3† Lighted Programmable Function Keyboard (LPFK) package, 120/240 V

VSX30-AA/A3† Programmable Function Dials (PFD) package, 120/240 V

*Not supported on multi-screen systems
†Supported on 3D graphics systems only

Step 9—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 10—Software

Select user licenses and additional software as required. Media and documentation is recommended for first system on site. Software Processor Code = **E**

Minimum Operating System Software Required:	DEC OSF/1 AXP systems	OpenVMS AXP systems
Model 600 AXP	DEC OSF/1 AXP V1.3A or later	OpenVMS AXP V1.5-1H1, orV6.0 or later
Model 700 AXP	DEC OSF/1 AXP V2.0	OpenVMS AXP V6.1 or later

Step 10—Software *(continued)*

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF	DEC OSF/1 AXP Interactive 16-user license
QL-MT7A9-BG	DEC OSF/1 AXP Interactive 32-user license
QL-MT7A9-BH	DEC OSF/1 AXP Interactive 64-user license
QL-MT7AE-AA	DEC OSF/1 AXP Interactive unlimited user license
QL-MT5AE-AA	DEC OSF/1 AXP developer's extension license

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP base hardcopy documentation
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are not specific to a single system and **can** be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a VMScluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a mixed VMScluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR	OpenVMS AXP Distributed Interactive 256-user license

OpenVMS AXP Media and Documentation

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ	OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ	OpenVMS AXP extended hardcopy documentation

Step 10—Software *(continued)*

Layered Products CD-ROM

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

NAS 250 Advance Kit

NAS 250 advance kit is included with system. Media available on layered products CD-ROM

DEC PHIGS Runtime License

DEC PHIGS Runtime license is included with all systems. Media available on layered products CD-ROM

QL-OKBAA-2B OpenVMS AXP DEC PHIGS Development license
QL-0A8AM-2B DEC OSF/1 AXP DEC PHIGS Development license

DEC Open3D License

DEC Open3D license is included with all systems. Media available on layered products CD-ROM. Note software version requirement for ZLX graphics options

DEC Open3D software version required for:	DEC OSF/1 AXP systems	OpenVMS AXP systems
Model 600 AXP with ZLX-E1, M1, and M2 graphics	DEC Open3D V2.1 or higher	DEC Open3D V1.1 or higher
Model 700 AXP with ZLX-E1, M1, and M2 graphics	DEC Open3D V2.3	DEC Open3D V2.4
DEC Open3D software version required for:	**DEC OSF/1 AXP systems**	**OpenVMS AXP systems**
Model 600 and 700 AXP with ZLX-E2 and E3 graphics	DEC Open3D V2.4	DEC Open3D V2.4

Multimedia Services for DEC OSF/1 AXP

Workstations running DEC OSF/1 AXP include a license for Multimedia Services for DEC OSF/1 AXP. Media available on layered products CD-ROM. Order Multimedia Services Runtime documentation kit and Multimedia Services Development kit license and documentation separately.

QA-20YAA-GZ Multimedia Services Runtime documentation

QL-20ZAE-AA Multimedia Services Development kit license
QA-20ZAA-GZ Multimedia Services Development kit documentation

DEC SoftPC for DEC OSF/1 AXP Systems

DEC SoftPC, an optional layered product, allows a DEC 3000 workstation running DEC OSF/1 AXP to run MS-DOS programs with no added hardware. DEC SoftPC with an installed Windows 3.1 kit also runs Windows applications. Media available on layered products CD-ROM

QL-0HSAM-3B DEC SoftPC License for DEC OSF/1 AXP

Step 11—Power Cords and Keyboards

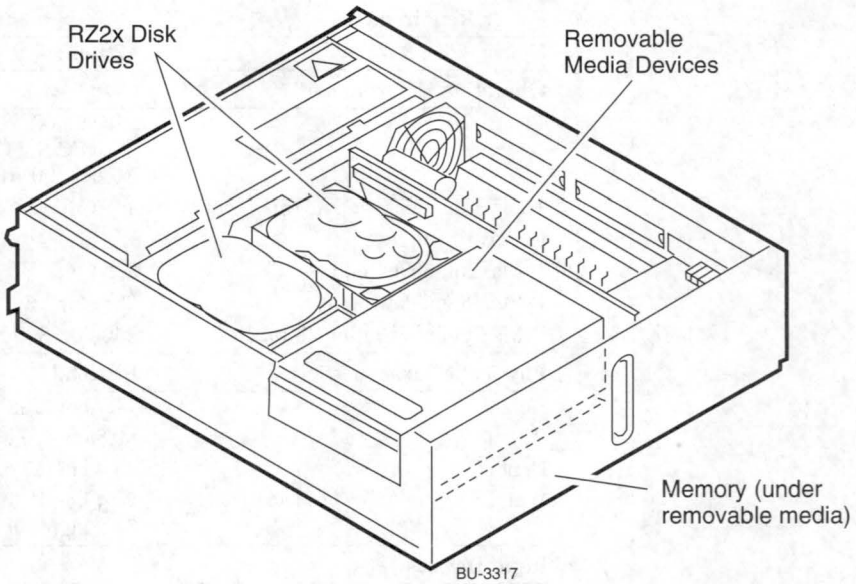
120 V Packaged systems include power cord and U.S. keyboard. 120 V Base systems include power cord; order keyboard separately. 240 V Packaged and Base systems require country-specific power cord and keyboard.

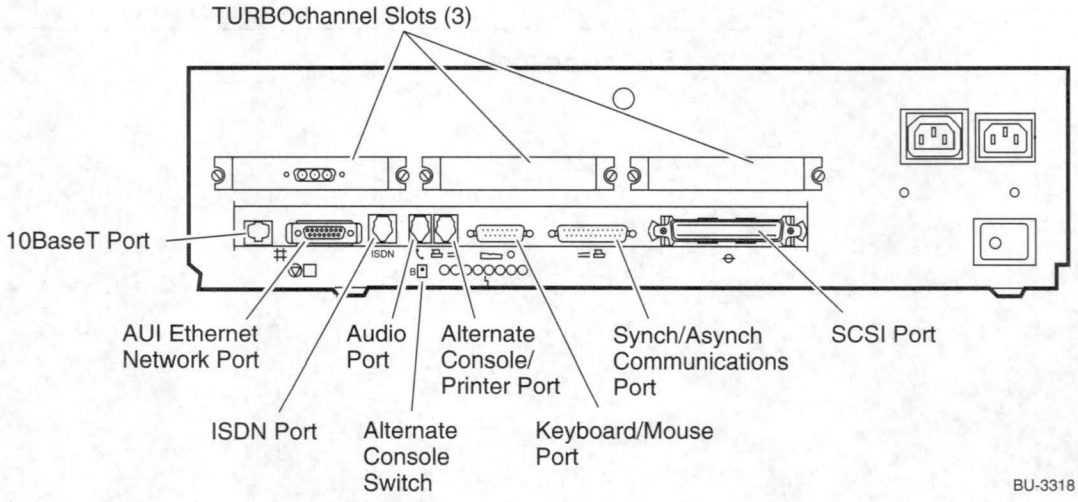
Power Cord	Standard Keyboard	UNIX Keyboard	Country	Language
BN26J-1K	**LK401-AA**	**LK421-AA**	U.S.	English
BN19C-2E	**LK401-AG**	**LK421-AA**	Austria	German/Austrian
BN19C-2E	**LK401-AB**	**LK421-AA**	Belgium	Flemish
BN19K-2E	**LK401-AD**	**LK421-AA**	Denmark	Danish
BN19C-2E	**LK401-AF**	**LK421-AA**	Finland	Suomi
BN19C-2E	**LK401-AP**	**LK421-AA**	France	French
BN19C-2E	**LK401-AH**	**LK421-AA**	Holland	Dutch
BN18L-2E	**LK401-AT**	**LK421-AA**	Israel	Hebrew
BN19M-2E	**LK401-AI**	**LK421-AA**	Italy	Italian
BN26J-1K	**LK401-AJ**	**LK421-AJ**	Japan	Katakana
BN19C-2E	**LK401-AN**	**LK421-AA**	Norway	Norwegian
BN19C-2E	**LK401-AV**	**LK421-AA**	Portugal	Portuguese
BN19C-2E	**LK401-AS**	**LK421-AA**	Spain	Spanish
BN19C-2E	**LK401-AM**	**LK421-AA**	Sweden	Swedish
BN19E-2E	**LK401-AK**	**LK421-AA**	Switzerland	French
BN19E-2E	**LK401-AL**	**LK421-AA**	Switzerland	German
BN19A-2E	**LK401-AA**	**LK421-AA**	U.K./Ireland	English
BN19H-2E	**LK401-AA**	**LK421-AA**	Australia/N.Z.	English
BN26J-1K	**LK401-AQ**	**LK421-AA**	Canada	English
BN26J-1K	**LK401-AC**	**LK421-AA**	Canada	French
BN19S-2E	**LK401-AC**	**LK421-AA**	India	English

Note: See DEC 3000 Model 600 and 700 AXP desktop system diagrams.

Step 12—Environmental Power Products

Select environmental power products if required. Refer to *Chapter 10, Environmental Products*, and to *Digital's Environmental Power Products Catalog*.

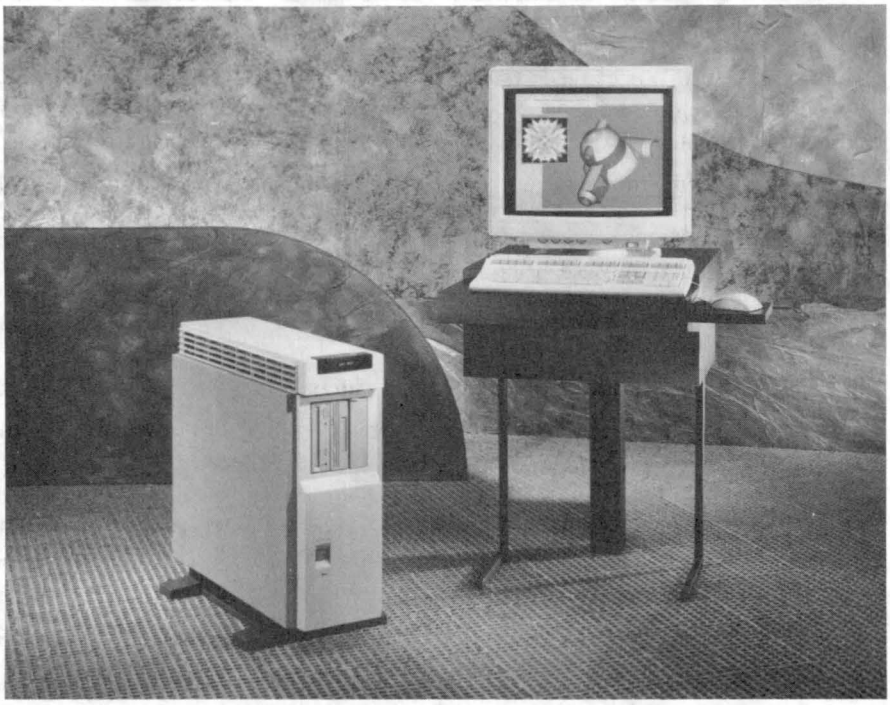

RZ2x Disk Drives
Removable Media Devices
Memory (under removable media)
BU-3317


TURBOchannel Slots (3)
10BaseT Port
ISDN
AUI Ethernet Network Port
Audio Port
Alternate Console/ Printer Port
Synch/Asynch Communications Port
SCSI Port
ISDN Port
Alternate Console Switch
Keyboard/Mouse Port
BU-3318

Specifications

TURBOchannel	100-Mbyte/s burst speed
Fast SCSI-2 bus	10-Mbyte/s transfer rate
FWD SCSI-2 (KZTSA)	20-Mbyte/s transfer rate
Ethernet	10-Mbit/s thick wire standard
FDDI	100 Mbits/s
Power Requirements	
Voltage/Phase/Watts	120 V/240 V, single phase, 420 ac Watts
Operating Environment	
Temperature	Model 600: 10° to 35° C (50° to 95° F) [DEC Std Class B rating] Model 700: 10° to 40° C (50° to 104° F)
Temperature change rate (maximum)	11° C/hr (20° F/hr)
Relative humidity	
Maximum wet bulb	25° C (77° F)
Maximum dew point	2° C (36° F)
Maximum operating altitude	2400 m (8000 ft) @ 36° C (97° F)
Physical Characteristics	**Pedestal**
Height	12.7 cm (5 in.)
Width	50.8 cm (20 in.)
Depth	44.4 cm (17.5 in.)
Weight	20.4 kg (45 lb) diskless 21.9 kg (48 lb) with optional pedestal
Input Devices	
Keyboard LK401	105 sculptured keys
LK421*	20 special-function keys
Mouse output	Three buttons, 200 pulses per inch
Graphics tablet	27.9 x 27.9 cm (11 x 11-inches)
Lighted Programmable Function Keyboard (LPFK)	32 individually programmable function keys in 4-6-6-6-6-4 array
Programmable Function Dials (PFD)	Eight individually programmable function dials with 360° rotation (256-bit resolution)arranged in two vertical rows of four dials

* DEC OSF/1 AXP systems only.



DEC 3000 Model 900 AXP Deskside Workstations

Product Description

The DEC 3000 Model 900 AXP workstation represents the high end of Digital's Alpha AXP 64-bit architecture workstation family. This workstation extends the power and range of workstation computing for all business needs.

The Model 900 AXP workstation features a 275-MHz CPU. This is Digital's highest performance industry-standard deskside workstation, providing 189 SPECint92 and 264 SPECfp92 performance. It is the system of choice for applications that require the fastest CPU performance available, such as financial modeling, structural analysis, and electrical simulation

The Model 900 AXP workstation provides the greatest expansion capability available in the industry today. The system supports 100-Mbyte/second I/O and graphics expansion slots, internal disk storage capacity of over 8 Gbytes and 1 Gbyte of memory. A second integral Fast SCSI-2 controller supports seven external devices and a Dual Fast SCSI-2 TURBOchannel option supports an additional 14 external storage devices. The DEC 3000 Model 900 AXP workstation can be expanded to accommodate the most powerful 3D graphics requirements. For custom configurations, it is also available as a rackmountable workstation.

The DEC 3000 Model 900 AXP workstation is the machine for developing and running very large data analysis and modeling/simulation programs. It is the ideal platform for users who need source code re-compiled and who want to use the same system for testing and deployment. The Model 900 suits the needs of technical users who need very fast graphics and CPU power for mechanical CAD, scientific analysis, data reduction/display, medical imaging, scientific modeling and animation/visualization; and commercial users who require large database retrieval such as financial analysis, insurance processing, network management and stock/options analysis. Users of older workstations can easily migrate to a DEC 3000 Model 900 AXP system.

Step 1—Systems

Select system. 120 V Packaged systems include power cord and U.S. keyboard. 120 V Base systems include power cord; keyboard must be ordered separately. 240 V systems require country-specific power cord and keyboard. Software media and documentation is recommended for first system on site. Select software from Step 10, if required.

- Options ordered with Packaged systems will be shipped outside the system enclosure. No additions can be made to Packaged systems.
- Options ordered with Base systems will be factory installed unless specified as **spares**.
- Minimum operating system software required is DEC OSF/1 AXP V2.0 or OpenVMS AXP V6.1; or later.
- Packaged and Base systems ordered with a disk include factory-installed software (FIS). FIS includes the latest version of operating system, DEC Open3D, cluster and networking software.

DEC 3000 Model 900 AXP Deskside Systems include

- DECchip 21064A 275-MHz CPU with 2-Mbyte secondary cache
- TURBOchannel I/O interconnect—6 slots total
- 64, 128, or 256 Mbytes of memory
- Thick wire Ethernet (AUI) connector and 10BaseT (twisted pair) connector
- Two Fast SCSI-2 controllers (one internal/one external) with Direct Memory Access
- EIA-232 serial communication (synchronous/asynchronous) port
- ISDN port
- Printer/console port
- Audio in/out
- Audio headset
- Monitor (Packaged systems only)
- U.S. keyboard, 120 V Packaged systems only. Base systems must order keyboard.
- Three-button mouse
- 1.8-meter (6-foot) power cord, 120 V systems
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- DEC OSF/1 AXP 2-user base license, DEC Open3D license, DEC PHIGS runtime license, MME runtime license, DECspin audio license, NAS 250 license **or** OpenVMS AXP base license, OpenVMS AXP 1-user license, DEC Open3D license, DEC PHIGS runtime license, NAS 250 license
- English-language user documentation

Packaged Systems

Order Number	Operating System	Memory	Monitor	Graphics		Available TURBOchannel Slots	RZ28=2.1 GB* RRD43=600 MB
Model 900 Packaged Systems							
PE541-AA†	DEC OSF/1 AXP	64 Mbytes	21 in C VRC21	ZLX-E1	8-plane 2D/3D	5	2.1 GB/600 MB
PE541-BA†	DEC OSF/1 AXP	64 Mbytes	21 in C VRC21	ZLX-M2	24-plane 3D	3	2.1 GB/600 MB
PE541-LA†	OpenVMS AXP	64 Mbytes	21 in C VRC21	ZLX-E1	8-plane 2D/3D	5	2.1 GB/600 MB
PE541-MA†	OpenVMS AXP	64 Mbytes	21 in C VRC21	ZLX-M2	24-plane 3D	3	2.1 GB/600 MB

* Internal disk includes factory-installed software (FIS). FIS is not a substitute for software media and documentation; see Step 10.
† Model 900 AXP Packaged systems ship with appropriate monitor according to geography.

Base Systems–require keyboard, graphics option, and monitor

120 V Base systems include power cord; order country-specific power cord for 240 V use.

Order Number	Operating System	Memory	Monitor	Graphics	Available TURBOchannel Slots
PE540-CA	DEC OSF/1 AXP	64 Mbytes	Required	Required	6
PE540-DA	DEC OSF/1 AXP	128 Mbytes	Required	Required	6
PE540-EA	DEC OSF/1 AXP	256 Mbytes	Required	Required	6
PE540-NA	OpenVMS AXP	64 Mbytes	Required	Required	6
PE540-PA	OpenVMS AXP	128 Mbytes	Required	Required	6
PE540-RA	OpenVMS AXP	256 Mbytes	Required	Required	6

Note: Systems ordered with one factory installed internal disk drive include factory-installed software (FIS). FIS is not a substitute for software media and documentation.

Step 2—Memory

System supports four memory options; 1-Gbyte maximum per system. Memory modules can be mixed.

MS15-CA	32-Mbyte ECC memory (8 x 4-Mbyte 4-Mbit 80-ns DRAM)
MS15-DA	64-Mbyte ECC memory (8 x 8-Mbyte 4-Mbit 80-ns DRAM)
MS15-EA	128-Mbyte ECC memory (8 x 16-Mbyte 16-Mbit 70-ns DRAM)
MS15-FA	256-Mbyte ECC memory (8 x 32-Mbyte 16-Mbit 70-ns DRAM)

Note: 1 Gbyte of memory can only be obtained by starting with a 256-Mbyte system (there are four memory option slots).

Step 2a—Memory Trade-In for Upgrade Systems

Some Model 800 systems include 32 Mbytes of memory. To configure 64-Mbyte, 128-Mbyte, or 256-Mbyte systems without losing a memory slot for future expansion, select memory upgrade

MS15-UE*	32 to 64-Mbyte ECC memory upgrade
MS15-UF*	32 to 128-Mbyte ECC memory upgrade
MS15-UG*	32 to 256-Mbyte ECC memory upgrade
MS15-UH†	64 to 256-Mbyte ECC memory upgrade

* Require return of original 32-Mbyte (MS15-CA) memory
† Requires return of original 64-Mbyte (MS15-DA) memory

Step 3—Storage

Select storage devices if required

- An RZ28 disk drive is recommended as a system device. An RZ25L, RZ26L, or RZ28 disk drive is recommended as a data/swap device.
- DEC OSF/1 AXP systems require one system disk; OpenVMS AXP systems can be networked configurations with supported page/swap functions
- Internal Fast SCSI-2 controller supports six internal devices; external Fast SCSI-2 controller supports a maximum of seven external SCSI devices. Select SCSI-2 TURBOchannel option cards if additional external storage is required. Maximum of five SCSI-2 TURBOchannel option cards supported per system.
- See Step 3c, External Storage, for SCSI cabling information.

Step 3a—Internal Storage

- System supports six internal storage devices.
- Packaged systems include one RRD43 CD-ROM drive and at least one disk drive.
- Slots 1 and 2 support 5.25-inch removable media device (RX26, RRD43, TLZ06, TZK11); one additional internal removable media device supported.
- Slots 3–6 support 3.5-inch hard disk drives (RZ25L, RZ26L, RZ28).

Packaged systems include RRD43 600-Mbyte CD-ROM reader.
Note: Software distribution is only available on CD-ROM.

Removable media devices

RX26-FT	2.8-Mbyte 3.5-inch diskette drive (requires 5.25-inch half-height bay)
RRD43-HM	600-Mbyte 5.25-inch half-height CD-ROM drive
TLZ06-MF	4.0-Gbyte 5.25-inch half-height 4-mm DAT drive
TLZ07-MF	8.0-Gbyte 5.25-inch half-height 4-mm DAT drive
TZK11-MF	2.0-Gbyte 5.25-inch half-height QIC tape drive

Hard disk drives

RZ25L-EJ	535-Mbyte 3.5-inch half-height disk drive
RZ26L-EJ	1.0-Gbyte 3.5-inch half-height disk drive
RZ28-EJ	2.1-Gbyte 3.5-inch half-height disk drive

Note: Systems ordered with one RZ25L, RZ26L, or RZ28 include factory-installed software (FIS).

Step 3b—External Storage

Systems support seven external devices on integral external Fast SCSI-2 controller. Select SCSI-2 TURBOchannel option cards if more are required. Maximum of five SCSI-2 TURBOchannel option cards supported per system.

- Dual Fast SCSI-2 option card supports 14 additional external devices
- Fast Wide Differential SCSI-2 option cards support 7 additional external devices

Dual Fast SCSI-2 TURBOchannel Option Card

PMAZC-AA Dual Fast SCSI-2 Option Card—requires one TURBOchannel slot

Fast Wide Differential SCSI-2 TURBOchannel Option Card

- 16-bit-wide SCSI bus supports 8-and 16-bit devices
- Over 1200 I/Os per second throughput
- Supported with HSZ10 and HSZ40
- Supports up to seven SCSI devices
- Customer installable

KZTSA-AA* Fast Wide Differential SCSI-2 Option Card—requires one TURBOchannel slot

* KZTSA-AA can be connected to StorageWorks products using a DWZZA adapter. See Chapter 8, *Storage Devices*, for ordering information.

Single Drive Expansion

RRD43-FA	600-Mbyte 5.25-inch half-height compact disk drive
TKZ09-BA*	5-Gbyte 5.25-inch 8-mm cartridge tape drive
TKZ60-BA*	3480/TA90-compatible cartridge tape drive
TLZ06-DA	4.0-Gbyte 5.25-inch half-height 4-mm DAT tape drive
TLZ07-DA	8.0- Gbyte 5.25-inch half-height 4-mm DAT tape drive
TSZ07-CA*	140-Mbyte 1600/6250 BPI reel to reel tape drive
TZK11-DA	2.0-Gbyte 5.25-inch half-height QIC tape drive
TZ85-TA	2.6-Gbyte 5.25-inch cartridge tape subsystem
TZ86-TA	6.0-Gbyte 5.25-inch cartridge tape subsystem, requires SCSI cable
SZ100-AA†#	SZ100 includes seven TZ85 (2.6-Gbyte) cartridge tapes and loader; requires SCSI cable
SZ106-AA†#	SZ106 includes seven TZ86 (6.0-Gbyte) cartridge tapes and loader; requires SCSI cable

* Supported under OpenVMS AXP V6.1 or later.
† OpenVMS AXP support only
# Not currently available on the Model 900 AXP systems
Note: Storage devices include 120 V power cord. See Chapter 8, *Storage Devices*, for 240 V power cord and SCSI cable ordering information.

StorageWorks Expansion Units (BA350 and BA353)

- BA350 Deskside Expansion Unit supports maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices
- BA353 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
- BA350 and BA353 Expansion units include 120 V power cord, order country specific power cord for 240 V use.
- Order SCSI cable separately; (BC09D-xx system box to BA350/BA353, or BN21H-xx when SCSI-2 TURBOchannel option card installed).

StorageWorks BA350 Deskside Expansion Unit

BA350-KB StorageWorks deskside expansion unit includes: BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and North American power cord

StorageWorks BA353 Desktop Expansion Box

BA353-AA	StorageWorks desktop expansion box
BA353-AE	StorageWorks desktop expansion box with one RRD43 5.25-inch half-height CD-ROM drive
BA353-AJ	StorageWorks desktop expansion box with TZK11 2.0-Gbyte, 5.25-inch half-height QIC tape drive

Step 3b—External Storage *(continued)*

Supported SCSI devices

SCSI devices may be purchased separately and are customer installable

		BA353	BA350
RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive	X	X
RZ26L-VA	1.0-Gbyte 3.5-inch half-height disk drive	X	X
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive	X	X
RZ28B-VA	2.1-Gbyte 3.5-inch half-height disk drive	X	X
RZ73-VA	2.0-Gbyte 5.25-inch full-height disk drive		X
RZ74-VA	3.57-Gbyte 5.25-inch full-height disk drive		X
RRD43-VA	600-Mbyte 5.25-inch half-height compact disk drive		X
RRD43-VU*	600-Mbyte 5.25-inch half-height compact disk drive		X
TZK11-VA	2.0-Gbyte 5.25-inch half-height QIC tape drive		X
TZ86-VA	6.0-Gbyte 5.25-inch cartridge tape drive		X
TZ87-VA	2.0-Gbyte 5.25-inch cartridge tape drive		X

* 600-Mbyte CD-ROM drive can be added to RRD43-VA or TZK11-VA for a total of two 5.25-inch drives in one carrier.

Country-specific 2.5-meter power cord—required for BA350/BA353 expansion units:

BN27X-09	U.S., Japan, Canada
BN15A-2E	Australia, New Zealand
BN13A-2E	Austria, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain, Belgium
BN12A-2E	U.K., Ireland
BN14A-2E	Switzerland
BN16A-2E	Denmark
BN17A-2E	Italy
BN18V-2E	India
BN18W-2E	Israel

Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations.

TURBOchannel Extender (TCE) Expansion Box

Note: Contact Digital Services before attaching existing TcE box to Model 900 AXP systems.

TcE expansion box supports TURBOchannel extender and three half-height devices: one half-height removable media device and two half-height hard disk drives. TcE includes base connector card and cable, SCSI cable, and 120 V power cord.

- TcE supports one dual-or triple-width TURBOchannel graphics card, leaving five additional slots available in the system for other TURBOchannel options.
- TcE level D03 (or greater) required.
- TcE supports one TURBOchannel option card.
- System supports maximum of six TcE boxes (one per TURBOchannel slot)
- TcE can be daisychained with other external storage devices but must be last device in chain.
- TcE connected to 240 V systems require a country-specific power cord.

PMTCE-AA TcE, no options, no disks

Step 3b—External Storage *(continued)*

VELOCITOR Storage Subsystems* (DEC OSF/1 AXP Systems Only)

TURBOchannel-based IPI (Intelligent Peripheral Interface) disk subsystem supports up to eight drives on a single controller. Requires one TURBOchannel slot (maximum of three). Supports controller-based striping or shadowing.

2L-RIT01-AA*	3-Gbyte disk drive in tabletop enclosure, 1.5-foot cable, documentation
2L-RIT02-AA*	6-Gbyte (two 3-Gbyte disk drives) in tabletop enclosure, 1.5-foot cable, documentation
2L-RITCL-BA*	TURBOchannel to IPI controller, DEC OSF/1 driver, 10-foot cable, documentation

* Not currently available on Model 900.

See Chapter 8, *Storage Devices*, for further ordering information.

Step 3c—SCSI Cables and Cabling Information

SCSI cabling recommendations:

- Maximum cable length for SCSI-2 (5 Mbytes/second) = 4 meters (13 feet)
- Maximum cable length for Fast SCSI-2 (10 Mbytes/second) = 3 meters (10 feet)
- Maximum cable length for FWD SCSI-2 (20 Mbytes/second) = 25 meters
- Include internal cabling in expansion box when calculating maximum bus length. Digital expansion boxes include approximately 1 meter of internal SCSI cable. (The Model 900's internal SCSI cable does not need to be considered in these calculations.)
- Devices that operate in Fast SCSI-2 mode include: RZ25L, RZ26L, RZ28, RZ73

SCSI Cables

BC19J-xx	SCSI large 50-pin connector to large 50-pin connector (system box to SZ03, SZ12)
BC09D-06	SCSI large 50-pin connector to small 50-pin connector (system box to BA350 modular storage shelf/BA353)
BN21H-xx	SCSI small 50-pin connector to small 50-pin connector (Dual-SCSI-2 TURBOchannel option to BA353/BA350)
BN21K-xx	SCSI 68-pin connector to 68-pin connector (FWD SCSI-2 TURBOchannel option to KZTSA to BA353/BA350)

Step 4—TURBOchannel Graphics Options and Monitors–required for Base Systems

- Base systems require a graphics option and monitor.
- ZLX-E1, -M1, and -M2 graphics options require specific versions of DEC Open3D software media:
  - Model 900 DEC OSF/1 AXP systems require DEC Open3D V2.3 or higher
  - Model 900 Open VMS AXP systems require DEC Open3D V2.4
- ZLX-E2 and -E3 graphics options require DEC Open3D V2.4 software media for all Model 900 AXP systems.
- ZLX-L1 graphics options require DEC Open3D V2.4 or later, and DEC OSF/1 AXP V3.0 or later.
- One 3D graphics option supported per system.
- Graphics cards installed in the TURBOchannel Extender (TcE) box require one TURBOchannel slot. Remaining five TURBOchannel slots are available for other TURBOchannel options. See Step 3b for additional information.
- Monitor cables included with each graphics option.

Step 4—TURBOchannel Graphics Options and Monitors–required for Base Systems *(continued)*

Order Number		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGD-AA	ZLX-E1	8-plane 2D/3D TURBOchannel color graphics accelerator, 1280 x 1024, 72 Hz, 2 Mpixels graphics memory	1	17-inch C VRT17-HA/H4 21-inch C VRC21-HA/H4	72 72
PMAGD-BA	ZLX-E2	24-plane 2D/3D TURBOchannel color graphics accelerator, 1280 x 1024, 72 Hz 2 Mpixels graphics memory	1		
PMAGD-CA	ZLX-E3	24-plane 2D/3D TURBOchannel color graphics accelerator, 24-bit Z-Buffer 1280 x 1024, 72 Hz 4 Mpixels graphics memory	1		
PMAGC-AA	ZLX-M1	24-plane 3D TURBOchannel color graphics accelerator, Double buffered, Z-Buffer 1 rendering processor 4 Mpixels graphics memory	2		
PMAGC-AT	ZLX-M1	ZLX-M1 24-plane 3D TURBOchannel color graphics accelerator installed in TcE expansion box	1		
PMAGC-BA	ZLX-M2	24-plane 3D TURBOchannel color graphics accelerator, double buffered, 24-bit Z-Buffer 2 rendering processor 8 Mpixels graphics memory	3		
PMAGC-BT	ZLX-M2	ZLX-M2 24-plane 3D TURBOchannel color graphics accelerator installed in TcE expansion box	1		
PMAGC-DA	ZLX-L1	ZLX-L1 24-plane 3D TURBOchannel color graphics accelerator, 24-bit image, 24-bit double buffer, 4-Mpixels graphics memory	2		

Step 4a—Multi-Screen TURBOchannel Graphics Options (Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 11.

- Add graphics card for each additional monitor provided there are free TURBOchannel slots. Six monitors are supported per system.
- DEC OSF/1 AXP and OpenVMS AXP systems support maximum of six ZLX-Ex option cards with six monitors.
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables included with each graphics option.
- TcE graphics options can be used with multiple monitors.

Order Number		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGD-AA	ZLX-E1	8-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz, 2 Mpixels graphics memory	1	17-inch C VRT17-HA/H4 21-inch C VRC21-HA/H4	72 72
PMAGD-BA*	ZLX-E2	24-plane 2D/3D color graphics accelerator, 1280 x 1024, 72 Hz 2 Mpixels graphics memory	1		
PMAGD-CA*	ZLX-E3	24-plane 2D/3D color graphics accelerator 24-bit Z-Buffer, 1280 x 1024, 72 Hz 4 Mpixels graphics memory	1		

* Supported on systems running DEC Open3D V2.4 only

Step 5—TURBOchannel Multimedia Options–DEC OSF/1 AXP Systems Only (Field Installable)

Workstations running DEC OSF/1 AXP include a license for Multimedia Services. See Step 10 for ordering information on Multimedia Services Runtime documentation kit and Multimedia Services Development kit license and documentation.

Sound and Motion (J300)—requires one TURBOchannel slot

- Audio/video single-slot TURBOchannel option that works with ANY graphics option
- Features include:
  - NTSC, PAL, SECAM full motion video input
  - NTSC, PAL video output
  - JPEG compression and decompression
  - 4–48 kHz audio (including CD-quality)
- Supported by Multimedia Services for DEC OSF/1 AXP and Multimedia Services Development kit for DEC OSF/1 AXP

AV300-AA* Sound and motion J300

* DEC OSF/1 AXP systems only.

Step 6—TURBOchannel Communications Options (Field Installable)

Each option requires one TURBOchannel slot

		Maximum Per System*
PMAD-AA/AB	Thick wire Ethernet TURBOchannel option card	5
DEFTA-FA	DEC FDDIcontroller/TURBOchannel (fiber-optic)	2
DEFTA-AA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter SAS (single attachment station), fiber	5
DEFTA-DA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter DAS (dual attachment station), fiber	5
DEFTA-UA†	DEC FDDIcontroller/TURBOchannel–TURBOchannel-to-FDDI adapter SAS (single attachment station), copper	5
DETRA-AA	DEC TRNcontroller 700; TURBOchannel-to-Token-Ring adapter	2
DJ-30APS-AA	Prestoserve option card (DEC OSF/1 AXP systems only)	1

*Assumes ZLX-E1 graphics in one TURBOchannel slot and no other TURBOchannel option installed
† OpenVMS AXP LAVc support not currently available.

Step 7—Networking Adapters (Field Installable)

Systems include thick wire Ethernet (AUI) connector and 10BaseT (twisted pair) connector. A ThinWire adapter is available separately. Right-angle Ethernet cables are not supported.

DECXM-AA ThinWire Ethernet station adapter

Select desired length of cable to connect ThinWire adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx Thick wire 802.3/Ethernet cable (-xx refers to length in meters: -02/-05 meters)

BNE3H-xx Thick wire transceiver cable with straight connector–PVC (-xx refers to length in meters=-05/-10/-20/-40 meters)

BNE3L-xx Thick wire transceiver cable with straight connector–Teflon (-xx refers to length in meters=05/-10/-20/-40 meters)

BN26L-xx 10BaseT (twisted pair) cable (-xx refers to length meters)

BC16M-xx ThinWire Ethernet cable -xx refers to length in feet=-06/-15/-30 feet)

Step 8—Optional Input/Output Devices

Tablet can be used in place of the mouse. Audio headset (input/output capability) uses the MJ audio connector.

VSXXX-AB*	28-x 28-cm (11-x 11-in.) tablet with a 2-button stylus and a 4-button puck
VSXXX-JA	Audio headset (included with all systems)

Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSX10-AA/A3†	Combination Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) package, 120 V/240 V
VSX20-AA/A3†	Lighted Programmable Function Keyboard (LPFK) package, 120 V/240 V
VSX30-AA/A3†	Programmable Function Dials (PFD) package, 120 V/240 V

* Not supported on multi-screen systems.
† Supported on 3D graphics systems only.

Step 9—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 10—Software

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

Software Processor Code = **G**

Minimum Operating System Software Required:	DEC OSF/1 AXP Systems	OpenVMS AXP Systems
Model 900 AXP	DEC OSF/1 AXP V2.0	OpenVMS AXP V6.1 or later

DEC OSF/1 AXP User Licenses

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF	DEC OSF/1 AXP Interactive 16-user license
QL-MT7A9-BG	DEC OSF/1 AXP Interactive 32-user license
QL-MT7A9-BH	DEC OSF/1 AXP Interactive 64-user license
QL-MT7AA-BR	DEC OSF/1 AXP Interactive 128-user license
QL-MT7AB-BR	DEC OSF/1 AXP Interactive 256-user license
QL-MT7AG-6H	DEC OSF/1 AXP Interactive unlimited user license
QL-MT5AG-AA	DEC OSF/1 AXP developer's extension license

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP base hardcopy documentation
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation

Step 10—Software *(continued)*

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are not specific to a single system and **can** be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a mixed OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems)

QL-MT3A9-BB OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR OpenVMS AXP Distributed Interactive 256-user license

OpenVMS AXP Media and Documentation

QA-MT1AA-H8 OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ OpenVMS AXP extended hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

NAS 250 Advance Kit

NAS 250 advance kit is included with system. Media available on layered products CD-ROM

DEC PHIGS Runtime License

DEC PHIGS Runtime license is included with all systems. Media available on layered products CD-ROM

QL-OKBAA-2B OpenVMS AXP DEC PHIGS Development license
QL-0A8AM-2B DEC OSF/1 AXP DEC PHIGS Development license

DEC Open3D License

DEC Open3D license is included with all systems. Media available on layered products CD-ROM. Note software version requirement for ZLX graphics options

DEC Open3D software version required for:	DEC OSF/1 AXP Systems	OpenVMS AXP Systems
Model 900 AXP with ZLX-E1, M1, and M2 graphics	DEC Open3D V2.3	DEC Open3D V2.4
Model 900 AXP with ZLX-E2 and E3 graphics	DEC Open3D V2.4	DEC Open3D V2.4

Step 10—Software *(continued)*

Multimedia Services for DEC OSF/1 AXP

Workstations running DEC OSF/1 AXP include a license for Multimedia Services for DEC OSF/1 AXP. Media available on layered products CD-ROM. Order Multimedia Services Runtime documentation kit and Multimedia Services Development kit license and documentation separately

QA-20YAA-GZ Multimedia Services Runtime documentation

QL-20ZAG-AA Multimedia Services Development kit license
QA-20ZAA-GZ Multimedia Services Development kit documentation

DEC SoftPC for DEC OSF/1 AXP Systems

DEC SoftPC, an optional layered product, allows a DEC 3000 workstation running DEC OSF/1 AXP to run MS-DOS programs with no added hardware. DEC SoftPC with an installed Windows 3.1 kit also runs Windows applications. Media available on layered products CD-ROM

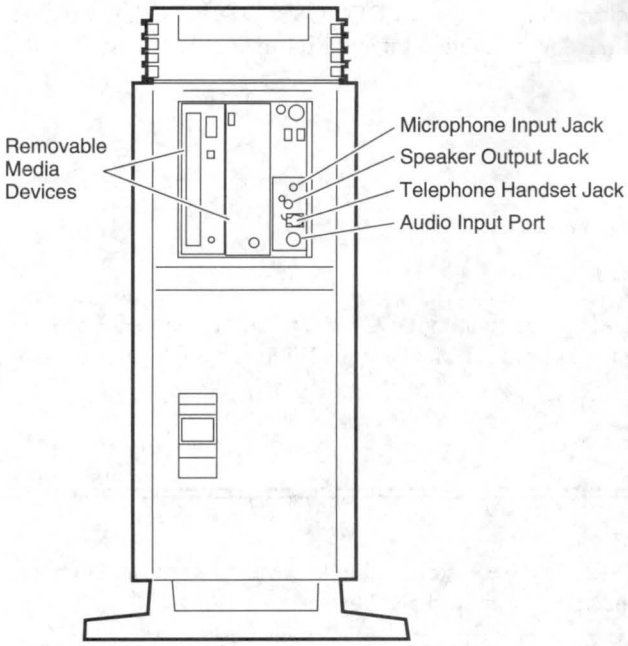
QL-0HSAM-3B DEC SoftPC License for DEC OSF/1 AXP

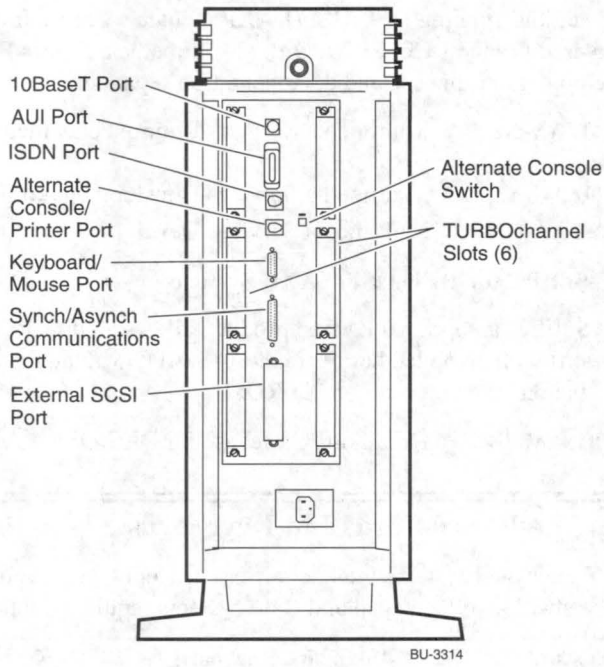
Step 11—Power Cords and Keyboards

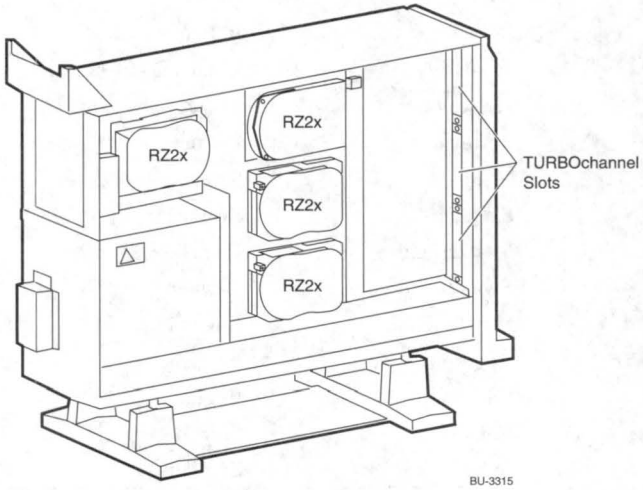
120 V Packaged systems include power cord and U.S. keyboard. 120 V Base systems include power cord; order keyboard separately. 240 V Packaged and Base systems require country-specific power cord and keyboard.

Power Cord	Standard Keyboard	Unix Keyboard	Country	Language
BN27X-09	**LK401-AA**	**LK421-AA**	U.S.	English
BN13A-2E	**LK401-AG**	**LK421-AA**	Austria	German/Austrian
BN13A-2E	**LK401-AB**	**LK421-AA**	Belgium	Flemish
BN16A-2E	**LK401-AD**	**LK421-AA**	Denmark	Danish
BN13A-2E	**LK401-AF**	**LK421-AA**	Finland	Suomi
BN13A-2E	**LK401-AP**	**LK421-AA**	France	French
BN13A-2E	**LK401-AH**	**LK421-AA**	Holland	Dutch
BN18W-2E	**LK401-AT**	**LK421-AA**	Israel	Hebrew
BN17A-2E	**LK401-AI**	**LK421-AA**	Italy	Italian
BN27X-09	**LK401-AJ**	**LK421-AJ**	Japan	Katakana
BN13A-2E	**LK401-AN**	**LK421-AA**	Norway	Norwegian
BN13A-2E	**LK401-AV**	**LK421-AA**	Portugal	Portuguese
BN13A-2E	**LK401-AS**	**LK421-AA**	Spain	Spanish
BN13A-2E	**LK401-AM**	**LK421-AA**	Sweden	Swedish
BN14A-2E	**LK401-AK**	**LK421-AA**	Switzerland	French
BN14A-2E	**LK401-AL**	**LK421-AA**	Switzerland	German
BN12A-2E	**LK401-AA**	**LK421-AA**	U.K./Ireland	English
BN15A-2E	**LK401-AA**	**LK421-AA**	Australia/N.Z.	English
BN27X-09	**LK401-AQ**	**LK421-AA**	Canada	English
BN27X-09	**LK401-AC**	**LK421-AA**	Canada	French
BN18V-2E	**LK401-AC**	**LK421-AA**	India	English

Note: See DEC 3000 Model 900 AXP deskside system diagrams.


Removable
Media
Devices
Microphone Input Jack
Speaker Output Jack
Telephone Handset Jack
Audio Input Port
BU-3313

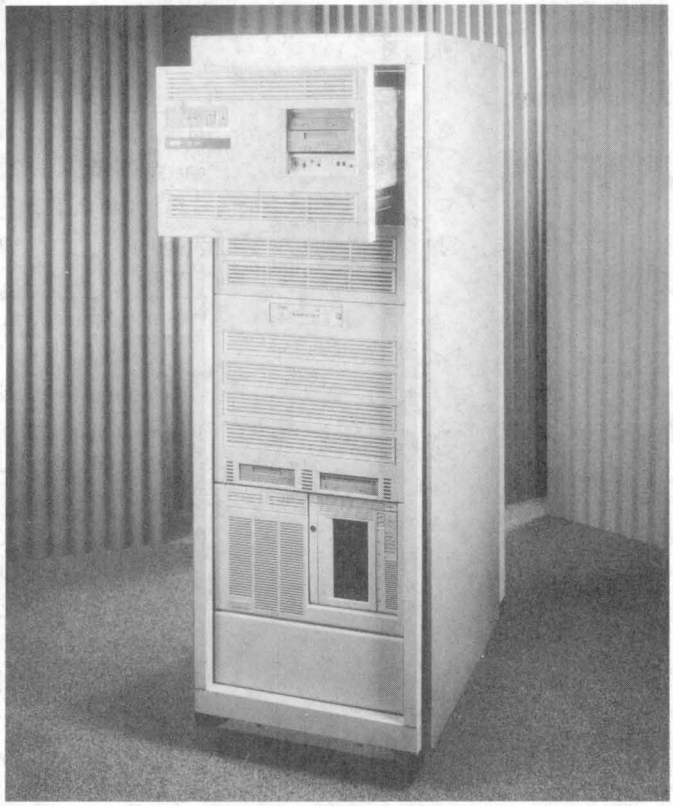

10BaseT Port
AUI Port
ISDN Port
Alternate
Console/
Printer Port
Keyboard/
Mouse Port
Synch/Asynch
Communications
Port
External SCSI
Port
Alternate Console
Switch
TURBOchannel
Slots (6)
BU-3314


RZ2x
RZ2x
RZ2x
RZ2x
TURBOchannel
Slots
BU-3315

Specifications

TURBOchannel	100-Mbyte/s burst speed
Fast SCSI-2 bus	10-Mbyte/s transfer rate
FWD SCSI-2 (KZTSA)	20-Mbyte/s transfer rate
Ethernet	10-Mbit/s thick wire standard
FDDI	100 Mbits/s
Power Requirements	
Voltage/Phase/Watts	120 V/240 V, single phase, 480 ac Watts
Operating Environment	
Temperature	10° to 40° C (50° to 104° F) [DEC class B]
Temperature change rate (maximum)	11° C/hr (20° F/hr)
Relative humidity	
Maximum wet bulb	28° C (82.4° F)
Maximum dew point	2° C (36° F)
Maximum operating altitude	2400 m (8000 ft) @ 36° C (97° F)
Physical Characteristics	**Pedestal**
Height	62.7 cm (24.7 in.)
Width	22.3 cm (8.8 in.)
Depth	75.4 cm (29.7 in.)
Weight	29.5 kg (65 lb) diskless
Input Devices	
Keyboard LK401	105 sculptured keys,
LK421*	20 special-function keys
Mouse output	Three buttons, 200 pulses per inch
Graphics tablet	27.9 x 27.9 cm (11 x 11 inches)
Lighted Programmable Function Keyboard (LPFK)	32 individually programmable function keys in 4-6-6-6-6-4 array
Programmable Function Dials (PFD)	Eight individually programmable function dials with 360-degree rotation (256-bit resolution)arranged in two vertical rows of four dials

* DEC OSF/1 AXP systems only.



Rackmountable DEC 3000 AXP Workstations and Servers

Product Description

Rackmountable DEC 3000 Models 600, 700, and 900 AXP systems are mechanically reconfigured DEC 3000 AXP desktop and deskside systems. Each system is front-to-back cooled and mounts onto chassis slides for easy installation and maintenance. For space saving and cost effectiveness, these systems can be configured with other peripherals and installed in the cabinet enclosure. Rackmountable DEC 3000 AXP systems have the same system configuration rules as the DEC 3000 AXP desktop and deskside systems.

Rackmountable DEC 3000 Models 600, 700, and 900 AXP systems are housed within a rackmountable chassis for immediate installation into a cabinet enclosure. The Model 900 AXP deskside system can be field converted to a rackmounted system by ordering a rackmount hardware kit.

Each system includes a 15-foot power cord. 240 V systems require a country specific power cord and country kit.

Items to consider when selecting a rackmount cabinet enclosure:

- Face or filler panel requirements (if non-Digital cabinet)
- Power controller location and power cord length requirements for 240 V areas
- Front stabilizing leg or bar **must** be used on the cabinet enclosure or the enclosure should be secured to the floor to prevent cabinet from tipping when systems are extended for servicing
- Front and rear doors must be louvered in the area of the system chassis to accommodate cooling
- Vertical rack space to accommodate systems and additional I/O requirements.

Please refer to the configuration rules and guidelines for DEC 3000 Models 600, 700, and 900 AXP Desktop/Deskside systems.

For assistance in creating customer specific configurations on any Rackmountable DEC 3000 Models 600, 700, or 900 AXP system, contact your local Digital Sales Representative or call the Digital Services Sales Support Team at 800-832-6277 or 603-884-8990.

Step 1—Systems

Select system. Systems include 120 V power cord, order country specific power cord for 240 V use. Select software from Step 2, if required.

Rackmountable DEC 3000 AXP Systems include

- DECchip 21064
  - Model 600 175-MHz CPU with 2-Mbyte secondary cache
  - Model 700 225-MHz CPU with 2-Mbyte secondary cache
  - Model 900 275-MHz CPU with 2-Mbyte secondary cache
- TURBOchannel I/O interconnect
  - Model 600/700—3 slots total
  - Model 900—6 slots total
- Thick wire Ethernet (AUI) connector and 10BaseT (twisted pair)connector
- Two Fast SCSI-2 controllers (one internal/one external) with Direct Memory Access
- EIA-232 serial communication (synchronous/asynchronous) port
- ISDN port
- Printer/console port
- Audio in/out
- Audio headset
- 15-foot 120 V power cord
- Servers include:
  - DEC OSF/1 AXP 2-user base license, NAS 200 license (includes server extension license)
- Workstations include:
  - DEC OSF/1 AXP 2-user base license, DEC Open3D license, DEC PHIGS runtime license, MME runtime license, DECspin audio license, NAS 250 license **or** OpenVMS AXP base license, OpenVMS AXP 1-user license, DEC Open3D license, DEC PHIGS runtime license, NAS 250 license

Order Number	Operating System	Model	Memory	RZ26L =1.05 GB RRD43=600 MB	Monitor	Graphics	Keyboard
Rackmountable Model 600 AXP Systems—175 MHz							
PE43B-AA	DEC OSF/1 AXP	Server	64 Mbytes	1 05 GB / 600 MB	Required	Required	Required
PE43B-LA	OpenVMS AXP	Server	64 Mbytes	1 05 GB / 600 MB	Required	Required	Required
PE43B-JA	DEC OSF/1 AXP	Server	Required	Required	Required	Required	Required
PE43B-KA	OpenVMS AXP	Server	Required	Required	Required	Required	Required
Rackmountable Model 700 AXP Systems—225 MHz							
PE44B-AA	DEC OSF/1 AXP	Server	64 Mbytes	1.05 GB/ 600 MB	Required	Required	Required
PE44B-LA	OpenVMS AXP	Server	64 Mbytes	1.05 GB/ 600 MB	Required	Required	Required
PE44B-JA	DEC OSF/1 AXP	Server	Required	Required	Required	Required	Required
PE44B-KA	OpenVMS AXP	Server	Required	Required	Required	Required	Required
Rackmountable Model 900 AXP Systems—275 MHz							
PE54B-AA*	DEC OSF/1 AXP	Workstation	Required	1.05 GB/ 600 MB	21" C VRC 21	Required	LK401
PE54B-LA*	OpenVMS AXP	Workstation	Required	1.05 GB/ 600 MB	21" C VRC 21	Required	LK401
PE54B-JA*	DEC OSF/1 AXP	Workstation	Required	Required	Required	Required	Required
PE54B-KA*	OpenVMS AXP	Workstation	Required	Required	Required	Required	Required
PE54C-JA	DEC OSF/1 AXP	Server	Required	Required	Required	Required	Required
PE54C-KA	OpenVMS AXP	Server	Required	Required	Required	Required	Required

*Workstations include U.S. Keyboard, 3-meter (10 foot) video cable, 3-meter (10-foot) keyboard/mouse cable and three button mouse.

Note: Systems ordered with one factory installed internal disk drive include factory-installed software (FIS). FIS is not a substitute for software media and documentation.

Step 2—Software

Media and documentation is recommended for first system on site.

QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (base, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP base hardcopy documentation
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation
QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP
QA-MT1AS-H8	OpenVMS AXP media and documentation CD-ROM
QA-MT1AB-GZ	OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ	OpenVMS AXP extended hardcopy documentation
QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

Step 3—Rackmount Kit

- Rackmountable DEC 3000 AXP systems do not include cabinet enclosure or rack, they must be ordered separately
- Rackmount kit may be purchased separately for field conversion of DEC 3000 Model 900 AXP deskside units

Rackmount Kit

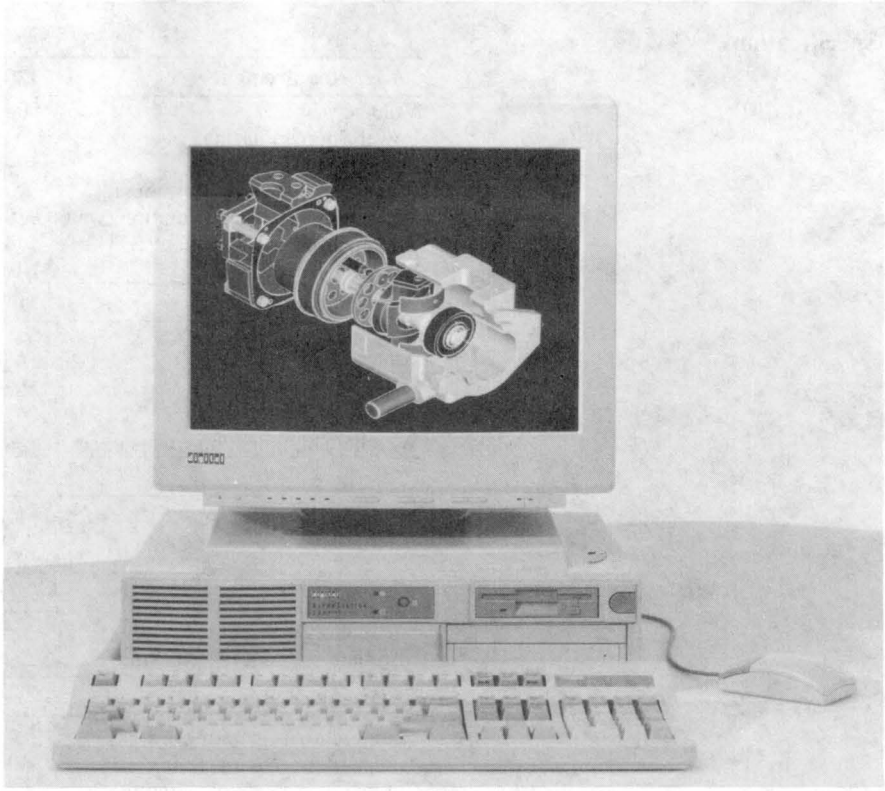
PE5XH-CD	Rackmount kit for field conversion of Model 900 AXP deskside systems

Specifications

Power Requirements	120 V/15 Amp/60 Hz	240 V/10 Amp/50 Hz
Voltage ranges	90–128	190–256
Power Source Phasing	Single	Single
Frequency Range (Hz)	49–61	49–61
Maximum rated current (amps)	8.5	4.3
Maximum power consumption (watts)	420	420
Maximum heat dissipation (BTU/hr)	1433	1433
U.S. power cord plug	NEMA 5–15P	NEMA 6–15P
Physical Characteristics	**Model 600 and 700**	**Model 900**
Height (Vertical)	8.75 inches (22.2 cm)	14.0 inches (35.6 cm)
Width	19 inches (48.2 cm)	19.0 inches (48.2)
Depth	25.6 inches (65 cm)	27.5 inches (70 cm)
Weight	75 lb. (34 kg)	60 lb. (27 kg)
Weight (Shipping–approximately)*	85 lb. (39 kg)	90 lb. (41 kg)
Clearances		
Mounting Requirements	Models 600, 700 and 900 AXP systems conform to ANSI/EISA 310 and IEC 297 standards for 19-inch panel width and 30-inch minimum depth enclosure	
Installation/Service (Front)	30 inches (76 cm)	36 inches (91 cm)
Installation/Service (Rear/Side)	up to 36 inches (92 cm)	24 inches (61 cm)
Environmental		
Temperature (Operating)	10–50° C (41–122° F)	10°–40° C (50°–104° F)
Temperature (Nonoperating	-40–66° C (40–151° F)	–40–66° C (–40–151° F)
Temperature (Rate of change)	11° C/hr (20° F/hr)	11° C/hr (20° F/hr)
Relative humidity	10–80% noncondensing	10–80% noncondensing
Maximum wet bulb	25° C (77° F)	28° C (82.4° F)
Maximum dew point	2° C (36° F)	2° C (36° F)
Altitude (Operating)	8000 feet (2438 meters)	8000 feet (2438 meters)
Altitude (Nonoperating)	16,000 feet (4877 meters)	16,000 feet (4877 meters)
Mechanical shock (Operating)	10g pk for 10 (+/-) 3ms	7.5 g pk for 10 +/- 3ms
Vibration (Operating))	**Frequency**	**Acceleration**
	5–10 Hz	0.020 inch (0.5 mm) double amplitude
	16–200	0,25 G peak (2.5 n/s$^{2)}$
	200–500–200 Hz	0,10 G peak (0.10 n/s$^{2)}$
	200–16	0,25 G peak (2.5 n/s$^{2)}$
	16–5 Hz	0.020 inch (0.5 mm) double amplitude
	Sweep rate 1.0 octave per minute all three axes	
Acoustics (Operating)	6.1 bels, 48 dbA	5.8 bels, B
Acoustics (Idle)	5.8 bels, 44 dbA	5.1 bels, B

* Weight is for fully loaded enclosure with module options, power supply and maximum storage devices

Note: Custom configurations may require a custom quote; contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.



AlphaStation 200 4/166 and 4/233 Desktop Workstations

Product Description

The AlphaStation 200 4/166 and 4/233 Desktop Workstations are the first in a family of PCI-based Alpha AXP Universal Client systems. The AlphaStation 200 series delivers premium performance and provides access to tens of thousands of applications running on DEC OSF/1 AXP, OpenVMS AXP or Microsoft Windows NT Workstation systems.

The **AlphaStation 200 4/166** uses the DECchip 21064 processor running at 166 MHz with performance measuring 107.7 SPECint92 and 134.8 SPECfp92. The **Alpha Station 200 4/233** uses the DECchip 21064A processor running at 233 MHz and boasts an impressive 157.6 SPECint92 and 183.8 SPECft92 performance on the desktop.

These systems are packaged in a compact, slimline desktop enclosure with capacity for up to 192 Mbytes of parity memory, four storage slots, and three option slots (two combination PCI/ISA and one ISA-only). 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. Lower performance options are supported on the ISA bus. Systems support a wide variety of industry-standard peripherals and PCI/ISA options. Other standard features include integrated Twisted Pair/ThinWire Ethernet, stereo-quality audio, and an array of external ports for serial/parallel communications, and external SCSI. This combination of standard features allows multiple in-box configurations without the need for additional tabletop options or expansion boxes.

Customer-installable chip upgrades provide investment protection to AlphaStation 200 4/166 and 4/233 users and Digital's ADVANTAGE-UPGRADE Program offers a cost-effective upgrade path for users of older workstations.

Step 1—Systems

Select system.

- Packaged systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord, U.S. keyboard,and documentation. Select country specific power cord and keyboard for **all** Packaged systems ordered in Europe.
- Base systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord. Select country specific power cord for Base systems ordered in Europe.
- Keyboard and mouse must be ordered separately for **all** Base systems.
- DEC OSF/1 AXP and OpenVMS AXP Packaged systems include factory-installed software (FIS).
- Windows NT Packaged and Base systems include Windows NT Workstation V3.5 media (CD-ROM), license, and documentation in shrink-wrapped package.
- Options ordered will be factory installed unless specified as **spares**

AlphaStation 200 4/166 and 4/233 Desktop Systems include

- DECchip 21064 166-MHz CPU with 512 Kbyte on-board secondary cache **or**
- DECchip 21064A 233-MHz CPU with 512 Kbyte on-board secondary cache
- Slimline desktop enclosure which includes:
  - Two PCI/ISA combination slots and one ISA slot
  - Six SIMM memory slots
  - Integrated PCI-based Fast SCSI-2 controller with Direct Memory Access and external SCSI-2 connector
  - Integrated high-performance Twisted Pair/ ThinWire Ethernet
  - Integrated sound card
  - 210-watt power supply
  - Two serial ports, support full modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- Memory (Packaged systems only)
- 1.44-Mbyte diskette drive (RX23L)
- Three-button mouse (Packaged systems only)
- Headphones and microphone
- Hardware and Software warranties*
- Hardware documentation
- DEC OSF/1 AXP 2-user base license, DEC Open3D license, Multimedia Services license, NAS 150 license, **or** OpenVMS AXP base license, OpenVMS AXP 1-user license, DEC Open3D license, NAS 150 license, **or** Windows NT Workstation V3.5 media kit

*See Step 11 Hardware and Software Supplemental Support Services for additional information

Packaged systems

Order Number	Operating System	Memory	Graphics	Monitor	Sound Card, Headphones, Microphone	Hard Disk Drive/ CD-ROM	Ethernet
AlphaStation 200 4/166—166 MHz							
PB420-AA/AB	DEC OSF/1 AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included	1.05 GB	Included
PB421-AA/AB	OpenVMS AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included	1.05 GB	Included
PB422-BA/BB	Windows NT	16 Mbytes	DEC864 8-plane 2D	Required	Included	340 MB/600 MB	Included
PB422-AA/AB	Windows NT	32 Mbytes	ZLXp-E1 8-plane 2D/3D[2]	Required	Included	1.05 GB/600 MB	Included
AlphaStation 200 4/233—233 MHz							
PB430-AA/AB	DEC OSF/1 AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included	1.05 GB	Included
PB431-AA/AB	OpenVMS AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included	1.05 GB	Included
PB432-AA/AB	Windows NT	32 Mbytes	ZLXp-E1 8-plane 2D/3D[2]	Required	Included	1.05 GB/600 MB	Included

[1] 8-plane, 2 Mpixel PCI graphics 1280 x 1024 72 Hz (PBXGA-AA for DEC OSF/1 AXP and OpenVMS AXP systems); uses one PCI slot

[2] 8-plane, 2 Mpixel PCI graphics 1280 x 1024 72 Hz (PBXGA-AN for Windows NT systems); uses one PCI slot

Note: xA = 120V and xB = 240V

Step 1—Systems *(continued)*

Base Systems

- Windows NT Base systems require a minimum of 16 Mbytes of memory and one hard disk drive. Windows NT software media is distributed on CD-ROM only, selection of a CD-ROM drive is recommended.
- DEC OSF/1 AXP and OpenVMS AXP Base systems require a minimum of 32 Mbytes of memory and 535 Mbyte hard disk drive. Select graphics option and monitor for DEC OSF/1 AXP and OpenVMS AXP systems if required.
- Select keyboard and mouse for **all** Base systems.

Order Number	Operating System	Memory	Graphics	Monitor	Sound Card, Headphones, Microphone	Hard Disk Drive	CD-ROM	Ethernet
AlphaStation 200 4/166—166 MHz								
PB41A-AA	DEC OSF/1 AXP	Required	Recommended	Optional	Included	Required	Optional	Included
PB41A-BA	OpenVMS AXP	Required	Recommended	Optional	Included	Required	Optional	Included
PB41A-CA	Windows NT	Required	Required	Optional	Included	Required	Recommended	Included
AlphaStation 200 4/233—233 MHz								
PB42A-AA	DEC OSF/1 AXP	Required	Recommended	Optional	Included	Required	Optional	Included
PB42A-BA	OpenVMS AXP	Required	Recommended	Optional	Included	Required	Optional	Included
PB42A-CA	Windows NT	Required	Required	Optional	Included	Required	Recommended	Included

Step 2—Monitors

- Windows NT systems require a graphics option and monitor to run **all** functions. A graphics adapter and monitor are recommended for DEC OSF/1 AXP and OpenVMS AXP Base systems

VRC15-PA/P4 15-inch color monitor, 120 V, 240 V N.H./S.H., SVGA, 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes jumper power cord, video cable, and 120 V power cord.

VRT17-PA/P4 17-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.

VRC21-PA/P4 21-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.

Step 3—Memory

Six SIMM slots support three memory options (3 SIMM pairs) for maximum of 192 Mbytes. Memory pairs can be mixed.

- DEC OSF/1 AXP and OpenVMS AXP systems required minimum of 32 Mbytes memory. Additional memory may be required for some applications.
- Windows NT systems **require** minimum of 16 Mbytes; 32 Mbyte is **recommended** if running MS-DOS and Windows V3.1 applications within Windows NT *Windows-on-Windows* environment.

MSP01-AA 8-Mbyte (2 x 4-Mbyte 70ns SIMMs)

MSP01-AB 16-Mbyte (2 x 8-Mbyte 70ns SIMMs)

MSP01-AC 32-Mbyte (2 x 16-Mbyte 70ns SIMMs)

MSP01-AD 64-Mbyte (2 x 32-Mbyte 70ns SIMMs)

Note: 192 Mbytes of memory can only be obtained by starting with a 64-Mbyte system

Step 4—Storage—see system diagram for recommended slot(s) for storage devices

Select storage devices if required.

- Integrated PCI-based Fast SCSI-2 controller supports three internal devices and four external SCSI devices. Seven external SCSI devices are supported if storage devices are not installed in system enclosure.
- DEC OSF/1 AXP and OpenVMS AXP Packaged systems include factory-installed software (FIS) on 1.05 Gbyte hard disk drive.
- DEC OSF/1 AXP and OpenVMS AXP Base systems require a minimum of one 535 Mbyte hard disk drive.
- Windows NT Packaged systems include Windows NT Workstation V3.5 media kit.
- Windows NT Base systems require CD-ROM and a minimum of one 535 Mbyte hard disk drive.

Step 4a—Internal Storage

- System enclosure supports four storage devices:
  - One dedicated 3.5-inch diskette drive slot
  - One 5.25-inch removable media device slot (DAT tape, QIC tape or CD-ROM)
  - One 3.5- x 1.6-inch slot (2.1-Gbyte hard disk drive)
  - One 3.5- x 1.0-inch low profile hard disk drive slot
- Systems include one 1.44-Mbyte diskette drive
- Software distribution is only available on CD-ROM

Removable Media Devices

Order Number	Description
PBXRX-AA	1.44-Mbyte 3.5-inch diskette drive (RX23L)
PBXRD-AA	600-Mbyte 5.25-inch half-height dual-speed CD-ROM drive (RRD43)
PBXTL-AA	4.0-Gbyte 5.25-inch half-height 4-mm DAT drive
PBXTZ-AA	2.0-Gbyte 5.25-inch half-height QIC tape drive

Hard Disk Drives

Order Number	Description
PBXRZ-AA	340-Mbyte 3.5-inch x 1-inch hard disk drive (Windows NT systems only)
PBXRZ-BA	535-Mbyte 3.5-inch x 1-inch hard disk drive (RZ25L)
PBXRZ-EA	1.05-Gbyte 3.5-inch x 1-inch hard disk drive (RZ26L)
PBXRZ-HA	2.1-Gbyte 3.5- x 1.6-inch hard disk drive (RZ28)

Step 4b—External Storage

Systems support four external devices on integrated PCI-based Fast SCSI-2 controller when three devices are installed in system enclosure. Seven external SCSI devices are supported if storage devices are not installed in system enclosure. Select PCI-based Fast SCSI-2 controller option cards if additional external storage is required.

PCI-based Fast SCSI-2 Controller (maximum of two KZPAA controllers supported per system)

- Select one additional Fast SCSI-2 controller.
- PCI-based Fast SCSI-2 controller supports seven additional external devices.

KZPAA-AA PCI-based Fast SCSI-2 controller—requires one PCI slot

Single Drive Tabletop 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).

TLZ06-FA 4.0-Gbyte 3.5- x 1.6-inch 4-mm DAT tape drive

RRD43-FA 600-Mbyte 5.25-inch half-height dual-speed CD-ROM

Step 4b—External Storage *(continued)*

StorageWorks Expansion Units (BA350 and BA353)

- BA350 Deskside Expansion Unit supports maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices.
- BA353 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.
- BA350 and BA353 Expansion Units include North American power cord. Order country-specific power cord for 240 V use. See Chapter 8, Storage Devices, for BA350 power cord information.
- Order SCSI cable separately; (BN21H-xx) system box to BA350/BA353.

StorageWorks BA350 Deskside Expansion Unit

BA350-KB StorageWorks deskside expansion unit includes: BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and North American power cord

StorageWorks BA353 Desktop Expansion Box

BA353-AA StorageWorks desktop expansion box

Supported SCSI devices

SCSI devices may be purchased separately and are customer installable.

		BA353	BA350
RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive	X	X
RZ26L-VA	1.0-Gbyte 3.5-inch half-height disk drive	X	X
RZ28-VA	2.1-Gbyte 3.5- x 1.6-inch disk drive	X	X
RRD43-VA	600-Mbyte 5.25-inch half-height compact disk drive		X
RRD43-VU*	600-Mbyte 5.25-inch half-height compact disk drive		X

* 600-Mbyte CD-ROM drive can be added to RRD43-VA or TZK11-VA for a total of two 5.25-inch drives in one carrier.
Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations.

Step 5—Graphics Options/Multi-Screen Options

Graphics Options

- Packaged systems include graphics option
- Windows NT Base systems require graphics option and monitor to run all functions
- Graphics option is recommended for DEC OSF/1 AXP and OpenVMS AXP Base systems.

Multi-Screen Options (DEC OSF/1 AXP and OpenVMS AXP systems only)

- DEC OSF/1 AXP and OpenVMS AXP systems support a maximum of three graphics cards and three monitors.
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables are included with each monitor.
- Add graphics card for each additional monitor, provided there are free PCI slots.
- Multi-screen PCI graphics options are **not** supported onWindows NT systems

Order Number	Description	Supported Operating System	Bus Slots Required / Recommended Slot
PBXGA-AA*	ZLXp-E1 8-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/A
PBXGA-BA*	ZLXp-E2 24-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/A
PBXGA-CA*	ZLXp-E3 24-plane, PCI graphics accelerator, 24-bit Z-buffer, 4 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/A

* Multi-screen graphics options for DEC OSF/1 AXP and OpenVMS AXP systems. Options require DEC Open3D media which is included in factory installed software (FIS).

Step 5—Graphics Options/Multi-Screen Options *(continued)*

Order Number	Description	Supported Operating System	Bus Slots Required / Recommended Slot
PBXGA-AN†	ZLXp-E1 8-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/A
PBXGA-BN†	ZLXp-E2 24-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/A
PBXGA-CN†	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/A
PBXGA-JA	DEC864, entry level graphics, with 2-Mbyte DRAM, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/A
MSP01-DA	2-Mbyte DRAM upgrade for PB2GA-JA	Windows NT	—

† Graphics options include ZLXp-E Support Services Software for Microsoft Windows NT license, media, and documentation.

Step 6—AlphaStation Sound Option

Packaged and Base systems include sound card, headphones and microphone; select replacement headphones and microphone if required.

AVH01-AA Replacement headphones and microphone

Step 7—Communications and Miscellaneous Adapters

Packaged and Base systems include integrated high-performance Ethernet (Twisted Pair/ThinWire)

Order Number	Description	Supported Operating Systems	Bus Slots Required/ Recommended Slot
DE435-AA	High-performance Ethernet BNE4G-02 for AUI BN26K-xx for 10BaseT (twisted pair) BC16M-xx for ThinWire	DEC OSF/1 AXP OpenVMS AXP Windows NT	One PCI/B
PBXDF-AA	Modem 14.4K	Windows NT	One ISA/C
DETTR-BA/BB	10BaseT to AUI (UTP to thick wire) single port adapter /repeater, 120/240V. 120 V variant includes North American power cord; order country-specific power cord for 240 V variant.	DEC OSF/1 AXP OpenVMS AXP Windows NT	N/A

Step 8—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information. The AlphaStation 200 has 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 Packaged and systems include Windows NT Workstation V3.5 media (CD-ROM), license, and documentation in shrink-wrapped package.
- DEC OSF/1 AXP and OpenVMS AXP Packaged and Base systems **require** operating system media and documentation for first system on site.

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8 DEC OSF/1 AXP media and documentation on CD-ROM
QA-MT4AA-GZ DEC OSF/1 AXP base hardcopy documentation
QA-MT4AB-GZ DEC OSF/1 AXP End User documentation
QA-MT5AA-GZ DEC OSF/1 AXP Developer's documentation
QA-MT6AA-GZ DEC OSF/1 AXP Server Extension documentation

Step 9—Software *(continued)*

DEC OSF/1 AXP Layered Products CD-ROM

DEC OSF/1 AXP systems include Multimedia Services license; order media and documentation separately. Media and documentation for Multimedia Services is included in Layered Products for DEC OSF/1 AXP CD-ROM.

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DEC Open3D for DEC OSF/1 AXP

DEC OSF/1 AXP systems include DEC Open3D license; media is included in factory installed software (FIS). Order media and documentation separately if required.

QA-0AFAA-H8 DEC Open3D for DEC OSF/1 AXP media and documentation

NAS 150 for DEC OSF/1 AXP

NAS 150 license is included with DEC OSF/1 AXP systems. Media available on layered products CD-ROM.
NAS 150 includes: DCE Runtime Services Kit, ObjectBroker, DECmessageQ for DEC OSF/1 AXP, Motif, NFS, TCP/IP.

OpenVMS AXP Media and Documentation

QA-MT1AP-H8 OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ OpenVMS AXP base hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DEC Open3D for OpenVMS AXP

OpenVMS AXP systems include DEC Open3D license; media is included in factory installed software (FIS). Order media and documentation separately if required.

QA-0ADAA-H8 DEC Open3D for OpenVMS AXP media and documentation

NAS 150 for OpenVMS AXP

NAS 150 license is included with OpenVMS AXP systems. Media available on layered products CD-ROM.

NAS 150 includes: DECwindows Motif for OpenVMS AXP, ObjectBroker (ACA Services), DECmessageQ for OpenVMS AXP, DECnet for OpenVMS AXP End System, DECnet/OSI for OpenVMS AXP End Node, DEC TCP/IP Client for OpenVMS AXP, DEC Runtime Services, VMScluster Client for OpenVMS AXP.

Support Serv ices Software for Microsoft Windows NT

Windows NT workstations with ZLXp-E graphics options (PBXGA-AN, -BN, -CN) include the following license, media, and documentation.

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

Step 10—Power Cords, Keyboards, Mouse, and Documentation

- Packaged systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord, U.S. keyboard, and documentation. Select country specific power cord and keyboard for **all** Packaged systems ordered in Europe.
- Base systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord. Select country specific power cord for **all** Base systems ordered in Europe.
- Keyboard and mouse must be ordered separately for **all** Base systems.
- An Installation Card (EK-PCDTA-II) is included with each system.

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

Power Cord	Keyboard	Country
BN19P-1K	**PCXAL-FA**	North American (English)
BN25U-2E	**PCXAL-FB**	Belgium (French)
BN19L-2E	**PCXAL-FD**	Denmark
BN25U-2E	**PCXAL-FP**	France
BN25U-2E		Swedish (Finish)
BN25U-2E	**PCXAL-FG**	Germany
BN24X-2E	**PCXAL-FI**	Italy
BN25U-2E	**PCXAL-FN**	Norway
BN25U-2E	**PCXAL-FV**	Portugal
BN25U-2E	**PCXAL-FS**	Spain
BN19E-2E	**PCXAL-FK**	Switzerland (French)
BN26D-2E	**PCXAL-FE**	U.K., Ireland
BN18L-2E		Israel (Hebrew)
BN22X-2E	**PCXAL-FA**	Africa, India (English)
BN19H-2E	**PCXAL-FA**	Australia, New Zealand (English)

Mouse

PCXAS-AA	PS/2 compatible 3-button Mouse

User Documentation

EK-PCDTA-UI	User Documentation—English
EK-PCDTA-UP	User Documentation—French
EK-PCDTA-UG	User Documentation—German
EK-PCDTA-UU	User Documentation—Italian
EK-PCDTA-US	User Documentation—Spanish
EK-PCDTA-UH	User Documentation—Dutch

Technical Documentation (Optional)

EK-PCDSA-TI	Technical Documentation

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**)

Hardware

- AlphaStation 200 systems include three-year hardware warranty (1st year on-site service, 5 x 9, next day response time; 2nd and 3rd years, return to Digital).
- Select optional Hardware Supplemental Support Services if required.

FM-ACXHW-36	Years 2 and 3, 5 x 9, Next day response time
FM-AC4HR-36	Years 1-3, 5 x 9, 4 Hour Response
FM-AC512-36	Years 1-3, 5 x 12, 4 Hour Response
FM-AC616-36	Years 1-3, 6 x 16, 4 Hour Response
FM-AC724-36	Years 1-3, 7 x 24, 4 Hour Response

Step 11—Hardware and Software Supplemental Support Services *(continued)*

Software

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software Supplemental Support Services for DEC OSF/1 AXP include advisory and remedial software support with new version license rights for DEC OSF/1 AXP, Open3D, Multimedia Services and NAS 150 for the time period indicated.
- Software Supplemental Support Services for OpenVMS AXP include advisory and remedial software support with new version license rights for OpenVMS AXP, Open3D and NAS 150 for the time period indicated
- Software Supplemental Support Services for Windows NT include advisory and remedial software support for the time period indicated.

FM-A2OSF-12	12-month Software Supplemental Support Services for **DEC OSF/1 AXP** systems
FM-A2OSF-36	36-month Software Supplemental Support Services for **DEC OSF/1 AXP** systems
FM-A2VMS-12	12-month Software Supplemental Support Services for **OpenVMS AXP** systems
FM-A2VMS-36	36-month Software Supplemental Support Services for **OpenVMS AXP** systems
FM-A2NTS-12	12-month Software Supplemental Support Services for **Windows NT** systems
FM-A2NTS-36	36-month Software Supplemental Support Services for **Windows NT** systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- DEC OSF/1 AXP systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System, Open3D, Multimedia Services and NAS 150.
- OpenVMS AXP systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System, Open3D and NAS 150.
- Select optional Supplemental Support Services if required.

- **Option A** upgrades hardware warranty to three year on-site service, 5 x 9, next day response time
- **Option B** upgrades hardware warranty on-site response time to 4-hours
- **Option C** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for DEC OSF/1 AXP Operating System, Open3D, Multimedia Services and NAS 150 **or** OpenVMS AXP Operating System, Open3D and NAS 150.

Alpha 200 4/166 MHz Packaged Systems

Option A	Option B	Option C	Supplemental Support Services for
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSH-36**	**DEC OSF/1 AXP** 32 Mbyte system (PB421-AB)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**OpenVMS AXP** 32 Mbyte system (PB420-AB)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**Windows NT** 32 Mbyte system (PB422-AB)
FM-X3HBE-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**Windows NT** 16 Mbyte system (PB422-BB)

AlphaStation 200 4/233 MHz Packaged Systems

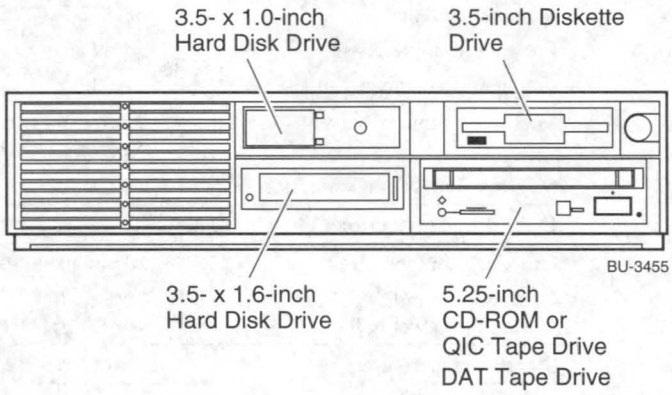
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSH-36**	**DEC OSF/1 AXP** 32 Mbyte system (PB430-AB)
FM-X3HBF-36	**FM-X3HDG-36**	**FM-X3DSH-36**	**OpenVMS AXP** 32 Mbyte system (PB431-AB)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSH-36**	**Windows NT** 32 Mbyte system (PB432-AB)

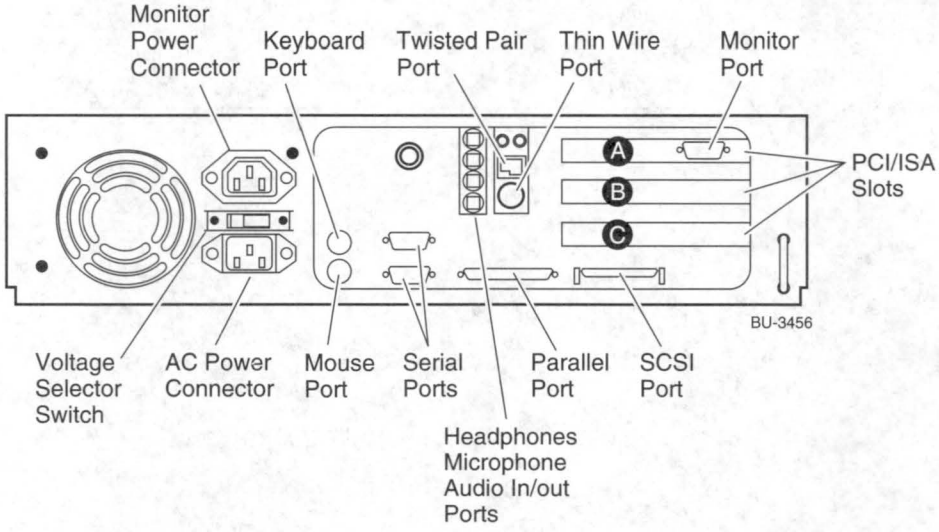
Alpha 200 4/166 MHz Base Systems

Option A	Option B	Option C	Supplemental Support Services for
FM-X3HBE-36	**FM-X3HDE-36**	**FM-X3DSG-36**	**DEC OSF/1 AXP** system (PB41A-AA)
FM-X3HBE-36	**FM-X3HDE-36**	**FM-X3DSF-36**	**OpenVMS AXP** system (PB41A-BA)
FM-X3HBE-36	**FM-X3HDE-36**	**FM-X3DSF-36**	**Windows NT** system (PB41A-CA)

AlphaStation 200 4/233 MHz Base Systems

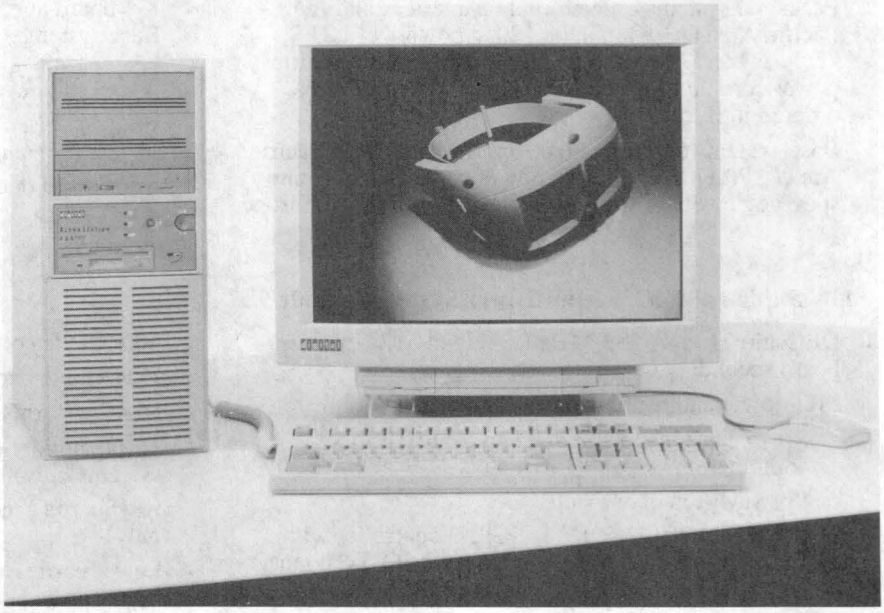
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSH-36**	**DEC OSF/1 AXP** system (PB42A-AA)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**OpenVMS AXP** system (PB42A-BA)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**Windows NT** system (PB42A-CA)


3.5- x 1.0-inch
Hard Disk Drive
3.5-inch Diskette
Drive
BU-3455
3.5- x 1.6-inch
Hard Disk Drive
5.25-inch
CD-ROM or
QIC Tape Drive
DAT Tape Drive


Monitor
Power
Connector
Keyboard
Port
Twisted Pair
Port
Thin Wire
Port
Monitor
Port
A
B
C
PCI/ISA
Slots
BU-3456
Voltage
Selector
Switch
AC Power
Connector
Mouse
Port
Serial
Ports
Parallel
Port
SCSI
Port
Headphones
Microphone
Audio In/out
Ports

Specifications

PCI	132-Mbyte/second
Fast SCSI-2 bus	10-Mbyte/s transfer rate
Ethernet	10-Mbit/s Twisted Pair/Thin Wire standard
Power Requirements	
Line voltage	120 V/240 V
Voltage tolerance	88-132 V / 176-264 V
Freqnency 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	180 W
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity Maximum wet bulb	20% to 80% relative mumidity 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 mumidity 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, 25ms halfsine
Physical Characteristics	**Pedestal**
Height	10 cm (4 inches)
Width	43 cm (17 inches)
Depth	41 cm (16 inches)
Weight	11-14 kg (25-30lb)



AlphaStation 400 4/233 Mini Tower Workstations

Product Description

The AlphaStation 400 4/233 is a Universal Client with 64-bit leadership performance and industry standard option support. It offers DEC OSF/1 AXP, OpenVMS AXP, and Microsoft Windows NT Workstation computing environments which provide access to tens of thousands of applications. The Alpha AXP processor delivers the power that Workstation users expect. The mini tower enclosure, which may fit on top or under a desk, accepts industry standard PCI and ISA options available from Digital and third parties providing open hardware and open software for changing business needs.

The AlphaStation 400 4/233 uses the DECchip 21064A processor running at 233 MHz, measuring 157.6 SPECint92 and 183.8 SPECfp92 with the ability to support high-speed options simultaneously.

The AlphaStation 400 4/233 is the system of choice for the most intensive applications in technical and commercial environments. Applications such as ECAD, MCAD, CAE, CASE, Imaging, Multimedia, Desktop Publishing, Finance, Scientific R&D, and Process Control will demonstrate the power and capabilities of this system.

The high-performance PCI I/O bus, running at 132 MB/sec, provides expansion for options such as high performance graphics, networking and SCSI adapters. Lower performance options are supported on the ISA bus. Memory can be increased up to 192 Mbytes to allow compute intensive applications to run without memory limitations. The system supports five internal storage devices to provide flexibility in configuring a system with diskette, tape, compact disk, and hard disk drives. Additional external expansion is supported on an optional PCI-based Fast SCSI-2 controller providing a maximum storage of up to 29.4 Gbytes.

Investment protection is key with the AlphaStation 400 4/233. This system comes with the best hardware warranty in the industry—a three year warranty. Digital's ADVANTAGE-UPGRADE Program provides a cost-effective upgrade path for users of older workstations.

Step 1—Systems

Select system.

- Packaged systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord, U.S. keyboard and documentation. Select country specific power cord and keyboard for **all** Packaged systems ordered in Europe.
- Base systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord. Select country specific power cord for Base systems ordered in Europe.
- Keyboard and mouse must be ordered separately for **all** Base systems.
- DEC OSF/1 AXP and OpenVMS AXP Packaged systems include factory-installed software (FIS).
- Windows NT Packaged and Base systems include Windows NT Workstation V3.5 media (CD-ROM), license and documentation in shrink-wrapped package.
- Options ordered will be factory installed unless specified as **spares**.

AlphaStation 400 4/233 Mini Tower Systems include

- DECchip 21064A 233-MHz CPU with 512 Kbyte on-board secondary cache
- Mini tower enclosure which includes
  - Six expansion slots: 2 PCI slots, 1 PCI/ISA combination slot and 3 ISA slots
  - Six SIMM memory slots
  - Integrated PCI-based Fast SCSI-2 controller with Direct Memory Access and external SCSI-2 connector
  - 300-watt power supply, switch selectable between 120 V and 240 V
  - Two serial ports
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- Memory (Packaged systems only)
- 1.44-Mbyte diskette drive
- 600-Mbyte compact disk drive (Packaged systems only)
- 1.05-Gbyte hard disk drive (Packaged systems only)
- High-performance Ethernet (Packaged systems only)
- 16-bit audio, headphone, and microphone (Packaaged systems only)
- Keyboard (Americans and APA Packaged system orders only)
- Power cord (Americans and APA orders only)
- Three-button mouse (Packaged systems only)
- 3-year Hardware Warranty*
- Hardware documentation
- DEC OSF/1 AXP 2-user base license, DEC Open3D license, Multimedia Services license, NAS 150 license, **or** OpenVMS AXP base license, DEC Open3D license, NAS 150 license, **or** Windows NT Workstation V3.5 kit

*See Step 11 Hardware and Software Supplemental Support Services for additional information

Packaged systems

Order Number	Operating System	Memory	Graphics	Monitor	Sound Card, Headphone, Microphone	Hard Disk Drive/ CD-ROM	Ethernet
PB520-AA/AB	DEC OSF/1 AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included[3]	1.05 GB/600 MB	Included[4]
PB521-AA/AB	OpenVMS AXP	32 Mbytes	ZLXp-E1 8-plane 2D/3D[1]	Optional	Included[3]	1.05 GB/600 MB	Included[4]
PB522-AA/AB	Windows NT	32 Mbytes	ZLXp-E1 8-plane 2D/3D[2]	Required	Included[3]	1.05 GB/600 MB	Included[4]

[1] 8-plane, 2 Mpixel PCI graphics 1280 x 1024 72 Hz (PBXGA-AA for DEC OSF/1 AXP and OpenVMS AXP systems); uses one PCI slot
[2] 8-plane, 2 Mpixel PCI graphics 1280 x 1024 72 Hz (PBXGA-AN for Windows NT systems); uses one PCI slot
[3] AlphaStation Sound Card, headphone, and microphone (PBXJA-AB); uses one ISA slot
[4] High-performance PCI Ethernet (DE435-AA); uses one PCI slot
Note: xA = 120 V, xB = 240 V

Base systems

- Windows NT Base systems require a minimum of 16 Mbytes of memory and one hard disk drive. Windows NT software media is distributed on CD-ROM only, selection of a CD-ROM drive is recommended.
- DEC OSF/1 AXP and OpenVMS AXP Base systems require a minimum of 32 Mbytes of memory and 535 Mbyte hard disk drive. Select graphics option and monitor for DEC OSF/1 AXP and OpenVMS AXP systems if required.
- Select keyboard, mouse and user documentation for **all** Base systems.

Order Number	Operating System	Memory	Graphics	Monitor	Sound Card, Headphones, Microphone	Hard Disk Drive	CD-ROM	Ethernet
PB51A-AA	DEC OSF/1 AXP	Required	Recommended	Optional	Optional	Required	Optional	Optional
PB51A-BA	OpenVMS AXP	Required	Recommended	Optional	Optional	Required	Optional	Optional
PB51A-CA	Windows NT	Required	Required	Optional	Optional	Required	Recommended	Optional

Step 2—Monitors

- Video adapter included in Packaged systems support 1024 x 768 and 1280 x 1024 resolution, 72-Hz monitors.
- Windows NT systems require a graphics monitor to run **all** functions. A graphics adapter and monitor are recommended for DEC OSF/1 AXP and OpenVMS AXP Base systems

VRC15-PA/P4	15-inch color monitor, 120 V, 240 V N.H./S.H., SVGA, 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes jumper power cord video cable, and 120 V power cord.
VRT17-PA/P4	17-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.
VRC21-PA/P4	21-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.

Step 3—Memory

Six SIMM slots support three memory options (3 SIMM pairs) for maximum of 192 Mbytes. Memory pairs can be mixed.

- DEC OSF/1 AXP and OpenVMS AXP systems required minimum of 32 Mbytes memory. Additional memory may be required for some applications.
- Windows NT systems **require** minimum of 16 Mbytes; 32 Mbyte is **recommended** if running MS-DOS and Windows V3.1 applications within Windows NT *Windows-on-Windows* environment.

MSP01-AA	8-Mbyte (2 x 4-Mbyte 70ns SIMMs)
MSP01-AB	16-Mbyte (2 x 8-Mbyte 70ns SIMMs)
MSP01-AC	32-Mbyte (2 x 16-Mbyte 70ns SIMMs)
MSP01-AD	64-Mbyte (2 x 32-Mbyte 70ns SIMMs)

Note: 192 Mbytes of memory can only be obtained by starting with a 64-Mbyte system

Step 4—Storage—see system diagram for recommended slot(s) for storage devices

Select storage devices if required.

- Integrated PCI-based Fast SCSI-2 controller supports up to seven Fast SCSI-2 devices, four of which may be internal.
- DEC OSF/1 AXP and OpenVMS AXP Packaged systems include factory-installed software (FIS) on 1.05 Gbyte hard disk drive.
- DEC OSF/1 AXP and OpenVMS AXP Base systems require a minimum of one 535 Mbyte hard disk drive.
- Windows NT Packaged systems include Windows NT Workstation V3.5 media kit.
- Windows NT Base systems require CD-ROM and a minimum of one 535 Mbyte hard disk drive.

Step 4a—Internal Storage

- System enclosure supports five storage devices: one dedicated diskette drive slot, three front accessible 5.25-inch slots for removable media (tapes or CD-ROM) or hard disk drives, and one internal 3.5-inch hard disk drive slot, see system diagram.
- Systems include one 1.44 Mbyte diskette drive.
- Software distribution is only available on CD-ROM.

Removable Media Devices

Order Number	Description
PBXRD-AA	600-Mbyte 5.25-inch half-height dual-speed CD-ROM drive
PBXTL-AA	4.0-Gbyte 3.5-inch half-height 4-mm DAT drive
PBXTZ-AA	2.0-Gbyte 5.25-inch half-height QIC tape drive

Hard Disk Drives

Order Number	Description
PBXRZ-AA	340-Mbyte 3.5-inch half-height hard disk drive (Windows NT systems only)
PBXRZ-BA	535-Mbyte 3.5-inch half-height hard disk drive
PBXRZ-EA	1.05-Gbyte 3.5-inch half-height hard disk drive

PBXRZ-HA	2.1-Gbyte 3.5-inch half-height hard disk drive

Step 4b—External Storage

Systems support three external devices on integrated PCI-based Fast SCSI-2 controller when four devices are installed in system enclosure. Seven external SCSI devices are supported if storage devices are not installed in system enclosure. Select PCI-based Fast SCSI-2 controller option card if additional external storage is required.

PCI-based Fast SCSI-2 Controller

- Select one additional Fast SCSI-2 controller
- PCI-based Fast SCSI-2 controller supports 7 additional external devices

KZPAA-AA	PCI-based Fast SCSI-2 controller—requires one PCI slot

Single Drive Tabletop 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).

TLZ06-FA	4.0-Gbyte 3.5-inch half-height 4-mm DAT tape drive
RRD43-FA	600-Mbyte 5.25-inch half-height dual-speed CD-ROM

StorageWorks Expansion Units (BA350 and BA353)

- BA350 Deskside Expansion Unit supports maximum of seven 3.5-inch half-height or two 5.25-inch SCSI devices
- BA353 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
- BA350 and BA353 Expansion units include North American power cord, order country-specific power cord for 240 V use
- Order SCSI cable separately; (BN21H-xx) system box to BA350/BA353

StorageWorks BA350 Deskside Expansion Unit

BA350-KB	StorageWorks deskside expansion unit includes: BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and North American power cord

StorageWorks BA353 Desktop Expansion Box

BA353-AA	StorageWorks desktop expansion box

Supported SCSI devices

SCSI devices may be purchased separately and are customer installable.

		BA353	BA350
RZ25L-VA	535-Mbyte 3.5-inch half-height disk drive	X	X
RZ26L-VA	1.0-Gbyte 3.5-inch half-height disk drive	X	X
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive	X	X
RRD43-VA	600-Mbyte 5.25-inch half-height compact disk drive		X
RRD43-VU*	600-Mbyte 5.25-inch half-height compact disk drive		X

* 600-Mbyte CD-ROM drive can be added to RRD43-VA or TZK11-VA for a total of two 5.25-inch drives in one carrier.

Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations.

Step 5—Graphics Options and Multi-Screen Options

Graphics Options

- Packaged systems include graphics option
- Windows NT Base systems require graphics option and monitor to run all functions
- Graphics option is recommended for DEC OSF/1 AXP and OpenVMS AXP Base systems

Multi-Screen Options (DEC OSF/1 AXP and OpenVMS AXP systems only)

- DEC OSF/1 AXP and OpenVMS AXP systems support a maximum of three graphics cards and three monitors
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse
- Monitor cables are included with each monitor
- Add graphics card for each additional monitor, provided there are free PCI slots
- Multi-screen PCI graphics options are **not** supported onWindows NT systems

Order Number	Description	Supported Operating System	Bus Slots Required/ Recommended Slot*
PBXGA-AA†	ZLXp-E1 8-plane, PCI graphics accelerator, 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/1, 2, 3a
PBXGA-BA†	ZLXp-E2 24-plane, PCI graphics accelerator. 2 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/1, 2, 3a
PBXGA-CA†	ZLXp-E3 24-plane, PCI graphics accelerator, 24-bit Z-buffer, 4 Mpixels, 1280 x 1024 x 256 colors, 72 Hz	DEC OSF/1 AXP, OpenVMS AXP	One PCI/1, 2, 3a
PBXGA-AN††	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††	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††	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
PBXGA-JA	DEC864, Entry Level graphics, with 2-Mbyte DRAM, 1280 x 1024 x 256 colors, 72 Hz	Windows NT	One PCI/1, 2, 3a
MSP01-DA	2-Mbyte DRAM upgrade for PB2GA-JA	Windows NT	—

* See system diagram

† Multi-screen graphics options for DEC OSF/1 AXP and OpenVMS AXP systems. Options require DEC Open3D media which is included in factory installed software (FIS)

†† Graphics options include ZLXp-E Support Services Software for Microsoft Windows NT license, media, and documentation

Step 6—AlphaStation Sound Option

- Packaged systems include AlphaStation sound option.
- Select AlphaStation sound option for Base systems if required.
- DEC OSF/1 AXP systems support audio through Multimedia Services for DEC OSF/1 AXP which is preloaded on all DEC OSF/1 AXP systems.
- OpenVMS AXP systems include an audio driver and example runtime library.
- Windows NT systems include audio support in operating system.

Order Number	Description	Bus Slots Required
AVA01-AA	16-bit stereo sound system. Jacks, headphone, microphone, Line-in, Line-out.	One ISA
AVH01-AA	Replacement headphone and microphone	—

Step 7—Communications and Miscellaneous Adapters

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

Order Number	Description	Supported Operating Systems	Bus Slots Required / Recommended Slot
DE435-AA	High-Performance Ethernet. Select AUI (Thick wire), 10BaseT (Twisted Pair) or ThinWire networking cable BNE4G-02 for AUI BN26K-xx for 10BaseT (twisted pair) BC16M-xx for ThinWire	DEC OSF/1 AXP OpenVMS AXP Windows NT	One PCI/1, 2, 3a
PBXDF-AA	Modem 14.4K	Windows NT	One ISA/3b, 4, 5, 6

Step 8—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information. The AlphaStation 400 4/233 has 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

Software Processor Code = E

- Windows NT Packaged systems include Windows NT Workstation V3.5 media (CD-ROM), license, and documentation in shrink-wrapped package
- DEC OSF/1 AXP and OpenVMS AXP systems **require** operating system media and documentation for first system on site

DEC OSF/1 AXP Licenses

QL-MT7A9-BB	DEC OSF/1 AXP 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP 16-user license
QL-MT7AE-AA	DEC OSF/1 AXP unlimited user license
QL-MT6AE-AA	DEC OSF/1 AXP server extension license
QL-MT5AE-AA	DEC OSF/1 AXP C developer's extension license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and documentation (end user, developer, server) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation
QA-MT4AB-GZ	DEC OSF/1 AXP end user documentation
QA-MT5AA-GZ	DEC OSF/1 AXP developer's documentation
QA-MT6AA-GZ	DEC OSF/1 AXP server extension documentation

DEC OSF/1 AXP Layered Products CD-ROM

DEC OSF/1 AXP systems include Multimedia Services license, order media and documentation separately. Media and documentation for Multimedia Services is included in Layered Products for DEC OSF/1 AXP CD-ROM.

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP (CD-ROM)

DEC Open3D for DEC OSF/1 AXP

DEC OSF/1 AXP systems include DEC Open3D license, media is included in factory installed software (FIS). Order media and documentation separately if required.

QA-0AFAA-H8 DEC Open3D for DEC OSF/1 AXP media and documentation

Step 9—Software *(continued)*

NAS 150 for DEC OSF/1 AXP

NAS 150 license is included with DEC OSF/1 AXP systems. Media available on layered products CD-ROM
NAS 150 includes: DCE Runtime Services Kit, ObjectBroker, DECmessageQ for DEC OSF/1 AXP.

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture specific, and **cannot** be shared across a mixed OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AE-AA	OpenVMS AXP unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

OpenVMS AXP Media and Documentation

QA-MT1AP-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP base hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DEC Open3D for OpenVMS AXP

OpenVMS AXP systems include DEC Open3D license, media is included in factory installed software (FIS). Order media and documentation separately if required.

QA-0ADAA-H8	DEC Open3D for OpenVMS AXP media and documentation

NAS 150 for OpenVMS AXP

NAS 150 license is included with OpenVMS AXP systems. Media available on layered products CD-ROM

NAS 150 includes: DECwindows Motif for OpenVMS AXP, ObjectBroker (ACA Services), DECmessageQ for OpenVMS AXP, DECnet for OpenVMS AXP End System, DECnet/OSI for OpenVMS AXP End Node, DEC TCP/IP Client for OpenVMS AXP; DCE Runtime Services, VMScluster Client for OpenVMS AXP.

Support Services Software for Microsoft Windows NT

Windows NT workstations with ZLXp-E graphics options (PBXGA-AN, -BN, -CN) include the following license, media and documentation.

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

Step 10—Power Cords, Keyboards, Mouse, and Documentation

- Packaged systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord, U.S. keyboard, and documentation. Select country specific power cord and keyboard for **all** Packaged systems ordered in Europe.
- Base systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord. Select country specific power cord for **all** Base systems ordered in Europe.
- Keyboard and mouse must be ordered separately for **all** Base systems.

Power Cord	Keyboard	Country
BN19P-1K	**PCXAL-FA**	North America, Japan (English)
BN25U-2E	**PCXAL-FB**	Belgium (French)
BN19L-2E	**PCXAL-FD**	Denmark
BN25U-2E	**PCXAL-FP**	France
BN25U-2E		Sweden (Finnish)
BN25U-2E	**PCXAL-FG**	Germany
BN24X-2E	**PCXAL-FI**	Italy
BN25U-2E	**PCXAL-FN**	Norway
BN25U-2E	**PCXAL-FV**	Portugal
BN25U-2E	**PCXAL-FS**	Spain
BN19E-2E	**PCXAL-FK**	Switzerland (French)
BN26D-2E	**PCXAL-FE**	U.K., Ireland
BN18L-2E		Israel (Hebrew)
BN22X-2E	**PCXAL-FA**	Africa, India (English)
BN19H-2E	**PCXAL-FA**	Australia, New Zealand (English)

Mouse

PCXAS-AA	PS/2 compatible 3-button Mouse

User Documentation and CPU Documentation—select one of each for 240 V systems

User Documentation	CPU Documentation	
EK-PCDSA-UI	**EK-PCDSA-CI**	User Documentation – CPU Documentation—English
EK-PCDSP-UI	**EK-PCDSP-CI**	User Documentation – CPU Documentation—French
EK-PCDSG-UI	**EK-PCDSG-CI**	User Documentation – CPU Documentation—German
EK-PCDSI-UI	**EK-PCDSI-CI**	User Documentation – CPU Documentation—Italian
EK-PCDSS-UI	**EK-PCDSS-CI**	User Documentation – CPU Documentation—Spanish
EK-PCDSH-UI	**EK-PCDSH-CI**	User Documentation – CPU Documentation—Dutch
EK-PCDSY-UI	**EK-PCDSY-CI**	User Documentation – CPU Documentation—Japanese

Technical Documentation (Optional)

EK-PCDSA-TI	Technical Documentation

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

- Systems include three-year hardware warranty (1st year on-site service, 5 x 9, next day response time; 2nd and 3rd years, return to Digital).
- Select optional Hardware Supplemental Support Services if required.

FM-ACXHW-36	Years 2 and 3, 5 x 9, Next day response time
FM-AC4HR-36	Years 1-3, 5 x 9, 4 Hour Response
FM-AC512-36	Years 1-3, 5 x 12, 4 Hour Response
FM-AC616-36	Years 1-3, 6 x 16, 4 Hour Response
FM-AC724-36	Years 1-3, 7 x 24, 4 Hour Response

Step 11—Hardware and Software Supplemental Support Services *(continued)*

Software

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software Supplemental Support Services for DEC OSF/1 AXP include advisory and remedial software support with new version license rights for DEC OSF/1 AXP, Open3D, Multimedia Services and NAS 150 for the time period indicated.
- Software Supplemental Support Services for OpenVMS AXP include advisory and remedial software support with new version license rights for OpenVMS AXP, Open3D and NAS 150 for the time period indicated
- Software Supplemental Support Services for Windows NT include advisory and remedial software support for the time period indicated.

FM-A4OSF-12	12-month Software Supplemental Support Services for **DEC OSF/1 AXP** systems
FM-A4OSF-36	36-month Software Supplemental Support Services for **DEC OSF/1 AXP** systems
FM-A4VMS-12	12-month Software Supplemental Support Services for **OpenVMS AXP** systems
FM-A4VMS-36	36-month Software Supplemental Support Services for **OpenVMS AXP** systems
FM-A4NTS-12	12-month Software Supplemental Support Services for **Windows NT** systems
FM-A4NTS-36	36-month Software Supplemental Support Services for **Windows NT** systems

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

Hardware and Software

- Systems include three-year hardware warranty (1st year on-site service, 5 x 9, next day response time; 2nd and 3rd years, return to Digital).
- DEC OSF/1 AXP systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System, Open3D, Multimedia Services and NAS 150.
- OpenVMS AXP systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System, Open3D and NAS 150.
- Select optional Supplemental Support Services if required.

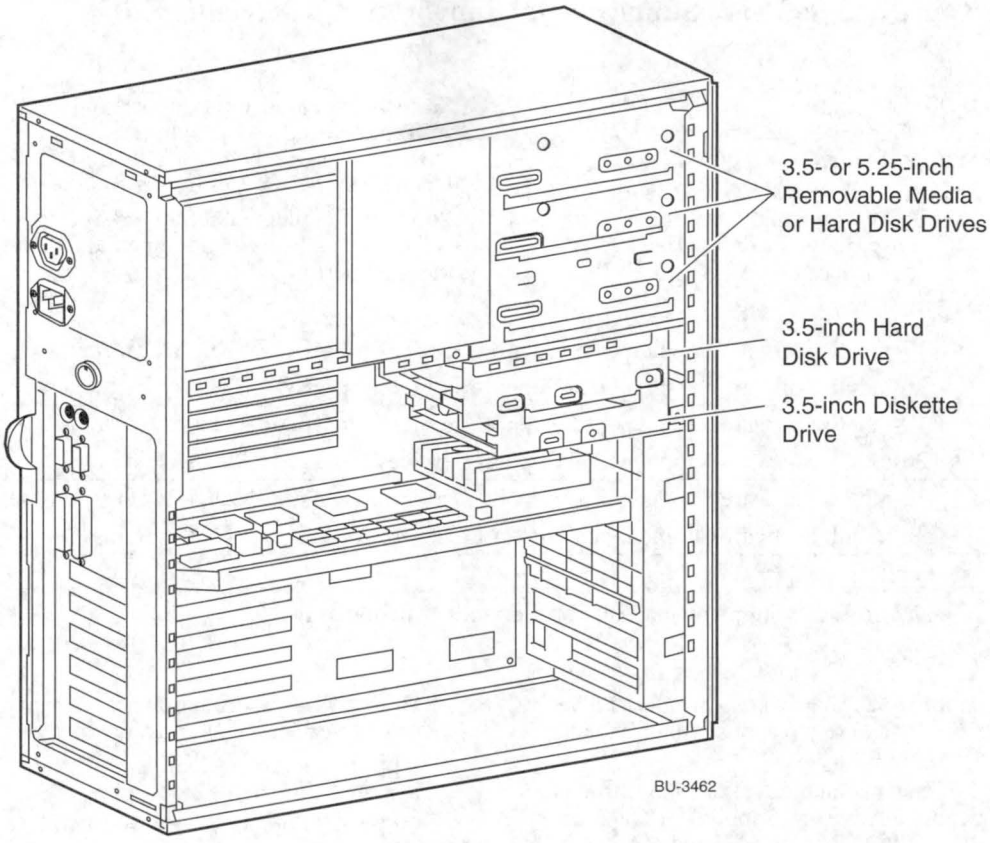
- **Option A** upgrades hardware warranty to three year on-site service, 5 x 9, next day response time
- **Option B** upgrades hardware warranty on-site response time to 4-hours
- **Option C** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for DEC OSF/1 AXP Operating System, Open3D, Multimedia Services and NAS 150 **or** OpenVMS AXP Operating System, Open3D and NAS 150.

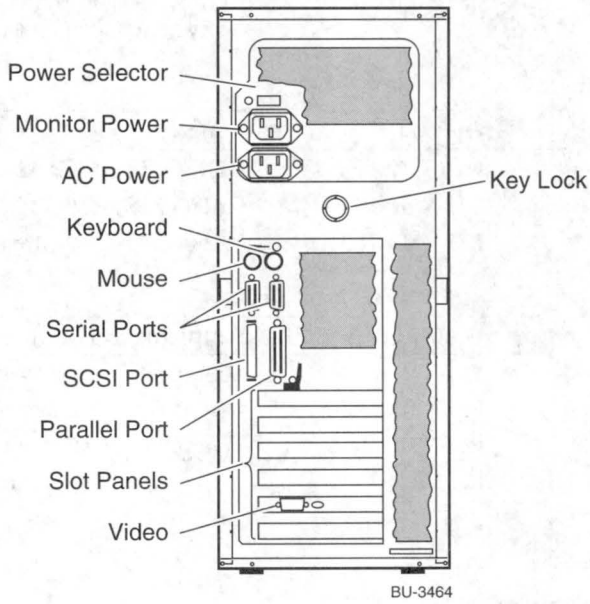
Alpha 400 4/233 Packaged Systems

Option A	Option B	Option C	Supplemental Support Services for
FM-X3HBG-36	**FM-X3HDG-36**	**FM-X3DSI-36**	**DEC OSF/1 AXP** 32 Mbyte system (PB520-AB)
FM-X3HBG-36	**FM-X3HDG-36**	**FM-X3DSH-36**	**OpenVMS AXP** 32 Mbyte system (PB521-AB)
FM-X3HBG-36	**FM-X3HDG-36**	**FM-X3DSH-36**	**Windows NT** 32 Mbyte system (PB522-AB)

Alpha 400 4/233 Base Systems

Option A	Option B	Option C	Supplemental Support Services for
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSH-36**	**DEC OSF/1 AXP** system (PB51A-AA)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**OpenVMS AXP** system (PB51A-BA)
FM-X3HBF-36	**FM-X3HDF-36**	**FM-X3DSG-36**	**Windows NT** system (PB51A-CA)

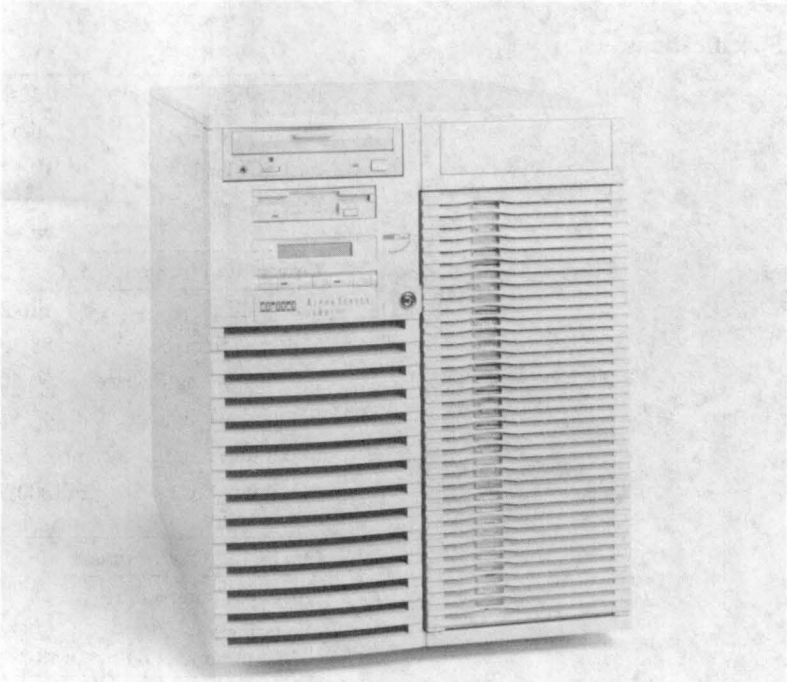




Enclosure – Rear

Specifications

PCI	132-Mbyte/second
ISA	16-Mbyte/second
Fast SCSI-2 bus	10-Mbyte/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 mumidity 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 mumidity 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, 25ms halfsine
Physical Characteristics	**Mini Tower**
Height	43 cm (17 inches)
Width	18 cm (7 inches)
Depth	43 cm (17 inches)
Weight	12+ kg (28+ lb)



AlphaServer 1000 4/200 Systems

Product Description

The AlphaServer 1000 4/200 system is a 200 MHz Alpha AXP uniprocessor server, with a 2-Mbyte ECC cache, in a deskside wide-tower enclosure. For investment protection, customers get a choice of three popular operating systems: DEC OSF/1 AXP, OpenVMS AXP and Microsoft Windows NT Server. The AlphaServer 1000 4/200 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 systems offer server management features such as heat sensor, fan failure sensor, and power supply sensors. Remote management can be handled via a simple serial link. AlphaServer 1000 systems include a LCD operator control panel.

The AlphaServer 1000 offers provision for up to 10 internal storage devices including a floppy diskette drive and a CD-ROM. It supports up to 512 Mbytes of memory and over 14 Gbytes of interal storage with seven 2.1-Gbyte disks. It includes the provision for a tape drive, support for Wide SCSI devices, and up to seven hot swap StorageWorks disk drives.

Integrated on the AlphaServer 1000 system motherboard are an SVGA controller, diskette controller, two serial ports, one parallel port, keyboard, and mouse controller.

High reliability features, combined with simple management features, make the AlphaServer 1000 ideal for organizations with little or no MIS support. Business-critical applications can run unattended and the management features provide early indications of potential system failures.

Remote diagnosis allows a system administrator to call in, remotely run the diagnostics, configure the system, recommend a fix, or pull the right part. Support costs are reduced because on-site visits and service calls are minimized.

The AlphaServer 1000 provides large system features and performance at small system prices. Its daughter-card CPU architecture is designed to be compatible with future generations of Alpha AXP chips; it can be easily upgraded for higher performance. AlphaServer 1000 systems are available in three flexible packages, Deskside wide tower enclosure, Rackmount and Cabinet. Rackmount and Cabinet systems are covered in separate menus.

Step 1—Systems

Select system.

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V U.S. power cord unless alternate is specified. Select country specific power cord for **all** systems ordered in Europe.
- Windows NT systems include Windows NT Server plus 5-client access, V3.5 media (CD-ROM) and license in shrink-wrapped package
  - Windows NT systems ordered in the Americas and Asia Pacific Area (APA) include 120 V North American keyboard. Order country specific keyboard for all systems ordered in Europe.
- DEC OSF/1 AXP and OpenVMS AXP systems include factory installed software on 2.1-Gbyte hard disk drive.
  - Select country specific keyboard for DEC OSF/1 AXP and OpenVMS AXP if graphics option and monitor are selected. Keyboard is not required if monitor is selected.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- Options ordered will be factory installed unless specified as **spares**.

AlphaServer 1000 4/200 Systems include

- DECchip 21064 200-MHz CPU with 2-Mbyte ECC onboard cache
- Pedestal enclosure which includes:
  - 10 expansion slots: Seven EISA slots, two PCI slots and one PCI/EISA combination slot
  - Integrated PCI-based Fast SCSI-2 controller with DMA and external SCSI-2 connector
  - Integrated SVGA graphics controller (supported on Windows NT and DEC OSF/1 AXP systems)
  - 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 disk drive slots
  - 400-Watt power supply
  - Two serial ports, support full modem control
  - One bi-directional enhanced parallel port
  - PS/2 style keyboard port and mouse port
- 64 Mbytes of memory
- 1.44-Mbyte diskette drive (RX23L) in dedicated slot
- 600-Mbyte (RRD43) CD-ROM–uses one removable media slot
- 2.1-Gbyte hard disk drive (RZ28-VA)–uses one storage assembly slot
- 2-button mouse (Windows NT systems)
- 3-button mouse (DEC OSF/1 AXP and OpenVMS AXP systems)
- High-performance Ethernet DE435-AA–uses one PCI slot
- Customer documentation (Americas and APA sytems)
- 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, V3.5 media kit, **or** DEC OSF/1 AXP 2-user base license and NAS 200 license, **or** OpenVMS AXP base license plust 1-user license and NAS 200 license

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

Order Number	Operating System	Memory	Storage	Monitor	Graphics	Ethernet
PB70B-AA/AB	Windows NT Server	64 Mbytes	1 x 2.1 GB	Required	Included	Included
PB70B-FA/FB	DEC OSF/1 AXP	64 Mbytes	1 x 2.1 GB	Optional	Included	Included
PB70B-MA/MB	OpenVMS AXP	64 Mbytes	1 x 2.1 GB	Optional	Optional†	Included

† EISA Configuration Utility (ECU) is accessible via the console port for OpenVMS AXP systems
Note: xA = 120V and xB = 240V

Step 2—Memory

- System includes 64-Mbyte memory, one PB7MA-AC memory kit.
- System supports four memory kits (each kit includes five industry-standard SIMMs, the fifth SIMM in each kit is for ECC support.
- System maximum of 512 Mbytes can only be obtained by replacing 64-Mbyte (standard in all systems) with 128-Mbyte memory kit.

PB7MA-AA	16-Mbyte 70ns (5 x 4 Mbyte SIMMs) memory kit
PB7MA-AB	32-Mbyte 70ns (5 x 8 Mbyte SIMMs) memory kit
PB7MA-AC	64-Mbyte 70ns (5 x 16 Mbyte SIMMs) memory kit
PB7MA-AD	128-Mbyte 70ns (5 x 32 Mbyte SIMMs) memory kit

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 DEC OSF/1 AXP and OpenVMS AXP systems. Optional graphics capability is available. Select graphics adapter, monitor, country specific keyboard and mouse for DEC OSF/1 AXP and OpenVMS AXP systems if required.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system
  DEC OSF/1 AXP supports 640 x 480 x 16 @ 60 Hz
  Windows NT supports 640 x 480 x 16 @ 60 Hz, 640 x 480 x 256 @ 60 Hz, 800 x 600 x 16 @ 72 Hz, 800 x 600 x 256 @ 72 Hz, 1024 X 768 X 16 @ 72 Hz.

VRC15-PA/P4	15-inch color monitor, 120 V, 240 V N.H./S.H., SVGA, 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes jumper power cord and video cable.
VRT17-PA/P4	17-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.
VRC21-PA/P4	21-inch high-resolution color monitor, 120 V, 240 V N.H./S.H., 1280 x 1024 resolution, multi-sync, MPR2, Energy Star compliant, includes video cable and North American power cord. Order country-specific power cord for 240 V use from Step 10.

Step 4—Storage

- Select storage devices if required.
- Integral Fast SCSI-2 controller supports maximum of seven devices; two internal 5.25-inch removable media devices, four internal 3.5-inch, RZ26L/RZ28 disk drives, and one external storage device.

Step 4a—Internal Storage

- System enclosure supports ten storage devices: One dedicated diskette drive slot, two removable media slots, and seven 3.5-inch disk drives (RZ26L/RZ28) in internal storage assembly
- Systems include:
  - One 1.44 Mbyte diskette drive
  - One CD-ROM
  - One 2.1 Gbyte hard disk drive
- Internal storage assembly supports seven 3.5-inch disk drives (RZ26L/RZ28) **only**.
- 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.
- Select SCSI cable kit (PB7HA-AA) for split bus mode or for second controller.
- Additional SCSI adapter is required to support internal storage assembly if set for single-bus mode.
- See Storage Diagrams for details.

Removable Media Devices

PBXRD-AA	600-Mbyte, 5.25-inch half-height CD-ROM (RRD43) drive
PBXRD-BA	600-Mbyte, 5.25-inch half-height CD-ROM (RRD44) drive
TZK10-MF	525-Mbyte, 5.25 inch half-height SCSI QIC tape drive
TZK11-MF	2.0-Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-MF	4.0-Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-VA	1.05-Gbyte, 3.5-inch half-height disk drive
RZ28 -VA	2.1-Gbyte, 3.5-inch half-height disk drive

Step 4b—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- KZESC-xx options **require** SCSI cable kit (PB7HA-AA).
- Maximum of three PCI-based Fast SCSI controllers (KZPAA-AA) supported.
- Maximum number of **each** EISA-based storage controller supported per system:
  - Two KZESC-xx (One- and three-port controllers)
  - Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots
- Each controller requires one bus slot
- External SCSI cables are **not** included and must be ordered separately (see Step 4d)
- External DSSI cables are **not** included and must be ordered separately (see Step 4d)
- See Storage Diagrams for details.

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit.
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit.
KZPAA-AA	PCI-based one-port high-performance Fast SCSI-2 controller
KFESA-AA†	EISA-based single-DSSI controller (OpenVMS AXP systems only)

* See Chapter 8, *Storage Devices*, for additional information on StorageWorks RAID Array 210 Subsystems

† Not supported as boot device. DSSI/SCSI controller (HSD05-xx) is not supported in internal storage assembly due to physical constraint.

Step 4c—External Expansion

- Integral Fast 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 Fast SCSI-2 controller (KZPAA-AA), maximum external bus length including cable and tape device cannot exceed 3.0 meter.
- External tape drives are not supported on one- and three-port (KZESC-xx) high performance Fast-SCSI-2 controllers.
- Each tabletop tape device **requires** a three-foot SCSI cable (BC09D-03).

External Tapes support on Windows NT servers

TLZ06-FA	4.0 Gbyte 4mm DAT tabletop tape drive
TLZ6L-DA*	16.0-48.0 Gbyte 4-mm DAT autoloader

External Tapes support on DEC OSF/1 AXP and OpenVMS AXP servers

TLZ06-FA	4.0 Gbyte 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0-48.0 Gbyte 4-mm DAT autoloader
TZK11-DA	2.0 Gbyte 5.25-inch tabletop QIC tape drive

* Includes four cartridge loader. Larger magazines are supported.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, Storage Devices, for details.

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals are supported on all Fast SCSI-2 controllers.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port (KZESC-xx) controllers.
- Order BN21H-02 cable to connect a single BA350 modular storage pedestal to controllers.

StorageWorks BA350 Modular Storage Pedestal

BA350-KB	Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx).

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices.

Step 4d—SCSI and DSSI Cables

SCSI

- One-port StorageWorks RAID Array 210 controller (KZESC-AA) options use BC25R-3B for internal connection or BN21H-02 SCSI cable (or cable supplied with device) for external connection.
- Three-port StorageWorks RAID Array 210 controller (KZESC-BA) options use one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection.
- PCI-based Fast SCSI-2 controller (KZPAA-AA) options use BC24R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection.

DSSI

- EISA-based DSSI controller (KFESA-AA) uses "Micro-Ribbon" connection.
- KFESA to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC22Q-xx DSSI cable.
- KFESA to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx DSSI cable.
- KFESA 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.
- KFESA to HSD05 requires BC29S-xx.
- HSD05 to HSD05 (inside system) requires BC29U-02.
- HSD05 to HSD05 (between systems) requires BC29T-09.
- HSD05 to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC29R-xx.
- HSD05 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 5—Graphics Adapters

- DEC OSF/1 AXP and Windows NT systems support the integrated SVGA graphics controller with the following monitors:
  DEC OSF/1 AXP supports 640 x 480 x 16 @ 60 Hz monitors
  Windows NT supports 640 x 480 x 16 @ 60 Hz, 640 x 480 x 256 @ 60 Hz, 800 x 600 x 16 @ 72 Hz, 800 x 600 x 256 @ 72 Hz, 1024 X 768 X 16 @ 72 Hz.
- EISA Configuration Utility (ECU) is accessible via the console port for DEC OSF/1 AXP and OpenVMS AXP systems. Optional graphics capability is available. Select graphics adapter, monitor, and country specific keyboard for DEC OSF/1 AXP and OpenVMS AXP systems if required.

PB2GA-AA	EISA-based VGA Qvision 1024 x 768 graphics adapter (Windows NT, DEC OSF/1 AXP, OpenVMS AXP systems)
PB2GA-HA	PCI-based VGA Qvision 1024 x 768 graphics adapter (DEC OSF/1 AXP ,OpenVMS AXP systems **only**)

Step 6—Networks and Communications

- Systems include PCI-based Ethernet controller (DE435-AA); uses one PCI slot, two additional PCI-based controllers supported per system.
- Select networking cable for DE435-AA:
  - 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:
  - One DE422-AA
  - Two DEFEA-xA
  - Five FR-DW300-AA

DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card
DE422-SA	EISA-based Ethernet
DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment
DEFEA-UA	EISA-based DEC FDDI (UTP) controller
FR-DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS AXP)
DNSES-AA	EISA-based synchronous communications controller, DEC OSF/1 AXP and OpenVMS AXP systems **only**

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply may be added for n+1 redundancy.
- Country specific power cord **must** be ordered separately, see Step 10.

H7895-AA 400-Watt power supply

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. See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

Windows NT Servers

Windows NT systems include 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

DEC OSF/1 AXP Interactive User Licenses

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

Software Processor Code = E

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7A9-BB DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC* DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD* DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE* DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF* DEC OSF/1 AXP Interactive 16-user license
QL-MT7AE-AA DEC OSF/1 AXP Interactive unlimited user license

QL-MT5AE-AA DEC OSF/1 AXP developer's extension license

* Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation—required for first system on site

QA-MT4AA-H8 DEC OSF/1 AXP media and on-line documentation on CD-ROM
QA-MT4AA-GZ DEC OSF/1 AXP full hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DECnet for DEC OSF/1 AXP

QL-MTJAE-AA DECnet/OSI end-system license for DEC OSF/1 AXP
QL-MTKAE-AA DECnet/OSI extended function license for DEC OSF/1 AXP

NAS 200 for DEC OSF/1 AXP

QL-306AE-AA NAS 200 for DEC OSF/1 AXP Update license
QT-306AE-L9 NAS 200 for DEC OSF/1 AXP Layered Product Support Service

Step 9—Software *(continued)*

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and **can** be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a mixed OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AE-AA	OpenVMS AXP Distributed Interactive unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

OpenVMS AXP Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DECnet for OpenVMS AXP

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

NAS 200 for OpenVMS AXP

QL-23EAE-AA	NAS 200 for OpenVMS AXP license
QT-23EAE-L9	NAS 200 for OpenVMS AXP Layered Product Support Service

DSSI Information

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

Step 10—Power Cords, Keyboards, and Documentation

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V U.S. power cord unless alternate is specified. Select country specific power cord for **all** systems ordered in Europe.
- DEC OSF/1 AXP and OpenVMS AXP ordered in Americas, APA and Europe with graphics option and monitor require a country specific keyboard. Keyboard is not required if monitor is selected.

Keyboards

PCXAL-FA*	**LK411-AA**	North American, Japan (English)
PCXAL-FB	**LK411-AB**	Belgian
PCXAL-FD	**LK411-AD**	Danish
PCXAL-FE	**LK411-AA**	United Kingdom (English)
PCXAL-FG	**LK411-AG**	German

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

Keyboards

PCXAL-FI	**LK411-AI**	Italian
PCXAL-FK	**LK411-AK**	Swiss/French
PCXAL-FN	**LK411-AN**	Norwegian
PCXAL-FP	**LK411-AP**	French
PCXAL-FS	**LK411-AS**	Spanish
PCXAL-FV	**LK411-AV**	Portuguese
	LK411-AQ	Canadian/English
	LK411-AC	Canadian/French
	LK411-AL	Swiss/German
	LK411-AM	Swedish

* Included if alternate not selected.

Power Cords

BN09A-1K*	North American, Japan, 120 V
BN19H-2E	Austrialia, New Zealand
BN19C-2E	Central Europe
BN19A-2E	U.K., Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN24X-2E	Italy
BN19S-2E	Egypt, India, South Africa
BN18L-2E	Israel

* Included if alternate not selected.

Mouse

PCXAS-AA	PS/2 compatible 3-button Mouse

Documentation: Customer and Service Kit

Customer Kit	Service Kit	
QZ-00MAA-GZ	**QA-00MAB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—English
QZ-00MPA-GZ	**QA-00MPB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—French
QZ-00MSA-GA	**QZ-00MSB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—Spanish
QZ-00MJA-GZ	**QZ-00MJB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—Japanese
QZ-00MUA-GZ	**QZ-00MUB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—Italian
QZ-00MGA-GZ	**QZ-00MGB-GZ**	Customer and Service kit for AlphaServer 1000 4/200—German

Documentation: Customer Kit and Service Kit

AG-Q95HA-BE	On-line documentation

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**)

Hardware

- 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

Software

- 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 DEC OSF/1 AXP and OpenVMS AXP include advisory and remedial software support with new version license rights for operating system and NAS 200 for the time period indicated.

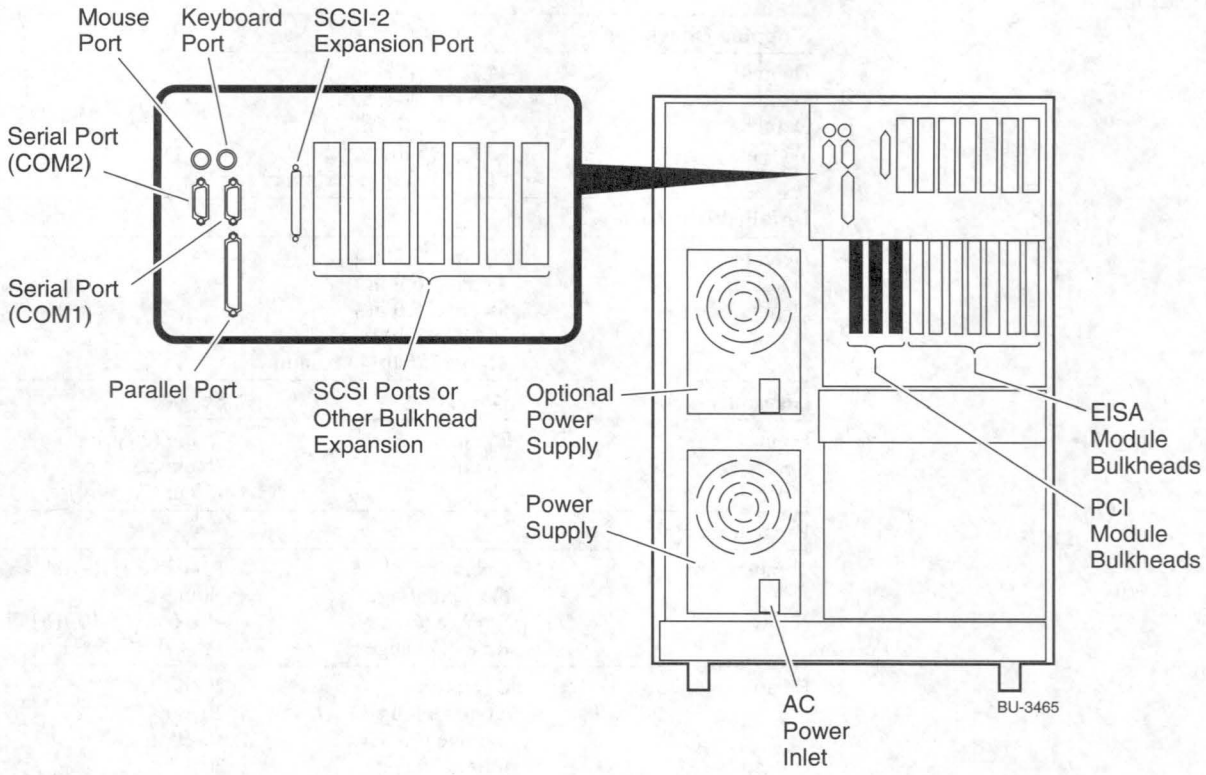
FM-MKNTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 1000 4/200 systems
FM-MKNTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 1000 4/200 systems
FM-MKOSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 1000 4/200 systems
FM-MKOSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 1000 4/200 systems
FM-MKVMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 1000 4/200 systems
FM-MKVMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 1000 4/200 systems

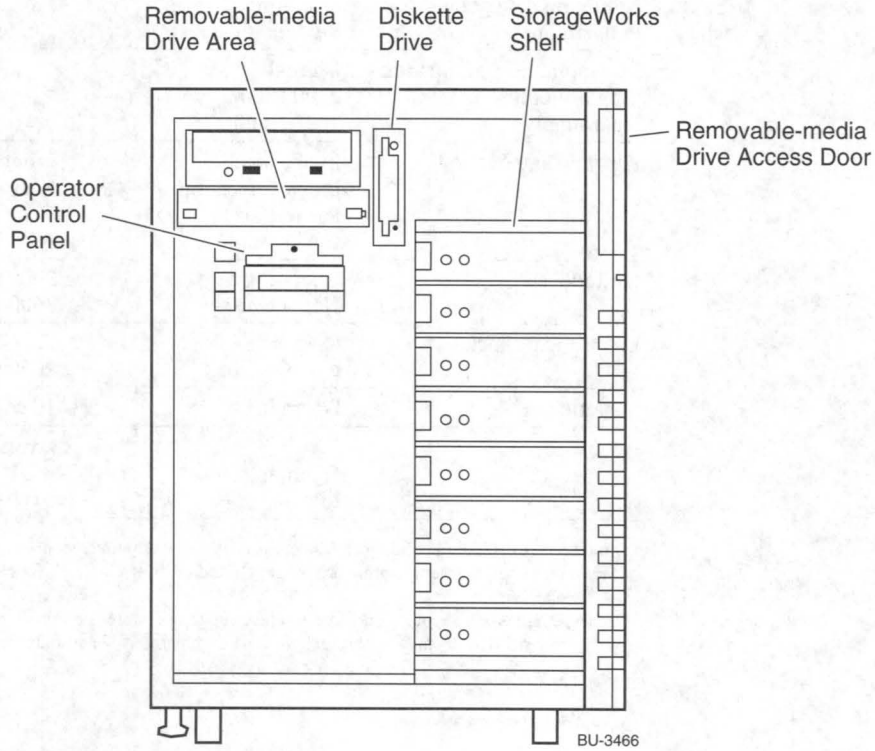
Step 11b—Hardware and Software Supplemental Support Services (**Europe only**)

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required.
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSG-36**	**Windows NT** 64 Mbyte system (PB70B-AB)
FM-X3HDH-36	**FM-X3DSH-36**	**DEC OSF/1 AXP** 64 Mbyte system (PB70B-FB)
FM-X3HDF-36	**FM-X3DSG-36**	**Open VMS AXP** 64 Mbyte system (PB70B-MB)


Mouse Port
Keyboard Port
SCSI-2 Expansion Port
Serial Port (COM2)
Serial Port (COM1)
Parallel Port
SCSI Ports or Other Bulkhead Expansion
Optional Power Supply
Power Supply
EISA Module Bulkheads
PCI Module Bulkheads
AC Power Inlet
BU-3465


Removable-media Drive Area
Diskette Drive
StorageWorks Shelf
Removable-media Drive Access Door
Operator Control Panel
BU-3466

Specifications

Shipping Dimension		
Height	44.2 cm (17.4 in.)	
Width*	35.8 cm (14.1 in.)	
Depth*	53.3 cm (21 in.)	
Weight	43 kg (95 lb) typical 51 kg (113 lb) maximum	
Installed Dimensions		
Height	60 cm (23.8 in.)	
Width	43 cm (16.9 in.)	
Depth	65 cm (25.6 in.)	
Weight	39 kg (86 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** 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		Average / Declared
	Operating	6.2 L^{wA}, B / 6.5 L^{wAd}, B
	Idle	6.0 **LwA**, B / 6.3 L^{wAd}, B

*Dimensions 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 disk drives.

Specifications *(continued)*

Electrical—Power Supplies are universal 120/240 Vac		
Nominal ac voltage	100-120 Vac	220-240 Vac
Operating Voltage range	90-132 Vac	180-264 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50 Hz
Frequency range	57-63 Hz	47-53 Hz
Maximum inrush current	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.)
	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 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)	

Recommended UPS: PUPS Prestige Model 1250

Rating: The UPS is a true On-Line system rated 1250VA/900W output and includes an EIA232 port for UPS monitoring. Battery support time is 9 minutes at full rated load or 15-20 minutes for a fully configured AlphaServer 1000. Unit includes "plug & play" battery extention provisions to upgrade support time.

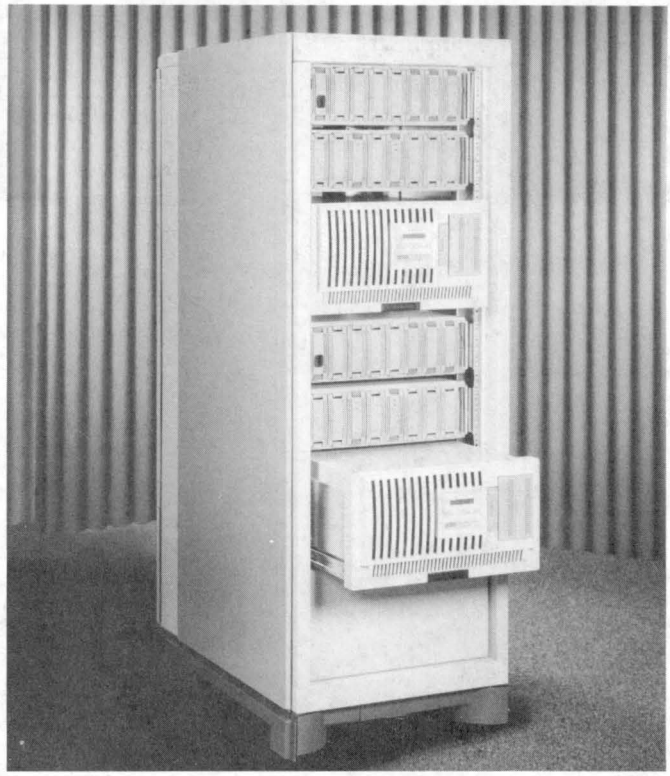
Service: Units sold & serviced in the Continental US feature a 3 yr, full unit hot-swap 24-48 hr replacement warranty through vendor. Other locations include a one year warranty with return to certified service location. A 5 year vendor on-site exchange upgrade (see below) and a Digital on-site exchange service contract is also available.

4N-AEABF-AA	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-AEABF-BF	For 240 Vac, 50 or 60 Hz systems. Features selectable 220, 230 or 240Vac output. Uses system power cord for detachable IEC 320 input connection at UPS. Unit has four IEC 320 receptacles and comes with two output jumpers with IEC320 connectors for connectionm to system.
4N-AEWAR-G1	5 Year on-site exchange warranty upgrade (available in Intercontinental U.S. only at time of purchase)

Basic UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

4N-AEAES-AA/AB	Windows NT for Alpha AXP and Intel x86, includes cables, media and documentation
4N-AEAES-ED	DEC OSF/1 AXP, includes cables, media and documentation
4N-JBBBB-GG	OpenVMS AXP, includes cables, media and documentation

For additional incormation, including other network options, refer to the Desktop UPS section in Chapter 10, *Environmental Products* for ordering information.



AlphaServer 1000 4/200 Rackmount and Cabinet Systems

Product Description

The Alphaserver 1000 4/200 rackmount system is the same low-cost Alpha AXP uni-processor PCI/EISA-based server that is offered in the pedestal format. The rackmount version is capable of being mounted into 19-inch wide industry-standard ANSI/EIA cabinets. This saves valuable floor space and enables system expansion and growth without enlarging the system footprint. Rackmounting AlphaServer 1000 4/200 systems into a cabinet enclosure allows flexibility in configuring applications unique to customer needs by providing vertical space for mounting several servers, storage and other I/O options in the same enclosure.

The AlphaServer 1000 4/200 Rackmount system is available as a packaged system with support for OpenVMS AXP, DEC OSF/1 AXP or Windows NT, as well as system building blocks that allow the flexibility to create configurations unique to customer's applications. The AlphaServer 1000 4/200 Rackmount system is a suitable choice for general-purpose commercial, high-performance application and database, and PC LAN Superserver computing environments.

The AlphaServer 1000 4/200 Rackmount and Cabinet system features a 200-MHz CPU with 2-Mbyte ECC cache, that supports up to 512 Mbytes of memory. Internal disk storage support of 6 Gbytes with the capability of expanding storage needs through the use of StorageWorks storage devices that are easily rackmountable right into the cabinet enclosure. The system supports two SCSI controllers for up to 56 Gbytes of external storage. The system bus bandwidth offers 267 Mbytes/second with a peak bandwidth of 133 Mbytes/second on the high-performance PCI I/O subsystem. The second EISA I/O bus support numerous industry-standard options at 33 Mbytes/second.

Step 1—Systems

Select system.

- 120 V and 240 V systems include power cord.
- Windows NT systems include Windows NT Server plus 5-client access, V3.5 media (CD-ROM)and license in shrink-wrapped package.
  - Windows NT systems ordered in the Americas and Asia Pacific Area (APA) include North American keyboard. Order country specific keyboard for all systems ordered in Europe.
- DEC OSF/1 AXP and OpenVMS AXP Packaged systems include factory installed software on 2.1 Gbyte hard disk drive.
  - DEC OSF/1 AXP and OpenVMS AXP Packaged systems ordered in North America and Asia Pacific Area (APA) include North American keyboard. Order country specific keyboard for all Packaged systems ordered in Europe.
- Base systems require memory and disk.
- Cabinet and monitor **must** be ordered separately for all systems
- Options ordered will be factory installed unless specified as **spares**
- Rackmount systems **do not** support dual-power supply*
- UPS features available by Custom Quote only*
- External storage is supported in StorageWorks BA350 shelves, see Step 2b.
- Refer to AlphaServer 1000 4/200 Pedestal configuration guidelines. All rules apply except where noted by asterisk above

AlphaServer 1000 4/200 Rackmount Systems include

- DECchip 21064 200-MHz CPU with 2-Mbyte ECC onboard cache
- Rackmountable chassis which includes:
  - Integrated 10 Mbyte/s Fast SCSI-2 controller
  - Integrated SVGA graphics controller (supported on Windows NT and DEC OSF/1 AXP systems)
  - Seven EISA slots
  - Two PCI slots
  - One PCI/EISA combination slot
  - 20 industry-standard SIMM slots
  - One diskette drive slot
    Two removable media slots
    Three hard disk drive slots
  - Power supply
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One bi-directional enhanced parallel port, 25-pin D-subminiature connector
  - PS/2 style keyboard port and mouse port
- 64 Mbyte memory (Packaged systems only)
- 1.44 Mbyte diskette drive
- 2-button mouse (Windows NT systems)
- 3-button mouse (DEC OSF/1 AXP and OpenVMS AXP systems)
- High-performance Ethernet DE435-AA (uses one PCI slot)
- Customer documentation
- EISA Configuration Utility (ECU)
- Three-year on-site warranty*
- Software Warranty, 90-day SPD conformance with advisory telephone support*
- Windows NT Server plus 5-client access V3.5 media kit, **or** DEC OSF/1 AXP 2-user base license and NAS 200 license, **or** OpenVMS AXP 1-user license and NAS 200 license

* Service upgrades are available; see AlphaServer 1000 4/200 for Hardware and Software Supplemental Services information.

Packaged systems

Order Number	Operating System	Memory	Storage Diskette	Hard Disk	CD-ROM	Monitor	Graphics	Ethernet	Key-board
PB7RB-AA/AB	Windows NT Server	64 MB	1.44 MB	2.1 GB	600 MB	Required	Included	Included	Included
PB7RB-FA/FB	DEC OSF/1 AXP	64 MB	1.44 MB	2.1 GB	600 MB	Optional	Included*	Included	Included
PB7RB-MA/MB	OpenVMS AXP	64 MB	1.44 MB	2.1 GB	600 MB	Optional	Optional*	Included	Included

Note: xA = 120 V and xB = 240 V

Base systems

Order Number	Operating System	Memory	Storage Diskette	Hard Disk	CD-ROM	Monitor	Graphics	Ethernet	Key-board
PB7RC-AA	Windows NT Server	—	1.44 MB	—	—	Required	Included	Included	Included
PB7RC-FA	DEC OSF/1 AXP	—	1.44 MB	—	—	Optional	Included	Included	Optional
PB7RC-MA	OpenVMS AXP	—	1.44 MB	—	—	Optional	Optional*	Included	Optional

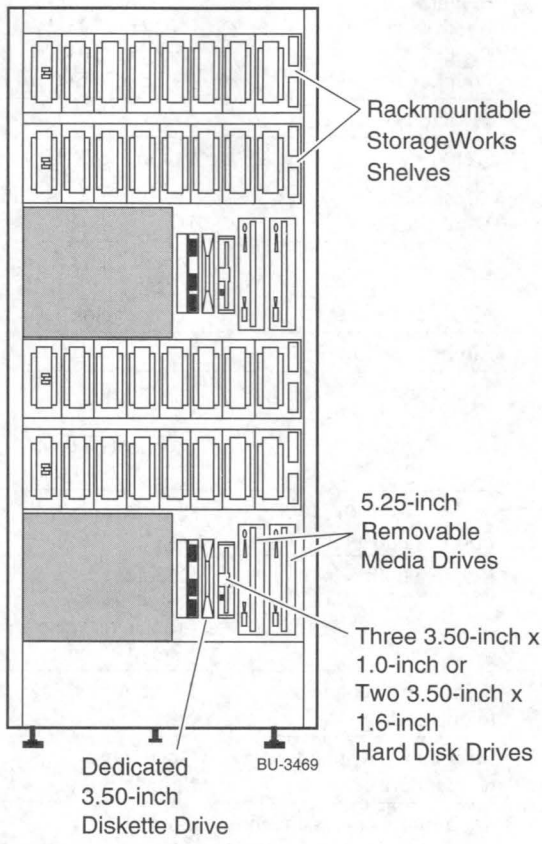
* EISA Configuration Utility (ECU) is accessible via the console port for DEC OSF/1 AXP and OpenVMS AXP systems.

Step 2—External Storage

- Additonal storage expansion can be added outside the AlphaServer 1000 4/200 rackmountable enclosure. Select rackmountable StorageWorks shelves if required.

2T-BA350-SF	Rackmountable modular storage assembly. Supports six 3.5-inch half-height (RZ26L/RZ28) hard disk drives, front accessible
2T-BA350-SR	Rackmountable modular storage assembly. Supports six 3.5-inch half-height (RZ26L/RZ28) hard disk drives, rear accessible

AlphaServer 1000 4/200 Rackmount and Cabinet System Diagram



Specifications

Installed Dimension		
Height	26.7 cm (10.5 in.)	
Width*	48.2 cm (19.0 in.)	
Depth*	73.7 cm (29.0 in.)	
Weight	29 kg (65 lb) typical	
Clearances	**Service**	
Front	91 cm (36.0 in.)	
Rear	61 cm (24.0 in.)	
Mounting		
	Model 4/200 systems conform to ANSI/EISA 310 :and IEC 297 standards for 19-inch panel width and 30-inch depth enclosure.	
Environmental		
Temperature	Operating*	10-35° C (50°-95° F)
	Nonoperating	Not tested
	Storage (60 days)	-40-66° C (-40-151° F)
	Rate of change	Not tested
* Maximum operating temperature at Sea Level. Reduce by 1 C (1.8 F) for each 600 m (2000 ft) above Sea Level.		
Relative humidity	Operating	20–80%
	Nonoperating	20–80%
	Storage (60 days)	10–95%
	Rate of change	20%/hr
Maximum wet bulb temperature	Operating Storage (60 days)	28° C (82° F) 46° C (115°F)
Minimum dew point temperature	Operating	2° C (36° F)
	Storage (60 days)	Not tested
Maximum heat dissipation Single supply	Current 2390 Btu/hr	
Air flow and quality	Intake location	Front
	Exhaust location	Rear
	Particle size	N/A
	Concentration	N/A
Altitude	Operating†	2000 m (6562 ft)
	Nonoperating	3600 m (12,000 ft)
†Higher altitudes are possible if maximum operating temperature is reduced (see Temperature, above); other restrictions may apply, such as maximum permissible altitude for hard disk drives.		
Mechanical shock	Operating	Not tested
	Nonoperating	20 G peak 30 ms
Vibration	Operating	Not tested
Acoustics		Average / Declared
	Operating	Not tested / Not tested
	Idle	Not tested / Not tested

Specifications *(continued)*

Electrical—Power Supplies are universal 120/240 Vac		
Nominal ac voltage	100-120 Vac	220-240 Vac
Operating Voltage range	90-132 Vac	180-264 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50 Hz
Frequency range	57-63 Hz	47-53 Hz
Maximum inrush current	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	457 cm (180 in.)
	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 FCC 15J Part 15 Verified Class A CE Verified Class A 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 2000 4/200 Systems

Product Description

The AlphaServer 2000 4/200 system is a low-cost Alpha AXP symmetric multiprocessing (SMP) PCI/EISA-based server. It offers support for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT, and is suitable for general-purpose commercial, high-performance application and database, and PC LAN Superserver computing environments.

The AlphaServer 2000 4/200 features a 190-MHz CPU, and can be configured with up to two processors with symmetric multiprocessing. It supports up to 640 Mbytes of memory and 16 Gbytes of internal disk storage.

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

The AlphaServer 2000 4/200 system supports 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 4/200 is offered in a compact pedestal enclosure that easily fits beneath a desk.

The AlphaServer 2000 4/200 Pedestal System menus are organized as follows:

- Windows NT Systems
- DEC OSF/1 AXP Systems
- OpenVMS AXP Systems
- EISA Bus IRQ Address Table (DEC OSF/1 AXP and OpenVMS AXP systems)
- System and Storage Diagrams
- Specifications

Step 1—Windows NT Server Systems

Select system.

- System includes Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package.
- Systems ordered in the Americas and Asia Pacific Area (APA) 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 4/200 (Windows NT) Systems include

- DECchip 21064 190-MHz CPU with 1 Mbyte onboard cache
- BA720 pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One bi-directional enhanced parallel port, 25-pin D-subminiature connector
  - PS/2 style keyboard port and mouse port
  - 8-slot RZxx storage assembly
  - Two 5.25-inch, half-height removable media slots
  - Seven EISA slots
  - Three PCI slots
  - 400-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 2.0 Gbyte hard disk drive (uses one storage assembly slot)
- 1280 x 1024 Video Graphics Adapter (uses one EISA slot)
- Ethernet DE435-AA Card (uses one PCI slot)
- 64 Mbytes memory
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA 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*
- Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
Windows NT Systems			
DN-241D1-B9	64 Mbyte	1 x 2.0 Gbytes	6 EISA/2 PCI

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to one additional CPU, for a maximum of two. Two CPU systems require additional power supply (see Step 7).

450NR-AA Windows NT Server upgrade includes one CPU processor; SMP license is not required.

Step 3—Memory

- System includes 64 Mbyte memory (one MS452-AA plus one MS452-UA); order additional memory using the following tables; no other combinations are supported.

Table 1—For system maximum of 256 Mbyte (in small increments)

Total Memory Required	Order Quantities Shown	
	MS452-UA	MS452-AA
96 Mbyte	1	0
128 Mbyte	2	0
160 Mbyte	2	1
192 Mbyte	3	1
256 Mbyte	5	1

Table 2—For system maximum of 640 Mbyte (in large increments)

Total Memory Required	Order Quantities Shown		
	MS452-UA	MS452-BA	MS452-UB
96 Mbyte	1	0	0
128 Mbyte	2	0	0
256 Mbyte	2	1	0
384 Mbyte	2	1	1
640 Mbyte	2	1	3

MS452-AA	32 Mbyte memory board (carrier with 8 x 4 Mbyte SIMMs)
MS452-BA	128 Mbyte memory board (carrier with 8 x 16 Mbyte SIMMs)
MS452-UA	32 Mbyte add-on memory (8 x 4 Mbyte SIMMs) for MS452-AA
MS452-UB	128 Mbyte add-on memory (8 x 16 Mbyte SIMMs) for MS452-BA

Step 4—Monitors

- System requires a graphics monitor to run **all** functions.
- Graphics adapter included in system supports 1024 x 768 and 1280 x 1024 resolution, 72-Hz monitors.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRC15-PA	Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRC15-P4	Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**
VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. Refer to Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs.
- Storage Option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT
  - Three, 2.0 Gbyte (RZ28) hard disk drives
  - One internal SCSI cable (BC25R-3B)
- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-BA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT
  - Five, 2.0 Gbyte (RZ28) hard disk drives
  - Three internal SCSI cable (BC25R-3B)
- Additional RZxx disk drives may be added; see Storage Diagrams for maximum storage configuration details.

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack

Step 5b—Internal Storage

Configuration Rules

- Internal storage assembly supports eight 3.5-inch disk drives (RZ26L/RZ28) only.
- Internal storage assembly is normally configured for split-bus (two buses), four drives per bus. By reversing the positions of the terminator and jumper plugs, internal storage assembly can be re-configured for single-bus mode with support for a maximum of seven disk drives.
- Additional SCSI adapter is required to support internal storage assembly if set for single-bus mode.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See Storage Diagrams for details.
- Integral Fast SCSI-2 controller supports maximum of six devices in system enclosure (two 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).
- 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.
- System includes 600 Mbyte CD-ROM; system supports one additional 5.25-inch, half-height removable media device

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28 -VA	2.0 Gbyte, 3.5-inch half-height disk drive

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based controllers supported.
- Maximum number of **each** EISA-based storage controllers supported per system:
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots
- Additional configuration information:
  - Each controller requires one bus slot
  - One- and three-port StorageWorks RAID Array 210 (KZESC-xx) controllers support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 (KZESC-BA) controller supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8.
- Cabling information for Fast-SCSI-2 controllers:
  - Internal cables are factory installed to support ordered configurations
  - External cables are **not** included and must be ordered separately
    KZESC-AA option uses BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
    KZESC-AA option uses one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection
    PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
  - See Storage Diagrams for details

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
PB2HA-SA	EISA- based one port Fast SCSI-2 controller
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller

* **See Chapter 8, *Storage Devices*, for additional information on StorageWorks RAID Array 210 Subsystems.**

Step 5d—External Storage

External 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-outport must be terminated with external terminator (12-37004-04) included with system.
- External tape drives are also supported on optional Fast SCSI-2 controllers (PB2HA-SA and KZPAA-AA); maximum external bus length including cable and tape device cannot exceed 3.0 meter.
- External tape drives are not supported on one- and three-port high performance Fast-SCSI-2 controllers (KZESC-xx).
- Each tabletop tape device **requires** a three-foot SCSI cable (BC09D-03)

TLZ06-FA	4.0 Gbyte, 4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0-48.0 Gbyte, 4-mm DAT autoloader
TZ85-TA	2.6 Gbyte, 5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive

* Includes four cartridge loader. Larger magazines are supported.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices*, for details.

Step 5d—External Storage *(continued)*

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals are supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA and KZPAA-AA controllers.
- External BA350 is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- Order BN21H-02 cable to connect a single BA350 modular storage pedestal to controllers

BA350-KB	Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10.**

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices

Step 6—Networks and Communications

- System includes PCI-based Ethernet controller (DE435-AA); uses one PCI slot
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
  - BC16M-xx for Thin Wire
- Maximum of three PCI-based (DE435-AA) controllers supported (one included with system plus two optional)
- Maximum number of **each** EISA-based network controllers supported per system
  - Four DE422-SA
  - Two DEFEA-xA
  - Five DW300-AA
  - One CXI01-xx
  - Maximum number of EISA-based network controllers of all types in combination is governed by EISA bus IRQ address assignments; see EISA Bus IRQ Address Table.

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment
DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS AXP)
CXI01-xx	EISA-based asynchronous multiplexer
D435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes two CPUs. In single CPU configurations, the additional power supply may be added for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **must** be ordered separately, see Step 10.

H7895-AA	400-Watt power supply

See UPS information in System Specifications

Step 8—Terminals and Printers

System includes 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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

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

Step 10—Keyboards and Power Cords

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 and keyboard for **all** systems ordered in Europe.

Keyboards

PCXAL-FA	U.S./English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

Power Cords

BN09A-1K*	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia, 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

* Orderable as 17-00083-09

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**)

Hardware

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

FM-DS4HR-36	5 x 9, 4-hour response time
FM-DS512-36	5 x 12, 4-hour response time
FM-DS616-36	6 x 16, 4-hour response time
FM-DS724-36	7 x 24, 4-hour response time

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)** *(continued)*

Software

- 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.

FM-DSNTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2000 4/200 systems
FM-DSNTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2000 4/200 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required:
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSG-36**	**Windows NT** 64 Mbyte system (DN-241D1-B9)

Step 1—DEC OSF/1 AXP Server Systems

Select system.

- **Operating System media and documentation kit is required for first system on site; see Step 9.**
- Systems ordered in the Americas and Asia Pacific Area (APA) 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.
- System includes DEC OSF/1 AXP factory installed software (FIS)
- Uninterruptable Power Supplies are available; see UPS Information in System Specifications.
- Options ordered will be factory installed unless specified as **spares**.

AlphaServer 2000 4/200 (DEC OSF/1 AXP) Systems include

- DECchip 21064 190-MHz CPU with 1 Mbyte onboard cache
- BA720 pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One bi-directional enhanced parallel port, 25-pin D-subminiature connector
  - PS/2 style keyboard port and mouse port
  - 8-slot RZxx storage assembly
  - Two 5.25-inch, half-height removable media slots
  - Seven EISA slots
  - Three PCI slots
  - 400-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 2.0 Gbyte hard disk drive (uses one storage assembly slot)
- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Ethernet DE435-AA Card (uses one PCI slot)
- 64 Mbytes memory
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA 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 for Operating System and NAS 200*
- DEC OSF/1 AXP operating system base license
- NAS 200 for DEC OSF/1 AXP license includes the following layered products: (order media and documentation separately)
  - PATHWORKS for DEC OSF/1 AXP (kit only, no license)
  - Polycenter Advanced File System Utilities
  - Objectbroker for DEC OSF/1 AXP Runtime
  - DECmessageQ for DEC OSF/1 AXP Runtime
  - DCE Runtime
  - DEC OSF/1 AXP Server Extensions
  - PrintServer software (kit only, licensed with printer)

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
DEC OSF/1 AXP Systems			
DA-241D1-B9	64 Mbyte	1 x 2.0 Gbytes	6 EISA/2 PCI

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to one additional CPU, for a maximum of two. Two CPU systems require additional power supply (see Step 7).

450AR-AA DEC OSF/1 AXP upgrade includes one CPU processor and DEC OSF/1 AXP SMP license.

Step 3—Memory

- System includes 64 Mbyte memory (one MS452-AA plus one MS452-UA); order additional memory using the following tables; no other combinations are supported.

Table 1—For system maximum of 256 Mbyte (in small increments)

Total Memory Required	Order Quantities Shown	
	MS452-UA	MS452-AA
96 Mbyte	1	0
128 Mbyte	2	0
160 Mbyte	2	1
192 Mbyte	3	1
256 Mbyte	5	1

Table 2—For system maximum of 640 Mbyte (in large increments)

Total Memory Required	Order Quantities Shown		
	MS452-UA	MS452-BA	MS452-UB
96 Mbyte	1	0	0
128 Mbyte	2	0	0
256 Mbyte	2	1	0
384 Mbyte	2	1	1
640 Mbyte	2	1	3

MS452-AA 32 Mbyte memory board (carrier with 8 x 4 Mbyte SIMMs)

MS452-BA 128 Mbyte memory board (carrier with 8 x 16 Mbyte SIMMs)

MS452-UA 32 Mbyte add-on memory (8 x 4 Mbyte SIMMs) for MS452-AA

MS452-UB 128 Mbyte add-on memory (8 x 16 Mbyte SIMMs) for MS452-BA

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

- Supported on DEC OSF/1 AXP systems **only.** Requires DEC OSF/1 AXP V3.0 operating system software
- Requires one EISA slot
- Maximum one Prestoserve option per system

PB2SX-AA Prestoserve non-Volatile Random Access Memory option; includes Prestoserve license and documentation kit

Step 4—Monitors

- System requires a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRC15-PA Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**

VRC15-P4 Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

VRT17-PA Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**

VRT17-P4 Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 4—Monitors *(continued)*

VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. Refer to Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs.for easy ordering
- Storage Option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Three, 2.0 Gbyte (RZ28) hard disk drives
  - One internal SCSI cable (BC25R-3B)
- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-BA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Five, 2.0 Gbyte (RZ28) hard disk drives
  - Three internal SCSI cable (BC25R-3B)
- Additional RZxx disk drives may be added; see Storage Diagrams for maximum storage configuration details.

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack

Step 5b—Internal Storage

Configuration Rules

- Internal storage assembly supports eight 3.5-inch disk drives (RZ26L/RZ28) only.
- Internal storage assembly is normally configured for split-bus (two buses), four drives per bus. By reversing the positions of the terminator and jumper plugs, internal storage assembly can be re-configured for single-bus mode with support for a maximum of seven disk drives.
- Additional SCSI adapter is required to support internal storage assembly if set for single-bus mode.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See Storage Diagrams for details.
- Integral Fast SCSI-2 controller supports maximum of six devices in system enclosure (two 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).
- 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.
- System includes 600 Mbyte CD-ROM; system supports one additional 5.25-inch, half-height removable media device.

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28-VA	2.0 Gbyte, 3.5-inch half-height disk drive

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based controllers supported.
- Maximum number of **each** EISA-based storage controllers supported per system:
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - Maximum number of EISA-based network controllers of all types in combination is governed by EISA bus IRQ address assignments; see EISA Bus IRQ Address Table.
- Additional configuration information:
  - Each controller requires one bus slot
  - One- and three-port StorageWorks RAID Array 210 (KZESC-xx) controllers support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 (KZESC-BA) controller supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8.
- Cabling information for Fast-SCSI-2 controllers
  - Internal cables are factory installed to support ordered configurations
  - External cables are **not** included and must be ordered separately
    KZESC-AA option uses BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
    KZESC-AA option uses one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection
    PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
  - See Storage Diagrams for details

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
PB2HA-SA	EISA- based one port Fast SCSI-2 controller
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller

* See Chapter 8, *Storage Devices*, for additional information on StorageWorks RAID Array 210 Subsystems

Step 5d—External Storage

External 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-outport must be terminated with external terminator (12-37004-04) included with system.
- External tape drives are also supported on optional Fast SCSI-2 controllers (PB2HA-SA and KZPAA-AA), maximum external bus length including cable and tape device cannot exceed 3.0 meter.
- External tape drives are **not** supported on one- and three-port high performance Fast-SCSI-2 controllers (KZESC-xx) .
- Each tabletop tape device **requires** a three-foot SCSI cable (BC09D-03)

TKZ09-BA	5.0 Gbyte 8mm tape drive
TKZ15-TA	5.0/10.0 Gbyte, 8mm tabletop tape drive
TKZ60-xx	3480-compatible tape drive (all variants)
TLZ06-FA	4.0 Gbyte ,4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0-48.0 Gbyte, 4-mm DAT autoloader
TSZ07-AA/BA/CA	1600.6250-bit/inch 9-track tabletop magtape drive
TZ85-TA	2.6 Gbyte, 5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive
TZK11-DA	2.0 Gbyte, 5.25-inch tabletop QIC tape drive

* Includes four cartridge loader. Larger magazines are supported.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices*, for details

Step 5d—External Storage *(continued)*

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals are supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA and KZPAA-AA controllers.
- External BA350 is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- Order BN21H-02 cable to connect a single BA350 modular storage pedestal to controller

BA350-KB Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10.**

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices

Step 6—Networks and Communications

- System includes PCI-based Ethernet controller (DE435-AA); uses one PCI slot.
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
  - BC16M-xx for Thin Wire
- Maximum of three DE435-AA supported (one included with system plus two optional).
  - Maximum number of **each** EISA-based network controllers supported per system:
    Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
  - Maximum number of EISA-based network controllers of all types in combination is governed by EISA bus IRQ address assignments; refer to EISA Bus IRQ Address Table for further information.

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment
DNSES-AA	EISA-based synchronous communications 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 AXP)
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes two CPUs. In single-CPU configurations, the additional power supply may be added for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **must** be ordered separately, see Step 10.

H7895-AA 400-Watt power supply

See UPS information in System Specifications

Step 8—Terminals and Printers

System includes 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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

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

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7AG-AA	DEC OSF/1 AXP Interactive unlimited user license
QL-MT5AG-AA	DEC OSF/1 AXP developer's extension license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation—required for first system on site

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DECnet License

QL-MTJAG-AA	DECnet/OSI end-system license for DEC OSF/1 AXP
QL-MTKAG-AA	DECnet/OSI extended function license for DEC OSF/1 AXP

Step 10—Keyboards and Power Cords

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 and keyboard for **all** systems ordered in Europe.

Keyboards

PCXAL-FA	U.S./English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

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

Power Cords

BN09A-1K*	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia, 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

* Orderable as 17-00083-09

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

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

FM-DS4HR-36	5 x 9, 4-hour response time
FM-DS512-36	5 x 12, 4-hour response time
FM-DS616-36	6 x 16, 4-hour response time
FM-DS724-36	7 x 24, 4-hour response time

Software

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for DEC OSF/1 AXP include advisory and remedial software support with new version license rights for operating system and NAS 200 for the time period indicated.

FM-DSOSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2000 4/200 systems
FM-DSOSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2000 4/200 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required:
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSH-36**	**DEC OSF/1 AXP** 64 Mbyte system (DA-241D1-B9)

Step 1—OpenVMS AXP Server Systems

Select system.

- **Operating System media and documentation kit is required for first system on site; see Step 9.**
- Systems ordered in the Americas and Asia Pacific Area (APA) 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.
- System includes OpenVMS AXP factory installed software (FIS)
- Uninterruptable Power Supplies are available; see UPS Information in System Specifications.
- Options ordered will be factory installed unless specified as **spares**.

AlphaServer 2000 4/200 (OpenVMS AXP) Systems include

- DECchip 21064 190-MHz CPU with 1 Mbyte onboard cache
- BA720 pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One bi-directional enhanced parallel port, 25-pin D-subminiature connector
  - PS/2 style keyboard port and mouse port
  - 8-slot RZxx storage assembly
  - Two 5.25-inch, half-height removable media slots
  - Seven EISA slots
  - Three PCI slots
  - 400-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 2.0 Gbyte hard disk drive (uses one storage assembly slot)
- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Ethernet DE435-AA Card (uses one PCI slot)
- 64 Mbytes memory
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA 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 for Operating System and NAS 200*
- OpenVMS AXP operating system base license
- NAS 200 for OpenVMS AXP license includes the following layered products: (order media and documentation separately)
  - DECnet for OpenVMS AXP End System
  - DECnet/OSI for OpenVMS AXP End Node
  - PATHWORKS for OpenVMS AXP (LAN Manager), kit only, no license
  - DEC TCP/IP services for OpenVMS AXP
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS AXP
  - Objectbroker for OpenVMS AXP (ACA Services)
  - DECmessageQ for OpenVMS AXP Runtime
  - DECprint Supervisor for OpenVMS AXP, Base
  - DECprint Supervisor for OpenVMS AXP, Plus
  - DECprint Supervisor for OpenVMS AXP, Open
  - PrintServer software (kit only, licensed with printer)

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
OpenVMS AXP Systems			
DY-241D1-B9	64 Mbyte	1 x 2.0 Gbytes	6 EISA/2 PCI

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to one additional CPU, for a maximum of two. Two CPU systems require additional power supply (see Step 7).

450YR-AA OpenVMS AXP upgrade includes one CPU processor and OpenVMS AXP SMP license.

Step 3—Memory

- System includes 64 Mbyte memory (one MS452-AA plus one MS452-UA); order additional memory using the following tables; no other combinations are supported.

Table 1—For system maximum of 256 Mbyte (in small increments)

Total Memory Required	Order Quantities Shown	
	MS452-UA	MS452-AA
96 Mbyte	1	0
128 Mbyte	2	0
160 Mbyte	2	1
192 Mbyte	3	1
256 Mbyte	5	1

Table 2—For system maximum of 640 Mbyte (in large increments)

Total Memory Required	Order Quantities Shown		
	MS452-UA	MS452-BA	MS452-UB
96 Mbyte	1	0	0
128 Mbyte	2	0	0
256 Mbyte	2	1	0
384 Mbyte	2	1	1
640 Mbyte	2	1	3

MS452-AA	32 Mbyte memory board (carrier with 8 x 4 Mbyte SIMMs)
MS452-BA	128 Mbyte memory board (carrier with 8 x 16 Mbyte SIMMs)
MS452-UA	32 Mbyte add-on memory (8 x 4 Mbyte SIMMs) for MS452-AA
MS452-UB	128 Mbyte add-on memory (8 x 16 Mbyte SIMMs) for MS452-BA

Step 4—Monitors

- System requires a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRC15-PA	Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRC15-P4	Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**
VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10.**
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. Refer to Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs.for easy ordering
- Storage Option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Three, 2.0 Gbyte (RZ28) hard disk drives
  - One internal SCSI cable (BC25R-3B)
- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-BA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT
  - Five 2.0 Gbyte (RZ28) hard disk drives
  - Three internal SCSI cable (BC25R-3B)
- Additional RZxx disk drives may be added; see Storage Diagrams for maximum storage configuration details

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack

Step 5b—Internal Storage

Configuration Rules

- Internal storage assembly supports eight 3.5-inch disk drives (RZ26L/RZ28) only.
- Internal storage assembly is normally configured for split-bus (two buses), four drives per bus. By reversing the positions of the terminator and jumper plugs, internal storage assembly can be re-configured for single-bus mode with support for a maximum of seven disk drives.
- Additional SCSI adapter is required to support internal storage assembly if set for single-bus mode.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See Storage Diagrams for details.
- Integral Fast SCSI-2 controller supports maximum of six devices in system enclosure (two 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).
- 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.
- System includes 600 Mbyte CD-ROM; system supports one additional 5.25-inch, half-height removable media device.

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28-VA	2.0 Gbyte, 3.5-inch half-height disk drive

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based controllers supported.
- Maximum number of **each** EISA-based storage controllers supported per system:
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - Two KFESA-AA
  - Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots
- Additional configuration information:
  - Each controller requires one bus slot
  - KFESA has dual (in/out) termination to allow connection in middle of DSSI bus
  - One- and three-port StorageWorks RAID Array 210 (KZESC-xx) controllers support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 (KZESC-BA) controller supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subsystem* in Chapter 8.
  - OpenVMS Volume Shadowing does not support KZESC-xx controllers; KZESC-xx controllers support RAID 1 (hardware-based shadowing)
- Cabling information for Fast-SCSI-2 controllers
  - Internal cables are factory installed to support ordered configurations
  - External cables are **not** included and must be ordered separately

    KZESC-AA option uses BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection

    KZESC-AA option uses one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection

    PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
- Cabling information for DSSI controllers (also see Storage Diagrams):
  - DSSI devices supported on OpenVMS AXP only
  - DSSI cables must be ordered separately
  - KFESA uses "Micro-Ribbon" connection
  - KFESA to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC22Q-xx DSSI cable
  - KFESA to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx DSSI cable
  - KFESA 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
  - KFESA to HSD05 requires BC29S-xx
  - HSD05 to HSD05 (inside system) requires BC29U-02
  - HSD05 to HSD05 (between systems) requires BC29T-09
  - HSD05 to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC29R-xx
  - HSD05 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
- See Storage Diagrams for details.

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
PB2HA-SA	EISA- based one port Fast SCSI-2 controller
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller
KFESA-AA	EISA-based single-DSSI controller (OpenVMS AXP systems only)

* See Chapter 8, *Storage Devices*, for additional information on StorageWorks RAID Array 210 Subsystems

Step 5d—External Storage

External 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. Maximum external bus length including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-outport must be terminated with external terminator (12-37004-04) included with system.
- External tape drives are also supported on optional Fast SCSI-2 controllers (PB2HA-SA and KZPAA-AA; maximum external bus length including cable and tape device cannot exceed 3.0 meter.
- External tape drives are **not** supported on one- and three-port high performance Fast-SCSI-2 controllers (KZESC-xx).
- Each tabletop tape device **requires** a three-foot SCSI cable (BC09D-03)

TKZ09-BA††	5.0 Gbyte 8mm tape drive
TKZ15-TA††	5.0/10.0 Gbyte, 8mm tabletop tape drive
TKZ60-xx	3480-compatible tape drive (all variants)
TLZ06-FA	4.0 Gbyte, 4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0-48.0 Gbyte, 4-mm DAT autoloader
TSZ07-AA/BA/CA	1600.6250-bit/inch 9-track tabletop magtape drive
TZ85-TA	2.6 Gbyte,5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive
TZK11-DA	2.0 Gbyte, 5.25-inch tabletop QIC tape drive

* Includes four cartridge loader. Larger magazines are supported.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices*, for details.

†† Supported on integral SCSI port

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals are supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA and KZPAA-AA controllers.
- External BA350 is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- Order BN21H-02 cable to connect a single BA350 modular storage pedestal to controller

BA350-KB	Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10.**

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices

Step 6—Networks and Communications

- System includes PCI-based Ethernet controller (DE435-AA); uses one PCI slot
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
  - BC16M-xx for Thin Wire
- Maximum of three DE435-AA supported (one included with system plus two optional)
- Maximum number of **each** EISA-based network controllers supported per system
  - Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
  - Maximum number of EISA-based network controllers of all types in combination is governed by EISA bus IRQ address assignments; refer to EISA Bus IRQ Address Table for further information.

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller, Single Attachment
DNSES-AA	EISA-based synchronous communications controller

Step 6—Networks and Communications *(continued)*

DEFEA-DA	EISA-based DEC FDDIcontroller, Dual Attachment
DW300-AA	EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS AXP)
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes two CPUs. In single CPU configurations, the additional power supply may be added for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **must** be ordered separately, see Step 10.

H7895-AA	400-Watt power supply

See UPS information in System Specifications.

Step 8—Terminals and Printers

System includes 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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

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

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and **can** be moved between systems (all OpenVMS AXP) at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a **homogeneous** OpenVMS Clu**ster (all OpenVMS AXP systems).**

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AG-AA	OpenVMS AXP Distributed Interactive unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

Step 9—Software *(continued)*

OpenVMS AXP Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DECnet Licenses

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

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 Area 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

LK411-AA	U.S./English
LK411-AB	Belgian
LK411-AQ	Canadian/English
LK411-AC	Canadian/French
LK411-AD	Danish
LK411-AF	Finnish
LK411-AG	German
LK411-AH	Dutch
LK411-AI	Italian
LK411-AK	Swiss/French
LK411-AL	Swiss/German
LK411-AM	Swedish
LK411-AN	Norwegian
LK411-AP	French
LK411-AS	Spanish
LK411-AV	Portuguese

Power Cords

BN09A-1K*	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia, 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

* Orderable as 17-00083-09

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

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

FM-DS4HR-36	5 x 9, 4-hour response time
FM-DS512-36	5 x 12, 4-hour response time
FM-DS616-36	6 x 16, 4-hour response time
FM-DS724-36	7 x 24, 4-hour response time

Software

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

FM-DSVMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2000 4/200 systems
FM-DSVMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2000 4/200 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required:
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSG-36**	**OpenVMS AXP** 64 Mbyte system (DY-241D1-B9)

AlphaServer 2000 4/200 System EISA Bus IRQ Address Table
(DEC OSF/1 AXP and OpenVMS AXP Systems Only)

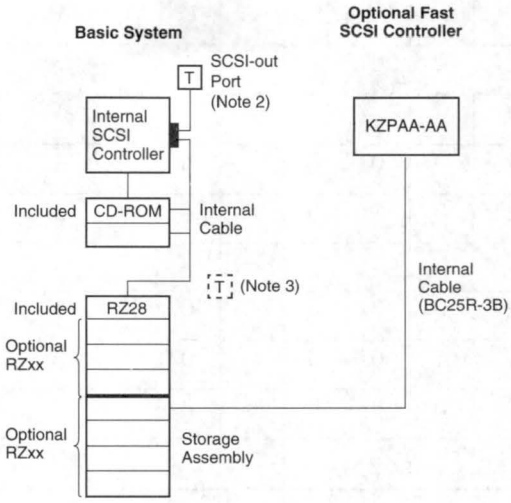
	EISA Bus IRQ Addresses									Maximum of Each Supported		
Option	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**OpenVMS AXP**	**DEC OSF/1 AXP**	**Windows NT**
DE422	0	–	–	N	0	0	–	–	–	3	3	4
PB2GA	–	–	–	0	–	–	–	–	–	1	1	1
DEFEA	–	–	–	N	0	0	–	–	0	2	2	2
DNSES	–	–	0	N	0	0	0	0	0	5	5	0
DW300-AA	0	–	–	N	0	0	–	–	0	4	4	5
PB2HA	–	–	–	N	0	0	0	0	0	1	1	1
KZESC	–	–	–	–	–	0	0	0	0	2	2	2
KFESA	–	–	–	N	0	0	0	0	0	2	0	0
PB2SX	–	–	–	–	–	–	–	–	–	0	1	0

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 DEC OSF/1 AXP and OpenVMS AXP systems only.
- Windows NT Server operating system permits the sharing of IRQ addresses; the only limitation for these systems is the maximum number of each device supported, and the number of EISA bus slots physically available.
- 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. (**Hint:** 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 DEC OSF/1 AXP systems only.

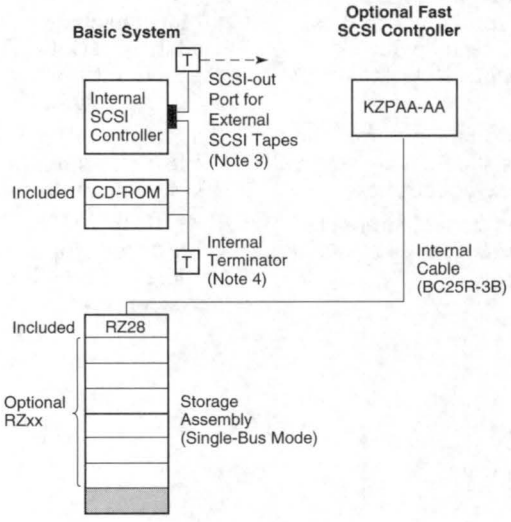
Sample Configuration Based on D*-241D1-*9 System with Storage Assembly in Split-Bus Mode



Notes:
1. All internal cables are included.
2. SCSI-out port in this configuration is not used. It must be terminated with External Terminator (12-37004-04) included with system.
3. Internal Terminator (12-41296-01) is not used in this configuration, but is included with the system (loose-piece).

BU-3458

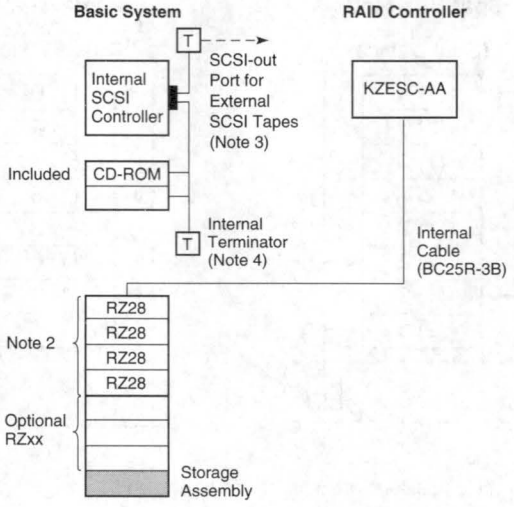
Sample Configuration Based on D*-241D1-*9 System with Storage Assembly in Single-Bus Mode



Notes:
1. All internal cables are included.
2. Optional SCSI controller in this configuration supports a maximum of seven RZxx disk drives.
3. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
4. Internal Terminator (12-41296-01) is included with system.

BU-3459

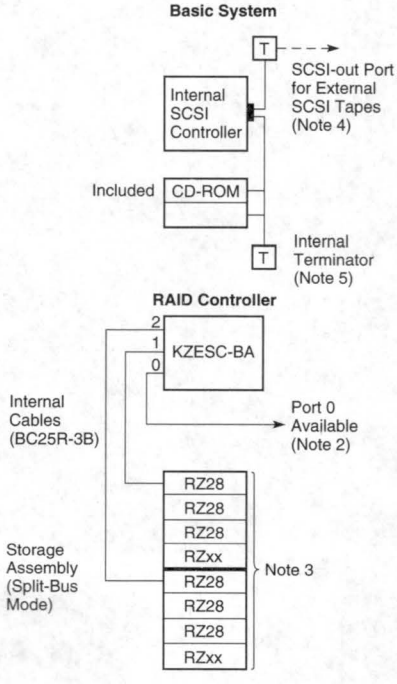
Sample Configuration Based on D*-241D1-*9 System with One-channel RAID Option Pack



Notes:
1. All internal cables are included.
2. One RZ28 is included with the system; three RZ28s are included with the option pack; up to three RZxx can be added.
3. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
4. Internal Terminator (12-41296-01) is included with system.

BU-3460

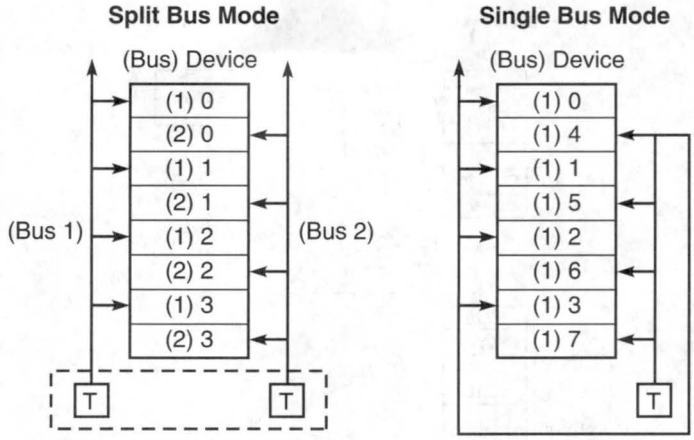
Sample Configuration Based on D*-241D1-*9 System with Three-channel Option Pack



Notes:
1. All internal cables are included.
2. SCSI port 0 can be connected to external disk drives; See Menu Step 5D (EXTERNAL DISK EXPANSION) for additional information.
3. One RZ28 is included with the system; five RZ28s are included with the option pack; two RZxx can be added, one to each bus.
4. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
5. Internal Terminator (12-41296-01) is included with system.

BU-3461

Internal Storage Assembly Disk Drive Positions



Notes:

1. Disk drive positions are interleaved as shown.
2. [T] represents the bus terminator.
3. Internal storage assembly is normally configured for split-bus mode. Single-bus mode is achieved by reversing the postions of the jumper plug and the terminator plug.
4. Remaining storage diagrams show internal storage assembly in split-bus mode; disk drives are shown logically grouped for simplicity.

BU-3457

Specifications

Shipping Dimension		
Height	109 cm (43.3 in.)	
Width*	102 cm (40.0 in.)	
Depth*	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†	10° - 40° C (50° - 104° F)
	Nonoperating	Not tested
	Storage (60 days)	-40° - 66° C (-40° - 151° F)
	Rate of change	11° C/hr (20° F/hr)
Relative humidity	Operating	20–80%
	Nonoperating	20–80%
	Storage (60 days)	10–95%
	Rate of change	20%/hr
Maximum wet bulb temperature	Operating Storage (60 days)	28° C (82° F) 46° C (115° F)
Minimum dew point temperature	Operating	2° C (36° F)
	Storage (60 days)	Not tested
Maximum heat dissipation	Current	
Single supply	2390 Btu/hr	
Dual supply	4097 Btu/hr	
Air flow and quality	Intake location	Front
	Exhaust location	Rear
	Particle size	N/A
	Concentration	N/A
Altitude	Operating††	2000 m (6562 ft)
	Nonoperating	3600 m (12,000 ft)
Mechanical shock	Operating	7.5 G 10 ms
	Nonoperating	20 G peak 30 ms
Vibration	Operating	10-500 Hz .1 G peak
Acoustics		Average Declared
	Operating	6.2 LwA, B 6.5 LwAd, B
	Idle	6.0 LwA, B 6.3 LwAd, B

* Dimensions 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 disk drives.

Specifications *(continued)*

Electrical—Power Supplies are universal 120/240 Vac		
Nominal ac voltage	100-120 Vac	220-240 Vac
Operating voltage range	90-132 Vac	180-264 Vac
Power source phase	Single	Single
Nominal frequency	60 Hz	50 Hz
Frequency range	57-63 Hz	47-53 Hz
Maximum inrush current	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.)
	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 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)

Recommended UPS

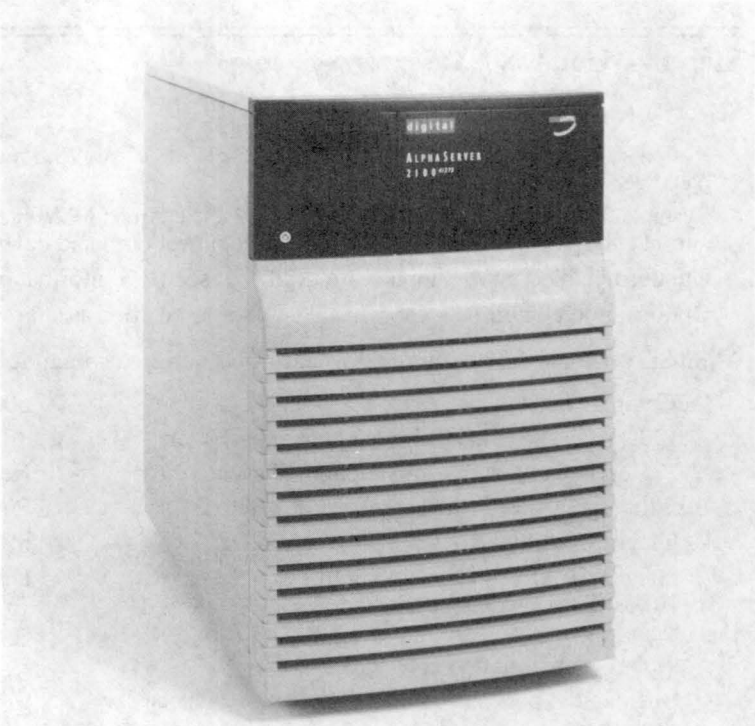
- **Rating:** Both units are rated 2000 VA/1300W and include a EIA232 port for UPS monitoring. Battery support time is 6 minutes at full load as above or 10-15 minutes for typical applications.
- **Service:** Units sold and serviced in the Continental US feature a 3 yr, full unit hot-swap 24-48 hour replacement warranty through vendor. Other locations include a one year warranty with return to certified service location. Digital on-site exchange service contract is also available.

4N-AEAAG-AF	For 120 Vac, 50 or 60Hz systems Includes detachable 6-foot input power cord with 5-20P plug and four NEMA 5-15R output receptacles.
4N-AEAAG-BF	For 240 Vac, 50 or 60Hz systems Features selectable 220, 230, or 240 Vac output. Uses system power cord for detachable IEC 320 input connection at UPS. Unit has four IEC 320 receptacles and comes with (2) output jumpers with IEC320 connectors for connection to system.

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

4N-AEAES-AA/AB	Windows NT for Alpha AXP and Intel x86, includes cables, media and documentation
4N-JBBBB-FA	DEC OSF/1 AXP, includes cables, media and documentation
4N-JBBBB-GA	OpenVMS AXP, includes cables, media and documentation

See Chapter 10, *Environmental Products* for ordering information.



AlphaServer 2100 4/200 and 4/275 Systems

Product Description

AlphaServer 2100 systems are low-cost Alpha AXP symmetric multiprocessing (SMP) PCI/EISA-based servers. They offer support for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT, and are suitable for general-purpose commercial, high-performance application and database, and PC LAN Superserver computing environments.

AlphaServer 2100 4/200 features a 190-MHz CPU with 1 Mbyte cache and the AlphaServer 2100 4/275 features a 275 MHz CPU with 4 Mbyte cache; each can be configured with up to four processors of the same speed for symmetric multiprocessing. The systems support up to 2 Gbytes of memory and 32 Gbytes of internal disk storage.

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

AlphaServer 2100 systems supports 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 2100 systems are offered in a compact pedestal enclosure.

AlphaServer 2100 pedestal system menus are organized as follows:

- Windows NT Systems
- DEC OSF/1 AXP Systems
- OpenVMS AXP Systems
- EISA Bus IRQ Address Table (DEC OSF/1 AXP and OpenVMS AXP systems)
- System and Storage Diagrams
- Specifications

Step 1—Windows NT Server Systems

Select system.

- Systems include Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package.
- Systems ordered in the Americas and Asia Pacific Area (APA) 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 2100 4/200 and 4/275 Windows NT Systems include

- DECchip 21064
  - 190-MHz CPU with 1 Mbyte onboard cache, **or**
  - 275-MHz CPU with 4 Mbyte onboard cache.
- BA740 large pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Integral 10-Mbit/s Ethernet controller, AUI or 10BaseT (twisted pair) selectable
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - 8-slot RZxx storage assembly
  - Three 5.25-inch, half-height removable media slots
  - Eight EISA slots
  - Three PCI slots
  - 602-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA orders only)
- Memory indicated below
- Disk drive indicated below (uses one storage slot)
- 1280 x 1024 Video Graphics Adapter (uses one EISA slot)
- 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*
- Windows NT Server plus 5-client access V3.5 media (CD-ROM) and license in shrink-wrapped package.

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200—190 MHz Windows NT Systems			
DN-251P1-E9*	64 Mbytes	1 x 2.0 Gbytes	7/3
DN-251P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DN-251P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/275—275 MHz Windows NT Systems			
DN-252P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DN-252P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to three additional CPUs, for a maximum of four.

- **Additional CPUs must match the speed of CPU in system**
- Four-CPU systems are restricted to two memory slots.
- Three- and four-CPU systems require additional power supply (see Step 7).

450NR-AA	Windows NT SMP upgrade, includes one 190 MHz CPU processor; SMP license is not required.
460NR-AA	Windows NT SMP upgrade, includes one 275 MHz CPU processor; SMP license is not required.

Step 3—Memory

- 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.

MS450-BA	64 Mbyte memory module
MS450-CA	128 Mbyte memory module
MS451-CA	512 Mbyte memory module

Step 4—Monitors

- System requires a graphics monitor to run **all** functions.
- Video adapter included in system supports 1024 x 768 and 1280 x 1024 resolution, 72-Hz monitors.
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRC15-PA	Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC15-P4	Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. Refer to Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs for easy ordering.
- Storage option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT
  - Three, 2.0 Gbyte (RZ28) hard disk drives
  - One internal SCSI cable (BC25R-3B)

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack

- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-BA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT
  - Five, 2.0 Gbyte (RZ28) hard disk drives
  - Three internal SCSI cable (BC25R-3B)
- Additional RZxx disk drives may be added; see Storage Diagrams for maximum storage configuration details

Step 5b—Internal Storage

Configuration Rules

- Included storage assembly supports eight 3.5-inch (RZ26L/RZ28) disk drives.
- One additional storage assembly in system enclosure supports an additional eight 3.5-inch (RZ26L/RZ28) disk drives. Additional storage assembly requires an additional power supply (see Step 7), and may require a controller (see Step 5c and Storage Diagrams).
- 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.
- Internal storage assemblies are normally configured 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.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See Storage Diagrams for details.
- Internal storage assemblies support RZ26L/RZ28 disk drives **only**.
- Systems include 600 Mbyte CD-ROM; system supports two additional 5.25-inch, half-height removable media devices, or one 5.25-inch, full-height removable media device.
- Integral Fast SCSI-2 controller supports maximum of seven devices in system enclosure (three 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).
- 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. Maximum external bus length, including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ6L-LG*†	16.0 Gbyte, 5.25-inch full-height 4-mm DAT drive loader

* Includes four cartridge magazine; requires two half-height removable media device slots. Larger magazines not supported due to physical constraints.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices*, for details.

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28 -VA	2.0 Gbyte, 3.5-inch half-height disk drive

Storage Assembly for Additional Internal Storage

- Requires additional power supply; see Step 7.
- Includes two SCSI cables (BC25R-3B) for factory integration; or if ordered as **spare**, for field installation.

BA35E-SA	Storage assembly supports eight 3.5-inch, half-height (RZ26L/RZ28) hard disk drives

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based storage controllers supported.
- Maximum number of **each** EISA-based storage controller supported per system
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots
- Additional configuration information:
  - Each controller requires one bus slot
  - One- and three-port StorageWorks RAID Array 210 controllers (KZESC-xx) support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 controller (KZESC-BA) supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8.
- Cabling information for Fast-SCSI-2 controllers:
  - Internal cables are factory installed to support ordered configurations
- External cables are **not** included and must be ordered separately
  KZESC-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
  KZESC-BA options use one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection
  PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
PB2HA-SA	EISA- based one port Fast SCSI-2 controller
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller

* See Chapter 8, *Storage Devices*, for StorageWorks RAID Array 210 Subsystem configuration rules.

Step 5d—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. Maximum external bus length, including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-outport must be terminated with external terminator (12-37004-04) included with system.
- External tape drives are also supported on optional Fast SCSI-2 controllers (PB2HA-SA, KZPAA-AA). External tape drives are **not** supported on KZESC-xx controllers.
- Maximum external bus length, including cable and tape device cannot exceed 3.0 meters.
- Each tabletop tape device **requires** three-foot SCSI cable (BC09D-03)

TLZ06-FA	4.0 Gbyte, 4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0-48.0 Gbyte, 4-mm DAT autoloader
TZ85-TA	2.6 Gbyte, 5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive

* Includes four cartridge loader. Larger magazines are supported.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices,* for details.

Step 5d—External Storage *(continued)*

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals are supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA or KZPAA-AA controllers.
- External BA350 is not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- SCSI cable (BN21H-02) is required to connect a single BA350 modular storage pedestal to controllers
- AlphaServer 2100 4/275 cabinet system is recommended for larger configurations using multiple external BA350 modular storage assemblies. Refer to Cabinet system order menu for ordering details.StorageWorks BA350 Modular Storage Pedestal

BA350-KB Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10.**

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI or 10BaseT selectable).
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported (DE435-AA)
- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller):
  - Four DE422-SA
  - Two DEFEA-xA
  - Five DW300-AA
  - One CXI01-xx
  - Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots

DE422-SA EISA-based Digital Etherworks network interface card

DEFEA-AA EISA-based DEC FDDIcontroller Single Attachment

DEFEA-DA EISA-based DEC FDDIcontroller Dual Attachment

DW300-AA EISA-based Token-Ring adapter includes NetWare V2.15 driver, LAN Manager Driver, and documentation (Not supported by DECnet/OSI for OpenVMS AXP)

CXI01-xx EISA-based asynchronous multiplexer

DE435-AA PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes second storage assembly, or more than two CPUs. In lesser configurations, the additional power supply may be ordered for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **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.

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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

Systems include 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

Step 10—Keyboards and Power Cords

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 and keyboard for **all** systems ordered in Europe.

Keyboards

PCXAL-FA	U.S. English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

Power Cords

BN27Y-1J*	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia/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 17-00083-15

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**)

Hardware

- 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 2100 4/200 Systems

FM-SE4HR-36	5 x 9, 4-hour response time
FM-SE512-36	5 x 12, 4-hour response time
FM-SE616-36	6 x 16, 4-hour response time
FM-SE724-36	7 x 24, 4-hour response time

Step 11—Hardware and Software Supplemental Support Services *(continued)*

AlphaServer 2100 4/275 Systems

FM-454HR-36	5 x 9, 4-hour response time
FM-45512-36	5 x 12, 4-hour response time
FM-45616-36	6 x 16, 4-hour response time
FM-45724-36	7 x 24, 4-hour response time

Software

- 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.

AlphaServer 2100 4/200 Systems

FM-SENTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems
FM-SENTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required:
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSH-36**	**Windows NT** 128 Mbyte system (DN-251P1-F9)
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 512 Mbyte system (DN-251P1-G9)

AlphaServer 2100 4/275 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSH-36**	**Windows NT** 128 Mbyte system (DN-252P1-F9)
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 512 Mbyte system (DN-252P1-G9)

Step 1—DEC OSF/1 AXP Server Systems

Select system.

- **Operating system media and documentation kit is required for first system on site; see Step 9**
- Systems ordered in the Americas and Asia Pacific Area (APA) 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 2100 4/200 and 4/275 DEC OSF/1 AXP Systems include

- DECchip 21064
  - 190-MHz CPU with 1 Mbyte onboard cache, **or**
  - 275-MHz CPU with 4 Mbyte onboard cache.
- BA740 large pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Integral 10-Mbit/s Ethernet controller, AUI or 10BaseT (twisted pair) selectable
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - 8-slot RZxx storage assembly
  - Three 5.25-inch, half-height removable media slots
  - Eight EISA slots
  - Three PCI slots
  - 602-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA orders only)
- Memory indicated below
- Disk drive indicated below (uses one storage slot)
- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Operating system base license and factory installed software (FIS)
- 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 for Operating System and NAS 200*
- NAS 200 for DEC OSF/1 AXP license (QL-306AG-AA), includes the following layered products: (order media and documentation separately)
  - PATHWORKS for DEC OSF/1 AXP (kit only, no license)
  - Polycenter Advanced File System utilities
  - Objectbroker for DEC OSF/1 AXP Runtime
  - DECmessageQ for DEC OSF/1 AXP Runtime
  - DCE Runtime
  - DEC OSF/1 AXP Server Extensions
  - PrintServer software (kit only, licensed with printer)

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200—190 MHz DEC OSF/1 AXP systems			
DA-251P1-E9*	64 Mbytes	1 x 2.0 Gbytes	7/3
DA-251P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DA-251P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/275—275 MHz DEC OSF/1 AXP systems			
DA-252P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DA-252P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to three additional CPUs, for a maximum of four.

- **Additional CPUs must match the speed of CPU in system.**
- Four-CPU systems are restricted to two memory slots.
- Three and four-CPU systems require additional power supply (see Step 7).

450AR-AA	DEC OSF/1 AXP SMP upgrade includes one 190 MHz CPU processor and DEC OSF/1 AXP SMP license.
460AR-AA	DEC OSF/1 AXP SMP upgrade includes one 275 MHz CPU processor and DEC OSF/1 AXP SMP license.

Step 3—Memory

- One-to three-CPU systems support a total of four memory boards in any combination.
- Four-CPU systems support a total of two memory boards in any combination.
- DEC OSF/1 AXP systems support maximum 1.0 Gbyte memory

MS450-BA	64 Mbyte memory module
MS450-CA	128 Mbyte memory module
MS451-CA	512 Mbyte memory module

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

- Supported on DEC OSF/1 AXP systems **only.** Requires DEC OSF/1 AXP V3.0 operating system software
- Requires one EISA slot
- Maximum one Prestoserve option per system

PB2SX-AA	Prestoserve non-Volatile Random Access Memory option; includes Prestoserve license and documentation kit

Step 4—Monitors

- System requires a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system

VRC15-PA	Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC15-P4	Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. See Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs for easy ordering.
- Storage option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Three, 2.0 Gbyte (RZ28) hard disk drives.
  - One internal SCSI cable (BC25R-3B).
- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Five, 2.0 Gbyte (RZ28) hard disk drives.
  - Three internal SCSI cable (BC25R-3B)
- Additional RZxx disk dries may be added; see Storage Diagrams for details.

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack

Step 5b—Internal Storage

Configuration Rules

- Included storage assembly supports eight 3.5-inch (RZ26L/RZ28) disk drives.
- One additional storage assembly in system enclosure supports an additional eight 3.5-inch (RZ26L/RZ28) disk drives. Additional storage assembly requires an additional power supply (see Step 7), and may require a controller (see Step 5c and Storage Diagrams).
- 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 re-configured for single-bus operation with a maximum of seven disk drives per storage assembly.
- Internal storage assemblies are normally configured 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.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See storage diagram for details.
- Internal storage assemblies support RZ26L/RZ28 disk drives **only**.
- Systems include 600 Mbyte CD-ROM; system supports two additional 5.25-inch, half-height removable media devices, or one 5.25-inch, full-height removable media device.
- Integral Fast SCSI-2 controller supports maximum of seven devices in system enclosure (three 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).
- 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. Maximum external bus length, including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ6L-LG*†	16.0 Gbyte, 5.25-inch full-height 4-mm DAT drive loader

* Includes four cartridge magazine; requires two half-height removable media device slots. Larger magazines not supported due to physical constraints.

† Base operating systems support sequential back-up mode only. Additional software is required for random access backup. See Chapter 8, Storage Devices, for details

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28 -VA	2.0 Gbyte, 3.5-inch half-height disk drive

Step 5b—Internal Storage *(continued)*

Storage Assembly for Additional Internal Storage

- Requires additional power supply; see Step 7
- Includes two SCSI cables (BC25R-3B) for factory integration; or if ordered as **spare**, for field installation

BA35E-SA Storage assembly supports eight 3.5-inch, half-height (RZ26L/RZ28) hard disk drives

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based storage controllers supported
- Maximum number of **each** EISA-based storage controller supported per system
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - 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.
- Additional configuration information
  - Each controller requires one bus slot
  - One- and three-port StorageWorks RAID Array 210 controllers (KZESC-xx) support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 controller (KZESC-BA) supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8
- Cabling information for Fast-SCSI-2 controllers (also see Storage Diagrams):
  - Internal cables are factory installed to support ordered configurations
- External cables are **not** included and must be ordered separately:
  KZESC-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
  KZESC-BA options use one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection
  PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection

Storage Controllers

KZESC-AA* One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT

KZESC-BA* Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT

PB2HA-SA EISA- based one port Fast SCSI-2 controller

KZPAA-AA PCI-based one port high-performance Fast SCSI-2 controller

* See Chapter 8, *Storage Devices*, for StorageWorks RAID Array 210 Subsystem configuration rules.

Step 5d—External Storage

External Tape Expansion

- Integral Fast SCSI-2 controller, if not connected to internal storage assembly, can be extended outside system enclosure via SCSI-out port to support external SCSI devices. Maximum external bus length, including cable and device cannot exceed 1.0 meter. 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 Fast SCSI-2 controllers (PB2HA-SA, KZPAA-AA). External tape drives are **not** supported on KZESC-xx controllers.
- Maximum external bus length, including cable and tape device cannot exceed 3.0 meters.
- Each tabletop tape device **requires** three-foot SCSI cable (BC09D-03)

Step 5d—External Storage *(continued)*

TKZ09-BA	5.0 Gbyte, 8mm tape drive
TKZ15-TA	5.0 Gbyte, 8mm tabletop tape drive
TKZ60-xx	3480-compatible tape drive (all variants)
TLZ06-FA	4.0 Gbyte, 4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0 Gbyte, 4-mm DAT autoloader
TSZ07-AA/BA/CA	1600/6250-bit/inch 9 track tabletop magtape drive
TZ85-TA	2.6 Gbyte, 5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive
TZK11-DA	2.0 Gbyte, 5.25-inch tabletop QIC tape drive

* Includes four cartridge loader. Larger magazines are supported. See Chapter 8, *Storage Devices*, for additional information.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices,* for details.

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA or KZPAA-AA controllers.
- External BA350 not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- SCSI cable (BN21H-02) required to connect single BA350 modular storage pedestal to controllers
- AlphaServer 2100 4/275 cabinet system is recommended for larger configurations using multiple external BA350 modular storage assemblies. Refer to Cabinet system order menu for ordering details.

BA350-KB	Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10**.

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices.

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI or 10BaseT selectable).
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported (DE435-AA):
- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller)
  - Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
  - Maximum number of EISA-based controllers of all types in combination are governed by EISA bus IRQ address assignments. See EISA Bus IRQ Address Table.

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment
DNSES-AA	EISA-based synchronous communications 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 AXP)
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes second storage assembly, or more than two CPUs. In lesser configurations, the additional power supply may be ordered for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **must** be ordered separately, see Step 10.

H7893-AA 602-Watt power supply

Note: Refer to System Specifications for UPS information.

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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

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

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC* DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD* DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE* DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF* DEC OSF/1 AXP Interactive 16-user license
QL-MT7AG-AA DEC OSF/1 AXP Interactive unlimited user license

QL-MT5AG-AA DEC OSF/1 AXP developer's extension license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation—required for first system on site

QA-MT4AA-H8 DEC OSF/1 AXP media and on-line documentation on CD-ROM
QA-MT4AA-GZ DEC OSF/1 AXP full hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8 Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DECnet Licenses

QL-MTJAG-AA DECnet/OSI end-system license for DEC OSF/1 AXP
QL-MTKAG-AA DECnet/OSI extended function license for DEC OSF/1 AXP

Step 10—Keyboards and Power Cords

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 and keyboard for **all** systems ordered in Europe.

Keyboards

PCXAL-FA	U.S./English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

Power Cords

BN27Y-1J*	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 17-00083-15

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

- 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 2100 4/200 Systems

FM-SE4HR-36	5 x 9, 4-hour response time
FM-SE512-36	5 x 12, 4-hour response time
FM-SE616-36	6 x 16, 4-hour response time
FM-SE724-36	7 x 24, 4-hour response time

AlphaServer 2100 4/275 Systems

FM-454HR-36	5 x 9, 4-hour response time
FM-45512-36	5 x 12, 4-hour response time
FM-45616-36	6 x 16, 4-hour response time
FM-45724-36	7 x 24, 4-hour response time

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**) *(continued)*

Software

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for DEC OSF/1 AXP include advisory and remedial software support with new version license rights for operating system and NAS 200 for the time period indicated.

AlphaServer 2100 4/200 Systems

FM-SEOSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems
FM-SEOSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45OSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems
FM-45OSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required.

- **Option A** upgrades hardware warranty on-site response time to 4-hours
- **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	**FM-X3DSH-36**	**DEC OSF/1 AXP** 128 Mbyte system (DA-251P1-F9)
FM-X3HDG-36	**FM-X3DSI-36**	**DEC OSF/1 AXP** 512 Mbyte system (DA-251P1-G9)

AlphaServer 2100 4/275 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	**FM-X3DSI-36**	**DEC OSF/1 AXP** 128 Mbyte system (DA-252P1-F9)
FM-X3HDG-36	**FM-X3DSK-36**	**DEC OSF/1 AXP** 512 Mbyte system (DA-252P1-G9)

Step 1—OpenVMS AXP Server Systems

Select system.

- **Operating system media and documentation kit is required for first system on site; see Step 9.**
- Systems ordered in the Americas and Asia Pacific Area (APA) 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 2100 4/200 and 4/275 OpenVMS AXP Systems include

- DECchip 21064
  - 190-MHz CPU with 1 Mbyte onboard cache, **or**
  - 275-MHz CPU with 4 Mbyte onboard cache.
- BA740 large pedestal enclosure which includes:
  - Integral 10 Mbyte/s Fast SCSI-2 controller
  - Integral 10-Mbit/s Ethernet controller, AUI or 10BaseT (twisted pair) selectable
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - 8-slot RZxx storage assembly
  - Three 5.25-inch, half-height removable media slots
  - Eight EISA slots
  - Three PCI slots
  - 602-Watt power supply
- 2.88 Mbyte diskette drive in dedicated slot
- 600 Mbyte CD-ROM (uses one removable media slot)
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA orders only)
- Memory indicated below
- Disk drive indicated below (uses one storage slot)
- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Operating system base license and factory installed software
- 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 for Operating System and NAS 200*
- NAS 200 for OpenVMS AXP license (QL-23EAG-AA), includes the following layered products: (order media and documentation separately)
  - DECnet for OpenVMS AXP End System
  - DECnet/OSI for OpenVMS AXP End Node
  - PATHWORKS for OpenVMS AXP (LAN Manager), kit only, no license
  - DEC TCP/IP services for OpenVMS AXP
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS AXP
  - Objectbroker for OpenVMS AXP (ACA Services)
  - DECmessageQ for OpenVMS AXP Runtime
  - DECprint Supervisor for OpenVMS AXP, Base
  - DECprint Supervisor for OpenVMS AXP, Plus
  - DECprint Supervisor for OpenVMS AXP, Open
  - PrintServer software (kit only, licensed with printer)

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

Order Number	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200—190 MHz OpenVMS AXP systems			
DY-251P1-E9*	64 Mbytes	1 x 2.0 Gbytes	7/3
DY-251P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DY-251P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/275— 275 MHz OpenVMS AXP systems			
DY-252P1-F9	128 Mbytes	1 x 2.0 Gbytes	7/3
DY-252P1-G9	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to three additional CPUs, for a maximum of four.

- **Additional CPUs must match the speed of CPU in system**
- Four-CPU systems are restricted to two memory slots.
- Three and four-CPU systems require additional power supply (see Step 7).

450YR-AA	OpenVMS AXP SMP upgrade includes one 190 MHz CPU processor and OpenVMS AXP SMP license.
460YR-AA	OpenVMS AXP SMP upgrade includes one 275 MHz CPU processor and OpenVMS AXP SMP license.

Step 3—Memory

- One-to three-CPU systems support a total of four memory boards in any combination.
- Four-CPU systems support a total of two memory boards in any combination.

MS450-BA	64 Mbyte memory module
MS450-CA	128 Mbyte memory module
MS451-CA	512 Mbyte memory module

Step 4—Monitors

- System requires a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
- Video adapter included in system supports 1024 x 768 resolution, 72-Hz monitors
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system

VRC15-PA	Northern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC15-P4	Southern Hemisphere 15-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. See Chapter 8, *Storage Devices,* for further details on devices listed.

Step 5a—Storage Option Packs

- Available in One- and Three-Port RAID Storage Option Packs and an OpenVMS AXP DSSI starter pack for easy ordering.
- Storage option packs are factory installed only
- One-Port RAID Storage Option Pack includes:
  - One-port EISA backplane RAID controller (KZESC-AA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Three, 2.0 Gbyte (RZ28) hard disk drives
  - One internal SCSI cable (BC25R-3B).
- Three-Port RAID Storage Option Pack includes:
  - Three-port EISA backplane RAID controller (KZESC-BA) with StorageWorks RAID Array 210 subsystem family software and documentation kit for DEC OSF/1 AXP, OpenVMS AXP, and Windows NT.
  - Five, 2.0 Gbyte (RZ28) hard disk drives
  - Three internal SCSI cable (BC25R-3B)
- OpenVMS AXP DSSI starter option pack includes:
  - Two KFESA-AA EISA-based DSSI adapters
  - Two HSD05-AA DSSI/SCSI converter
  - Three RZ28-VA 2.0 Gbyte disk drives
  - Two BC29S-06 DSSI cables (KFESA to HSD05)*
  - VMScluster license (QL-MUZAG-AA)
- Additional RZxx disk drives may be added to achieve maximum storage configuration; see Storage Diagrams for details

* Additional cables are required to connect to external DSSI storage devices or systems; see Storage Diagram for details.

SD001-AA	One-Port RAID Storage Option Pack
SD001-BA	Three-Port RAID Storage Option Pack
SD002-AA	OpenVMS AXP DSSI Starter Option Pack

Step 5b—Internal Storage

Configuration Rules

- Included storage assembly supports eight 3.5-inch (RZ26L/RZ28) disk drives.
- One additional storage assembly in system enclosure supports an additional eight 3.5-inch (RZ26L/RZ28) disk drives. Additional storage assembly requires an additional power supply (see Step 7), and may require a controller (see Step 5c and Storage Diagrams).
- 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 re-configured for single-bus operation with a maximum of seven disk drives per storage assembly.
- Internal storage assemblies are normally configured 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.
- BA35E StorageWorks internal storage drive slots are interleaved with electrically contiguous drives in every other slot. See storage diagram for details.
- Internal storage assemblies support RZ26L/RZ28 disk drives **only**.
- Systems include 600 Mbyte CD-ROM; system supports two additional 5.25-inch, half-height removable media devices, or one 5.25-inch, full-height removable media device.
- Integral Fast SCSI-2 controller supports maximum of seven devices in system enclosure (three 5.25-inch removable media devices and four 3.5-inch, RZ26L/RZ28 disk drives).

  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. Maximum external bus length, including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.

Removable Media Devices

RRD43-AC	600 Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0 Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0 Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ6L-LG*†	16.0 Gbyte, 5.25-inch full-height 4-mm DAT drive loader

* Includes four cartridge magazine; requires two half-height removable media device slots. Larger magazines not supported due to physical constraints.

† Base operating systems support sequential back-up mode only. Additional software is required for random access backup. See Chapter 8, *Storage Devices,* for details

Step 5b—Internal Storage *(continued)*

Hard Disk Drives

RZ26L-VA	1.05 Gbyte, 3.5-inch half-height disk drive
RZ28 -VA	2.0 Gbyte, 3.5-inch half-height disk drive

Storage Assembly for Additional Internal Storage

- Requires additional power supply; see Step 7
- Includes two SCSI cables (BC25R-3B) for factory integration; or if ordered as **spare**, for field installation

BA35E-SA	Storage assembly supports eight 3.5-inch, half-height (RZ26L/RZ28) hard disk drives

Step 5c—Storage Controllers

Configuration Rules

- StorageWorks RAID Array 210 (KZESC-xx) includes EISA backplane RAID controller (SWXCR-Ex) and StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF AXP and Windows NT.
- Maximum of three PCI-based storage controllers supported.
- Maximum number of **each** EISA-based storage controller supported per system:
  - One PB2HA-SA
  - Two KZESC-xx (One- and three-port controllers)
  - Two KFESA-AA
  - 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.
- Additional configuration information:
  - Each controller requires one bus slot
  - KFESA has dual (in/out) termination to allow connection in middle of DSSI bus
  - One- and three-port StorageWorks RAID Array 210 controllers (KZESC-xx) support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported
  - Three-port StorageWorks RAID Array 210 controller (KZESC-BA) supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subsystem* in Chapter 8
  - OpenVMS Volume Shadowing does not support KZESC-xx controllers; KZESC-xx controllers support RAID 1 (hardware-based shadowing)
  - HSZ40-xx StorageWorks array controller is **not** supported on PCI-based KZPAA-AA controller
- Cabling information for Fast-SCSI-2 controllers (also see Storage Diagrams)
  - Internal cables are factory installed to support ordered configurations
- External cables are **not** included and must be ordered separately
  - KZESC-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
  - KZESC-BA options use one or two BC25R-3B for internal connection or BN21H-02 for Port 0 and CK-SWXCR-AA cable kit for Ports 1 and 2 for external connection
  - PB2HA-SA and KZPAA-AA options use BC25R-3B for internal connection or BN21H-02 (or cable supplied with device) for external connection
- Cabling information for DSSI controllers (also see Storage Diagrams):
  - DSSI devices supported on OpenVMS AXP only
  - DSSI cables must be ordered separately
  - KFESA uses "Micro-Ribbon" connection
  - KFESA to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC22Q-xx DSSI cable
  - KFESA to any external "Micro-Ribbon" DSSI straight connection (all other DSSI systems and storage devices requiring straight connection) requires BC21Q-xx DSSI cable
  - KFESA 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
  - KFESA to HSD05 requires BC29S-xx
  - HSD05 to HSD05 (inside system) requires BC29U-02
  - HSD05 to HSD05 (between systems) requires BC29T-09
  - HSD05 to any external "Pin-Socket" DSSI connection (VAX 4000s, R400X) requires BC29R-xx
  - HSD05 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

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT
KZESC-BA*	Three-port EISA backplane RAID controller; includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for OpenVMS AXP, DEC OSF/1 AXP, and Windows NT

Step 5c—Storage Controllers *(continued)*

KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller
KFESA-AA	EISA-based single-DSSI controller (OpenVMS AXP systems only)

* See Chapter 8, *Storage Devices*, for StorageWorks RAID Array 210 Subsystem configuration rules.

Step 5d—External Storage

External 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. Maximum external bus length, including cable and device cannot exceed 1.0 meter. If not used for external expansion, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA and KZPAA-AA controllers.
- Maximum external bus length, including cable and tape device cannot exceed 3.0 meters.
- Each tabletop tape device **requires** a three-foot SCSI cable (BC09D-03)

TKZ09-BA††	5.0 Gbyte 8mm tape drive
TKZ15-TA††	5.0 Gbyte, 8mm tabletop tape drive
TKZ60-BA	3480-compatible tape drive (all variants)
TLZ06-FA	4.0 Gbyte, 4mm DAT tabletop tape drive
TLZ07-DA	8.0 Gbyte, 4mm DAT tabletop tape drive
TLZ6L-DA*†	16.0 Gbyte, 4-mm DAT autoloader
TSZ07-AA/BA/CA	1600/6250-bit/inch 9 track tabletop magtape drive
TZ85-TA	2.6 Gbyte, 5.25-inch tabletop tape drive
TZ86-TA	6.0 Gbyte, 5.25-inch tabletop tape drive
TZ87-TA	20.0 Gbyte, 5.25-inch tabletop tape drive
TZK11-DA	2.0 Gbyte, 5.25-inch tabletop QIC tape drive

* Includes four cartridge loader. Larger magazines are supported. See Chapter 8, *Storage Devices*, for additional information.

† Base operating systems support sequential back-up mode only; additional software is required for random access backup. See Chapter 8, *Storage Devices*, for details.

†† Supported on integral SCSI port

External Disk Expansion

- External BA350 StorageWorks modular storage pedestals supported on all Fast SCSI-2 controllers listed in Step 5c.
- External BA350 supports RZ26L-VA and RZ28-VA disk drives **only** when connected to one- and three-port controllers (KZESC-xx).
- External BA350 supports RZ26L-VA, RZ28-VA, RZ73-VA, RZ74-VA, and TZK10-VA when connected to PB2HA-SA and KZPAA-AA controllers.
- External BA350 not supported on integral Fast SCSI-2 controller due to insufficient remaining external bus length.
- SCSI cable (BN21H-02) is required to connect single BA350 modular storage pedestal to controllers
- AlphaServer 2100 4/275 cabinet system is recommended for larger configurations using multiple external BA350 modular storage assemblies. Refer to Cabinet system order menu for ordering details.

BA350-KB	Modular storage pedestal includes BA350-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord; requires SCSI cable (BN21H-xx). **Order country specific power cord for 240 V use from Step 10**.

See Chapter 8, *Storage Devices*, for additional ordering information for StorageWorks modular storage expansion and supported devices.

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI or 10BaseT selectable).
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported (DE435-AA)
- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller)
  - Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
  - 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.

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment
DNSES-AA	EISA-based synchronous communications 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 AXP)
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Additional power supply required if fully configured system includes second storage assembly, or more than two CPUs. In lesser configurations, the additional power supply may be ordered for n+1 redundancy.
- Americas and Asia Pacific Area 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 for **must** be ordered separately, see Step 10.

H7893-AA	602-Watt power supply

Note: Refer to System Specifications for UPS information.

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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

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 AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and **can** be moved between systems (all OpenVMS AXP) at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a **homogeneous** OpenVMS Cluster (**all OpenVMS AXP systems**)

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems)

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AG-AA	OpenVMS AXP Distributed Interactive unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

OpenVMS AXP Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DECnet Licenses

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

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 Area 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

LK411-AA	U.S./English
LK411-AB	Belgian
LK411-AQ	Canadian/English
LK411-AC	Canadian/French
LK411-AD	Danish
LK411-AF	Finnish
LK411-AG	German
LK411-AH	Dutch
LK411-AI	Italian
LK411-AK	Swiss/French
LK411-AL	Swiss/German
LK411-AM	Swedish
LK411-AN	Norwegian
LK411-AP	French
LK411-AS	Spanish
LK411-AV	Portuguese

Power Cords

BN27Y-1J*	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia/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 17-00083-15

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

- 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 2100 4/200 Systems

FM-SE4HR-36	5 x 9, 4-hour response time
FM-SE512-36	5 x 12, 4-hour response time
FM-SE616-36	6 x 16, 4-hour response time
FM-SE724-36	7 x 24, 4-hour response time

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)** *(continued)*

AlphaServer 2100 4/275 Systems

FM-454HR-36	5 x 9, 4-hour response time
FM-45512-36	5 x 12, 4-hour response time
FM-45616-36	6 x 16, 4-hour response time
FM-45724-36	7 x 24, 4-hour response time

Software

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

AlphaServer 2100 4/200 Systems

FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45VMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems
FM-45VMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems

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

Hardware and Software

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required.

- **Option A** upgrades hardware warranty on-site response time to 4-hours
- **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSG-36**	**OpenVMS AXP** 128 Mbyte system (DY-251P1-F9)
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 512 Mbyte system (DY-251P1-G9)

AlphaServer 2100 4/275 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 128 Mbyte system (DY-252P1-F9)
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 512 Mbyte system (DY-252P1-G9)

AlphaServer 2100 4/200 and 4/275 EISA Bus IRQ Address Table

(DEC OSF/1 AXP and OpenVMS AXP Systems Only)

	EISA Bus IRQ Addresses									Maximum of Each Supported		
Option	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**OpenVMS AXP**	**DEC OSF/1 AXP**	**Windows NT**
DE422	0	–	–	N	0	0	–	–	–	3	3	4
PB2GA	–	–	–	0	–	–	–	–	–	1	1	1
DEFEA	–	–	–	N	0	0	–	–	0	2	2	2
DNSES	–	–	0	N	0	0	0	0	0	5	5	0
DW300	0	–	–	N	0	0	–	–	0	4	4	5
PB2HA	–	–	–	N	0	0	0	0	0	1	1	1
KZESC	–	–	–	–	–	0	0	0	0	2	2	2
KFESA	–	–	–	N	0	0	0	0	0	2	0	0
PB2SX	–	–	–	–	–	–	–	–	–	0	1	0

Table Codes:

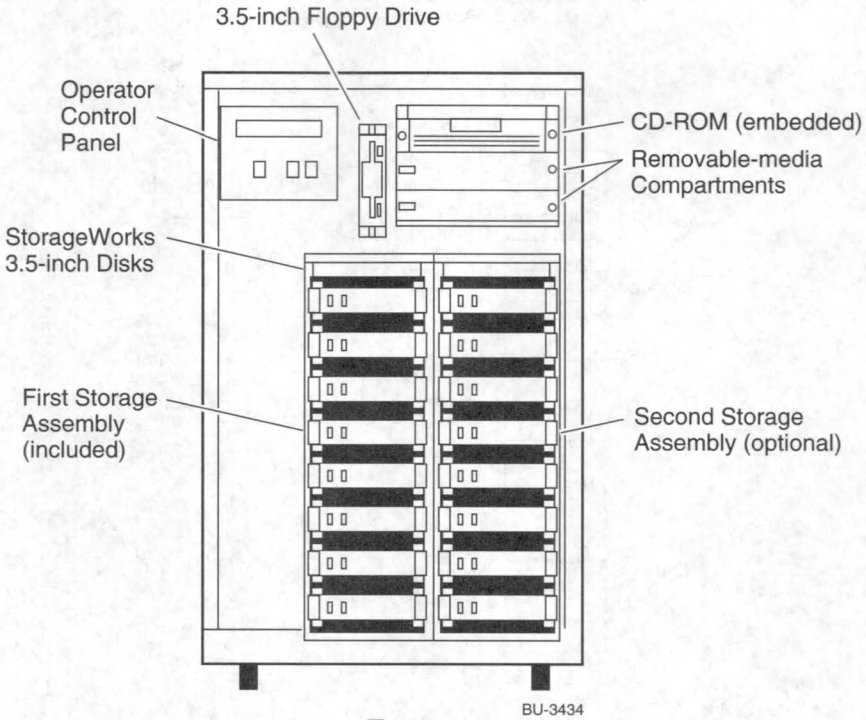
0 = address is available for device

– = address not available for device

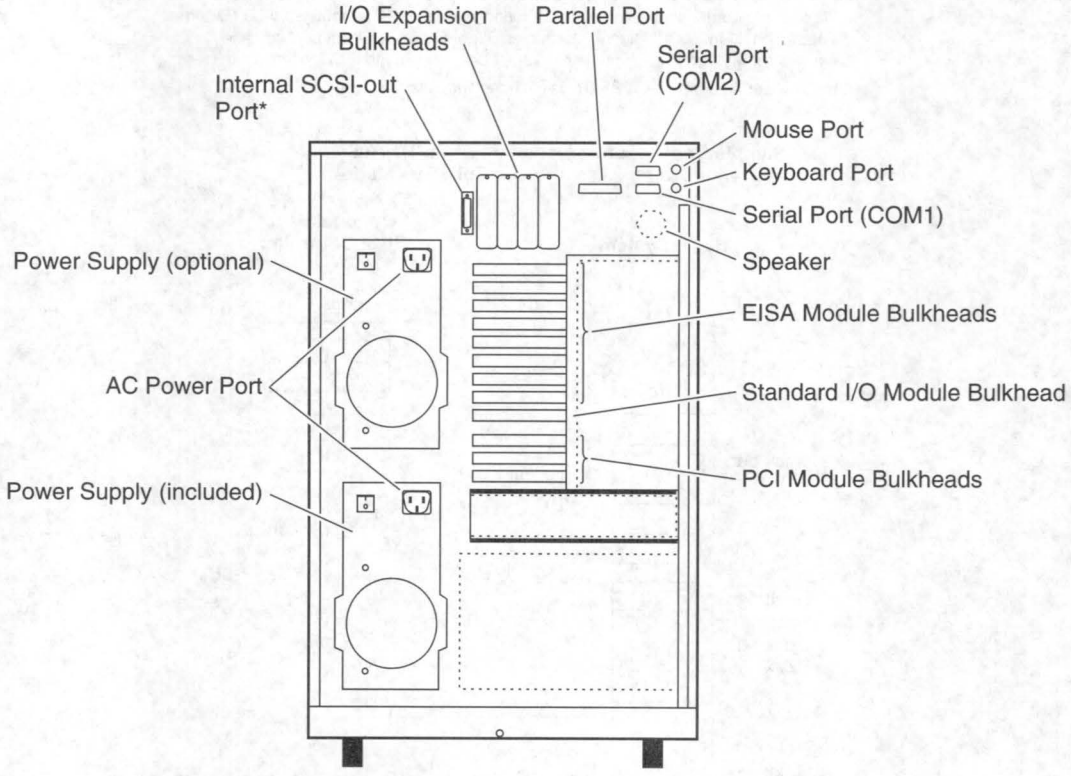
N in address location **9** = address is assigned, but its use is precluded due to presence of PB2GA-xx Video Graphics Adapter

Configuration Rules and Information

- EISA Bus IRQ address assignments are for DEC OSF/1 AXP and OpenVMS AXP systems only
- Windows NT Server operating system permits the sharing of IRQ addresses; the only limitation for these systems is the maximum number of each device supported, and the number of EISA bus slots physically available.
- 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. (**Hint:** 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.
- PB2SX (DEC OSF/1 AXP systems only) does not use any IRQ address.



Front

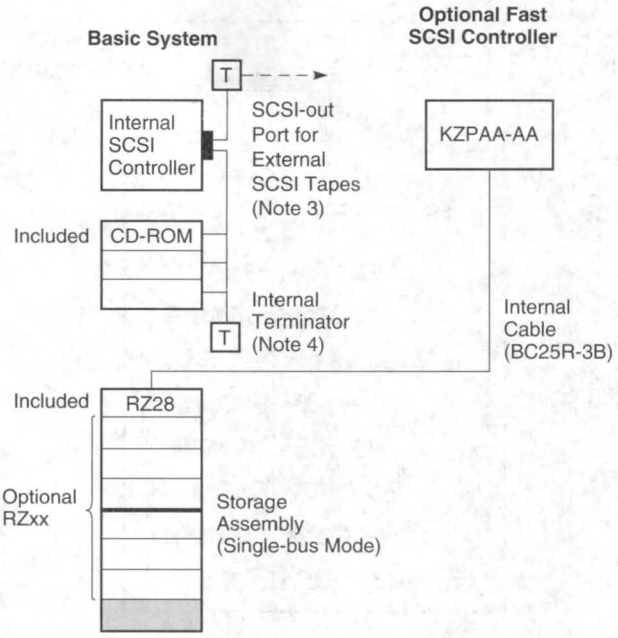


Back

* If not used, internal SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.

BU-3435

Sample Configuration Based on D*-25*P1-*9 System with Storage Assembly in Single-Bus Mode

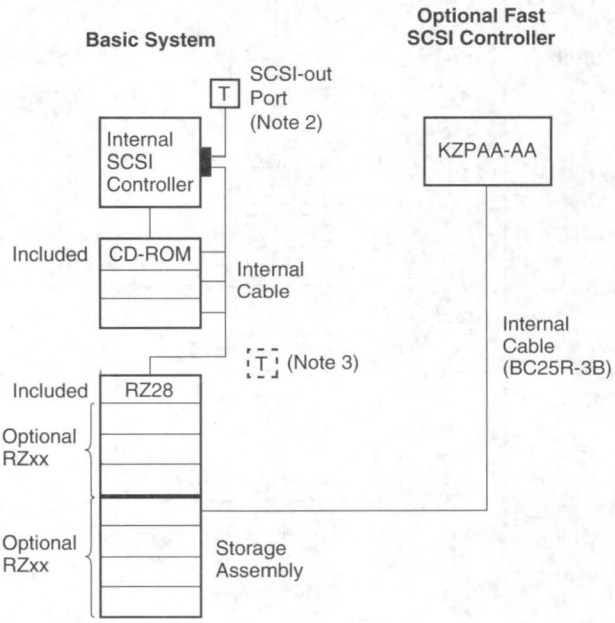


Notes:

1. All internal cables are included.
2. Optional SCSI controller in this configuration supports a maximum of seven RZxx disk drives.
3. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
4. Internal Terminator (12-41296-01) is included with system.

BU-3473

Sample Configuration Based on D*-25*P1-*9 System with Storage Assembly in Split-Bus Mode

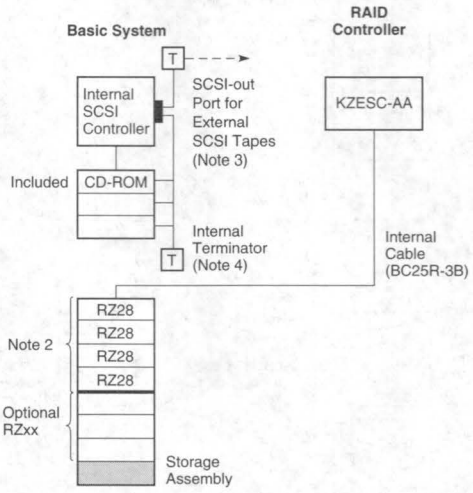


Notes:

1. All internal cables are included.
2. SCSI-out port in this configuration is not used. It must be terminated with External Terminator (12-37004-04) included with system.
3. Internal Terminator (12-41296-01) is not used in this configuration, but is included with the system (loose-piece).

BU-3436

Sample Configuration Based on D*-25*P1-*9 System with One-channel RAID Option Pack (SD001-AA)

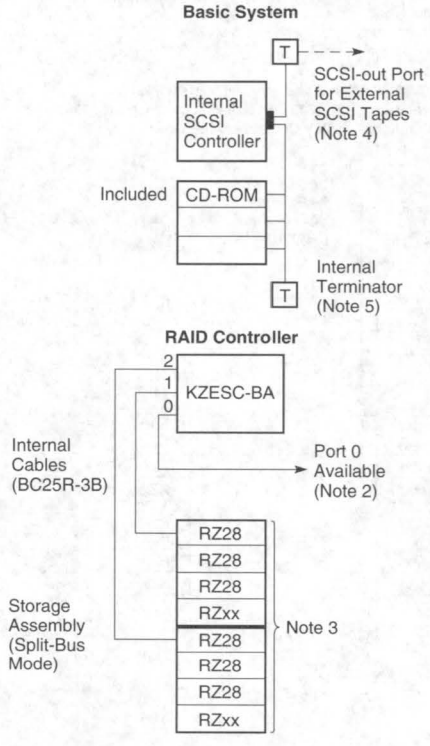


Notes:

1. All internal cables are included.
2. One RZ28 is included with the system; three RZ28s are included with the option pack; up to three RZxx can be added.
3. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
4. Internal Terminator (12-41296-01) is included with system.

BU-3472

Sample Configuration Based on D*-25*D1-*9 System with Three-channel Option Pack (SD001-BA)

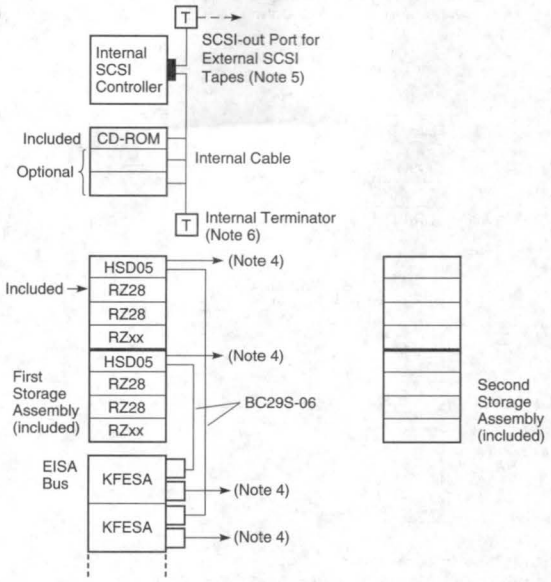


Notes:

1. All internal cables are included.
2. SCSI port 0 can be connected to second internal storage assembly, or to external disk drives; See Menu Step 5D (EXTERNAL DISK EXPANSION) for additional information.
3. One RZ28 is included with the system; five RZ28s are included with the option pack; two RZxx can be added, one to each bus.
4. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (External Tape Expansion) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
5. Internal Terminator (12-41296-01) is included with system.

BU-3474

Sample Configuration Based on D*-25*P1-*9 System with DSSI Option Starter Pack (SD002-AA)

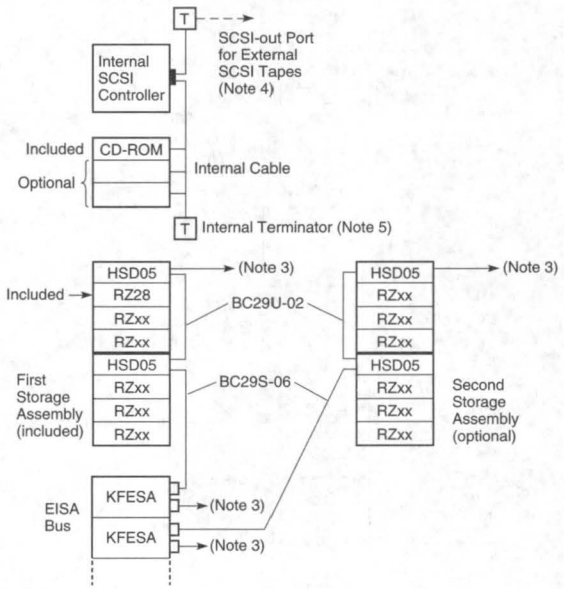


Notes:

1. System includes one RZ28; SD002-AA option pack includes two KFESAs, two HSD05s, three RZ28s, and two BC295S-06 cables (all items shown); two RZxx disks can be added, as indicated.
2. Second storage assembly can be added to further expand the configuration, provided in this diagram as a blank template.
3. Each HSD05 counts as one DSSI node; current DSSI configuration rules and bus lengths apply.
4. KFESA and HSD05 adapters, in addition to being internally connected as shown, can be connected to external DSSI storage or system(s). See Menu Step 5C for cable information.
5. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5C (TABLETOP EXPANSION) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
6. Internal Terminator (12-41296-01) is included with system.

BU-3438

Sample Configuration Based on D*-25*P1-*9 System with Maximum Internal DSSI/SCSI and External DSSI Connections (When Optional HSD05 Controllers are Ordered)

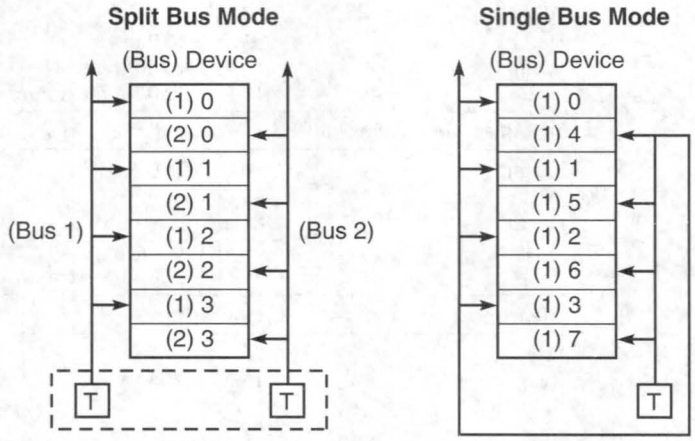


Notes:

1. All internal cables are included.
2. Each HSD05 counts as one DSSI node; current DSSI configuration rules and bus lengths apply.
3. KFESA and HSD05 adapters, in addition to being internally connected as shown, can be connected to external DSSI storage or system(s). See Menu Step 5C for cable information.
4. Internal SCSI-out port in this configuration can be connected to external SCSI tapes. Maximum external bus length cannot exceed 1.0 meter. See Menu Step 5D (TABLETOP EXPANSION) for additional information. If not used, SCSI-out port must be terminated with External Terminator (12-37004-04) included with system.
5. Internal Terminator (12-41296-01) is included with system.

BU-3439

Internal Storage Assembly Disk Drive Positions



Notes:

1. Disk drive positions are interleaved as shown.
2. [T] represents the bus terminator.
3. Internal storage assembly is normally configured for split-bus mode. Single-bus mode is achieved by reversing the postions of the jumper plug and the terminator plug.
4. Remaining storage diagrams show internal storage assembly in split-bus mode; disk drives are shown logically grouped for simplicity.

BU-3457

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 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	LNPEc (Bels) 6.6 maximum per ISO 7779

*Dimensions 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 disk drives.

Specifications *(continued)*

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 (amps)	50 Amps	50 Amps
RMS current at nominal voltage (steady state)	8.5 Amps	4.0 Amps
Maximum power consumption (Watts)	See maximum heat dissipation	See maximum heat dissipation
Power cord	Type Length U.S. plug	IEC 320 C16 240 cm (113 in.) NEMA 5-15, Socket EIC 320 Sheet, C-15
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 UPS

- Units may also be optionally hardwired on the input or output
- **Rating:** Units listed are rated 3000 VA/2000W (2100W for 240 V model). Units include an EIA 232 port for UPS monitoring and feature modular design which allows users to safely swap out components without disconnecting critical load. Battery support time is seven minutes at full load, or 14 minutes for the AlphaServer 2100 system with two power supplies and monitor. Support time is extendaable via add-on "plug & play battery modules.
- **Service:** Units sold and serviced in the Continental US feature a 3 year, full unit hot-swap 24-48 hour replacement warranty through vendor. A five-year, 5 x 8 on-site upgrade option is also availaable (see below). Other locations include a one-year warranty with return to certified service location. Digital on-site exchange service contract is also available.

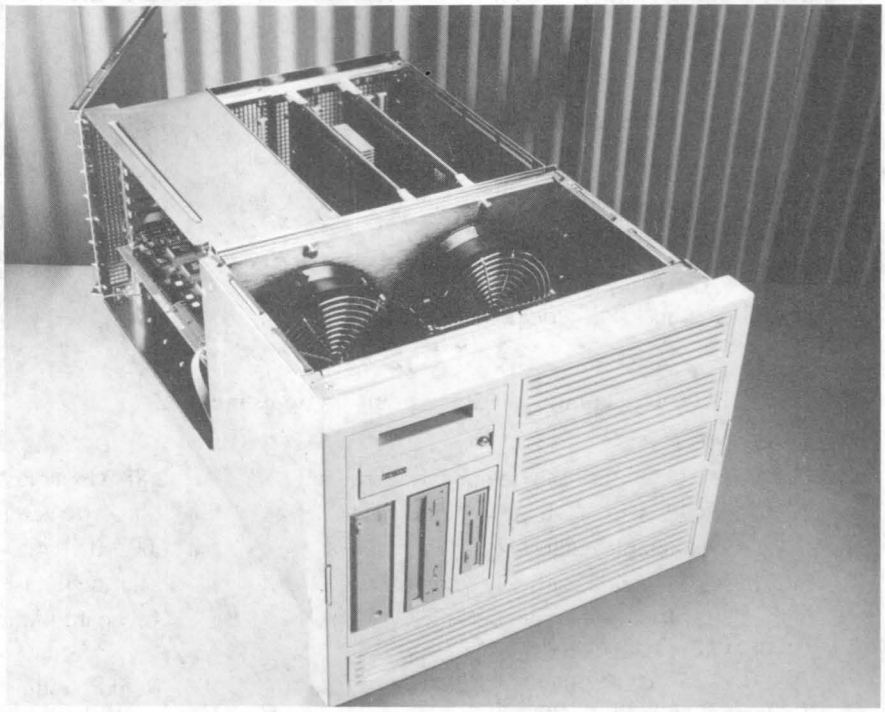
4N-AEAAH-AM	Prestige UPS for 120 Vac, 60Hz systems; wired for 208Vac single-phase input (can be wired for 240Vac single-phase input if specified). Includes 6-foot input power cord with L6-30P plug, two 5-15R2 (duplex) and one L5-30R output receptacle (can be optionally extended).
4N-AEWAR-G2	Prestige UPS five-year on-site exchange warranty upgrade for Prestige UPS 4N-AEAAH.
4N-AEAAH-AR	Prestige UPS for 240 Vac, 50-60Hz systems; wired for 220/240 Vac single-phase input. Includes 6-foot detachable power cord with VDE stripped pigtail connection for attachment of country specific plug (order plug separately). Unit has an IEC 32020A output receptacle for connection to choice of output modules listed below.
4N-AEACH-DA	Power strip with 6 SCHUKO 16amp receptacles
4N-AEACH-DB	Power strip with 6 French 16amp receptacles
4N-AEACH-DC	Power strip with 6 British 13amp receptacles

Specifications ***(continued)***

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

4N-AEAES-AA/AB	Windows NT for Alpha AXP and Intel x86, includes cables, media and documentation
4N-AEAES-ED	DEC OSF/1 AXP, includes cables, media and documentation
4N-JBBBB-GG	OpenVMS AXP, includes cables, media and documentation

See Chapter 10, *Environmental Products* for additional information.



AlphaServer 2100 4/200 and 4/275 Rackmount Systems

Product Description

The AlphaServer 2100 4/200 and 4/275 rackmount systems are rackmountable versions of the Alphaserver 2100 4/200 and 4/275 pedestal system having the same features and capacities as the pedestal system, but with minimal internal storage capacity.

The AlphaServer 2100 Rackmount system unit is designed to be installed in 30-inch deep cabinet equipment with standard RETMA or METRIC rails with mounting holes 19-inches apart, using only 14-inches of vertical space. It is an ideal building block for custom configurations suitable for those installations where floor space is at a premium, where large disk storage arrays and/or other expansion is required, or when high avilability systems are required. The AlphaServer 2100 Rackmount is used as the basic building block for the AlphaServer 2100 4/200 and 4/275 Cabinet packaged systems.

The ordering menus and diagrams that follow provide the information necessary to configure devices inside the rackmountable system unit with guidelines for cabling to external storage. For more external configuration information refer to the AlphaServer 2100 Cabinet system menus.

Step 1—Systems

Select system.

- Systems ordered in the Americas and Asia Pacific Area (APA) 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.
- Windows NT systems include: Windows NT Server plus 5-client access, V3.5 media (CD-ROM), license, and documentation in shrink-wrapped package.
- DEC OSF/1 AXP and OpenVMS AXP systems **require** operating system media and documentation kit for first system on site; see Step 9
- Options ordered will be factory installed unless specified as **spares.**
- See AlphaServer 2100 Cabinet system for UPS information or call for specific rackmount configuration support.

AlphaServer 2100 4/200 and 4/275 Rackmount Systems include

- DECchip 21064
  - 190-MHz CPU with 1-Mbyte onboard cache, **or**
  - 275-MHz CPU with 4-Mbyte onboard cache.
- BA741 rackmountable enclosure which includes:
  - Integral 10-Mbyte/s Fast SCSI-2 controller
  - Integral 10-Mbit/s Ethernet controller, AUI or 10BaseT (twisted pair) selectable
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - Two 3.50-inch RZxx hard disk drives slots
  - Two 5.25-inch, half-height removable media slots
  - Eight EISA slots
  - Three PCI slots
  - 840-Watt power supply
- 2.88-Mbyte diskette drive in dedicated slot
- 2.0 Gbyte hard disk drive (uses one RZxx disk slot)
- 600-Mbyte CD-ROM (uses one removable media slot)
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord (Americas and APA orders only)
- Memory indicated below
- Customer documentation
- EISA Configuration Utility
- Hardware Warranty: Three-year, on-site, with 5 x 9, 24-hour response time*
- Software Warranty: Operating System and NAS 200 90-day SPD conformance with advisory telephone support*

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

Windows NT Rackmount servers include

- 1280 x 1024 Video Graphics Adapter (uses one EISA slot)
- Windows NT Server plus 5-client access, V3.5 media (CD-ROM) and license in shrink-wrapped package.

Order Number	Model	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
Windows NT Rackmount Systems				
DN-251W1-E9	4/200	64 Mbytes*	1 x 2.0 Gbytes	7/3
DN-251W1-F9	4/200	128 Mbytes	1 x 2.0 Gbytes	7/3
DN-251W1-G9	4/200	512 Mbytes	1 x 2.0 Gbytes	7/3
DN-252W1-F9	4/275	128 Mbytes	1 x 2.0 Gbytes	7/3
DN-252W1-G9	4/275	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

Step 1—Systems (*continued*)

DEC OSF/1 AXP Rackmount servers include

- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Operating system base license and factory installed software, NAS 200 for DEC OSF/1 AXP license (QL-306AG-AA), includes the following layered products: (order media and documentation separately)
  - PATHWORKS for DEC OSF/1 AXP (kit only, no license)
  - Polycenter Advanced File System utilities
  - Objectbroker for DEC OSF/1 AXP Runtime
  - DECmessageQ for DEC OSF/1 AXP Runtime
  - DCE Runtime
  - DEC OSF/1 AXP Server Extensions
  - PrintServer software (kit only, licensed with printer)

Order Number	Model	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
DEC OSF/1 AXP Rackmount Systems				
DA-251W1-E9	4/200	64 Mbytes*	1 x 2.0 Gbytes	7/3
DA-251W1-F9	4/200	128 Mbytes	1 x 2.0 Gbytes	7/3
DA-251W1-G9	4/200	512 Mbytes	1 x 2.0 Gbytes	7/3
DA-252W1-F9	4/275	128 Mbytes	1 x 2.0 Gbytes	7/3
DA-252W1-G9	4/275	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

OpenVMS AXP Rackmount servers include

- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- **OpenVMS AXP** system include: operating system base license and factory installed software, NAS 200 for OpenVMS AXP license (QL-23EAG-AA), includes the following layered products: (order media and documentation separately)
  - DECnet for OpenVMS AXP End System
  - DECnet/OSI for OpenVMS AXP End Node
  - PATHWORKS for OpenVMS AXP (LAN Manager), kit only, no license
  - DEC TCP/IP services for OpenVMS AXP
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS AXP
  - Objectbroker for OpenVMS AXP (ACA Services)
  - DECmessageQ for OpenVMS AXP Runtime
  - DECprint Supervisor for OpenVMS AXP, Base
  - DECprint Supervisor for OpenVMS AXP, Plus
  - DECprint Supervisor for OpenVMS AXP, Open
  - PrintServer software (kit only, licensed with printer

Order Number	Model	Memory	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
OpenVMS AXP Rackmount Systems				
DY-251W1-E9	4/200	64 Mbytes*	1 x 2.0 Gbytes	7/3
DY-251W1-F9	4/200	128 Mbytes	1 x 2.0 Gbytes	7/3
DY-251W1-G9	4/200	512 Mbytes	1 x 2.0 Gbytes	7/3
DY-252W1-F9	4/275	128 Mbytes	1 x 2.0 Gbytes	7/3
DY-252W1-G9	4/275	512 Mbytes	1 x 2.0 Gbytes	7/3

* 64 Mbyte system **not** available in Europe. Order for Americas and APA **only**.

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to three additional CPUs, for a maximum of four.

- **Additional CPUs must match the speed of CPU in system**
- Four-CPU systems are restricted to two memory slots.

450NR-AA	**Windows NT** SMP upgrade, includes one 190 MHz CPU processor; SMP license is not required.
460NR-AA	**Windows NT** SMP upgrade, includes one 275 MHz CPU processor; SMP license is not required.
450AR-AA	**DEC OSF/1 AXP** SMP upgrade includes one 190 MHz CPU processor and DEC OSF/1 AXP SMP license.
460AR-AA	**DEC OSF/1 AXP** SMP upgrade includes one 275 MHz CPU processor and DEC OSF/1 AXP SMP license.
450YR-AA	**OpenVMS AXP** SMP upgrade includes one 190 MHz CPU processor and OpenVMS AXP SMP license.
460YR-AA	**OpenVMS AXP** SMP upgrade includes one 275 MHz CPU processor and OpenVMS AXP SMP license.

Step 3—Memory

- 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.

Note: DEC OSF/1 AXP systems support a maximum of 1 Gbyte memory

MS450-BA	64-Mbyte memory module
MS450-CA	128-Mbyte memory module
MS451-CA	512-Mbyte memory module

Step 3a—Prestoserve Non-Volatile Random Access Memory

- Supported on **DEC OSF/1 AXP** systems **only.** Requires DEC OSF/1 AXP V3.0 operating system software
- Requires one EISA slot
- Maximum one Prestoserve option per system

PB2SX-AA	Prestoserve non-Volatile Random Access Memory (NVRAM) option; includes Prestoserve license and documentation kit

Step 4—Monitors

- **Windows NT** systems require a graphics monitor to run **all** functions.
  - Video adapter included in Windows NT systems support 1280 x 1024 and 1024 x 768 resolution, 72-Hz monitors.
- **DEC OSF/1 AXP** and **OpenVMS AXP** systems require a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
  - Video adapter included in DEC OSF/1 AXP and OpenVMS AXP system supports 1024 x 768 resolution, 72-Hz monitors
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.

Step 4—Monitors *(continued)*

VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required. Refer to Chapter 8, *Storage Devices,* for further details on devices listed.

- Integral Fast SCSI-2 controller supports maximum of seven devices (two removable media devices and two hard disk drives inside the base chassis) and three external devices via the SCSI-out port.
- External devices must be mounted next to chassis since maximum external SCSI bus length, including cable and device, **cannot** exceed 1.0 meter.
- If external expansion is not used, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.

Step 5a—Internal Storage

Configuration Rules

- Systems include 600 Mbyte CD-ROM drive, select one additional removable media device if required.
- Systems include 2.0 Gbyte hard disk drive, select one additional hard disk drive if required.

Removable Media Devices

RRD43-AC	600-Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0-Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0-Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0-Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-MY	1.05-Gbyte, 3.5-inch half-height disk drive
RZ28 -MY	2.0-Gbyte, 3.5-inch half-height disk drive

Step 5b—External Storage

- Additonal storage expansion can be added outside the BA741 rackmountable enclosure. Select rackmountable StorageWorks shelves if required.

2T-BA350-SF	Rackmountable BA350 StorageWorks Shelf; front accessible
2T-BA350-SR	Rackmountable BA350 StorageWorks Shelf; rear accessible

Configuration Rules

- PCI-based controller occupy one PCI bus slot. Maximum of three PCI-based storage controllers supported per system.
- EISA-based controllers occupy one EISA-bus slot. Maximum of two (one- and three-port KZESC-xx controllers) supported per system.
- One- and three-port StorageWorks RAID Array 210 controllers (KZESC-xx) support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported.
- Three-port StorageWorks RAID Array 210 controller (KZESC-BA) supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8.
- Three-port StorageWorks RAID Array 210 controller (KZESC-BA) **requires** internal cable kit (2T-SWXCK-AA) see SCSI cabling information Step 5c

Step 5b—External Storage *(continued)*

Windows NT systems support

- Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots.

DEC OSF/1 AXP systems support

- 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.

OpenVMS AXP systems support

- 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.
- Maximum of two KFESA-AA EISA-based single-DSSI controllers support.

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller (SWXCR-Ex); includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for all operating systems
KZESC-BA*	Three-port EISA backplane RAID controller(SWXCR-Ex); includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for all operating systems
PB2HA-SA	EISA- based one port Fast SCSI-2 controller
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller
KFESA-AA	EISA-based single-DSSI controller (supported on OpenVMS AXP systems only)

* See Chapter 8, *Storage Devices*, for StorageWorks RAID Array 210 Subsystem configuration rules.

SCSI Cabling Information

- External cables are **not** included and must be ordered separately
  - Order BN21H-03 SCSI cable for 2T-BA350-Sx shelves in positions 1, 3, 5, 7, 9 (see 'A' on SCSI-based Storage diagram)
  - Order BN21H-02 SCSI cable for 2T-BA350-Sx shelves in positions 2, 4, 6, 8 (see 'B' on SCSI-based Storage Diagram
  - Three-port controller (KZESC-BA) requires 2T-SWXCK-AA cable kit for Ports 1 and 2 for external connection

DSSI Cabling Information (OpenVMS AXP systems only)

- External cables are **not** included and must be ordered separately
- Order BC29S-09 DSSI cable for HSD05-AA in 2T-BA350-Sx shelves (see 'A' on DSSI-based Storage Diagram)
- Order BC29U-02 DSSI cable for HSD05-AA in adjacent 2T-BA350-Sx shelves (see 'B' DSSI-based on Storage Diagram
- Order BC29V-06 DSSI cable for HSD05-AA in non-adjacent 2T-BA350-Sx shelves (see 'C' DSSI-based on Storage Diagram

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI or 10BaseT selectable).
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported (DE435-AA)

Windows NT systems

- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller):
  - Four DE422-SA
  - Two DEFEA-xA
  - Five DW300-AA
  - One CXI01-xx
- Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots

Step 6—Networks and Communications *(continued)*

DEC OSF/1 AXP and OpenVMS AXP systems

- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller)
  - Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
- Maximum number of EISA-based controllers of all types in combination are governed by EISA bus IRQ address assignments. See EISA Bus IRQ Address Table

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment (requires two EISA 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 AXP)
CXI01-xx	EISA-based asynchronous multiplexer
DNSES-AA	EISA-based synchronous communications controller
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply

- Standard power supply supports a fully configured system
- Select an addittional power supply for n+1 redundancy, if required.
- H7893-AA power supply for AlphaServer 2100 pedestal is **not** compatible with, and will not mount in the rackmount system.

2T-450HR-AA	840-watt additional power supply with 120 VAC power cord
2T-450HR-AB	840-watt additional power supply with 240 VAC power cord

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 (included with system) for each connection. A cable must be ordered unless otherwise provided.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

Windows NT systems

Systems include 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

Step 9—Software *(continued)*

DEC OSF/1 AXP systems

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

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

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7AG-AA	DEC OSF/1 AXP Interactive unlimited user license
QL-MT5AG-AA	DEC OSF/1 AXP developer's extension license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation—required for first system on site

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DECnet Licenses

QL-MTJAG-AA	DECnet/OSI end-system license for DEC OSF/1 AXP
QL-MTKAG-AA	DECnet/OSI extended function license for DEC OSF/1 AXP

OpenVMS AXP systems

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and **can** be moved between systems (all OpenVMS AXP) at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a **homogeneous** OpenVMS Cluster (all OpenVMS AXP systems)

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems)

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AG-AA	OpenVMS AXP Distributed Interactive unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

Step 9—Software *(continued)*

OpenVMS AXP Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DECnet Licenses

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

DSSI Information (OpenVMS AXP systems only)

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

Step 10—Power Cords and Keyboards

System Power Cords

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V system power cord and U.S. keyboard unless alternate is specified. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Select system power cord if additional Power Supply is ordered

Included*	U.S., Canada, Japan, 120 V
BN19J-2E	Austrialia, 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
BN18Y-2E	Israel

* Orderable as 17-00083-51

Monitor Power Cords

- Monitors ordered in the Americas and Asia Pacific Area **include** 120 V (BN27S-03) monitor power cord
- Monitors ordered in Europe **require** country specific 240 V monitor power cord.

BN27S-03	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia, 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

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

Keyboards

PCXAL-FA*	U.S. English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

* Included if alternate not selected

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)**

Hardware

- 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 2100 4/200 Systems	
FM-SE4HR-36	5 x 9, 4-hour response time
FM-SE512-36	5 x 12, 4-hour response time
FM-SE616-36	6 x 16, 4-hour response time
FM-SE724-36	7 x 24, 4-hour response time

AlphaServer 2100 4/275 Systems	
FM-454HR-36	5 x 9, 4-hour response time
FM-45512-36	5 x 12, 4-hour response time
FM-45616-36	6 x 16, 4-hour response time
FM-45724-36	7 x 24, 4-hour response time

Step 11a—Hardware and Software Supplemental Support Services **(Americas and Asia Pacific Area only)** *(continued)*

Software

- 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 DEC OSF/1 AXP include advisory and remedial software support with new version license rights for DEC OSF/1 AXP and NAS 200 for the time period indicated.
- Software service upgrades for OpenVMS AXP include advisory and remedial software support with new version license rights for OpenVMS AXP and NAS 200 for the time period indicated.

AlphaServer 2100 4/200 Systems

FM-SENTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems
FM-SENTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems
FM-SEOSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems
FM-SEOSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems

Step 11—Hardware and Software Supplemental Support Services *(continued)*

FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems
FM-45OSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems
FM-45OSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems
FM-45VMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems
FM-45VMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems

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

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required.
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDF-36	**FM-X3DSG-36**	**Windows NT** 64 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 512 Mbyte system
FM-X3HDF-36	**FM-X3DSH-36**	**DEC OSF/1 AXP** 64 Mbyte system
FM-X3HDF-36	**FM-X3DSH-36**	**DEC OSF/1 AXP** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSI-36**	**DEC OSF/1 AXP** 512 Mbyte system
FM-X3HDF-36	**FM-X3DSG-36**	**OpenVMS AXP** 64 Mbyte system
FM-X3HDF-36	**FM-X3DSG-36**	**OpenVMS AXP** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 512 Mbyte system

AlphaServer 2100 4/275 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**Windows NT** 512 Mbyte system
FM-X3HDF-36	**FM-X3DSI-36**	**DEC OSF/1 AXP** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSK-36**	**DEC OSF/1 AXP** 512 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 128 Mbyte system
FM-X3HDG-36	**FM-X3DSH-36**	**OpenVMS AXP** 512 Mbyte system

AlphaServer 2100 4/200 and 4/275 EISA Bus IRQ Address Table

(DEC OSF/1 AXP and OpenVMS AXP Systems Only)

	EISA Bus IRQ Addresses									Maximum of Each Supported		
Option	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**OpenVMS AXP**	**DEC OSF/1 AXP**	**Windows NT**
DE422	0	–	–	N	0	0	–	–	–	3	3	4
PB2GA	–	–	–	0	–	–	–	–	–	1	1	1
DEFEA	–	–	–	N	0	0	–	–	0	2	2	2
DNSES	–	–	0	N	0	0	0	0	0	5	5	0
DW300-AA	0	–	–	N	0	0	–	–	0	4	4	5
PB2HA	–	–	–	N	0	0	0	0	0	1	1	1
KZESC	–	–	–	–	–	0	0	0	0	2	2	2
KFESA	–	–	–	N	0	0	0	0	0	2	0	0
PB2SX	–	–	–	–	–	–	–	–	–	0	1	0

Table Codes:

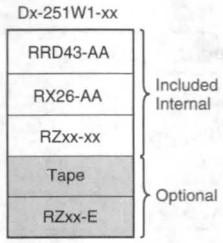
0 = address is available for device

– = address not available for device

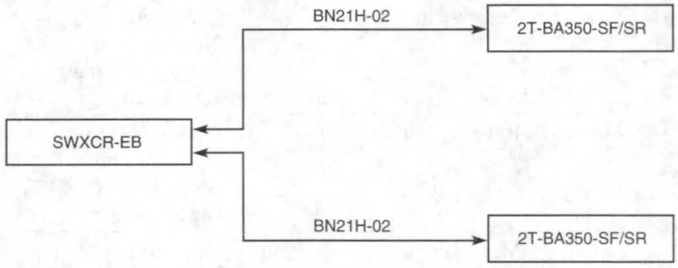
N in address location **9** = address is assigned, but its use is precluded due to presence of PB2GA-xx Video Graphics Adapter

Configuration Rules and Information

- EISA Bus IRQ address assignments are for DEC OSF/1 AXP and OpenVMS AXP systems only
- Windows NT Server operating system permits the sharing of IRQ addresses; the only limitation for these systems is the maximum number of each device supported, and the number of EISA bus slots physically available.
- 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. (**Hint:** 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.
- PB2SX (DEC OSF/1 AXP systems only) does not use any IRQ address.

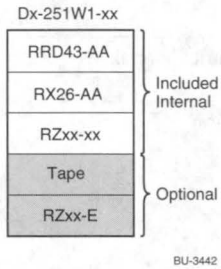


Suggested configuration when using SWXCR

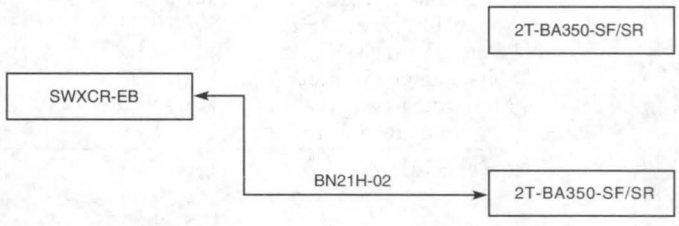


Note:
When installing a SWXCR-EB, order one 2T-SWXCK-AA cable kit.

BU-3447



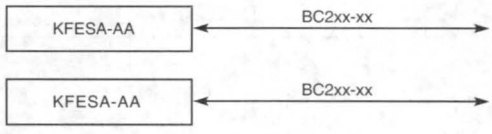
Suggested configuration when using SWXCR



Note:
When installing a SWXCR-EB, order one 2T-SWXCK-AA cable kit.

BU-3443

Suggested configuration when using KFESA-AA



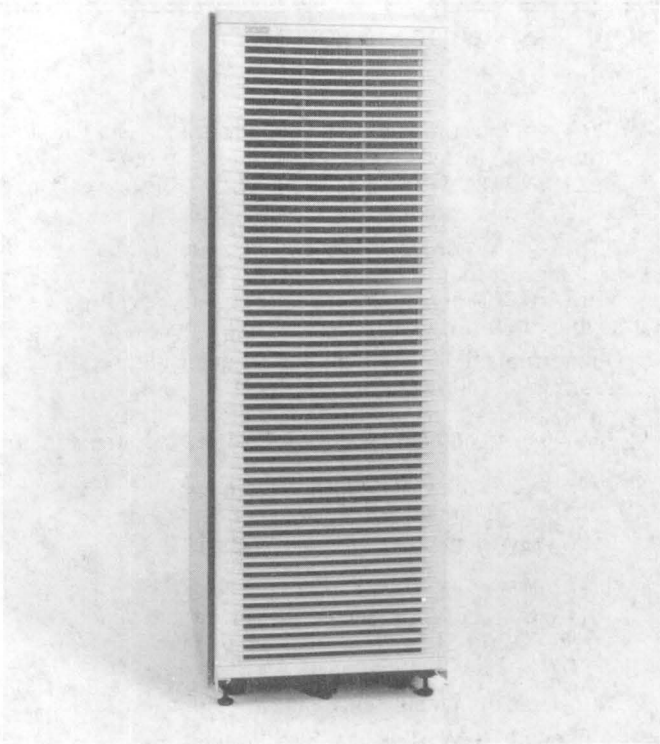
Cable selecton guide for KFESA-AA DSSI adapter:

Cable	For Connection To:
BC22Q-xx	VAX 4000, R400X
BC21Q-xx	All others, straight connection
BC29S-xx	All others, right angled connection

BU-3444

Specifications

Shipping Dimension		
Height	35 cm (14 in.)	
Width	45 cm (19 in.)	
Depth	66 cm (26 in.)	
Weight	45.5kg (100 lb)	
Clearances	**Operating**	**Service**
Front	20.3 cm (8 in.)	100 cm (39.4 in.)
Rear	20.3 cm (8 in.)	61 cm (24 in.)
Sides	None	61 cm (24 in.)
Environmental		
Temperature	Operating Nonoperating Storage (60 days) Rate of change	10°-40° C (50°-104° F) -40°-66° C (-40°-151° 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% noncondensing 10-95% noncondensing 10–95% noncondensing 20% / hr
Maximum heat dissipation	Operating	1200 Watt AC, 4095 Btu/hr
Air flow and quality	Operating Intake location Exhaust location	200 CFM Front Rear
Altitude	Operating Nonoperating	2000 m (6562 ft) 3600 m (12,000 ft)
Mechanical shock	Operating Nonoperating	10 g pk for 10 ± 3 ms 20 g pk for 10 ± 3 ms
Vibration	Operating	5-16 Hz @ 0.02-in da min 16-200 Hz @ 0.25 g max 200-500 Hz @ 0.10 g max 1 hr per axis
Acoustics	Operating	LNPEc (Bels) 6.5 maximum per ISO 7779
Electrical		
Voltage range (AVS) Power source phase Nominal frequency (Hz) Frequency range (Hz) Maximum rated current Maximum power consumption (Watts)	100-120 / 220 - 240 Vac Single 50 - 50 Hz 49 - 61 Hz 10 a / 5 a 1,200 W (PFC = 0.99, 10A @ 120 V)	
Power cord	Type Length U.S. plug	IEC 320 C16 452 cm (178 in.) NEMA 5-15, Socket EIC 320 Sheet, C-15
Agency approvals	UL 114 (office equipment) UL 478 (EDP units) VDE 0875 (RFI suppression) Australian AS C 100 IEC Publication 950 FCC Part 15 Docket 20780 CSA C22.2 No. 134 (office equipment) CSA C22.2 No. 154 (data processing)	



AlphaServer 2100 4/200 and 4/275 Cabinet Systems

Product Description

The AlphaServer 2100 4/200 and 4/275 Cabinet systems are cabinet versions of the AlphaServer 2100 4/200 and 4/275 Rackmount low-cost Alpha AXP symmetric multiprocessing (SMP) PCI/EISA-based server. The AlphaServer 2100 Rackmount is used as the basic building block for the AlphaServer 2100 Cabinet packaged system. The AlphaServer 2100 Cabinet is designed for office, satellite equipment rooms, and shop-floor 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 AlphaServer 2100 4/200 and 4/275 Cabinet packaged systems:

- Storage:
  - AlphaServer 2100 Rackmount enclosure mounted in AlphaServer 2100 Cabinet contains one RZ28 system disk. All other disks, controllers and cables must be ordered separately.
  - Each Alpha 2100 Rackmount enclosure requires 14-inches of vertical space when mounted in the AlphaServer 2100 Cabinet.
  - Each StorageWorks shelf (2T-BA350-Sx) requires 7-inches of vertical space. Note that 2T-BA350-SF (front mounted) and 2T-BA350-SR (rear mounted) shelves can be mounted back-to-back in the same 7-inch space.
- Power controller as well as voltage and total current requirements.

The photograph shows an AlphaServer 2100 Cabinet system including one AlphaServer 2100 Rackmountable chassis and two StorageWorks shelves.

Step 1—Systems

Select system.

- 120 V systems ordered in the Americas and Asia Pacific Area (APA) include NEMA Locking, 15-foot (4.57 meter), NEMA 5-30P, Socket NEMA 5-30R power cord and U.S. keyboard unless alternate is selected..
- 240 V systems ordered in Europe include NEMA Locking, 15-foot (4.57 meter), NEMA 6-30P, Socket NEMA 6-30R power cord. Select country specific keyboard for **all** systems ordered in Europe.
- Uninterruptable Power Supplies are available; see UPS Information following System Specifications.
- DEC OSF/1 AXP and OpenVMS AXP operating system media and documentation kit is required for first system on site; see Step 9
- Additional AlphaServer 2100 Rackmountable systems and optional storage ordered with cabinet systems will be factory installed and include required power cords.
- Options ordered will be factory installed unless specified as **spares**.

AlphaServer 2100 4/200 and 4/275 Cabinet Systems include

- H9A10-Cx Cabinet with installed AlphaServer 2100 Rackmount system with
  - 190-MHz CPU with 1-Mbyte onboard cache, **or**
  - 275-MHz CPU with 4-Mbyte onboard cache.
  - Two StorageWorks shelves; one front mounted (2T-BA350-SF) and one rear mounted (2T-BA350-SR)
- BA741 rackmountable enclosure which includes
  - Integral 10-Mbyte/s Fast SCSI-2 controller
  - Integral 10-Mbit/s Ethernet controller, AUI or 10BaseT (twisted pair) selectable
  - Two EIA-232 asynchronous serial ports, 9-pin D-subminiature connectors
  - One parallel port, 25-pin D-subminiature connectors
  - Two 3.50-inch RZxx hard disk drives slots
  - Two 5.25-inch, half-height removable media slots
  - Eight EISA slots
  - Three PCI slots
  - 840-Watt power supply
- 2.88-Mbyte diskette drive in dedicated slot
- 2.0 Gbyte hard disk drive (uses one RZxx disk slot
- 600-Mbyte CD-ROM (uses one removable media slot)
- 3-button mouse
- Keyboard (Americas and APA orders only)
- Power cord
- Memory indicated below
- 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 for Hardware and Software Supplemental Services.

Windows NT Cabinet servers include

- 1280 x 1024 Video Graphics Adapter (uses one EISA slot)
- Windows NT Server plus 5-client access, V3.5 media (CD-ROM) and license in shrink-wrapped package.
- ISV Marketing Kit

Order Number	Model	Memory	Cabinet Power Required	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200 190 MHz Windows NT Cabinet systems					
DN-261C1-F2	4/200	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DN-261C1-F3	4/200	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DN-261C1-G2	4/200	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DN-261C1-G3	4/200	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/200 275 MHz Windows NT Cabinet systems					
DN-262C1-F2	4/275	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DN-262C1-F3	4/275	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DN-262C1-G3	4/275	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DN-262C1-G3	4/275	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3

Step 1—Systems *(continued)*

DEC OSF/1 AXP Cabinet servers include

- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Operating system base license and factory installed software, NAS 200 for DEC OSF/1 AXP license (QL-306AG-AA), includes the following layered products: (order media and documentation separately)
  - PATHWORKS for DEC OSF/1 AXP (kit only, no license)
  - Polycenter Advanced File System utilities
  - Objectbroker for DEC OSF/1 AXP Runtime
  - DECmessageQ for DEC OSF/1 AXP Runtime
  - DCE Runtime
  - DEC OSF/1 AXP Server Extensions
  - PrintServer software (kit only, licensed with printer)

Order Number	Model	Memory	Cabinet Power Required	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200 190 MHz DEC OSF/1 AXP Cabinet systems					
DA-261C1-F2	4/200	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DA-261C1-F3	4/200	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DA-261C1-G2	4/200	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DA-261C1-G3	4/200	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/200 275 MHz DEC OSF/1 AXP Cabinet systems					
DA-262C1-F2	4/275	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DA-262C1-F3	4/275	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DA-262C1-G2	4/275	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DA-262C1-G3	4/275	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3

OpenVMS AXP Cabinet servers include

- 1024 x 768 Video Graphics Adapter (uses one EISA slot)
- Operating system base license and factory installed software, NAS 200 for OpenVMS AXP license (QL-23EAG-AA), includes the following layered products: (order media and documentation separately)
  - DECnet for OpenVMS AXP End System
  - DECnet/OSI for OpenVMS AXP End Node
  - PATHWORKS for OpenVMS AXP (LAN Manager), kit only, no license
  - DEC TCP/IP services for OpenVMS AXP
  - Polycenter Software Distribution (Client)
  - DECwindows Motif for OpenVMS AXP
  - Objectbroker for OpenVMS AXP (ACA Services)
  - DECmessageQ for OpenVMS AXP Runtime
  - DECprint Supervisor for OpenVMS AXP, Base
  - DECprint Supervisor for OpenVMS AXP, Plus
  - DECprint Supervisor for OpenVMS AXP, Open
  - PrintServer software (kit only, licensed with printer

Order Number	Model	Memory	Cabinet Power Required	Storage RZ28 = 2.0 Gbytes	EISA/PCI slots available for additional options
AlphaServer 2100 4/200 MHz OpenVMS AXP Cabinet Systems					
DY-261C1-F2	4/200	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DY-261C1-F3	4/200	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DY-261C1-G2	4/200	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DY-261C1-G3	4/200	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
AlphaServer 2100 4/275 MHz OpenVMS AXP Cabinet Systems					
DY-262C1-F2	4/275	128 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DY-262C1-F3	4/275	128 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3
DY-262C1-G2	4/275	512 Mbytes	120 VAC	1 x 2.0 Gbytes	7/3
DY-262C1-G3	4/275	512 Mbytes	240 VAC	1 x 2.0 Gbytes	7/3

Step 2—CPU Symmetrical Multiprocessing (SMP) Upgrade

Order up to three additional CPUs, for a maximum of four CPUs in **each** AlphaServer 2100 Rackmount system included in an AlphaServer 2100 Cabinet

- **Additional CPUs must match the speed of CPU in system**
- Four-CPU systems are restricted to two memory slots.

450NR-AA	**Windows NT** SMP upgrade, includes one 190 MHz CPU processor; SMP license is not required.
460NR-AA	**Windows NT** SMP upgrade, includes one 275 MHz CPU processor; SMP license is not required.
450AR-AA	**DEC OSF/1 AXP** SMP upgrade includes one 190 MHz CPU processor and DEC OSF/1 AXP SMP license.
460AR-AA	**DEC OSF/1 AXP** SMP upgrade includes one 275 MHz CPU processor and DEC OSF/1 AXP SMP license.
450YR-AA	**OpenVMS AXP** SMP upgrade includes one 190 MHz CPU processor and OpenVMS AXP SMP license.
460YR-AA	**OpenVMS AXP** SMP upgrade includes one 275 MHz CPU processor and OpenVMS AXP SMP license.

Step 3—Memory

- 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.
- DEC OSF/1 AXP systems support a maximum of 1 Gbyte memory

MS450-BA	64-Mbyte memory module
MS450-CA	128-Mbyte memory module
MS451-CA	512-Mbyte memory module

Step 3a—Prestoserve Non-Volatile Random Access Memory

- Supported on **DEC OSF/1 AXP** systems **only.** Requires DEC OSF/1 AXP V3.0 operating system software
- Requires one EISA slot
- Maximum one Prestoserve option per system

PB2SX-AA	Prestoserve non-Volatile Random Access Memory (NVRAM) option; includes Prestoserve license and documentation kit

Step 4—Monitors

- **Windows NT** systems require a graphics monitor to run **all** functions.
  - Video adapter included in Windows NT systems support 1280 x 1024 and 1024 x 768 resolution, 72-Hz monitors.
- **DEC OSF/1 AXP** and **OpenVMS AXP** systems require a graphics monitor to run EISA Configuration Utility (ECU) and RAID Configuration Utility (RCU); all other console functions can be accomplished using a standard video terminal.
  - Video adapter included in DEC OSF/1 AXP and OpenVMS AXP system supports 1024 x 768 resolution, 72-Hz monitors
- Graphics monitors other than those listed below can be used if compatible with graphics adapter included with system.

VRT17-PA	Northern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRT17-P4	Southern Hemisphere 17-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10**.
VRC21-PA	Northern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10) and 120 V North American power cord. **Order country specific power cord for 240 V use from Step 10**.
VRC21-P4	Southern Hemisphere 21-inch high-resolution color monitor 120 or 240 V, 1024 x 768, 1280 x 1024 resolution, multi-sync; MPR2, Energy Star compliant, includes video cable (BC13L-10). **Order country specific power cord from Step 10.**

Step 5—Storage

Select storage devices as required.

- AlphaServer 2100 Rackmount system includes integral Fast SCSI-2 controller that supports maximum of seven devices (two removable media devices and two hard disk drives inside base chassis) and three external devices via the SCSI-out port.
- Storage expansion within cabinet, but external to the BA741, is "external storage".
- External devices must be mounted next to chassis since maximum external SCSI bus length, including cable and device, **cannot** exceed 1.0 meter.
- If external expansion is not used, SCSI-out port must be terminated with external terminator (12-37004-04) included with system.

Step 5a—Internal Storage

Configuration Rules

- Systems include 600 Mbyte CD-ROM drive, select one additional removable media device if required.
- Systems include 2.0 Gbyte hard disk drive, select one additional hard disk drive if required.

Removable Media Devices

RRD43-AC	600-Mbyte, 5.25-inch half-height CD-ROM
TZK11-LG	2.0-Gbyte, 5.25-inch half-height SCSI QIC tape drive
TLZ06-LG	4.0-Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive
TLZ07-LG	8.0-Gbyte, 5.25-inch half-height SCSI 4-mm DAT drive

Hard Disk Drives

RZ26L-MY	1.05-Gbyte, 3.5-inch half-height disk drive
RZ28 -MY	2.0-Gbyte, 3.5-inch half-height disk drive

Step 5b—External Storage

- Additonal storage expansion can be added outside the BA741 rackmountable enclosure. Select rackmountable StorageWorks shelves if required.
- External cable between BA741 rackmountable enclosure and included 2T-BA350-SF/SR is included when a storage controller is ordered. External cable to additional 2T-BA350-SF/SR are **not** included and **must** be ordered separately

2T-BA350-SF	Rackmountable BA350 StorageWorks Shelf; front accessible
2T-BA350-SR	Rackmountable BA350 StorageWorks Shelf; rear accessible

Configuration Rules

- PCI-based controller occupy one PCI bus slot. Maximum of three PCI-based storage controllers supported per system.
- EISA-based controllers occupy one EISA-bus slot. Maximum of one PB2HA-SA controller. Maximum of two KZESC-xx (One- and three-port controllers) supported per system.
- One- and three-port StorageWorks RAID Array 210 controllers (KZESC-xx) support RZ26L/RZ28 disk drives **only;** tape drives are **not** supported.
- Three-port StorageWorks RAID Array 210 controller (KZESC-BA) supports up to 21 disk drives in eight logical groups; RAID sets must be created to support more than eight physical disk drives; for additional information see *StorageWorks RAID Array 210 Subystem* in Chapter 8.

Windows NT systems support

- Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots.

DEC OSF/1 AXP systems support

- 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.

OpenVMS AXP systems support

- 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.
- Maximum of two KFESA-AA EISA-based single-DSSI controllers support.

Step 5b—External Storage *(continued)*

Storage Controllers

KZESC-AA*	One-port EISA backplane RAID controller (SWXCR-Ex); includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for all operating systems
KZESC-BA*	Three-port EISA backplane RAID controller(SWXCR-Ex); includes StorageWorks RAID Array 210 Subsystem family software and documentation kit for all operating systems
KZPAA-AA	PCI-based one port high-performance Fast SCSI-2 controller
KFESA-AA	EISA-based single-DSSI controller (supported on OpenVMS AXP systems only)

* See Chapter 8, *Storage Devices*, for StorageWorks RAID Array 210 Subsystem configuration rules.

SCSI Cabling Information

- External cable between BA741 and the included 2T-BA350-SF/SR is included when a storage controller is ordered.
- External cable to additional 2T-BA350-SF/SR are **not** included and **must** be ordered separately
  - Order BN21H-03 SCSI cable for 2T-BA350-Sx shelves in positions 3, 5, 7, 9 (see 'A' on SCSI-based Storage diagram)
  - Order BN21H-02 SCSI cable for 2T-BA350-Sx shelves in positions 4, 6, 8 (see 'B' on SCSI-based Storage Diagram
  - Three-port controller KZESC-BA requires 2T-SWXCK-AA cable kit for Ports 1 and 2 for external connection

DSSI Cabling Information (OpenVMS AXP systems only)

- External cables are **not** included and must be ordered separately
- Order BC29S-09 DSSI cable for HSD05-AA in 2T-BA350-Sx shelves (see 'A' on DSSI-based Storage diagram)
- Order BC29U-02 DSSI cable for HSD05-AA in adjacent 2T-BA350-Sx shelves (see 'B' DSSI-based on Storage Diagram

Step 6—Networks and Communications

- Systems include integral Ethernet controller (AUI or 10BaseT selectable).
- Select networking cable:
  - BNE4G-02 for AUI
  - BN26K-xx for 10BaseT (twisted pair)
- Maximum of three PCI-based network controllers supported (DE435-AA)

Windows NT systems

- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller):
  - Four DE422-SA
  - Two DEFEA-xA
  - Five DW300-AA
  - One CXI01-xx
- Maximum number of EISA-based controllers of all types is limited to the total number of available EISA slots

DEC OSF/1 AXP and OpenVMS AXP systems

- Maximum number of **each** EISA-based network controller supported per system (not including integral Ethernet controller)
  - Three DE422-SA
  - Two DEFEA-xA
  - Five DNSES-AA
  - Four DW300-AA
- Maximum number of EISA-based controllers of all types in combination are governed by EISA bus IRQ address assignments. See EISA Bus IRQ Address Table

Step 6—Networks and Communications *(continued)*

DE422-SA	EISA-based Digital Etherworks network interface card
DEFEA-AA	EISA-based DEC FDDIcontroller Single Attachment
DEFEA-DA	EISA-based DEC FDDIcontroller Dual Attachment (requires two EISA 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 AXP)
CXI01-xx	EISA-based asynchronous multiplexer
DNSES-AA	EISA-based synchronous communications controller
DE435-AA	PCI-based Digital Etherworks 32-bit high-performance network interface card

See Chapter 7, *Networks, Communications, and Cables,* and the *Network Products Guide* for more information.

Step 7—Additional Power Supply (for BA741 rackmountable enclosure)

- There are no power supplies in an H9A10-Cx cabinets. Dual power distribution in the cabinet is provided for all rackmounted equipment.
- Standard power supply supports a fully configured system
- Select an addittional power supply for n+1 redundancy, if required.

2T-450HR-AA	840-watt additional power supply with 120 VAC power cord
2T-450HR-AB	840-watt additional power supply with 240 VAC power cord

Note: H7893-AA power supply for AlphaServer 2100 pedestal is not compatible with, and will not mount in the rackmount system.

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.

See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software

Windows NT systems

Systems include 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

Step 9—Software *(continued)*

DEC OSF/1 AXP 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

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User Licenses are **not** specific to a single system and can be moved from one system to another at user discretion

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7AG-AA	DEC OSF/1 AXP Interactive unlimited user license
QL-MT5AG-AA	DEC OSF/1 AXP developer's extension license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

DEC OSF/1 AXP Media and Documentation—required for first system on site

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation

DEC OSF/1 AXP Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP on CD-ROM

DECnet Licenses

QL-MTJAG-AA	DECnet/OSI end-system license for DEC OSF/1 AXP
QL-MTKAG-AA	DECnet/OSI extended function license for DEC OSF/1 AXP

OpenVMS AXP systems

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User Licenses are **not** specific to a single system and **can** be moved between systems (all OpenVMS AXP) at user discretion. OpenVMS AXP Distributed Interactive User Licenses can also be shared across a **homogeneous** OpenVMS Cluster (all OpenVMS AXP systems)

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture-specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems)

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AG-AA	OpenVMS AXP Distributed Interactive unlimited user license

*Not available in Europe. European customers may select as many 1-user licenses as required, or the unlimited user license.

Step 9—Software *(continued)*

OpenVMS AXP Media and Documentation—required for first system on site

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AH-GZ	OpenVMS AXP hardcopy documentation

OpenVMS AXP Layered Products CD-ROM

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

DECnet Licenses

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

DSSI Information (OpenVMS AXP systems only)

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

Step 10— Power Cords and Keyboards

- Power connection to the H9A10-Cx cabinet is sight specific and provided by customer.
- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V NEMA Locking, 15-foot (4.57 meter), NEMA 5-30P, Socket NEMA 5-30R power cord and U.S. keyboard, unless alternate is selected..
- Systems ordered in Europe include 240 V NEMA Locking, 15-foot (4.57 meter), NEMA 6-30P, Socket NEMA 6-30R power cord. Select country specific keyboard for **all** systems ordered in Europe.
- Power cords from rackmounted equipment to cabinet power distriubution is included.

Monitor Power Cords

- Monitors ordered in the Americas and Asia Pacific Area **include** 120 V (BN27S-03) monitor power cord
- Monitors ordered in Europe **require** country specific 240 V monitor power cord.

BN27S-03	U.S., Canada, Japan, 120 V
BN19H-2E	Austrialia, 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

Keyboards

PCXAL-FA*	U.S. English
PCXAL-FB	Belgian
PCXAL-FD	Danish
PCXAL-FE	United Kingdom
PCXAL-FG	German
PCXAL-FI	Italian
PCXAL-FK	Swiss/French
PCXAL-FN	Norwegian
PCXAL-FP	French
PCXAL-FS	Spanish
PCXAL-FV	Portuguese

* Included if alternate not selected.

Step 11—Hardware and Software Supplemental Support Services

Step 11a—Hardware and Software Supplemental Support Services (**Americas and Asia Pacific Area only**)

Hardware

- 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 2100 4/200 Systems	
FM-SE4HR-36	5 x 9, 4-hour response time
FM-SE512-36	5 x 12, 4-hour response time
FM-SE616-36	6 x 16, 4-hour response time
FM-SE724-36	7 x 24, 4-hour response time
AlphaServer 2100 4/275 Systems	
FM-454HR-36	5 x 9, 4-hour response time
FM-45512-36	5 x 12, 4-hour response time
FM-45616-36	6 x 16, 4-hour response time
FM-45724-36	7 x 24, 4-hour response time

Software

- 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 DEC OSF/1 AXP include advisory and remedial software support with new version license rights for DEC OSF/1 AXP and NAS 200 for the time period indicated.
- Software service upgrades for OpenVMS AXP include advisory and remedial software support with new version license rights for OpenVMS AXP and NAS 200 for the time period indicated.

AlphaServer 2100 4/200 Systems

FM-SENTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems
FM-SENTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45NTS-12	12-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems
FM-45NTS-36	36-month Software Supplemental Support for **Windows NT** AlphaServer 2100 4/275 systems

AlphaServer 2100 4/200 Systems

FM-SEOSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems
FM-SEOSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45OSF-12	12-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems
FM-45OSF-36	36-month Software Supplemental Support for **DEC OSF/1 AXP** AlphaServer 2100 4/275 systems

AlphaServer 2100 4/200 Systems

FM-SEVMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems
FM-SEVMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/200 systems

AlphaServer 2100 4/275 Systems

FM-45VMS-12	12-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems
FM-45VMS-36	36-month Software Supplemental Support for **OpenVMS AXP** AlphaServer 2100 4/275 systems

Step 11—Hardware and Software Supplemental Support Services *(continued)*

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

- Systems include three-year hardware warranty, on-site with 5 x 9, 24-hour response time.
- Systems include 90-day Conformance to SPD and Telephone Advisory Support for Operating System and NAS 200.
- Select optional Supplemental Support Services if required.
  - **Option A** upgrades hardware warranty on-site response time to 4-hours
  - **Option B** upgrades hardware warranty on-site response time to 4-hours and upgrades software warranty to three-year advisory and remedial software support with new version license rights for Operating System and NAS 200

AlphaServer 2100 4/200 systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	FM-X3DSH-36	**Windows NT** 128 Mbyte system
FM-X3HDG-36	FM-X3DSH-36	**Windows NT** 512 Mbyte system
FM-X3HDF-36	FM-X3DSH-36	**DEC OSF/1 AXP** 128 Mbyte system
FM-X3HDG-36	FM-X3DSI-36	**DEC OSF/1 AXP** 512 Mbyte system
FM-X3HDF-36	FM-X3DSG-36	**OpenVMS AXP** 128 Mbyte system
FM-X3HDG-36	FM-X3DSH-36	**OpenVMS AXP** 512 Mbyte system

AlphaServer 2100 4/275 Systems

Option A	Option B	Supplemental Support Services for
FM-X3HDG-36	FM-X3DSH-36	**Windows NT** 128 Mbyte system
FM-X3HDG-36	FM-X3DSH-36	**Windows NT** 512 Mbyte system
FM-X3HDF-36	FM-X3DSI-36	**DEC OSF/1 AXP** 128 Mbyte system
FM-X3HDG-36	FM-X3DSK-36	**DEC OSF/1 AXP** 512 Mbyte system
FM-X3HDG-36	FM-X3DSH-36	**OpenVMS AXP** 128 Mbyte system
FM-X3HDG-36	FM-X3DSH-36	**OpenVMS AXP** 512 Mbyte system

AlphaServer 2100 4/200 and 4/275 Cabinet Systems: EISA Bus IRQ Address Table

(DEC OSF/1 AXP and OpenVMS AXP Systems Only)

	EISA Bus IRQ Addresses									Maximum of Each Supported		
Option	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**OpenVMS AXP**	**DEC OSF/1 AXP**	**Windows NT**
DE422	0	–	–	N	0	0	–	–	–	3	3	4
PB2GA	–	–	–	0	–	–	–	–	–	1	1	1
DEFEA	–	–	–	N	0	0	–	–	0	2	2	2
DNSES	–	–	0	N	0	0	0	0	0	5	5	0
DW300	0	–	–	N	0	0	–	–	0	4	4	5
PB2HA	–	–	–	N	0	0	0	0	0	1	1	1
KZESC	–	–	–	–	–	0	0	0	0	2	2	2
KFESA	–	–	–	N	0	0	0	0	0	2	0	0
PB2SX	–	–	–	–	–	–	–	–	–	0	1	0

Table Codes:

0 = address is available for device

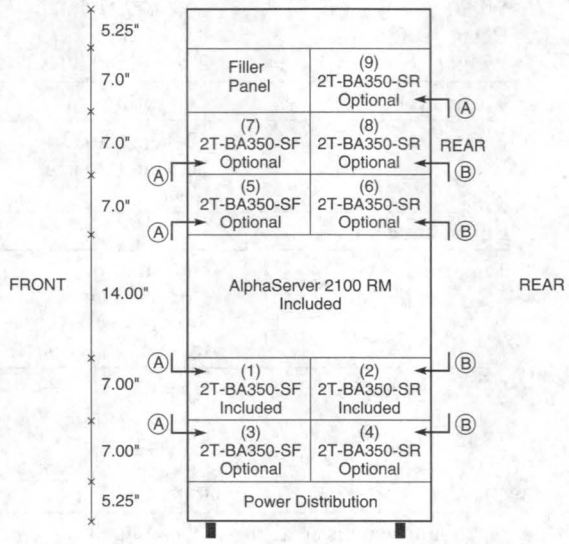
– = address not available for device

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 DEC OSF/1 AXP and OpenVMS AXP systems only
- Windows NT Server operating system permits the sharing of IRQ addresses; the only limitation for these systems is the maximum number of each device supported, and the number of EISA bus slots physically available.
- 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. (**Hint:** 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.
- PB2SX (DEC OSF/1 AXP systems only) does not use any IRQ address.

Cabinet Assembly and External Storage Cabling Guide
for SCSI-based Systems
54.25" Total Mounting Space



CONTROLLERS:

- KZESC-AA one channel EISA RAID controller, one per each 2T-BA350-Sx
- KZESC-BA three channel EISA RAID controller, one per maximum of three 2T-BA350-Sx

* Note: Maximum of TWO KZESC-xA controllers per AlphaServer 2100 RM system

- KZPAA-AA one channel PCI controller
  - one per each 2T-BA350-Sx
  - maximum of three per AlphaServer 2100 RM system

CABLING:

Note: Cabling between the AlphaServer 2100 RM and any external devices is NOT included. All cables listed below must be purchased separately.

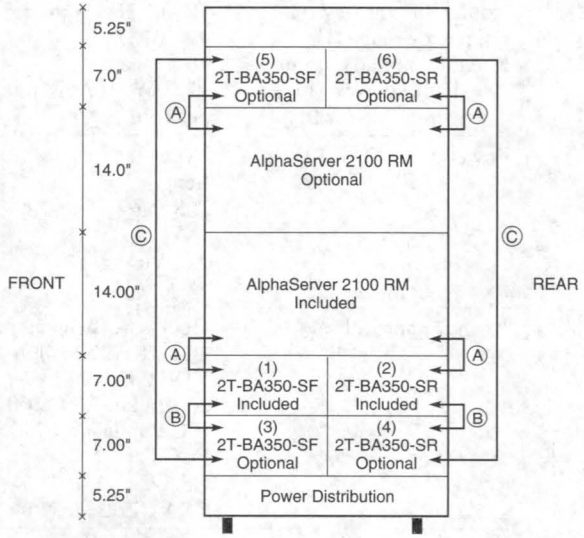
(A) For cabling from the AlphaServer 2100 RM to 2T-BA350-Sx in postitions 3, 5, 7, 9 use BN21H-03, one per 2T-BA350-Sx ('A' in the diagram).

(B) For cabling from the AlphaServer 2100 RM to 2T-BA350-Sx in positions 4, 6, 8 use BN21H-02, one per 2T-BA350-Sx ('B' in the diagram).

When using a KZESC-BA three channel SCSI RAID controller, use one 2T-SWXCK-AA cable kit.

BU-3448

Cabinet Assembly and External Storage Cabling Guide
for DSSI-based Cluster Systems – OpenVMS Systems, only.
54.25" Total Mounting Space



CONTROLLERS:

KFESA-AA EISA-based single-DSSI controller (OpenVMS systems only)

CABLING:

Note: Cabling between the AlphaServer 2100 RM and any external devices is NOT included. All cables listed below must be purchased separately.

(A) For DSSI cabling between AlphaServer 2100 RM and HSD05-AA in a 2T-BA350-Sx, use one BC29S-09 ('A' in the diagram)

(B) For DSSI cabling between HSD05-AA in adjacent 2T-BA350-Sx, use one BC29U-02 ('B' in the diagram).

(C) For DSSI cabling between HSD05-AA in NON-adjacent 2T-BA350-SX, use one BC29V-06 ('C' in the diagram).

For mounting and cabling efficiency, consider using all 2T-BA350-SF on one DSSI network and all 2T-BA350-SR on the other DSSI network.

BU-3450

Specifications

Shipping Dimension		
Height	170 cm (66.9 in.)	
Width	60 cm (23.6 in.)	
Depth	85 cm (34.0 in.)	
Weight	286 kg (630 lb)	
Clearances	**Operating**	**Service**
Front	20.3 cm (8.0 in.)	100 cm (39.4 in.)
Rear	20.3 cm (8.0 in.)	61 cm (24.0 in.)
Sides	None	61 cm (24.0 in.)
Environmental		
Temperature	Operating	10°-35° C (50°-95° F)
	Nonoperating	-40°-66° C (-40°-151° F)
	Storage (60 days)	-40°-66° C (-40°-151° F)
	Rate of change	11° C/hr (20° F/hr)
Relative humidity	Operating	10–90% noncondensing
	Nonoperating	10–95% noncondensing
	Storage	10–95% noncondensing
	Storage (60 days)	10-95% noncondensing
	Rate of change	20% / hr
Maximum heat dissipation	Operating	3450 Watt AC, 11,730 Btu/hr
Air flow and quality	Operating	400 CFM
	Intake location	Front
	Exhaust location	Rear and top
Altitude	Operating	2000 m (6562 ft)
	Nonoperating	3600 m (12,000 ft)
Mechanical shock	Operating	5 g pk for 10 ± 3 ms
	Nonoperating	20 g pk for 10 ± 3 ms
Vibration	Operating	10-500 Hz 0.1 g peak
Acoustics	Operating	LNPEc (Bels)
		6.7 maximum 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)	49 - 61 Hz	
Maximum rated current	16 a / 8 a	
Maximum power consumption (Watts)	1725 W (16A @ 120 V) per cord	
Power cord	Type	NEMA locking
	Length	4.57 m (15 feet)
	U.S. plug	NEMA 5-30P Socket NEMA 5-30R
	240 V plug	NEMA 6-30P Socket NEMA 6-30R
Agency approvals	UL 114 (office equipment) UL 478 (EDP units) VDE 0875 (RFI suppression) Australian AS C 100 IEC Publication 950 FCC Part 15 Docket 20780 CSA C22.2 No. 134 (office equipment) CSA C22.2 No. 154 (data processing)	

Specifications ***(continued)***

Recommended UPS

Rating: Both units listed are rated 6000 VA/42000W include an EIA 232 port for UPS monitoring and feature modular design which allows users to safely swap out components without disconnecting critical load. Battery support time is seven minutes at full load, or appoximately 12-15 minutes with typical configurations. Support time is extendable via add-on "plug and Play" battery modules.

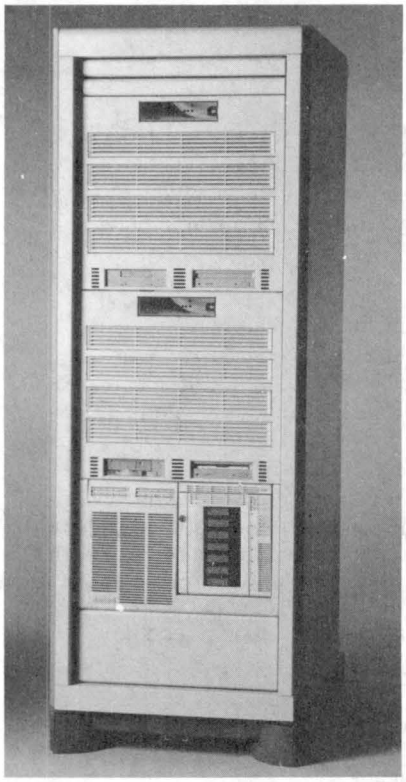
Service: Units sold and serviced in the Continental US feature a 3 year, full unit hot-swap 24-48 hour replacement warranty through vendor. A five-year, 5 x 8 on-site upgrade option is also availaable (see below). Other locations include a one-year warranty with return to certified service location. Digital on-site exchange service contract is also available.

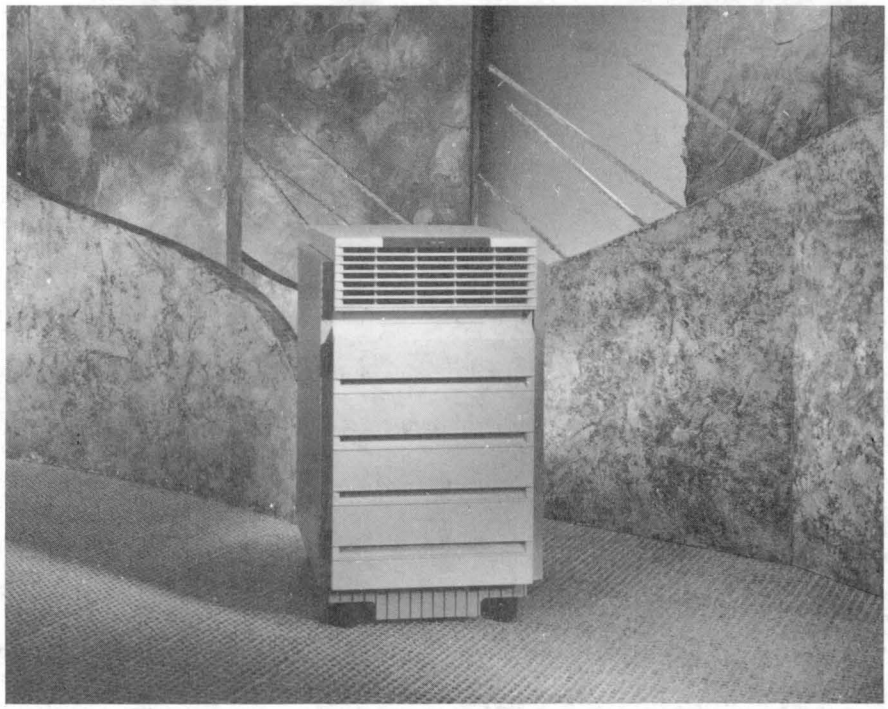
4N-AEAAJ-CM	Prestige UPS for 120 Vac, 60 Hz systems; wired for 208Vac single-phase input (240 Vac single-phase input model also available). Includes 6-foot input power cord with L6-30P plug, two 5-15R2 (duplex) and two L5-30R output receptacle (can be optionally extended). Units may also be hardwired on the output via optional hardwire output extension module.
4N-AEWAR-G3	Prestige 6000 UPS five-year on-site exchange warranty upgrade.
4N-AEAAJ-CR	For 240 Vac, 50-60Hz systems; wired for 220/240 Vac single-phase input. Includes terminal strip for hardwired in/out connections..

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

4N-AEAES-AA/AB	Windows NT for Alpha AXP and Intel x86, includes cables, media and documentation
4N-AEAES-ED	DEC OSF/1 AXP, includes cables, media and documentation
4N-JBBBB-GG	OpenVMS AXP, includes cables, media and documentation

See Chapter 10, *Environmental Products* for additional information.





DEC 4000 Model 700 AXP Distributed/Departmental Servers

Product Description

DEC 4000 Model 700 AXP systems are members of the family of distributed/departmental, open office systems based on Digital's Alpha AXP 64-bit RISC microprocessor. They offer exceptional speed and performance for CPU-intensive applications, such as seismic analysis, CAD/CAM, and simulations. The DEC 4000 AXP systems deliver balanced I/O performance for demanding database, document processing, and server applications. They deliver powerful, cost-effective performance to both technical and commercial customers.

Features of the DEC 4000 AXP systems include outstanding uniprocessor power, symmetric multiprocessing (SMP) capabilities, and balanced I/O. System performance can be nearly doubled when a DEC 4000 AXP system is configured with two CPUs running symmetric multiprocessing.

The DEC 4000 Model 700 AXP server runs at 190 MHz and has onboard cache of 4 Mbytes. The Model 700 provides approximately 30% more performance than the Model 600, for both technical and commercial applications.

The DEC 4000 Model 700 AXP systems come in two flexible packages: pedestal packages and industry-standard RETMA rackmount packages. Pedestal systems are designed primarily for the office environment, where aesthetic considerations are dominant and medium disk storage densities are required. Rackmount systems are designed for two environments: office or equipment room installations where floor space is at a premium, but large disk storage densities are required; and laboratory/factory environments where rackmounted application-specific equipment needs to be configured with the system.

Both system packages (pedestal and rackmount) offer identical functionality. They have the same CPUs, memories, power supply, operator control panel, and electrical requirements. They support OpenVMS AXP, Digital's industry-standard operating environment, and DEC OSF/1 AXP, a standards-compliant UNIX operating environment. All DEC OSF/1 AXP systems include the Prestoserve I/O performance enhancement option.

Operating system software and layered software are shipped on CD-ROM. For customers who want the advantages of factory-installed software (FIS), an internal disk drive can be ordered pre-loaded with operating system software.

Product Description ***(continued)***

For optimum investment protection, the DEC 4000 AXP systems can be smoothly integrated with existing VAX and DECsystem family members or into a multi- vendor environment. With Digital's Network Application Support (NAS), DEC 4000 AXP systems will support a wide range of devices, ensuring hardware and software protection into the 21st century.

The memory subsystem of the DEC 4000 AXP system is tightly integrated with the system architecture. Maximum memory is 2 Gbytes for DEC OSF/1 AXP and OpenVMS AXP systems. Memory access is provided by a 128-bit super-high-speed system bus that virtually eliminates bottlenecks. These features complement the CPU to deliver unprecedented balanced performance.

An integral disk I/O subsystem is standard, providing extraordinary throughput capability. Two versions are available: a DSSI/SCSI-2 subsystem or a Fast SCSI/ SCSI-2 subsystem. The type of disk protocol supported is determined by the I/O controller purchased with the system. All available I/O controllers support the SCSI-2 protocol.

The I/O subsystem provides four independently programmable controllers, plus a fifth SCSI-2 only controller primarily for removable media. This dedicated SCSI-2 bus also expands outside the cabinet to allow for connection of external tapes, cartridge loaders, and other low-performance storage subsystems (for example, optical jukebox). An RRD43 CD-ROM device is standard, allowing room for additional removable-media storage devices.

The DEC 4000 AXP pedestal and rackmount systems utilize six Futurebus+ slots for system I/O expansion. Futurebus+, the IEEE 898 industry standard, is supported by a growing number of peripheral vendors worldwide. Digital's FDDI network adapter and IPI storage adapter are currently available for DEC 4000 AXP systems. Other network and storage adapters will be available in the future.

Note: Due to the similarities between the DEC 4000 AXP Pedestal and Rackmount systems, Steps 1–4 are unique to each system but Steps 5–12 are common to both systems.

Step 1—Pedestal Systems (BA640)

Select system. **Note:** Storage bus selection is determined by system type, e.g., DSSI/SCSI-2 I/O subsystem or Fast SCSI/SCSI-2 I/O subsystem. Options ordered with systems will be factory installed unless specified as SPARES.

- ADVANTAGE-SERVERS are complete systems including system disk with factory-installed software (FIS)*, tape, memory, operating system, and NAS 300 advance kit software licenses.
- Base Servers are partially configured systems with memory and operating system software license. A disk is required for an operational system. Base Servers ordered with one system disk include FIS*.
- User licenses may be ordered as needed.
- A console terminal is required unless available on site.
- 120 V power cord included unless specified differently on order; 240 V systems require country-specific power cord.

* Delivery of software on system disk is not a substitute for software media and documentation; see Step 9.

ADVANTAGE-SERVER Systems include

- DECchip 21064 190-MHz CPU with 4-Mbyte onboard cache
- BA640 deskside pedestal enclosure
- Futurebus+ I/O bus (IEEE 896 Profile B)—six slots
- 256 Mbytes of memory
- Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)
- DSSI/SCSI-2 I/O subsystem (with two 802.3/Ethernet controllers) or Fast SCSI/SCSI-2 I/O subsystem (with one 802.3/Ethernet controller)
  - 802.3/Ethernet controllers include a thick wire and ThinWire connector
- TZ87 20-Gbyte tape drive
- Four storage drawers
- RRD43 600-Mbyte internal CD-ROM drive
- Asynchronous serial console/printer port
- Asynchronous serial modem port
- Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 120 V power cord
- Console cable
- NAS 300 software
- DEC OSF/1 AXP two-user base license and DEC OSF/1 AXP server extension license or OpenVMS AXP base license
- Hardware documentation

Order Number	Operating System	I/O Subsystem Drawer Type	Number of Ethernet	Disk Drives
DA-47106-A9	DEC OSF/1 AXP	**Fast SCSI/SCSI-2**	1	
		One SCSI-2 drawer		1 x 2.1-Gbyte RZ28
		Two Fast SCSI drawers		6 x 1.05-Gbyte RZ26L
DY-47107-A9	OpenVMS AXP	**Fast SCSI/SCSI-2**	1	
		One SCSI-2 drawer		1 x 2.1-Gbyte RZ28
		Two Fast SCSI drawers		6 x 1.05-Gbyte RZ26L

Step 1—Pedestal Systems (BA640) *(continued)*

Note: Base Servers ordered with one system disk include FIS*.

Base Servers include

- DECchip 21064 190-MHz CPU with 4-Mbyte onboard cache
- BA640 deskside pedestal enclosure
- Futurebus+ I/O bus (IEEE 896 Profile B)—six slots
- 64, 128, or 512 Mbytes of memory
- Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)
- DSSI/SCSI-2 I/O subsystem (with two 802.3/Ethernet controllers) or FAST SCSI/SCSI-2 I/O subsystem (with one 802.3/Ethernet controller)
  - 802.3/Ethernet controllers include a thick wire and ThinWire connector
- RRD43 600-Mbyte internal CD-ROM drive
- Asynchronous serial console/printer port
- Asynchronous serial modem port
- Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 120-V power cord
- Console cable
- DEC OSF/1 AXP two-user base license or OpenVMS AXP base license
- Hardware documentation

* Delivery of software on system disk is not a substitute for software media and documentation; see Step 9.

Note: Systems ordered without storage devices in drawers include drawer front panels with DSSI or SCSI-2 output connectors for external storage.

- OpenVMS AXP systems with DSSI/SCSI-2 I/O subsystem include four front panels with DSSI connectors for external storage
- DEC OSF/1 AXP systems with Fast SCSI/SCSI-2 I/O subsystem include four front panels with SCSI-2 connectors for external storage

Order SCSI-2 front panel for an OpenVMS AXP system with DSSI default front panels if SCSI-2 external storage is required.

BA6ZE-MA Front panel with SCSI-2 output connector for external SCSI storage

Order Number	Operating System	Memory	I/O Subsystem	Number of Ethernet
DA-47104-B9	DEC OSF/1 AXP	64 Mbytes	Fast SCSI/SCSI-2	1
DA-47104-D9	DEC OSF/1 AXP	128 Mbytes	Fast SCSI/SCSI-2	1
DA-47104-F9	DEC OSF/1 AXP	512 Mbytes	Fast SCSI/SCSI-2	1
DA-47104-A9	DEC OSF/1 AXP	64 Mbytes	Standard SCSI-2	2
DA-47104-C9	DEC OSF/1 AXP	128 Mbytes	Standard SCSI-2	2
DA-47104-E9	DEC OSF/1 AXP	512 Mbytes	Standard SCSI-2	2
DY-47105-A9	OpenVMS AXP	64 Mbytes	DSSI/SCSI-2	2
DY-47105-C9	OpenVMS AXP	128 Mbytes	DSSI/SCSI-2	2
DY-47105-E9	OpenVMS AXP	512 Mbytes	DSSI/SCSI-2	2
DY-47105-B9	OpenVMS AXP	64 Mbytes	Fast SCSI/SCSI-2	1
DY-47105-D9	OpenVMS AXP	128 Mbytes	Fast SCSI/SCSI-2	1
DY-47105-F9	OpenVMS AXP	512 Mbytes	Fast SCSI/SCSI-2	1

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

431XR-FA **DEC OSF/1 AXP SMP upgrade**—upgrades DEC 4000 Model 710 to Model 720; includes second CPU and DEC OSF/1 AXP SMP upgrade license.

430XR-CA **DEC OSF/1 AXP SMP upgrade**—upgrades DEC 4000 Model 610 to Model 620; includes second CPU and DEC OSF/1 AXP base license

431XR-CA **OpenVMS AXP SMP upgrade**—upgrades DEC 4000 Model 710 to Model 720; includes second CPU and OpenVMS AXP SMP extension license

430XR-BA **OpenVMS AXP SMP upgrade**—upgrades DEC 4000 Model 610 to 620; includes second CPU and OpenVMS AXP SMP extension license

Step 3—Memory

Select memory as required. System supports a total of four memory options; maximum 2 Gbytes per system.

MS430-CA	64 Mbytes of memory, field/factory installed
MS430-DA	128 Mbytes of memory, field/factory installed
MS430-FA	512 Mbytes of memory, field/factory installed
MS430-UC	Upgrade from 64 Mbytes of memory to 128 Mbytes of memory

Note: 2-Gbyte maximum memory can only be obtained by starting with 512-Mbyte system; otherwise one memory option must be removed.

Step 4—Pedestal (BA640) Storage

Select storage devices as required. See supported storage device chart for more information.

Step 4a—Pedestal (BA640) Internal Storage

Configuration Rules

- System enclosure includes four compartments for storage drawers—DSSI/SCSI-2, Standard SCSI-2 or Fast SCSI/SCSI-2.
- Storage bus is determined by selection of system type, e.g., DSSI/SCSI-2, Standard SCSI-2, Fast SCSI/SCSI-2 I/O subsystem.
- Each I/O subsystem provides four programmable storage buses for fixed disks and one dedicated SCSI-2 bus for removable media and half-height disk drives.
- Storage buses can be mixed (DSSI/SCSI-2 or Fast SCSI/SCSI-2) within the system enclosure but not within a storage drawer; except Standard SCSI-2 systems which only support SCSI-2 devices.
- System enclosure includes mounting space for removable storage on dedicated SCSI-2 bus. One 5.25-inch half-height RRD43 CD-ROM is included in all systems; the following combinations of additional removable media drives are supported:
  - One additional 5.25-inch half-height and one 5.25-inch full-height drive or
  - One additional 5.25-inch half-height and two 3.5-inch half-height drives or
  - Three additional 5.25-inch half-height drives or
  - Three additional 3.5-inch half-height drives
- Insertion of a disk drawer into disk compartment automatically programs the storage bus—DSSI drawer selects a DSSI bus, Fast SCSI drawer selects Fast SCSI bus, Standard SCSI-2 drawer selects a SCSI-2 bus.
- Each drawer must be configured with the same type of devices, e.g., DSSI, Fast SCSI, Standard SCSI-2.
- DSSI or SCSI drawers support up to four 3.5-inch devices **or** one 5.25-inch device with a connector for additional external storage:
  - DSSI bus supports a maximum of seven devices (internal/external)
  - DSSI devices are not supported on DEC OSF/1 AXP systems
  - SCSI-2 bus supports a maximum of seven devices (internal/external)
- Fast SCSI drawers support up to four 3.5-inch devices.
  - Fast SCSI drawers do not support 5.25-inch devices
  - Fast SCSI drawers do not support external devices

Storage Drawers

Order Number	Drawer Type	Drives Supported	External Drives	OpenVMS AXP	DEC OSF/1 AXP
BA6FE-MY	DSSI	4 x 3.5-inch/DSSI	Up to 3	X	
BA6FE-MX	DSSI	1 x 5.25-inch/DSSI	Up to 6	X	
BA6ZE-MY	SCSI-2	4 x 3.5-inch/SCSI-2	Up to 3	X	X
BA6ZE-MX	SCSI-2	1 x 5.25-inch/SCSI-2	Up to 6	X	X
BA6ZB-MY	Fast SCSI	4 x 3.5-inch/SCSI-2	N/A	X	X

Step 4a—Pedestal (BA640) Internal Storage *(continued)*

Disk Drives (for Storage Drawers)

Note: All 3.5-inch SCSI drives operate in Fast SCSI mode as well as standard SCSI-2 mode. Mode of operation is determined by type of storage drawer (Fast SCSI or Standard SCSI-2).

RF36-MY	1.6-Gbyte, 3.5-inch half-height DSSI disk
RZ26L-MY	1.05-Gbyte, 3.5-inch half-height SCSI disk
RZ28-MY	2.1-Gbyte, 3.5-inch half-height SCSI disk

Note: Above disk drives currently installed in other Digital systems can be mounted in DEC 4000 AXP storage trays using mounting hardware kits (one required per drive):

BA6AA-MY	Mounting hardware for 3.5-inch drives
BA6AA-MX	Mounting hardware for 5.25-inch drives
BA6ZE-MA	Storage panel with standard SCSI external connector. Allows access of internal standard SCSI controller to connect to externally installed disks. For use when no disk tray is to be installed. Use BA6ZE-MX/MY when disks are to be installed in storage compartment.

Removable Devices (for Dedicated SCSI-2 Removable Compartments)

Note: -MX variants include device and mounting hardware for second half-height device. RRD43-MX CD-ROM drive is standard in all systems; select 3.5-inch or 5.25-inch half-height -MY variant for second device. Third device requires -MX variant with mounting hardware for fourth device; select -MY variant for fourth device.

RRD43-MX	1st or 3rd device 600-Mbyte RRD43, 5.25-inch half-height CD-ROM drive
RRD43-MY	2nd or 4th device 600-Mbyte RRD43, 5.25-inch half-height CD-ROM drive
TZ85E-MX	2.6-Gbyte, 5.25-inch full-height cartridge tape drive
TZ86-MX	6.0-Gbyte, 5.25-inch full-height cartridge tape drive
TLZ06-MX	1st or 3rd 4.0-Gbyte 4-mm, 3.5-inch half-height DAT drive
TLZ06-MY	2nd or 4th 4.0-Gbyte 4-mm, 3.5-inch half-height DAT drive
TLZ07-MX	1st or 3rd 8.0-Gbyte 4-mm, 3.5-inch half-height DAT drive
TLZ07-MY	2nd or 4th 8.0-Gbyte 4-mm, 3.5-inch half-height DAT drive

Step 4b—Pedestal (BA640) External Storage

- Factory-installed software (FIS) is **not** supported on external devices.
- Maximum of seven devices supported per DSSI or SCSI-2 bus.
- The number of external DSSI or SCSI-2 devices supported is determined by the number of internal devices installed in storage drawers: Drawers with four half-height drives support three external devices; drawers with one full-height drive support six external devices. All drives on one controller must be the same type whether mounted internally or externally.
- Fast SCSI bus supports internal devices only (maximum four 3.5-inch drives per controller).
- SCSI cables supported are BC06P-xx (for external expansion devices) and BN21R-xx (for BA350 modular storage).
  - Maximum SCSI bus length (internal and external) is 6 meters (236 inches).
  - Internal SCSI-2 bus uses 1 meter. See SCSI cable chart below.
  - External SCSI-2 drives are supported in BA350 modular expansion and R400X expansion pedestal.
- DSSI cables supported are BC21M-09 (for R400X) and BC22Q-xx (for SF35/SF73 SABBs).
  - External DSSI drives are supported in R400X expansion cabinet and SF12 expansion box.

Step 4b—Pedestal (BA640) External Storage *(continued)*

SCSI Cable Chart

Enclosure	Internal Cable Length	External Cable (inc/required/cable length)
TSZ07	0.30 m (12 in.)	1.82 m (72 in.) BC06P-06 included
TZ85	0.28 m (11 in.)	Cable required—see BC06P listing
SZ100	0.30 m (12 in.)	Cable required—see BC06P listing
R400X	1.7 m (67 in.)	1.82 m (72 in.) BC06P-06 included
BA350-SA/KA		
Single bus	1.0 m (39.6 in.)	Cable required—see BC21R listing
Split bus	0.5 m (19.8 in.)	Cables required—see BC21R listing BC06P-06—1.82 m (72 in.), BC06P-09—2.73 m (108 in.)* BN21R-02—2 m (79 in.), BN21R-03—3 m (118 in.)

* No other external device can be daisychained if 2.73-m (BC06P-09) cable is selected (one external option only)

R400X-B9 **DSSI or SCSI** storage expansion pedestal

DSSI—Supports RF-series disk drives and one TF85 tape drive. Includes one BC21M-09 DSSI cable. Supported devices: RF74E-AA (3.6-Gbyte), RF73E-AA (2.0-Gbyte), RF35E-AA (852-Mbyte ISE), RF352-AA (two 852-Mbyte ISEs)

SCSI—Supports RZ-series disk drives. Includes one BC06P-06 SCSI cable. Supported devices: RZ74 (3.6-Gbyte), RZ73 (2.0-Gbyte)

SF12 Expansion Pedestal

SF12 supports four 3.5-inch DSSI disks; includes BC21M-09 DSSI cable and 120 V power cord; order country-specific power cord for 240 V systems. Floor stand is available separately.

SF12-AA SF expansion pedestal with one RF31T (381-Mbyte) disk

SF12-BA SF expansion pedestal with one RF35 (852-Mbyte) disk

BA46X-AA Floor stand for SF12 expansion pedestal

SZ100-AA SCSI 18.2-Gbyte cartridge tape subsystem in pedestal enclosure

TZ85-TA SCSI 2.6-Gbyte cartridge tape subsystem in tabletop enclosure

TZ86-TA SCSI 6.0-Gbyte cartridge tape subsystem in tabletop enclosure

TLZ6L-GA* SCSI 4.0-Gbyte, 4-mm DAT tape loader in tabletop enclosure

TSZ07-CA SCSI 1600/6250-bit/inch, 9-track magtape tabletop enclosure; requires TSZK7 country kit

TKZ09-BA SCSI 5.0-Gbyte, 8-mm helical scan tape drive in tabletop enclosure

TKZ60-BA/BC SCSI 200-Mbyte, 3480/TA90-compatible tape drive (OpenVMS only)

* Loader support for DEC OSF/1 AXP is available via DECnsr.

BA350 Modular Storage Expansion

BA350 modular storage shelf supports a maximum of seven 3.5-inch half-height SCSI devices or two 5.25-inch full-height SCSI drives.

- In split-bus mode, the BA350 can be connected to two SCSI buses; each bus connects to a separate SCSI-2 drawer.
- Maximum one BA350 modular storage expansion enclosure supported.

BA350-JA Modular storage shelf packages includes: BA350-SA basic shelf, BA35X-HA universal ac power supply, BA35X-RD metric cabinet mounting kit, and ac power cords.

BA350-SA BA350 modular storage shelf—supports a maximum combination of seven 3.5-inch half-height devices (RZ26, TLZ06) or two full-height drives (RZ73, RZ74). See Chapter 8, *Storage Devices*, for additional items required.

Step 4b—Pedestal (BA640) External Storage *(continued)*

SCSI devices may be ordered separately and are customer installable. The following SCSI devices are supported in BA350 storage shelf.

RZ26L-VA	1.0-Gbyte, 3.5-inch half-height disk drive
RZ28-VA	2.1-Gbyte, 3.5-inch half-height disk drive
TLZ06-VA	4.0-Gbyte, 3.5-inch half-height 4-mm DAT drive
TLZ6L-VA*	4.0-Gbyte, 4-mm DAT tape loader

* Loader support for DEC OSF/1 AXP is available via DECnsr.

See Chapter 8, *Storage Devices*, for ordering information.

The following devices are supported but are not recommended for new system orders. Support allows expansion cabinets installed with other Digital systems to be used with DEC 4000 AXP systems.

SF100	DSSI 18.2-Gbyte magazine tape subsystem in pedestal enclosure
R215F	DSSI storage expansion pedestal
TF85	DSSI 2.6-Gbyte cartridge tape in tabletop enclosure

VELOCITOR Storage Subsystems (DEC OSF/1 AXP Support Only)

Futurebus-based IPI (Intelligent Peripheral Interface) disk subsystem. Supports up to eight drives on single controller. Requires Futurebus channel slot. Supports controller-based striping or shadowing.

2L-RIT01-AA	3-Gbyte disk drive, tabletop enclosure, 1.5-foot cable, documentation
2L-RIT02-AA	Two 3-Gbyte disk drives, tabletop enclosure, 1.5-foot cable, documentation
2L-RIPR1-AA	3-Gbyte disk drive, rackmount assembly, 120 V, documentation
2L-RIPR4-AA	Four 3-Gbyte disk drives, rackmount assembly, 120 V, documentation
2L-RIPUG-AA	Upgrade assembly, rackmount, 120 V
2L-RIACL-BA	Futurebus IPI controller, DEC OSF/1 AXP driver, 10-foot cable, documentation

See Chapter 8, *Storage Devices* for further ordering information.

Step 1—Rackmount Systems (BA641)

Select system. **Note:** Storage bus selection is determined by system type, e.g., DSSI/SCSI-2 I/O subsystem or Fast SCSI/SCSI-2 I/O subsystem. Options ordered with systems will be factory installed unless specified as SPARES.

- ADVANTAGE-SERVERS are complete systems mounted in cabinets, including system disk with factory-installed software (FIS)*, tape, memory, operating system, and NAS 300 software licenses.
- Base Servers are partially configured systems with memory and operating system software license. A disk is required for an operational system. Base Servers ordered with one system disk installed include FIS*. Disk must be installed in Base System or in a disk array mounted in the same rack as the Base System.
- Base Servers include Rackmountable BA641 chassis, order cabinet separately.
- Multiple servers within one cabinet enclosure are supported by ordering two Base Servers, an H9A00 cabinet, and external storage (up to a maximum of 17.5 inches of vertical rackmount space); see Step 4b.
- User licenses may be ordered as needed.
- A console terminal is required unless available on site.
- 120 V power cords included unless specified differently on order; 240 V systems require country-specific power cords.

* Delivery of software on system disk is not a substitute for software media and documentation; see Step 9.

ADVANTAGE-SERVER Systems include

- DECchip 21064 190-MHz CPU with 4-Mbyte onboard cache
- BA641 19-inch rackmountable chassis
- H9A00-EE/EF rackmount cabinet enclosure (25 inches wide x 67 inches high x 34 inches deep) with two power controllers; 57.75 inches of vertical rackmount space
- Futurebus+ I/O bus (IEEE 896 Profile B)—six slots
- 128 or 256 Mbytes of memory
- Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)
- DSSI/SCSI-2 I/O subsystem (with two 802.3/Ethernet controllers) or Fast SCSI/SCSI-2 I/O subsystem (with one 802.3/Ethernet controller)—802.3/Ethernet controllers include a thick wire and ThinWire connector
- Rackmount disk enclosures and disks (see configuration table)
- Rackmounted tape loader or single tape drives (see configuration table)
- RRD43 600-Mbyte internal CD-ROM drive
- Asynchronous serial console/printer port
- Asynchronous serial modem port
- Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- Power cords for all embedded equipment; two power cords connected to power controllers from H9A00 cabinet; (2) L5-30P for H9A00-EE, (2) L6-30P for -EF
- Console cable
- NAS 300 software
- DEC OSF/1 AXP two-user base license and DEC OSF/1 AXP server extension license or OpenVMS AXP base license
- Hardware documentation

					Storage Devices	
Order Number	**Operating System**	**Memory**	**I/O Subsystem Storage Cabinet**	**Number of Ethernet**	**RZ26L = 1.05 GB RF36 = 1.6 GB Disk Drives**	**TLZ06 = 4.0 GB Tape Drives**
DA-471C3-B2/B3	**DEC OSF/1 AXP**	256 Mbytes	**Fast SCSI/SCSI-2** 2 x BA350	1	12 x RZ26L	1 x TLZ06*
DY-471C3-B2/B3	**OpenVMS AXP**	256 Mbytes	DSSI/SCSI-2 2 x SF36	2	12 x RF36	1 x TLZ06*
DY-471C4-B2/B3	**OpenVMS AXP**	256 Mbytes	**Fast SCSI/SCSI-2** 2 x BA350	1	12 x RZ26L	1 x TLZ06*

* Tape drive is mounted in dedicated SCSI-2 removable storage compartment. Tape loader can be ordered separately, added in rack and connected to dedicated SCSI-2 controller.

Note: x2 = 120V, x3 = 240V

Step 1—Rackmount Systems (BA641) *(continued)*

Note: Base Servers ordered with one system disk include FIS*. Disk must be installed in dedicated SCSI-2 internal storage.

Rackmount Base Servers include

- DECchip 21064 190-MHz CPU with 4-Mbyte onboard cache
- BA641 19-inch rackmountable chassis
- Futurebus+ I/O bus (IEEE 896 Profile B)—six slots
- 64 or 128 Mbytes of memory
- Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)
- DSSI/SCSI-2 I/O subsystem (with two 802.3/Ethernet controllers) or Fast SCSI/SCSI-2 I/O subsystem (with one 802.3/Ethernet controller)—802.3/Ethernet controllers include a thick wire and ThinWire connector
- RRD43 600-Mbyte internal CD-ROM drive
- Asynchronous serial console/printer port
- Asynchronous serial modem port
- Universal power supply for both 110 and 220 Vac
- 120 V power cord (240 V power cord must be ordered separately)
- Console cable
- DEC OSF/1 AXP two-user base license or OpenVMS AXP base license
- Hardware documentation

* Delivery of software on system disk is not a substitute for software media and documentation; see Step 8.

Order Number	Operating System	Memory	I/O Subsystem	Number of Ethernet
DA-471A2-B9	**DEC OSF/1 AXP**	64 Mbytes	Fast SCSI/SCSI-2	1
DA-471A2-F9	**DEC OSF/1 AXP**	128 Mbytes	Fast SCSI/SCSI-2	1
DA-471A1-J9	**DEC OSF/1 AXP**	64 Mbytes	Standard SCSI-2	2
DA-471A1-K9	**DEC OSF/1 AXP**	128 Mbytes	Standard SCSI-2	2
DY-471A1-B9	**OpenVMS AXP**	64 Mbytes	DSSI/SCSI-2	2
DY-471A1-F9	**OpenVMS AXP**	128 Mbytes	DSSI/SCSI-2	2
DY-471A2-A9	**OpenVMS AXP**	64 Mbytes	Fast SCSI/SCSI-2	1
DY-471A2-E9	**OpenVMS AXP**	128 Mbytes	Fast SCSI/SCSI-2	1

Rackmount Enclosure (Cabinet)

H9A00-EE/EF Rackmount enclosure supports BA641 19-inch rackmountable chassis, rackmount external storage options, and most industry-standard rackmount devices. Includes two power controllers. 25 inches wide x 67 inches high x 34 inches deep; 57.75 inches of vertical rackmount space.

Items to consider when selecting 19-inch-wide rackmount cabinets:

- Power controller, voltage, and total current requirements
- Face or filler panel requirements
- Front and rear doors must be louvered in the area of the BA641 chassis (17.5 inches high)to accommodate 255 CFM minimum of cooling air.
- Front stabilizer leg or bar **must** be provided to compensate for systems being pulled out for servicing **or** cabinets must be secured to the floor or to another cabinet in order to prevent overturning.

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

431XR-FA **DEC OSF/1 AXP SMP upgrade**—upgrades DEC 4000 Model 710 to Model 720; includes second CPU and DEC OSF/1 AXP SMP upgrade license.

430XR-CA **DEC OSF/1 AXP SMP upgrade**—upgrades DEC 4000 Model 610 to Model 620; includes second CPU and DEC OSF/1 AXP base license

431XR-CA **OpenVMS AXP SMP upgrade**—upgrades DEC 4000 Model 710 to Model 720; includes second CPU and OpenVMS AXP SMP extension license

430XR-BA **OpenVMS AXP SMP upgrade**—upgrades DEC 4000 Model 610 to 620; includes second CPU and OpenVMS AXP SMP extension license

Step 3—Memory

Select memory as required. System supports a total of four memory options; maximum 2 Gbytes per system.

MS430-CA	64 Mbytes of memory, field/factory installed
MS430-DA	128 Mbytes of memory, field/factory installed
MS430-FA	512 Mbytes of memory, field/factory installed
MS430-UC	Upgrade from 64 Mbytes of memory to 128 Mbytes of memory

Note: 2-Gbyte maximum memory can only be obtained by starting with 512-Mbyte system; otherwise one memory option must be removed.

Step 4—Rackmount (BA641) Storage

Configuration Rules

- Storage bus is determined by selection of system type, e.g., DSSI/SCSI-2, Standard SCSI-2, Fast SCSI-2.
  - Each I/O subsystem provides four programmable storage bus connections for external devices and one dedicated SCSI-2 connection which supports internal devices and is available for additional external devices.
- BA641 rackmount system supports four internal SCSI-2 devices only;
  - Two 5.25-inch, half-height removable media devices (RRD43, TLZ06, TZ30*) and
  - Two 3.5-inch, half-height hard disk drives
  - Factory installed software (FIS) is only supported in system enclosure SCSI-2, 3.5-inch disk drive
- System supports external rackmount storage devices on DSSI/SCSI-2, Standard SCSI-2, and Fast SCSI/SCSI-2 I/O controllers.

* See the supported storage device chart

Note: All five I/O controllers are accessible from rear of rackmount chassis

Step 4a—Rackmount (BA641) Internal Storage

Systems include RRD43 600-Mbyte CD-ROM; select one additional half-height tape and up to two RZxx disks. Devices for dedicated SCSI-2:

TLZ06-MX	4.0-Gbyte 4-mm, 3.5-inch half-height DAT drive
TZ30-MX	95-Mbyte, 5.25-inch half-height tape drive
RZ26L-MY	1.05-Gbyte, 3.5-inch half-height SCSI disk
RZ28-MY	2.1-Gbyte, 3.5-inch half-height SCSI disk

Step 4b—Rackmount (BA641) External Storage

Configuration Rules

- Maximum seven devices supported per DSSI, Fast SCSI-2 or SCSI-2 bus.
- Maximum 35 devices (including internal storage) supported on the five controllers embedded in all systems.

Step 4b—Rackmount (BA641) External Storage *(continued)*

The following list describes available storage devices, capacities, and components included with initial offering; supported options can be added as required. See Chapter 8, *Storage Devices*, for specific device information or contact the Digital Services Sales Support Team at 800-832-6277 or 603-884-8990 for ordering information.

Storage Arrays	Capacity	Storage Devices
SF73	8-Gbyte half-rack	RF73 disk drives
SF36	19.2-Gbyte half-rack	RF36 disk drives
BA350	7 Gbytes	RZ26L disk drives
BA350	4--7.2 Gbytes	RZ73 disk drives
Tape Loaders*		
TF857	18.2-Gbyte DSSI tape drive	TF85 tape drives
TZ857	18.2-Gbyte SCSI tape drive	TZ85 tape drives
TF867	42-Gbyte DSSI tape drive	TF86 tape drives
TZ867	42-Gbyte SCSI tape drive	TZ86 tape drives
TKZ60	2.2-Gbyte SCSI tape drive	TA90 compatible

* Loader support for DEC OSF/1 AXP is available for DECnsr.

Supported Storage Device Chart

Operating Systems Version	OpenVMS AXP V1.0	OpenVMS AXP V1.5	DEC OSF/1 AXP V1.2	DEC OSF/1 AXP V1.3
Disks				
RF31	N	Y	N	N
RF31T	N	Y	N	N
RF35	Y	Y	N	N
RF36	N	Y	N	N
RF73	Y	Y	N	N
RF74	N	Y	N	N
RRD42	Y	Y	Y	Y
RRD43	N	Y	N	Y
RZ26L	Y	Y	Y	Y
RZ28	N	Y	N	Y
RZ73	Y	Y	Y	Y
RZ74	N	Y	N	Y
Tapes				
TF85	Y	Y	N	N
TKZ08	N	N	Y	Y
TKZ09	N	Y	Y	Y
TKZ60	N	Y	N	Y
TLZ04	N	N	Y	Y
TLZ06	Y	Y	Y	Y
TLZ6L*	N	Y	N	N
TZ30	Y	Y	Y	Y
TSZ07	Y	Y	Y	Y
TZ85E	Y	Y	Y	Y
TZ857	Y	Y	N	N
TZ86	N	Y	N	N
TZ867	N	Y	N	N

* Loader support for DEC OSF/1 AXP is available via DECnsr.

Step 4b—Rackmount (BA641) External Storage *(continued)*

VELOCITOR Storage Subsystems (DEC OSF/1 AXP Support Only)

Futurebus-based IPI (Intelligent Peripheral Interface) disk subsystem. Supports up to eight drives on single controller. Requires Futurebus channel slot. Supports controller-based striping or shadowing.

2L-RIT01-AA	3-Gbyte disk drive, tabletop enclosure, 1.5-foot cable, documentation
2L-RIT02-AA	Two 3-Gbyte disk drives, tabletop enclosure, 1.5-foot cable, documentation
2L-RIPR1-AA	3-Gbyte disk drive, rackmount assembly, 120 V, documentation
2L-RIPR4-AA	Four 3-Gbyte disk drives, rackmount assembly, 120 V, documentation
2L-RIPUG-AA	Upgrade assembly, rackmount, 120 V
2L-RIACL-BA	Futurebus IPI controller, DEC OSF/1 AXP driver, 10-foot cable, documentation

See Chapter 8, *Storage Devices* for further ordering information.

Step 5—OpenVMS Cluster Pedestal (BA640) and Rackmount Systems (BA641)

DEC 4000 Model 700 AXP systems can be configured in OpenVMS Clusters. For detailed configuration guidelines and cable definitions, see Chapter 6, *High Availability and High Performance Products*.

Step 6—Networks and Communications

Select devices as required. Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3x)or ThinWire BNC connector (e.g., BC16M). See Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for more information.

DEC FDDIcontroller/FUTUREBUS+

The DEC FDDIcontroller/FUTUREBUS+ is available both as a single attachment station (SAS/-AA), and a dual attachment station (DAS/-DA) option. Both options include Modular-PMDs that utilize the ANSI standard MIC (Media Interface Connector) and 62.5/125 multimode fiber up to distances of 2 km between stations.

DEFAA-AA	Futurebus+ to FDDI Adapter SAS (single attachment station) MMF; requires one Futurebus+ slot
DEFAA-DA	Futurebus+ to FDDI Adapter DAS (dual attachment station) MMF; requires one Futurebus+ slot
DEFAA-YA	Futurebus+ to FDDI Adapter without PMDs; requires one (SAS) or two (DAS) PMD connectors
DEFXS-AA	Single-mode fiber PMD, for DEFAA-YA (supports up to 40 km between stations)
DEFXM-AA	Multi-mode fiber PMD, for DEFAA-YA
DEFXU-AA	Twisted Pair PMD for DEFAA-YA

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, 250 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 conserve host resources.

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.

Step 6—Networks and Communications *(continued)*

Network Connectivity Products

See Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for ordering information.

Note: X.25 connectivity requires host software as well as a LAN-based network router/gateway.

Step 7—Console Terminal

A console terminal is required for each system. Any VT-series terminal can be used. An X Windows terminal is recommended as a second console display due to enhanced facility management flexibility in a windows environment.

Step 8—Terminals, Scanners, and Printers

All printers and terminals are connected via network terminal/printer servers. See Chapter 9, *Terminals, Scanners, Printers* for ordering information.

Step 9—Software and Documentation

Select user licenses and additional software as required. Media and documentation are recommended for the first system on site.

Software Processor Code = Q

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7A9-BG*	DEC OSF/1 AXP Interactive 32-user license
QL-MT7A9-BH*	DEC OSF/1 AXP Interactive 64-user license
QL-MT7AQ-AA	DEC OSF/1 AXP unlimited user license
QL-MT5AQ-AA	DEC OSF/1 AXP developer's extension license
QL-MT6AQ-AA	DEC OSF/1 AXP server extension license
QL-MTJAQ-AA	DECnet/OSI end-system license
QL-MTKAQ-AA	DECnet/OSI extended function license

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation (base system and complementary products) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation
QA-MT4AB-GZ	DEC OSF/1 AXP end user hardcopy documentation subkit
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	DEC OSF/1 AXP server extension hardcopy documentation subkit

Step 9—Software and Documentation *(continued)*

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AQ-AA	OpenVMS AXP unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI end-system to extended function upgrade license
QL-MUZAQ-AA	VMScluster software license. Required with each system that connects to OpenVMS Cluster.

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

OpenVMS AXP Media and Documentation

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ	OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ	OpenVMS AXP extended hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP
QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

NAS 300 Software

NAS 300 software included with ADVANTAGE-SERVER systems. Media available on layered product CD-ROM.

Step 10—Hardware Documentation

Pedestal System (BA640)

EK-KN430-KT	DEC 4000 AXP information kit, one kit included with each system. Kit includes all items listed below (each document may also be ordered separately).
EK-KN430-IM	Information map, provides descriptions and ordering information for marketing, Digital Services, technical material, and course offerings
EK-KN430-SP	Site preparation card
EK-KN430-IN	Installation card
EK-KN430-OP	Owner's guide

Rackmount System (BA641)

EK-BA641-IN	DEC 4000 AXP Rackmount Series Installation/Owner's Guide

Step 11—Power Cords (Not Required for 120 V Systems)

BA640 Pedestal System

Select appropriate country-specific power cord; systems ship with 120 V power cord unless noted differently on order.

BN27H-2E	U.S., Canada, Japan (120 V included)
BN27R-2E	U.S., Canada, Japan (240 V)
BN27L-2E	Australia, New Zealand
BN27M-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN27Q-2E	U.K., Ireland
BN27G-2E	Switzerland
BN27K-2E	Denmark
BN27J-2E	Italy
BN27P-2E	India
BN27N-2E	Israel

Rackmount System (BA641)

Base Systems ship with 120 V, 20-Amp power cord unless noted differently on order.

For 240 V systems:

Country-specific power cords plug directly into the BA641; see BA640 Pedestal power cords (5 ft long) listed below.

When mounting the BA641 system in a rack using the 877-H* 240 V power controller, where the BA641 is connected to the 877-H* use:

BN18T-4E	240 V 20-Amp, 15-ft power cord

* For a list of country-specific power cords for the 877-H power controller, see Rackmount ADVANTAGE-SERVER systems.

Step 11—Power Cords (Not Required for 120 V Systems) *(continued)*

Rackmount ADVANTAGE-SERVER Systems

All 120 V ADVANTAGE-SERVER systems include all required power cords. Note that these systems have two 877-DB power controllers with attached 120 V power cords.

All 240 V ADVANTAGE-SERVER systems must have two power cords ordered for the two 877-H power controllers included in the system. The internal power cord (between the 877-H and the BA641) BN18T-4E is included.

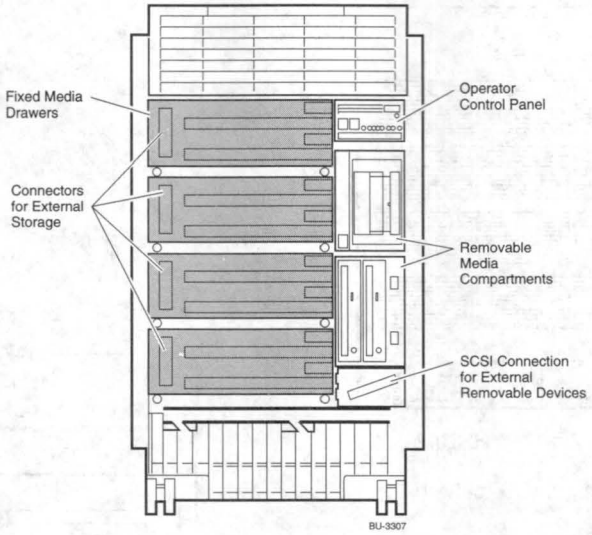
Country-specific 240 V power cords connect the 877-H power controller to an external 240 V power source.

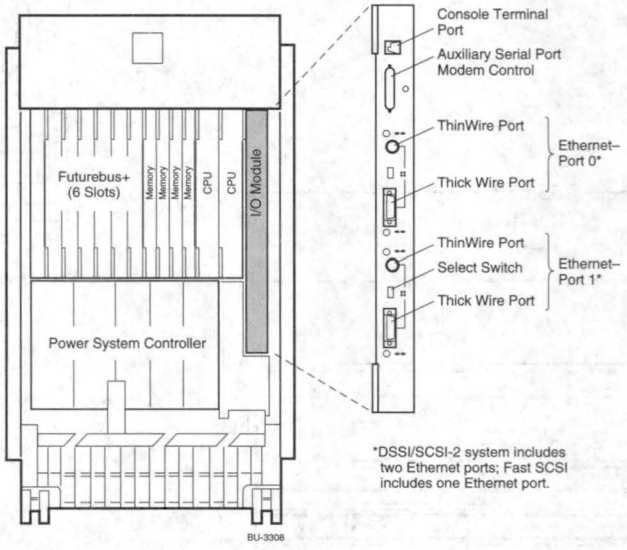
BN18C-4E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN18D-4E	Australia, New Zealand
BN18E-4E	Italy
BN18B-4E	U.K., Ireland
BN18P-4E	Denmark (IEC 309 plug)

Step 12—Environmental Power Products

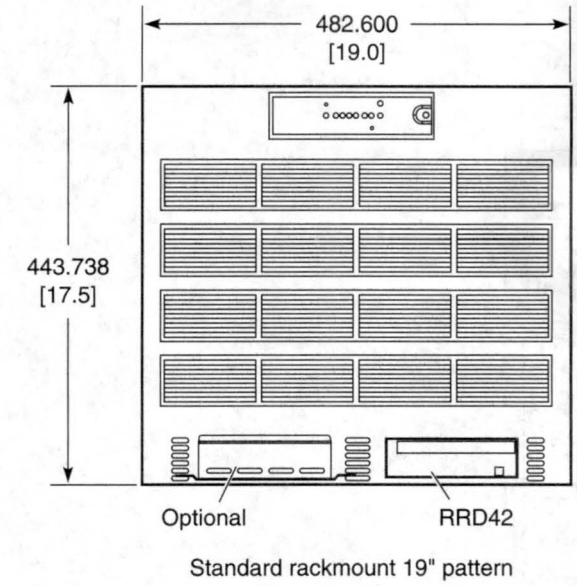
Select environmental power products if required. Refer to Chapter 10, *Environmental Products*, and Digital's *Environmental Power Products Catalog*.

DEC 4000 Model 700 AXP Pedestal Server Diagrams

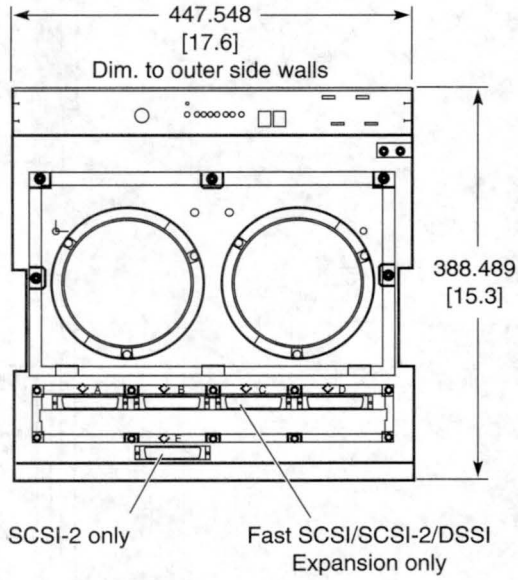




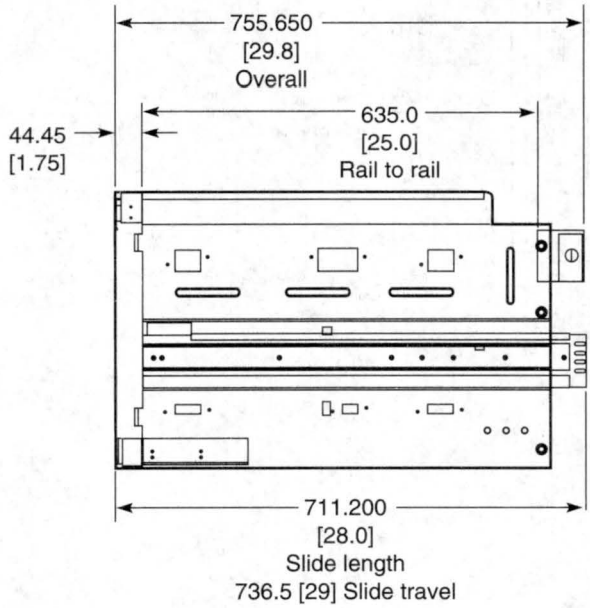
*DSSI/SCSI-2 system includes two Ethernet ports; Fast SCSI includes one Ethernet port.



Front



Back



Side

BU-3426

Specifications

Physical Characteristics	Operating	Shipping
Height	88.28 cm (34.75 in)	110 cm (43.3 in.)
Width	49.93 cm (19.66 in.)	67 cm (26.4 in.)
Depth	77.47 cm (30.50 in.)	104 cm (40.9 in.)
Weight (max)	124.7 kg (275.0 lb)	124.7 kg (275.0 lb)
Clearances	**Operating**	**Service**
Front	2.54 cm (1.00 in.)	100.0 cm (39.37 in.)
Rear	2.54 cm (1.00 in.)	100.0 cm (39.37 in.)
Sides	2.54 cm (1.00 in.)	2.54 cm (1.00 in.)
Environmental		
Temperature		
Operating	10° to 35° C (50° to 95° F)	
Nonoperating	-40° to 66° C (-40° to 151° F)	
Storage	-40° to 66° 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	
Rate of change	30% per hour	
Max. Wet Bulb Temperature		
Operating	25° C (77° F)	
Storage	28° C (82° F)	
Min. Dew Point Temperature (Operating)	2° C (36° F)	
Max. Heat Dissipation (Operating)	4912 Btu/hr (1440 W)	
Air Flow and Quantity Storage Devices		
Operating at 25° C (77° F)	61 l/s (130 CFM)	
Operating at 35° C (95° F)	70 l/s (150 CFM)	
Exhaust location	System base	
Particle size	N/A	
Concentration	N/A	
Card Cage and Power		
Operating at 25° C (77° F)	94 l/s (200 CFM)	
Operating at 35° C (95° F)	141 l/s (300 CFM)	
Exhaust location	System base	
Particle size	N/A	
Concentration	N/A	
Altitude		
Operating	2438 meters (8000 ft)	
Nonoperating	4877 meters (16000 ft)	
Mechanical Shock[1]		
Operating	7.5 g pk for 10 ± 3 ms	
Nonoperating	20 g pk for 30 ± 3 ms	
Vibration (Operating)	5–10 Hz @ .02" da min 10–500 Hz @ 0.1 g max	
Acoustics		
Operating	6.4 bels, 49 dBA typical	
Idle	6.3 bels, 46 dBA typical	

Specifications ***(continued)***

Electrical	**Nominal ac Voltage**			
	101	**120**	**220**	**240**
Voltage range (Vac)	93–110	104–128	190–235	208–256
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, maximum, at nominal voltage (Amps)	14.3	12.0	6.5	6.0
Startup current (Amps)	20.0	17.0	9.3	8.6
Maximum inrush current (Amps)	50	50	50	50
Maximum power (Watts)	1440	1440	1440	1440
U.S. power cord plug		NEMA 5-20P		NEMA 6-20P
Agency Approvals	Australian AS C 100 TUV GS-Mark testing EN 60950 CSA C22.2 no. 134 Office Equipment UL 114 Office Equipment CSA C22.2 no. 154 Data Processing UL 478 Electronic Data Processing Units CSA C22.2 no. 950-M89 Safety Standard UL 1950 Safety FCC Part 15 Docket 20780 VDE 0875 RFI Suppression IEC 896.2 Profile B IEC Publication 950			

[1] Nominal AC Voltage

Specifications

Physical Characteristics		
Height	44.4 cm (17.5 in.)	
Width	48.2 cm (19.0 in.)	
Depth (with brackets)	75.7 cm (29.8 in.)	
System weight* (approximate)	66.4 kg (146 lb)	
Shipping weight (approximate)	72.7 kg (160 lb)	
Mounting Requirements		
Conforms with ANSI/EIA ES-310-C-77 and MIL-STD 189 for 19-inch panel width and 30-inch minimum depth enclosure. **Note**: The DEC 4000 AXP Rackmountable Base Systems do **not** include a 19-inch wide cabinet or rack.		
Installation/Removal Clearance Required		
Front	76.0 cm (30.0 in.)	
Sides/rear	Up to 92.0 cm (36.0 in.) of clearance may be required for installation and removal of the system chassis.	
Normal Service Clearance Required		
Front	76.0 cm (30.0 in.)	
Sides/rear	Adequate clearance for service personnel Bottom 17.5 inches from floor for storage tray service clearance	
Min. Clearances Required for Airflow		
Front	20.3 cm (8.0 in.)	
Rear	20.3 cm (8.0 in.)	
Electrical		
Power requirements (ac input)	120 V/20 Amp/60 Hz	240 V/10 Amp/50 Hz
Voltage ranges	90–128 Vrms**	190–256 Vrms**
Power source phasing	Single	Single
Frequency range	49–61 Hz	49–61 Hz
Maximum rated current	14.5 amps	7.0 amps
Maximum power consumption	1650 Watts	1650 Watts
Maximum heat dissipation	4774 Btu hour	4774 Btu hour
Power supply power connector	IEC 320 C20	IEC 320 C20
U.S. power cord plug	NEMA 5-20P	NEMA 6-20P
Environmental		
Temperature		
Operating	10° to 40° C (50° to 104° F)	
Nonoperating	-40° to 66° C (-40° to 151° F)	
Cooling air required	200 ft^3 per minute	
Relative Humidity		
Operating	20% to 80% noncondensing	
Nonoperating	10% to 90% noncondensing	
Altitude		
Operating	2438 meters (8000 ft)	
Nonoperating	4877 meters (16,000 ft)	
Mechanical Shock		
Operating	10 g pk for 10 ± 3 ms	
Nonoperating	20 g pk for 10 ± 3 ms	
Vibration		
Operating	5–16 Hz @ .02" da min 16–200 Hz @ 0.25 g max 200–500 Hz @ 0.10 g max	
Duration	1 hour per axis	

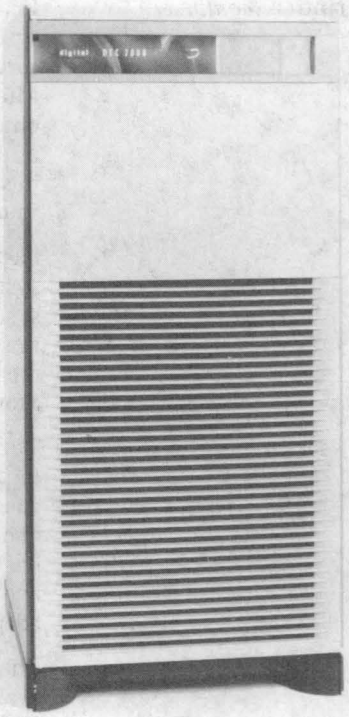
* Weight given is for typical enclosure fully loaded with module options,powersupply, maximum number of storage devices.

** Built-in universal power supply automatically selects the correct voltage range for either 120 V or 240 V operation.

Specifications *(continued)*

Acoustics	
Operating	6.2 bels, 48 dBA
Nonoperating	6.1 bels, 27 dBA

Listed by UL to 1950
Certified to CSA Standard C22.2 No. 950/M89
TUV approved to EN60950
Tested in accordance with VDE-0971, EN55022, EN50082-1
Tested and in compliance with Class A Subpart B of Part 15 FCC Rules
Tested and in compliance with VCCI Class 1
Tested and in compliance with CSA 108.8, Class A



DEC 7000 Model 700 AXP Enterprise Servers

Product Description

DEC 7000 AXP Enterprise Servers, part of Digital's 64-bit family of Alpha AXP servers, are designed for the rigorous demands of enterprise computing. They offer single or multiprocessing for mission-critical technical and commercial applications that previously required larger, more costly systems—applications such as transaction processing, general ledger, securities trading, signal processing, molecular modeling, and imaging. The DEC 7000 AXP server provides powerful performance at low cost.

DEC 7000 AXP servers are the fastest in the industry, running at 275 MHz with on-board cache of 4 Mbytes. They are also the industry's most expandable servers. Their modular platform allows for improved performance in a number of different dimensions—symmetric multiprocessing (SMP), larger memory, more I/O bandwidth, and greater disk capacity. DEC 7000 AXP systems support up to six CPUs and up to 3.5 Gbytes of memory (14 Gbytes available in the future).

The DEC 7000 Base Enterprise Server system allows maximum flexibility and simplicity for ordering. Customers may create configurations to satisfy their unique requirements by adding memory, I/O controllers, storage, user licenses, database software, and/or networking support. Or, they may choose to configure a system by adding Enterprise Expansion Packages to the Base Enterprise Server system. Enterprise Expansion Packages are built with ease of ordering in mind. They contain all the necessary hardware and software needed to get a system up and running. DEC 7000 AXP servers are also available in Rackmount configurations.

DEC 7000 AXP servers offer a choice of open operating system environments: OpenVMS AXP or the UNIX-based DEC OSF/1 AXP. Both operating systems provide seamless integration with servers, workstations, and PCs from other computer vendors, as well as from Digital. Hardware and software investment protection is ensured through Network Application Support (NAS) and client/server computing.

Product Description *(continued)*

In addition to its outstanding configuration flexibility, the DEC 7000 AXP system also provides balanced performance. Standard on the DEC 7000 AXP server is an internal 128-bit wide synchronous system bus, which provides 800 Mbyte/second peak (640-Mbyte/second sustained) bandwidth, virtually eliminating the potential for bottlenecks. For those applications where I/O is critical, XMI or Futurebus+ I/O channels allow users to configure large systems to suit a wide variety of needs. The CPU, memory, and I/O is upgradable to future generations of components.

Fast SCSI-2, CI-based, and DSSI storage are supported in the DEC 7000 AXP system. The SCSI disks reside in BA350 StorageWorks shelves within the system cabinet and expander cabinets. Each StorageWorks shelf holds as many as seven SCSI devices. Up to 58.8 Gbytes of storage can be configured within the DEC 7000 AXP system cabinet. For maximum storage expansion, the StorageWorks data center cabinet, the SW800, is available.

The balanced I/O subsystem on the DEC 7000 AXP system provides substantial throughput (one 100-Mbyte/second XMI I/O channel is standard). That capacity can be greatly expanded by the addition of up to three 12-slot XMI channel or one 9-slot 180-Mbyte/second Futurebus+ I/O channel, for a maximum I/O bandwidth of 400 Mbytes/second. The ability to access third-party I/O adapters and devices is provided via Futurebus+ adapters. XMI devices supported include adapters for Ethernet, CI, FDDI, SDI/STI, and DSSI.

The DEC 7000 AXP server is designed to provide high reliability and availability. The CPU technology is based on Digital's proven high-reliability CMOS technology. ECC protection is provided on the system bus, all memory modules, and the 4-Mbyte CPU write-back cache. The power system uses several power conditioning functions to protect against high-voltage transients.

Optional N+1 power system allows for higher system availability in the event of a power regulator failure. Optional fully-integrated system-level UPS (Uninterruptible Power System) capability is available to support all elements within the CPU and I/O expansion cabinets: CPU, memory, I/O channels and devices, and in-cabinet disk storage. Warm swap of disks is also supported.

Futurebus+ Profile B (IEEE 896) is the peripheral I/O bus on the Alpha AXP distributed and enterprise systems. Futurebus+ is an industry-standard, open, bus interconnect that delivers up to 180-Mbyte/second I/O throughput.

DEC 7000 AXP systems can be added to an OpenVMS Cluster to enable efficient, economical resource sharing, plus increased availability and storage capacities. There is no disruption to users when the cluster grows—new systems or disks and tape subsystems can be added without taking the cluster offline. DEC 7000 AXP systems also support the DECsafe Available Server software (DEC OSF/1 AXP only) for high availability and failover functionality.

Rackmount DEC 7000 AXP 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. Rackmount DEC 7000 AXP systems are offered in two configurations: Traditional Systems and Base Servers.

Step 1—Pedestal Systems

DEC OSF/1 AXP and OpenVMS AXP user licenses may be added as needed. System disk and console terminal required unless available on site.

DEC OSF/1 AXP Base Enterprise Server Systems include

- DECchip 21064A/275-MHz CPU with 4-Mbyte cache
- High-speed system interconnect bus, 12-slot XMI I/O channel
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KZMSA (Fast SCSI-2) disk/tape adapter
- RRD43 600-Mbyte, 5.25-inch CD-ROM drive
- 48 V power regulator
- DEC OSF/1 AXP two-user base license
- NAS 200 software
- One year hardware product warranty
- One year software product warranty
- System installation

OpenVMS AXP Base Enterprise Server Systems include

- DECchip 21064A/275-MHz CPU with 4-Mbyte cache
- High-speed system interconnect bus, 12-slot XMI I/O channel
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KZMSA (Fast SCSI-2) disk/tape adapter
- RRD43 600-Mbyte, 5.25-inch CD-ROM drive
- 48 V power regulator
- OpenVMS AXP base license
- NAS 200 software
- One year hardware product warranty
- One year software product warranty
- System installation

Order Number	Operating System	Memory
7KAMC-PA/PB/PC	DEC OSF/1 AXP	128 Mbytes
7KAMD-PA/PB/PC	DEC OSF/1 AXP	256 Mbytes
7KAME-PA/PB/PC	DEC OSF/1 AXP	512 Mbytes
7KAMH-PA/PB/PC	DEC OSF/1 AXP	2 Gbytes
7KAMC-MA/MB/MC	OpenVMS AXP	128 Mbytes
7KAMD-MA/MB/MC	OpenVMS AXP	256 Mbytes
7KAME-MA/MB/MC	OpenVMS AXP	512 Mbytes
7KAMH-MA/MB/MC	OpenVMS AXP	2 Gbytes

Note: xA = 60 Hz, 208 V; xB = 50 Hz, 380/416 V; xC = 50/60 Hz, Japan

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

7KATA-NK **DEC OSF/1 AXP SMP upgrade**—includes one CPU processor, DEC OSF/1 AXP SMP extension license, and one full-year product warranty. Upgrades DEC 7000 AXP system to the next higher-level processor: Model 710 to Model 720; Model 720 to Model 730; Model 730 to Model 740; Model 740 to Model 750; Model 750 to Model 760.

7KATA-MK **OpenVMS AXP SMP upgrade**—includes one CPU processor, OpenVMS AXP SMP extension license, and one full-year product warranty. Upgrades DEC 7000 AXP system to the next higher-level processor: Model 710 to Model 720; Model 720 to Model 730; Model 730 to Model 740; Model 740 to Model 750; Model 750 to Model 760.

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.

DEC OSF/1 AXP Base Enterprise Server Systems:

7YEHA-DA/DB **High Availability SCSI Package**, includes:
- SW800 StorageWorks cabinet with
  - HSZ40 StorageWorks array controller in BA350-MB
  - Six RZ28 2.1-Gbyte, 3.5-inch disk drives in BA350 shelf
  - TZ87 20-Gbyte, 5.25-inch SCSI tape drive in BA350 shelf
- BN21K 10-meter cable and DWZZA for connecting HSZ40 to KZMSA in system cabinet
- DECsafe Available Server software license kit

OpenVMS AXP Base Enterprise Server Systems:

7YCHA-AA/AB* **Cluster Starter Package**, includes:
- SW800 StorageWorks cabinet with
  - HSJ40 StorageWorks array controller in BA350-MB
  - Six RZ28 2.1-Gbyte, 3.5-inch disk drives in BA350 shelf
  - TZ87 20-Gbyte, 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 cables
- SC008 Star Coupler
- VMScluster License

7YCAA-AX **Cluster Add-on Package**, includes:
- CIXCD-AC XMI CI controller
- Two BNCIA 10-meter cables
- VMScluster License

Step 4—Memory

Select additional memory if required; maximum 3.5 Gbytes per system.

MS7AA-BA 128-Mbyte memory module

MS7AA-CA 256-Mbyte memory module

MS7AA-DA 512-Mbyte memory module

MS7AA-FA 2048-Mbyte memory module

DJ-70APS-AA 16-Mbyte Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)

Step 5—Console Load Device

RRD43 CD-ROM load device included with each system; uses one dedicated SCSI-2 bus.

Step 6—Storage Controllers

KZMSA included with each system; CIXCD and KDM70 can be added to OpenVMS AXP and DEC OSF/1 AXP systems.

KZMSA-AB **Fast SCSI-2 disk/tape adapter**. OpenVMS AXP supports maximum six per XMI, 12 per system. DEC OSF/1 AXP supports eight per XMI, maximum 16 per system (V3.0). Requires one XMI slot. Provides two SCSI-2 buses; each bus provides seven ports for SCSI devices; no more than two tapes per bus. **Note**: The KZMSA can be fast enabled when using the BC10U-04 cable; requires placement of drives in back open expansion bay in the system cabinet. For further detail, refer to the *KZMSA Installation Guide* (EK-KXMSX-IN). The KZMSA supports DECsafe Available Server. See Chapter 6, *High Availability and High Performance Products*, for details.

CK-KZMSA-LA Two 30-inch internal cabinet cables. One kit per KZMSA required

KZASA-AA **Fast Wide Differential SCSI disk adapter.** DEC OSF/1 AXP supports eight per system (min. V2.0). Requires one Futurebus+ I/O slot, provided by DWLAA-** Futurebus+ plug-in unit (see Step 12 for details on DWLAA-**). Disk connection supported via HSZ40-A* only. Does not provide boot support or DECsafe ASE support.

Step 6—Storage Controllers *(continued)*

KFMSB-AA	**DSSI disk/tape adapter.** OpenVMS AXP supports 6 per XMI, 12 per system. Requires 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. Requires OpenVMS AXP V6.1.
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-** to KFMSB-AA. Includes KFMSB-AA, CK-KFMSB-LB, and requires return of KFMSA-**.
KDM70-AA	**XMI disk/tape controller**. OpenVMS AXP supports three per XMI, maximum 12 per system. DEC OSF/1 AXP supports three per XMI, maximum six per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes.
CK-KDM00-LF	0.9-m (3-ft) cabinet kit. Required with each KDM70-AA
CIXCD-AC	**XMI CI controller**. OpenVMS AXP systems support ten (V6.1). Requires one XMI slot. CIXCD requires one BNCIA cable set to connect system to Star Coupler. VMScluster software license required for each system when multiple OpenVMS systems are used in an OpenVMS Cluster environment. **Note:** One CIXCD is supported on DEC OSF/1 AXP systems for expanded disk interconnect capability only.
BNCIA-xx	**Computer interconnect cable sets.**Connect Star Coupler to system and SW800. Choose required length—10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
HSZ40-AD/AF	**StorageWorks array controller.** Supports up to 42 SCSI-2 devices. Includes 16-or 32-Mbytes ReadCache. Supported by **DEC OSF/1 AXP**. Requires BA350-MB StorageWorks shelf.

Step 7—Storage

Select storage devices as required. See Chapter 8, *Storage Devices*, for complete 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 BA350 modular expansion shelves; each shelf holds a maximum of two 5.25-inch devices or seven 3.5-inch devices.

BA655-AA	**SCSI-2 disk plug-in unit**—includes two BA350-LA modular expansion shelves; each shelf includes a power supply. **Note**: For required BC10U-xx cables, see page xxx.
RZ28-VA	2.1-Gbyte, 3.5-inch SCSI disk drive
RZ26L-VA	1.05-Gbyte, 3.5-inch SCSI disk drive
TLZ06-VA	4.0-Gbyte, 3.5-inch SCSI tape drive
TZ87-VA	20-Gbyte, 5.25-inch SCSI tape drive
TZ86-VA	6.0-Gbyte, 5.25-inch SCSI tape drive
EZ54R-VA	428-Mbyte, SCSI solid state disk
EZ51R-VA	107-Mbyte, SCSI solid state disk

Step 7b—External Storage (I/O Expansion Cabinet)

The I/O expansion cabinet provides space for four disk plug-in units. XMI plug-in unit is required in each I/O expansion cabinet to support SCSI disks.

Step 7c—External Storage

The following list describes available disk storage devices, capacities, and components included with initial offerings; supported options can be added as required. See Chapter 8, *Storage Devices*, for detailed ordering information.

Storage Arrays	Capacity	Storage Array Disk Drive Components
SW5XX, SW8XX	6–227 Gbytes	RZ26L/RZ28 SCSI-2 disk drives
Disk Drives		
RZ28 SCSI	2.1 Gbytes	
RZ26L SCSI	1.05 Gbytes	
ESE50 SDI solid state	120–600 Mbytes	
EZ54R SCSI solid state	428 Mbytes	
EZ51R SCSI solid state	107 Mbytes	
RWZ01 optical	594 Mbytes	
Tape Drives		
TZ85, TZ86, TZ87, TZ857*,TZ867*, TZ877, TSZ07, TLZ06, TKZ09, TKZ60	See Chapter 8, *Storage Devices*, for ordering information.	

* Loader support for DEC OSF/1 AXP is available via DECnsr.

Step 8—CI OpenVMS Cluster Options

For CI OpenVMS Cluster configurations, select appropriate options. CI controller, BNCIA cables, and VMScluster Software license required. See Chapter 6, *High Availability and High Performance Products*, for more configuration information.

HSJ40-AD/AF	**StorageWorks array controller.** Supports up to 42 SCSI-2 devices. Includes 16-or 32-Mbytes ReadCache and controller-based disk striping. Supported by **OpenVMS VAX** V5.5-1 and later, OpenVMS AXP V1.5.
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.
BNCIA-XX	**Computer interconnect cable sets.** Connect Star Coupler to system and SW800. Choose required length of 10, 20, or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
QL-MUZAJ-AA	**VMScluster License.** Required with each system that connects to 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 Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for details.

LAN Communications Controllers

DEMNA-M	**802.3/Ethernet controller**—one included, requires one XMI slot. OpenVMS AXP supports four per XMI, maximum six per system. DEC OSF/1 AXP 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, SAS with fiber MIC connector; requires one XMI slot. OpenVMS AXP supports four per XMI, maximum four per system. DEC OSF/1 AXP supports four per XMI, maximum eight per system.
DEFAA-AA	**DEC FDDIcontroller/Futurebus+,** Futurebus+ to FDDI adapter SAS (Single Attachment Station); requires one Futurebus+ slot. OpenVMS AXP and DEC OSF/1 AXP support two per system.
DEFAA-DA	**DEC FDDIcontroller/Futurebus+,** Futurebus+ to FDDI adapter DAS (Dual Attachment Station); requires one Futurebus+ slot. OpenVMS AXP and DEC OSF/1 AXP support two per system.
DEFAA-YA	**DEC FDDIcontroller/Futurebus+,** Futurebus+ to FDDI adapter without PMDs. OpenVMS AXP and DEC OSF/1 AXP support two DEFAA adapters per system require one (SAS) or two (DAS) PMD connectors.
DEFXS-AA	**Single-mode fiber PMD,** for DEFAA-YA (supports up to 40 km between stations)
DEFXM-AA	**Multi-mode fiber PMD,** for DEFAA-YA (supports up to 40 km between stations)
DEFXU-AA	**Twisted pair PMD,** for DEFAA-YA

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 descriptions in Chapter 8, Networks, Communications, and Cables, for ordering information.

DECserver 90M, 90L+, 90TL, 900TM, 700, 250, 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 Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for details.

Step 10—Console Terminal

Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

VT510-xx	VT510 terminal.
LA75S-xx	LA75 Plus printer.
LAXXS-AD	VT510/LA75 table for both VT510 and LA75.

Step 11—Terminals, Scanners, Printers

See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet)

The **system cabinet** includes one 12-slot XMI-plug-in unit, one power regulator, and one RRD43 CD-ROM drive. It provides space for two additional power regulators and includes two lower expansion bays for plug-in units. The lower bays accommodate plug-in units as follows. **Note:** Maximum four I/O channels per system.

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 (one included)	Two each
Lower	Battery plug-in unit	One maximum	Two
Lower	Futurebus+ plug-in unit	One maximum	One

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet) *(continued)*

The **I/O expansion cabinet** includes one power regulator and space for two additional power regulators. Also included are 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.

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	Two maximum	One each
Lower	XMI plug-in unit	Two maximum	Two each
Lower	Battery plug-in unit	One maximum	Two
Lower	Futurebus plug-in unit	One maximum	One

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 additional H7238-AA battery options.

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.

Note: Maximum one Futurebus+ plug-in unit per OpenVMS AXP and DEC OSF/1 AXP systems.

DWLAA-AA	**Futurebus+ plug-in unit** with 9-slot I/O channel for system cabinet.
DWLAA-BA	**Futurebus+ plug-in unit** with 9-slot I/O channel for I/O expansion cabinet.
H7263-AA/AB	**48 V power regulator;** maximum three per cabinet (one included). A second regulator may be required to supply adequate power depending on configuration. See power configuration table which follows. A third regulator assures N+1 power redundancy and higher availability in the event of a power regulator failure. **Note:** The power configuration table provides a manual method of determining the need for a second power regulator. Equivalent power unit (EPU) is an equivalent value of power used at 48 Vdc by each option.
H7238-AA	**4-pack battery option;** one required per optional 48 V power regulator to support battery backup/UPS capability.

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet) *(continued)*

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, DWLMA-AA, DEMNA	30	1	30			
I/O expansion cabinet (H9F00-BA/BB/BC) includes one power regulator					1	0
Additional CPU modules	7					
MS7AA-AA 64-Mbyte memory	10					
MS7AA-BA 128-Mbyte memory	10					
MS7AA-CA 256-Mbyte memory	10					
MS7AA-DA 512-Mbyte memory	10					
MS7AA-FA 2-Gbyte memory	10					
CIXCD XMI CI controller	4					
DEMNA-M XMI Ethernet controller	3			3		
DEMFA-AA XMI FDDI adapter	5			6		
DWLMA XMI plug-in unit	4					
DWLAA Futurebus+ plug-in unit	4			4		
KDM70-AA XMI disk/tape adapter	6			6		
KZMSA XMI SCSI controller	3					
KFMSB DSSI disk/tape adapter	3					
RZ26L-VA SCSI disk drive	1					
RZ28-VA SCSI disk drive	1					
TLZ06-VA SCSI tape drive	1					
Total the Last Column						

If EPU is greater than 80, order second power regulator (H7263-AA/AB); EPU must not exceed 180.

Note: Depending on the configuration, the 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, modems, etc., a universal UPS can be ordered separately. See Chapter 10, *Environmental Products* and *Digital's Environmental Power Products Catalog*.

Step 13—Software

Select user licenses and additional software as required. Media and documentation are recommended for the first system on site.

Software Processor Code = Q

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7A9-BG*	DEC OSF/1 AXP Interactive 32-user license
QL-MT7A9-BH*	DEC OSF/1 AXP Interactive 64-user license
QL-MT7AQ-AA	DEC OSF/1 AXP unlimited user license
QL-MT5AQ-AA	DEC OSF/1 AXP developer's extension license
QL-MT6AQ-AA	DEC OSF/1 AXP 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 (DEC OSF/1 AXP only). Media available on layered product CD-ROM. KZMSA adapter required. See Chapter 6, *High Availability and High Performance Products*, for configuration information.

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation (base system and complementary products) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation
QA-MT4AB-GZ	DECOSF/1 AXP end user hardcopy documentation subkit
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	DEC OSF/1 AXP server extension hardcopy documentation subkit

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary.

Step 13—Software *(continued)*

QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AQ-AA	OpenVMS AXP unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license
QL-MUZAQ-AA	VMScluster software license. Required with each system that connects to OpenVMS Cluster.

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

OpenVMS AXP Media and Documentation

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ	OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ	OpenVMS AXP extended hardcopy documentation

Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP
QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

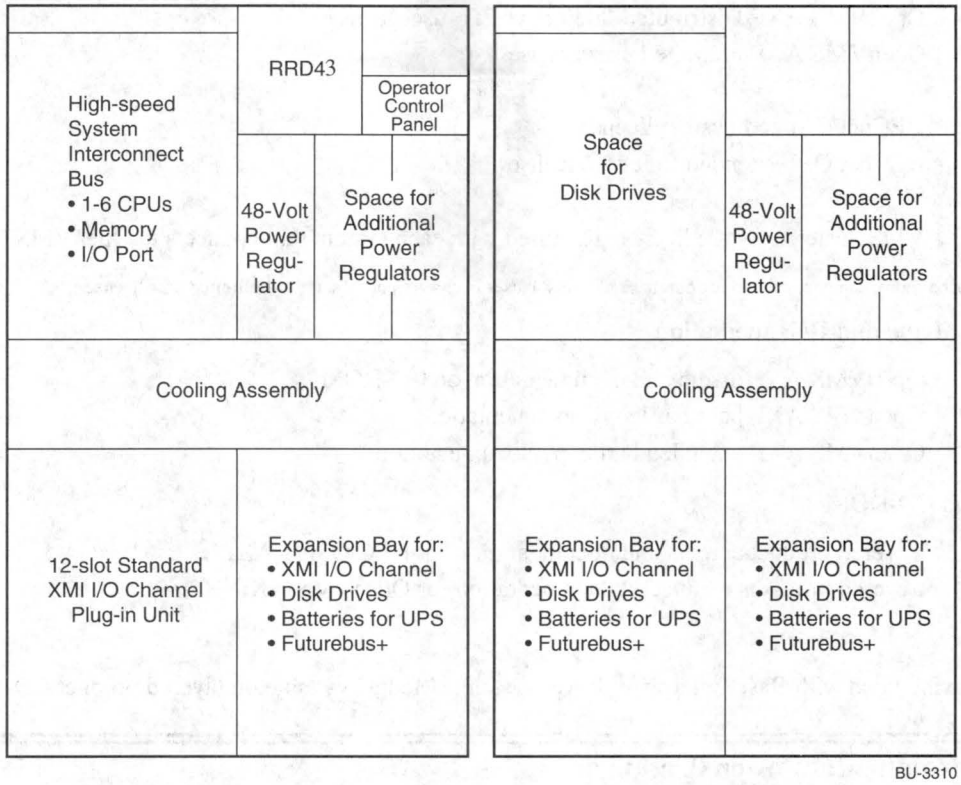
NAS 200 Software

NAS 200 software included with Base Enterprise Server systems. Media available on layered product CD-ROM.

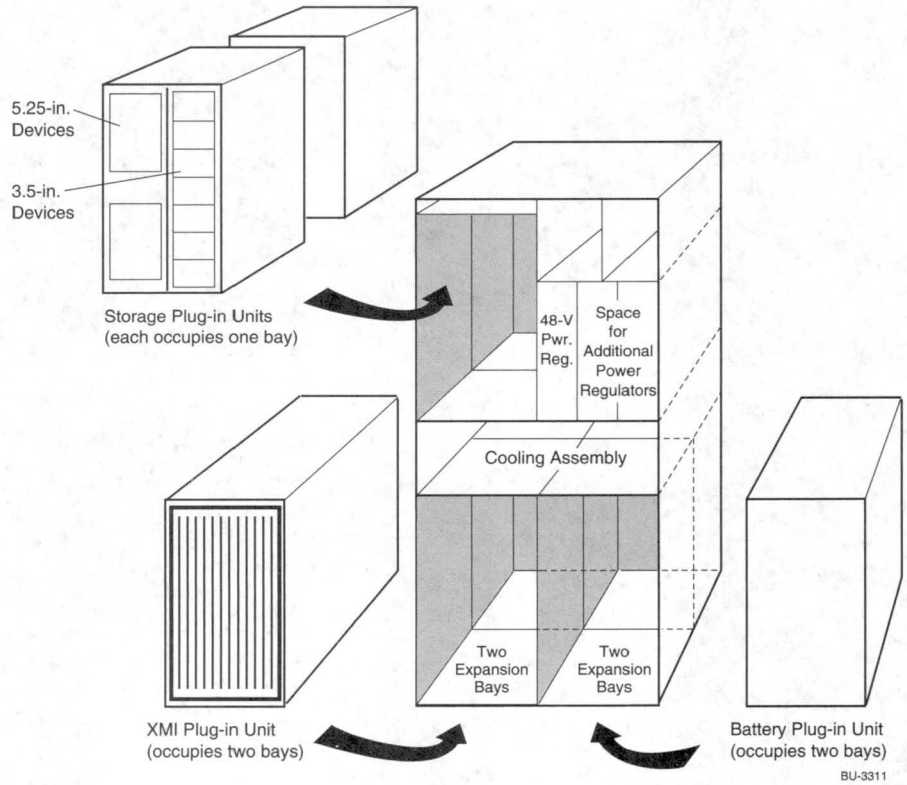
Step 14—Environmental Power Products

Select environmental power products if required. Refer to Chapter 10, *Environmental Products*, and to *Digital's Environmental Power Products Catalog*.

DEC 7000 Model 700 AXP System Diagram



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	0.0 cm (31.5 in.)	8106.0 cm (41.7 in.)
Depth	87.5 cm (34.4 in.)	119.0 cm (46.8 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 max.
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) 37,500 Btu/hr, 11,020 W
	Minimally configured system[2] (system cabinet) 3,400 Btu/hr, 1,000 W	

Power requirements[3]	U.S./Canada	Europe/GIA	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 Btus for a given system configuration can be calculated by multiplying the "EPU" value per cabinet by 85.4.

[2]Minimally configured system contains one regular, 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

DEC OSF/1 AXP and OpenVMS AXP user licenses may be added as needed. System disk required for Base Servers. Console terminal required for Base Servers unless available on site.

Rackmount DEC OSF/1 AXP Base Enterprise Server Systems include

- DECchip 21064A/275-MHz CPU with 4-Mbyte cache
- High-speed system interconnect bus, 12-slot XMI I/O channel
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KZMSA (Fast SCSI-2) disk/tape adapter
- RRD43 600-Mbyte, 5.25-inch CD-ROM drive
- DEC OSF/1 AXP two-user base license
- NAS 200 software
- One year hardware product warranty
- One year software product warranty
- System installation

Rackmount OpenVMS AXP Base Enterprise Server Systems include

- DECchip 21064A/275-MHz CPU with 4-Mbyte cache
- High-speed system interconnect bus, 12-slot XMI I/O channel
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KZMSA (Fast SCSI-2) disk/tape adapter
- RRD43 600-Mbyte, 5.25-inch CD-ROM drive
- OpenVMS AXP base license
- NAS 200 software
- One year hardware product warranty
- One year software product warranty
- System installation

Order Number	Operating System	Memory
2T-7KAMC-PA	DEC OSF/1 AXP	128 Mbytes
2T-7KAMD-PA	DEC OSF/1 AXP	256 Mbytes
2T-7KAME-PA	DEC OSF/1 AXP	512 Mbytes
2T-7KAMH-PA	DEC OSF/1 AXP	2 Gbytes
2T-7KAMC-MA	OpenVMS AXP	128 Mbytes
2T-7KAMD-MA	OpenVMS AXP	256 Mbytes
2T-7KAME-MA	OpenVMS AXP	512 Mbytes
2T-7KAMH-MA	OpenVMS AXP	2 Gbytes

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

7KATA-NK **DEC OSF/1 AXP SMP upgrade**—includes one CPU processor, DEC OSF/1 AXP SMP extension license, and one full-year product warranty. Upgrades DEC 7000 AXP system to the next higher-level processor: Model 710 to Model 720; Model 720 to Model 730.

7KATA-MK **OpenVMS AXP SMP upgrade**—includes one CPU processor, OpenVMS AXP SMP extension license, and one full-year product warranty. Upgrades DEC 7000 AXP system to the next higher-level processor: Model 710 to Model 720; Model 720 to Model 730.

Step 3—Memory

Select additional memory if required; maximum three memory modules per CPU.

MS7AA-BA 128-Mbyte memory module

MS7AA-CA 256-Mbyte memory module

MS7AA-DA 512-Mbyte memory module

MS7AA-FA 2048-Mbyte memory module

DJ-70APS-AA 16-Mbyte Prestoserve I/O performance enhancement option (DEC OSF/1 AXP systems only)

Step 4—XMI I/O Channel

Select additional XMI I/O chassis if required.

DWLMR-AA	Rackmount XMI I/O chassis. Includes DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller, KZMSA (Fast SCSI-2) disk/tape adapter, RRD43 600-Mbyte, 5.25-inch CD-ROM drive.
DWLMR-DA	Rackmount XMI I/O chassis. Includes DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller.
DWLMR-BA	Rackmount XMI I/O expansion chassis (empty).

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

KZMSA included with DWLMR-AA XMI chassis only. CIXCD and KDM70 can be added to OpenVMS AXP and DEC OSF/1 AXP systems.

KZMSA-AB	**Fast SCSI-2 disk/tape adapter.** OpenVMS AXP supports maximum six per XMI, twelve per system. DEC OSF/1 AXP supports eight per XMI, maximum 16 per system (V3.0). Requires one XMI slot. Provides two SCSI-2 buses; each bus provides seven ports for SCSI Integrated Storage Element (ISE) devices; no more than two tapes per bus.
CK-KZMSA-RB	Two 48-inch internal cabinet cables. One kit per KZMSA required.
KFMSB-AA	**DSSI disk/tape adapter.** OpenVMS AXP supports six per XMI, twelve per system. Required on 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. Requires OpenVMS AXP V6.1.
CK-KFMSB-RA	Two 48-inch internal cabinet cables. One kit per KFMSB required.
KDM70-AA	**XMI disk/tape controller.** OpenVMS AXP supports three per XMI, maximum 12 per system. DEC OSF/1 AXP supports three per XMI, maximum six per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes. Cabinet kit must be ordered separately.
CK-KDM60-RA	Cabinet kit; required with each KDM70-AA.
2T-CIXCD-AC	**XMI CI controller.** OpenVMS AXP systems support ten (V6.1). DEC OSF/1 AXP systems support one. Requires one XMI slot. CISCD requires on BNCIA cable set to connect system to Star Coupler. VMScluster software license required for each system when OpenVMS systems are used in OpenVMS Cluster environment. Cabinet kit included.
BNCIA-XX	**Computer interconnect cable sets.**Choose required length—10, 20, or 45m (10m = 32.8ft, 20m = 65.6ft, 45m = 147.6ft).

Step 7–Storage

There is **no** storage provided in the rackmount system order numbers. A variety of rackmount storage is available. A controller and at least 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 system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable. See Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for details.

LAN Communications Controllers

DEMNA-M	**802.3/Ethernet controller**—requires one XMI slot. OpenVMS AXP supports four per XMI, maximum six per system. DEC OSF/1 AXP supports six per XMI, maximum eight per system.
CK-DEMNA-RA	**DEMNA cabinet kit**—required with DEMNA-M.
2T-DEMFA-RA	**DEC FDDIcontroller 400,** XMI-to-FDDI adapter, SAS with fiber MIC connector—requires one XMI slot. OpenVMS AXP supports four per XMI, maximum four per system. DEC OSF/1 AXP supports four per XMI, maximum eight per system. Cabinet kit included.

Step 9—Console Terminal

Console terminal with EIA-232 25-pin DSUB connector and printer, required, unless otherwise available. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

VT510-xx	VT510 terminal.
LA75S-xx	LA75 Plus printer.
LAXXS-AD	VT510/LA75 table for both VT510 and LA75.

Step 10—Terminals, Scanners, Printers

See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 11—Software

Select user licenses and additional software as required. Media and documentation are recommended for the first system on site.

Software Processor Code = Q

DEC OSF/1 AXP Interactive User Licenses

DEC OSF/1 AXP Interactive User licenses are **not** specific to a single system and can be moved from one system to another at user discretion.

QL-MT7A9-BB	DEC OSF/1 AXP Interactive 1-user license
QL-MT7A9-BC*	DEC OSF/1 AXP Interactive 2-user license
QL-MT7A9-BD*	DEC OSF/1 AXP Interactive 4-user license
QL-MT7A9-BE*	DEC OSF/1 AXP Interactive 8-user license
QL-MT7A9-BF*	DEC OSF/1 AXP Interactive 16-user license
QL-MT7A9-BG*	DEC OSF/1 AXP Interactive 32-user license
QL-MT7A9-BH*	DEC OSF/1 AXP Interactive 64-user license
QL-MT7AQ-AA	DEC OSF/1 AXP unlimited user license
QL-MT5AQ-AA	DEC OSF/1 AXP developer's extension license
QL-MT6AQ-AA	DEC OSF/1 AXP 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 (DEC OSF/1 AXP only). Media available on layered product CD-ROM. KZMSA adapter required. See Chapter 6, *High Availability and High Performance Products*, for configuration information.

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

Step 11—Software *(continued)*

DEC OSF/1 AXP Media and Documentation

QA-MT4AA-H8	DEC OSF/1 AXP media and on-line documentation (base system and complementary products) on CD-ROM
QA-MT4AA-GZ	DEC OSF/1 AXP full hardcopy documentation
QA-MT4AB-GZ	DECOSF/1 AXP end user hardcopy documentation subkit
QA-MT5AA-GZ	DEC OSF/1 AXP developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	DEC OSF/1 AXP server extension hardcopy documentation subkit

OpenVMS AXP Distributed Interactive User Licenses

OpenVMS AXP Distributed Interactive User licenses are **not** specific to a single system and can be moved between systems at user discretion. OpenVMS AXP Distributed Interactive User licenses can also be shared across an OpenVMS Cluster.

Note: OpenVMS AXP Distributed Interactive User Licenses are architecture specific and **cannot** be shared across a **mixed** OpenVMS Cluster (OpenVMS AXP and OpenVMS VAX systems).

QL-MT3A9-BB	OpenVMS AXP Distributed Interactive 1-user license
QL-MT3A9-BC*	OpenVMS AXP Distributed Interactive 2-user license
QL-MT3A9-BD*	OpenVMS AXP Distributed Interactive 4-user license
QL-MT3A9-BE*	OpenVMS AXP Distributed Interactive 8-user license
QL-MT3A9-BF*	OpenVMS AXP Distributed Interactive 16-user license
QL-MT3A9-BG*	OpenVMS AXP Distributed Interactive 32-user license
QL-MT3A9-BH*	OpenVMS AXP Distributed Interactive 64-user license
QL-MT3AA-BR*	OpenVMS AXP Distributed Interactive 128-user license
QL-MT3AB-BR*	OpenVMS AXP Distributed Interactive 256-user license
QL-MT2AQ-AA	OpenVMS AXP unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license
QL-MUZAQ-AA	VMScluster software license. Required with each system that connects to OpenVMS Cluster.

* Not available in Europe. European customers must purchase as many 1-user licenses as necessary, or unlimited user license.

OpenVMS AXP Media and Documentation

QA-MT1AA-H8	OpenVMS AXP media and documentation on CD-ROM
QA-MT1AB-GZ	OpenVMS AXP base hardcopy documentation
QA-MT1AA-GZ	OpenVMS AXP extended hardcopy documentation

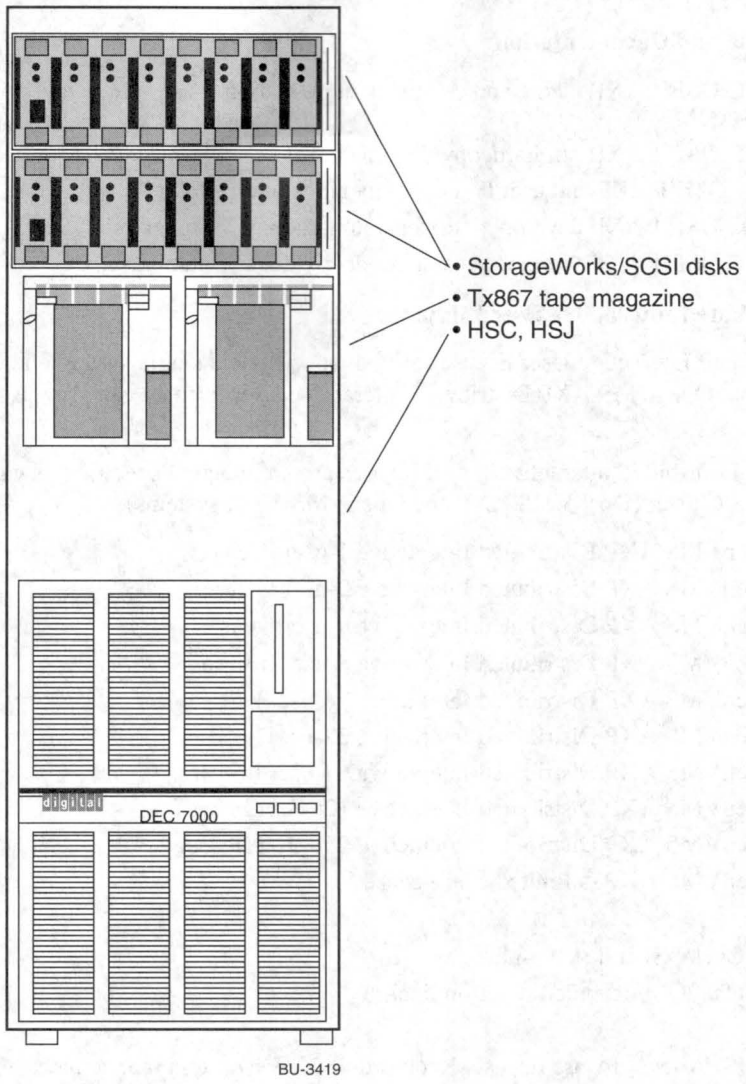
Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DEC OSF/1 AXP
QA-03XAA-H8	Layered products media and documentation for OpenVMS AXP

NAS 200 Software

NAS 200 software included with Base Enterprise Server systems. Media available on layered product CD-ROM.

Rackmount DEC 7000 Model 700 AXP System Diagram



Rackmount DEC 7000 Model 700 AXP System Specifications

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	1	1	1
Receptacle	NEMA 6-15	NEMA L6-15	L6-30R (2 required)

Physical Characteristics	System Box	XMI I/O Box	H9702-FB Cabinet
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	~41 kg (90 lb)	~59 kg (130 lb)	~136 kg (300 lb)

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	

Chapter 2
VAX Systems

VAX Systems Comparison Chart

VAXstation 4000 VLC Systems

VAXstation 4000 Model 60 Systems

VAXstation 4000 Model 90A Systems

MicroVAX 3100 Systems and Servers

VAX 4000 Model 105A Systems and Servers

VAX 4000 Model 505A/705A Systems and Servers

Rack-Mountable VAX 4000 Model 105A Systems

Rack-Mountable VAX 4000 Model 505A/705A Systems

VAX 7000 Model 700 Enterprise Servers

VAX Systems Comparison Chart

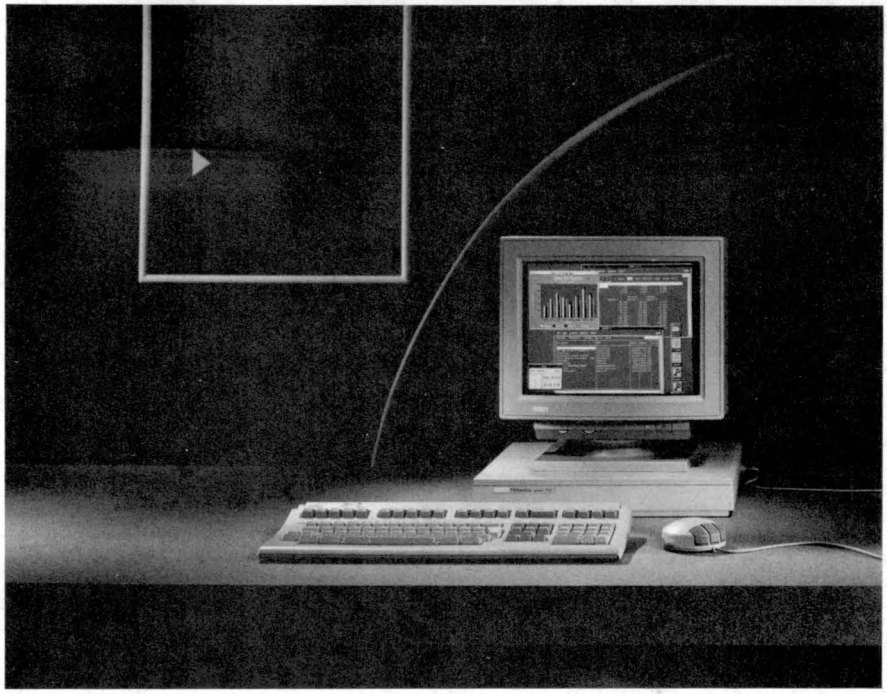
System	VAXstation 4000 VLC, Models 60 and 90A	MicroVAX 3100 Models 40, 85, and 95	VAX 4000 Model 105A
Number of Processors	1	1	1
CPU Clock Speed	VLC: 25 MHz Model 60: 55 MHz Model 90A: 83 MHz	Model 40: 25 MHz Model 85: 72 MHz Model 95: 83 MHz	83 MHz
Cache Size (On Chip/On Board)	VLC: 8 KB/0 KB Models 60 and 90A: 2 KB/256 KB	Model 40: 6 KB/0 KB Model 85: 2 KB/256 KB Model 95: 10 KB/128 KB	10 KB/512 KB
OpenVMS Performance	VLC: 6.2 SPECmark89 Model 60: 12 SPECmark89 Model 90A: 39 SPECmark89	Model 40: 32 TPS Model 85: 110 TPS Model 95: 165 TPS	180 TPS
In-Cabinet CPU Upgrade	Model 60 to Model 90A	Model 40 to Model 85 or Model 95; Model 85 to Model 95	Model 100/100A to Model 105A
I/O Features			
Maximum Memory	VLC: 24 MB Model 60: 104 MB Model 90A: 128 MB	Model 40: 32 MB Model 85: 128 MB Model 95: 128 MB	128 MB
Maximum Disk (In Cabinet/Total)	VLC: 245 MB/8.5 GB Models 60 and 90A: 2.1 GB/9.3 GB	10.5 GB/14.7 GB	4.8 GB/100 GB
Maximum I/O Bandwidth	VLC: 5.0 MB/s Models 60 and 90A:10 MB/s	4 MB/s Model 95: 2 x 4 MB/s	16.3 MB/s
I/O Support	VLC: SCSI, Ethernet; Models 60 and 90A: SCSI, Ethernet, TURBOchannel; Model 90A: FDDI	Model 40: 1 SCSI, Ethernet Model 85: 2 SCSI, Ethernet Model 95: 2 SCSI, 2 Ethernet	2 DSSI, 1 SCSI, 3 Ethernet, Q-bus
High Availability Features			
OpenVMS Cluster Support	All Models: Ethernet Model 90A: FDDI	Ethernet	Ethernet, DSSI, FDDI
High Availability Features Supported	Disk Shadowing	Disk Shadowing	Disk Shadowing, Uninterruptible Power Supply

Note: Digital believes the information in this table is accurate as of its publication date; such information is subject to change without notice. Digital is not reponsible for inadvertent errors.

VAX Systems Comparison Chart

System	VAX 4000 Models 505A and 705A	VAX 7000 Models 710 to 760
Number of Processors	1	Up to 6
CPU Clock Speed	Model 505A: 83.3 MHz Model 705A: 111 MHz	137.5 MHz
Cache Size (On Chip/On Board)	Model 505A: 10 KB/512 KB Model 705A: 10 KB/2 MB	10 KB/4 MB per processor
OpenVMS Performance	Model 505A: 185 TPS Model 705A: 275 TPS	Model 710: 300 TPS Model 760: 1000 TPS
In-Cabinet CPU Upgrade	Each VAX 4000 system upgrades to any higher VAX 4000 system	To symmetric multiprocessing VAX CPUs and Alpha AXP CPUs
I/O Features		
Maximum Memory	512 MB	3.5 GB
Maximum Disk (In Cabinet/Total)	14.4 GB/500 GB	42 GB/Over 10 TB
Maximum I/O Bandwidth	20.3 MB/s	400 MB/s
I/O Support	6 DSSI, 3 Ethernet, Q-bus	4 XMI, 10 CI, 24 DSSI, 8 FDDI, 16 Ethernet, 12 SDI, 6 VAXBI, 8 VME
High Availability Features		
OpenVMS Cluster Support	Ethernet, DSSI	Ethernet, DSSI, CI, FDDI
High Availability Features Supported	Disk Shadowing, Uninterruptible Power Supply	Disk Shadowing, N+1 Redundant Power System, Integrated Uninterruptible Power System, Integrated Power Conditioning

Note: Digital believes the information in this table is accurate as of its publication date; such information is subject to change without notice. Digital is not reponsible for inadvertent errors.



VAXstation 4000 VLC Systems

Product Description

Starting at prices comparable to PCs, VAXstation 4000 VLC systems offer an affordable and attractive graphical user interface with fast native graphics. The VLC at 6.2 SPECmark89 is an excellent alternative to a text terminal. Terminal users can achieve an immediate increase in productivity using this low-cost workstation running current applications under DECwindows Motif. The 2.5-inch system box supports a maximum of 24 Mbytes of memory and an RZ25L hard disk drive. The system also supports a variety of monitors: 17-inch and 21-inch color, and 19-inch grayscale. Audio input and output capabilities are included. VLC systems come equipped with thick wire Ethernet, one DEC-423 serial line, and one EIA-232D serial line with modem control.

Additional storage expansion options are available externally via synchronous SCSI controller. This increases SCSI throughput by up to three times that of the asynchronous SCSI controller. External expansion boxes can be connected to the VLC system.

Base System software licenses included with VAXstation 4000 VLC systems are: OpenVMS VAX and Network Application Support (NAS 250) for VAXstations. Many software licenses are included in NAS 250 for VAXstations. They are: ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX Connection, and VAXcluster. Systems ordered with a factory- installed disk will have OpenVMS and DECwindows Motif installed.

With the addition of DEC SoftPC, Digital's PC emulator, or with native applications such as Lotus 1-2-3, dBASE IV and WordPerfect, the VAXstation 4000 VLC system becomes a legitimate alternative to PCs in the OpenVMS VAX environment.

Upgrades are available for VAXstation 3100 systems. Target applications for VLC workstations are: low-end CASE, desktop publishing, office automation, low-end CAD, medical/hospital, and shop floor control.

Step 1—Systems

Select system. 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 12.

- Options ordered with Base Systems will be factory installed unless specified as SPARES.

VAXstation 4000 VLC Base Systems include

- Base module
- Memory—six SIMM connectors
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- 2D graphics accelerator
- 8-plane color/grayscale graphics board
- U.S. keyboard (120 V systems 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 Network Application Support (NAS 250) for VAXstations: ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster
- English-language user documentation

Note: Base Systems ordered with a factory-installed disk include factory-installed software (FIS).

Order Number	Memory	Monitor C = Color, M = Monochrome	Hz	Graphics
Base System (Requires Monitor From Step 2)				
PV31U-C9	8 MB	Requires monitor	72	8-plane 2D color/grayscale
PV31U-D9	8 MB	Requires monitor	66	8-plane 2D color/grayscale

Step 2—Monitor (Required for Base Systems)

VR319-DA/D4	19-inch monochrome, 1280 x 1024 refresh rate, 72 Hz
PCXAV-EC/ED	17-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch
VRC21-HA/H4	21-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch

Note: xA, xC = 120/240 V Northern Hemisphere; x4, xD = 240V Southern Hemisphere

Step 3—Storage

Select storage devices if required.

- A system disk must be ordered if the system is not being booted over the network by a server.
- Maximum of seven SCSI storage devices—not to exceed one internal hard drive and three external expansion boxes.

Step 3a—Internal Storage (Factory/Field Installed)

VLC systems have one internal storage cavity. Factory-installed variant (RZ2xL-ES) includes factory-installed software (FIS)* which includes OpenVMS VAX and DECwindows Motif.

RZ25L-ES/ER 535-Mbyte internal disk drive

* FIS is not a substitute for a software load device; media and documentation are required for first installation on site.

Step 3b—External Storage

- Small tabletop expansion boxes (120 V and 240 V) include 18-inch SCSI cable.
- 120 V expansion boxes include a power cord; order country-specific power cord for 240 V variants from Step 12.

Single-Drive Expansion Boxes

RRD43-FA/DG	600-Mbyte dual speed compact disk drive; 120/240 V
TLZ06-FA	4.0-Gbyte 4-mm Digital Audio Tape (DAT) drive
TLZ07-FA	8.0-Gbyte 4-mm Digital Audio Tape (DAT) drive

Expansion Boxes

For StorageWorks (BA353) desktop expansion box information, see Chapter 8, *Storage Devices*.

Step 3c—Wall-Mount Bracket

BA10X-AA	Wall-mount bracket for VLC system box

Step 4—Memory

- System includes 8 Mbytes of memory; additional memory may be added in 8-Mbyte increments.
- Six SIMM memory slots total.

MS40-BA	8 Mbytes (2-x 4-Mbyte 80-ns SIMMs), maximum 24 Mbytes

Step 5—Video Cables

Systems include a 9-foot video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/monochrome monitors

Step 6—Networking Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (twisted pair).

DECXM-AA	ThinWire Ethernet station adapter
DW29-AA	ThinWire Ethernet station adapter
DETPM-AA	10BaseT (twisted pair) Ethernet adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx	Thick wire 802.3/Ethernet cable (xx = 02/05; refers to length in meters)
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (xx =05/10/20/40; refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40; refers to length in meters)
BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30; refers to length in feet)
H8225-00	ThinWire terminator
BN24F-03	Twisted pair cable

See Chapter 7, *Networks, Communications, and Cables*, for more information and more choices.

Step 7—Optional Input/Output Devices (Customer Installable)

VSXXX-AB	11-inch x 11-inch tablet
VSXXX-GA	Three-button ergonomic rectangular mouse (included with system)
VSXXX-JA	Audio headset

Step 8—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 9—Hardware Documentation

Information kits are shipped with every system. The information kit includes Installation Quick Card, Adding Memory Quick Card, and Adding a Drive Quick Card. Order additional copies from Digital Publishing Services, if required.

EK-VAXVL-OG	VLC Owner's Guide
EK-INTRE-QC	Installation Quick Card
EK-INTNA-QC	Adding Memory Quick Card
EK-PERDE-QC	Adding a Drive Quick Card
EK-VMSFI-RC	VAXstation Factory-Installed Software Guide

Step 10—Graphic Options (Field Installable)

Base systems include 8-plane color/grayscale graphics board. Graphics options are listed with compatible monitors. Options require Digital Services installation.

Order Number	Description	Compatible Monitors	Hz
PV31G-AC	8-plane color/grayscale graphics, 1280 x 1024 resolution, 72 Hz	19-inch M VR319-DA/D4 17-inch C PCXAV-EC/ED 21-inch C VRC21-HA/H4	72 66/72 multi-synch 66/72 multi-synch
PV31G-AD	8-plane color/grayscale graphics, 1280 x 1024 resolution, 66 Hz		

Step 11—Software Media and Documentation

VAXstation 4000 VLC systems require OpenVMS VAX V5.5 or higher. A media and documentation kit is recommended for the first system on site. Systems include the following Base System license PAKs: OpenVMS VAX operating system and NAS 250 for VAXstations (ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster).

OpenVMS VAX and DECwindow 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

NAS 250 Media and Documentation

QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-H8	NAS 250 for VAXstations media and documentation on CD-ROM

Step 11—Software Media and Documentation *(continued)*

DECSoft PC License, Media, and Documentation

DEC SoftPC, an optional layered product, allows a VAXstation 4000 VLC system to run MS-DOS programs on the workstation with no added hardware. Order license, media, and documentation below.

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

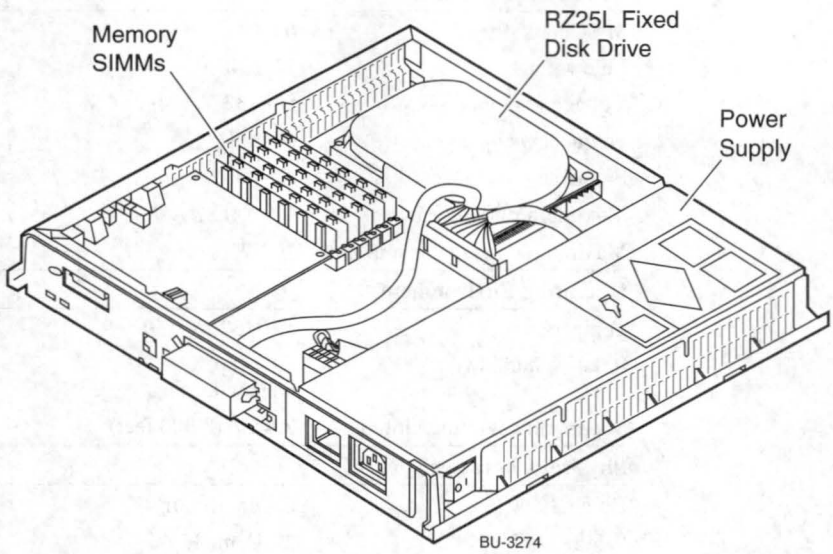
Step 12—Country Kits, Power Cords, Keyboards (Not Required for 120 V Systems)

Select country kit, or power cord and keyboard for all 240 V systems.

- Country kits include power cord and keyboard.
- Power cords connect system to wall socket.

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/N.Z.	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
		LK402-AA	WPS keyboard	English
		LK402-AQ	WPS keyboard	French
		LK402-AS	WPS keyboard	Spanish

VAXstation 4000 VLC System Diagram

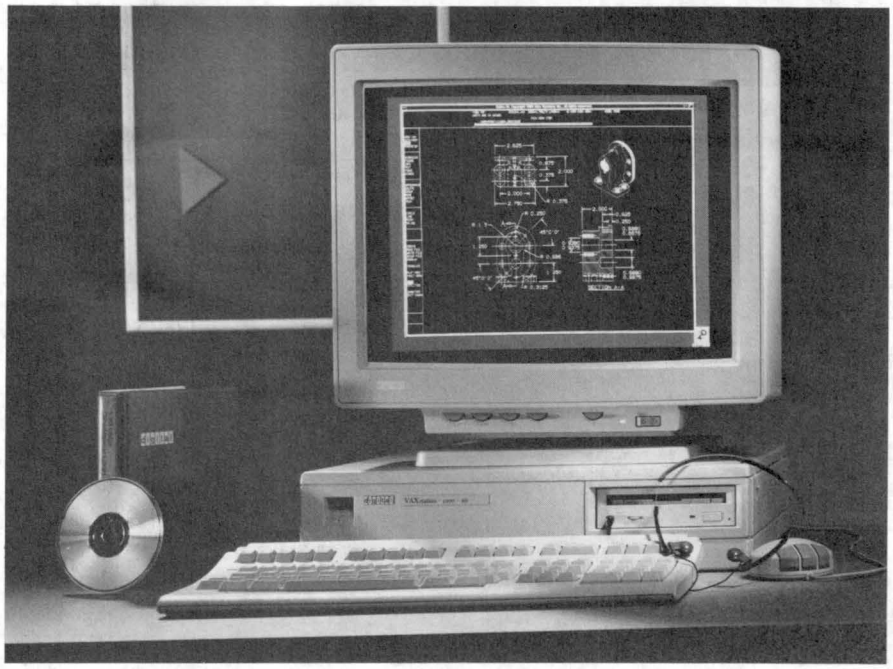


Specifications

Power Requirements	
SPECmark89	6.2
Line voltage	120/240 V
Voltage tolerance—RMS	88–132 V/194–264 V
Frequency/single phase	60/50 Hz
Frequency tolerance	47–63 Hz
Maximum running current	1.6 A/0.82 A
Maximum power consumption	108 W
Operating Environment	
Temperature	15 °–32 ° C (59 °–90 ° F)
Relative humidity	20%–80% noncondensing
Maximum operating altitude	2.4 km (8,000 feet)
Physical Characteristics	
Height	6.1 cm (3.6 in.)
Width	39.1 cm (15.4 in.)
Depth	36.8 cm (14.5 in.)
Weight (diskless)	3.6 kg (8 lb)

Monitor Specifications

	Workstation Color Monitors		Workstation Grayscale Monitors
Product			
N.H.	PCXAV-EC	VRC21-HA	VR319-DA
S.H.	PCXAV-ED	VRC21-H4	VR319-D4
CRT			
Screen size	16 V/17-in. FS	20 V/21-in. FS	19-in.
Dot pitch	0.26 mm	0.31 mm	N/A
Phosphor	P22	EBU type	P192
Surface treatment	Silica	Conductive AR	Mechanical Etch
Resolution/Refresh Rate (Hz)	1280 x 1024 (75) 1280 x 1024 (72) 1280 x 1024 (66) 1280 x 1024 (60) 1024 x 864 (60) 1024 x 768 (72) 1024 x 768 (70) 800 x 600 (72) 640 x 480 (72) 640 x 480 (60)	1280 x 1024 (72) 1280 x 1024 (66) 1280 x 1024 (60) 1152 x 900 (76) 1152 x 900 (66) 1280 x 512 (140 stereo) 1024 x 864 (60) 1024 x 768 (72) 800 x 600 (72) 640 x 480 (72) 640 x 480 (60)	1280 x 1024 (72)
Active display			
Horizontal (max)	293 mm (11.6 in.)	356 mm (14.0 in.)	342 mm (13.5 in.)
Vertical (max)	234 mm (9.2 in.)	285 mm (15.2 in.)	273 mm (10.7 in.)
Connectors			
Signal	BNC (5)	BNC (5)	BNC (1)
Power	IEC receptacle	IEC receptacle	IEC receptacle
Signal cable for VAXstation	Included with system	Included with system	Included with system
Power supply			
AC	90–132, 180–264 V 47–63 Hz	100–120/240V, 47–63 Hz	90–264 V/ 50–60 Hz
Auto ranging	Yes	Yes	Yes
Consumption	140 W maximum	150 W maximum	
Dimensions			
Height	414 mm (16.3 in.)	493 mm (19.6 in.)	457 mm (18.1 in.)
Width	406 mm (16.0 in.)	494 mm (19.6 in.)	495 mm (19.5 in.)
Depth	450 mm (17.7 in.)	543 mm (21.5 in.)	401 mm (15.8 in.)
Weight	22.5kg (49.5 lb)	36 kg (79.2 lb)	21.8 kg (48 lb)
MPRII low-emission monitor		Yes	—
FCC/VDE/VCCI			
Class A	—	—	Yes
Class B	Yes	Yes	—
UL/CSA/TUV	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes



VAXstation 4000 Model 60 Systems

Product Description

VAXstation 4000 Model 60 systems offer performance of 12.0 SPECmark89. VAXstation 4000 Model 60 systems support 2D and 3D graphics. 3D capability is available as an option. Eight-plane SPXg with 16-bit Z-Buffering and 24-plane SPXgt with 24-bit Z-Buffering provide support for full double buffering. A choice of grayscale or color graphics is offered on a variety of monitors. Audio input and output capabilities are included. Dual-and quad-screen color graphics systems can be ordered as optional upgrades.

System memory, internal storage, and graphics option upgrades are customer installable. The system box supports up to 104 Mbytes of memory. Internal storage permits a maximum of two 3.5-inch hard disks and one removable media device—diskette, compact disk, or tape drive. The VAXstation 4000 Model 60 system has a synchronous SCSI controller on the CPU board. External expansion boxes can be connected to the VAXstation 4000 Model 60 system, including the StorageWorks BA353 and BA350 modular storage units.

For communication and networking needs, the system is equipped with both ThinWire and thick wire Ethernet, one DEC-423 serial line, and one EIA-232D serial line with modem control. An additional synchronous communications option is available to allow DECnet Phase V, OSI, and TCP/IP layered products to use synchronous wide area network communication.

VAXstation 4000 Model 60 software licenses include OpenVMS VAX and Network Application Support (NAS 250) for VAXstations. Systems ordered with a factory-installed disk will have OpenVMS and DECwindows Motif factory installed. These workstations can expand distributed networks, run graphics-based applications, or improve user productivity with the multiwindow capability of DECwindows. DEC SoftPC runs MS-DOS applications on this workstation.

Upgrade kits are available to upgrade VAXstation 3100 Models 30, 38, 40, 48, and 76 systems to a VAXstation 4000 Model 60 system.

Step 1—Systems

Select system. 120 V 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 60 Packaged and Base Systems include

- Base module with 8-Mbyte embedded memory
- Memory—six 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
- Monitor (Packaged Systems only)
- 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 Network Applications Support (NAS 250)for VAXstations; ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster
- English-language user documentation

Note: Packaged and Base Systems ordered with a factory-installed disk include factory-installed software (FIS).

Order Number	Memory	Monitor C = Color, M = Monochrome	Hz	Graphics
Packaged Systems				
PV61A-AA/AB/AC	8 MB	19-inch M VR319, 1280 x 1024	72	4-plane 2D color/grayscale
Base System (Requires Monitor From Step 2)				
PV61A-DA/DB	8 MB	Requires monitor	72	8-plane 2D color/grayscale

Note: xA = 120 V Northern Hemisphere; xB = 240 V Northern Hemisphere, xC = 240V Southern Hemisphere

Step 2—Monitors (Required for Base Systems)

VR319-DA/D4	19-inch monochrome, 1280 x 1024 refresh rate, 72 Hz
PCXAV-EC/ED	17-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch
VRC21-HA/H4	21-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch

Note: xA, xC = 120/240 V Northern Hemisphere; x4, xD = 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)

Note: The combination of an RZ25L and a TZK10 is ONLY supported if each is used on a separate power supply, i.e., one in system box and one in an external expansion box.

Systems have three internal storage cavities.

Slot 1—Removable media (RX26, RRD43, TLZ06, TLZ07, TZK10)

Slot 2—3.5-inch disk RZ25L, RZ26L, or RZ28

Slot 3—3.5-inch disk RZ25L, RZ26L, or RZ28

Select up to one half-height removable media device.

RX26-ES/UL	2.8-Mbyte 3.5-inch internal diskette drive
RRD43-JM/JL	600-Mbyte internal dual speed compact disk drive
TLZ06-GF/GG	4.0-Gbyte 4-mm Digital Audio Tape (DAT)
TLZ07-GF/GG	8.0-Gbyte 4-mm Digital Audio Tape (DAT)
TZK10-GF/GG	525-Mbyte quarter-inch cartridge (QIC) tape

Select up to two 3.5-inch half-height disk drives. Factory-installed variants (-EM) include factory-installed software (FIS).

RZ25L-EM/EL	535-Mbyte internal disk drive
RZ26L-EM/EL	1.05-Gbyte internal disk drive
RZ28-EM/EL	2.10-Gbyte internal disk drive

Step 3b—External Storage (Expansion Box)

TZ85-TA	2.6-Gbyte cartridge tape drive; requires SCSI cable.
TSZ07-CA	1600/6250-bit/inch 9-track tape drive; requires country kit TSZK7-xx. See Chapter 8, *Storage Devices*, for more information.

For StorageWorks BA353 and BA350 modular storage units expansion information, see Chapter 8, *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 8-Mbyte memory embedded on base system module. Additional memory may be added in 8-Mbyte or 32-Mbyte increments. Six SIMM memory slots total; 8-Mbyte and 32-Mbyte modules may be combined.

MS44L-BA	8 Mbytes parity (2 x 4-Mbyte, 100-ns SIMMs)
MS44-DA	32 Mbytes parity (2 x 16-Mbyte, 100-ns 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

Note: Quad-monitor systems **do not** support TURBOchannel adapter or synchronous communication options.

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

Step 6—Synchronous Communication Options

Select synchronous communication option if TURBOchannel adapter was not selected from Step 5.

Note: Quad-monitor systems DO NOT support TURBOchannel adapter or synchronous communication options

VAX Wide Area Network (WAN) device driver license is required before adding a synchronous 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—Video and Keyboard/Mouse Extender Cables

Systems include a 9-foot (2.7-meter) color/monochrome video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/monochrome monitors
VSXXX-KA	10-foot keyboard/mouse extender cable and power cord

Step 8—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 9—Optional Input/Output Devices

The tablet can be used in place of the mouse. The Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. The LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. In addition, each package includes a power supply, cables, and user documentation.

VSXXX-AB	11-inch x 11-inch tablet
VSXXX-GA	Three-button ergonomic rectangular mouse (included with system)
VSXXX-JA	Audio headset
VSX10-AA/A3	Combination LPFK and PFD package, 120/240 V
VSX20-AA/A3	LPFK package, 120/240 V
VSX30-AA/A3	PFD package, 120/240 V

Step 10—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 11—Hardware Documentation

Information kits ship with every system. Information kits include the following documents: VAXstation 4000 Model 60 or 90 Quick Installation Card, Owners and System Installation Guide, and Options Installation Guide. Order additional copies from Digital Publishing Services if required.

EK-PMARI-OM	Model 60 Owner's and System Installation Guide
EK-PMARI-IG	Model 60 and 90 Options Installation Guide
EK-VMSFI-RC	VAXstation Factory-Installed Software Guide

Step 12—Graphics Options (Customer Installable)

- Graphics options are listed with compatible monitors.
- Upgrades include video cables.
- Dual-and quad-monitor options include video cables; require additional monitors and power cords.
- Recommended configurations for SPXg/gt are 24--32 Mbytes of memory and 1-Gbyte internal disk.

VAXstation 4000 Model 60 Graphics

Order Number	Description	Compatible Monitors	Hz
PV21X-GL	8-plane 2D color/grayscale graphics 1280 x 1024 resolution, 72 Hz	19-inch M VR319-DA/D4 17-inch C PCXAV-EC/ED 21-inch C VRC21-HA/H4	72 66/72 multi-synch 66/72 multi-synch
PV71G-BA[1]	8-plane 3D color graphics SPXg 16-bit Z-Buffer, 1280 x 1024 resolution, 72 Hz		
PV61G-BA[1]	8-plane 3D color graphics SPXg 16-bit Z-Buffer, 1280 x 1024 resolution, 66 Hz		
PV71G-CA[1]	24-plane 3D color graphics SPXgt 24-bit Z-Buffer, 1280 x 1024 resolution, 72 Hz		
PV61G-AA[1]	24-plane 3D color graphics SPXgt 24-bit Z-Buffer, 1280 x 1024 resolution, 66 Hz		
PV21E-GA	Quad-monitor color graphics 1280 x 1024 resolution, 60 Hz, 66 Hz, or 72 Hz Three additional video cables Supports four color monitors		
PV21X-GA	Dual-monitor color graphics 1280 x 1024 resolution, 66 Hz One additional cable Supports two color monitors		

[1] SPXg and SPXgt options include DEC PHIGS Runtime license and require DECwindows Motif V1.1 media.

Step 13—Software Media and Documentation

Requires OpenVMS VAX V5.5 or higher; a media and documentation kit is recommended for the first system on site.

VAXstation 4000 Model 60 systems include the following license PAKs: OpenVMS VAX operating system and NAS 250 for VAXstations (ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX connection, VAXcluster).

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

NAS 250 Software

QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-H8	NAS 250 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

DEC SoftPC License, Media, and Documentation

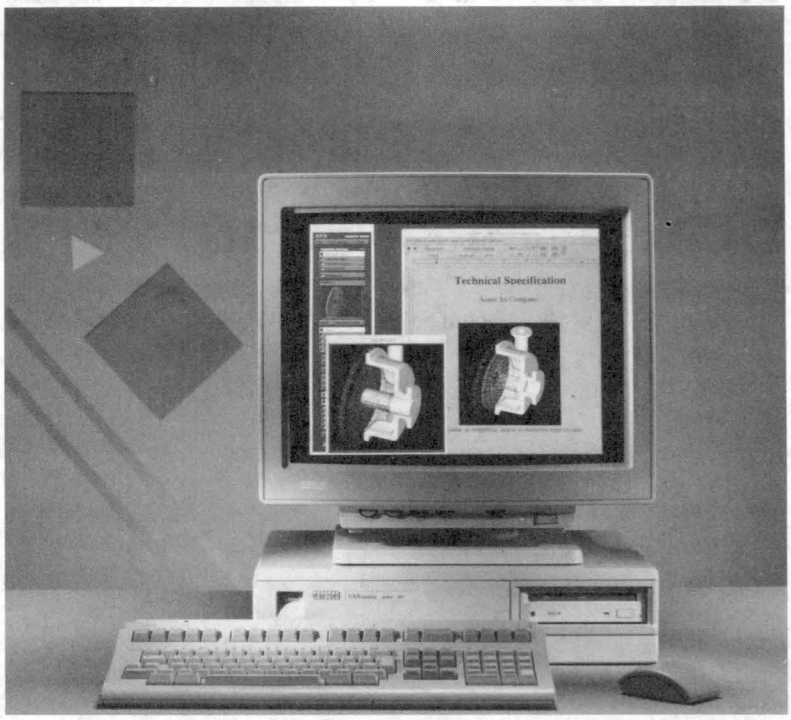
DEC SoftPC, an optional layered product, allows a VAXstation 4000 system to run MS-DOS programs with no added hardware. Order license, media, and documentation.

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 14—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/N.Z.	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
		LK402-AA	WPS keyboard	English
		LK402-AQ	WPS keyboard	French
		LK402-AS	WPS keyboard	Spanish

Note: For VAXstation 4000 Model 60/90A System Diagram and Specifications, see VAXstation Model 90A section.



VAXstation 4000 Model 90A Systems

Product Description

The VAXstation 4000 Model 90A system is a high-performance, 38.5-SPECmark89, OpenVMS VAX workstation offering more than three times the performance of the VAXstation 4000 Model 60 system.

The VAXstation 4000 Model 90A 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.

The VAXstation 4000 Model 90A system enclosure is the same as the VAXstation 4000 Model 60 enclosure; 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 and BA350 modular storage units.

VAXstation 4000 Model 90A Base System software licenses include the OpenVMS operating system and Network Application Support (NAS 250) for VAXstations. Systems ordered with a factory-installed disk will have OpenVMS and DECwindows Motif factory installed.

The VAXstation 4000 Model 90A 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 90A 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 90A system.

Step 1—Systems

Select system. 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 90A 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
- 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 Network Applications Support (NAS 250) for VAXstations; ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster
- English-language user documentation

Note: Base Systems ordered with a factory-installed disk include factory-installed software (FIS).

Order Number	Memory	Monitor C = Color, M = Monochrome	Hz	Graphics
Base System (Requires Monitor From Step 2)				
PV71A-AA/AB	16 MB	Requires monitor	72	LCSPX 8-plane 2D color/grayscale
PV71A-AC/AD	64 MB	Requires monitor	72	LCSPX 8-plane 2D color/grayscale

Note: xA, xC = 120/240 V Northern Hemisphere; xB, xD = 240 V Southern Hemisphere

Step 2—Monitor (Required for Base Systems)

Note: VAXstation 4000 Model 90A does not support dual-and quad-monitor configurations.

VR319-DA/D4	19-inch monochrome, 1280 x 1024 refresh rate, 72 Hz
PCXAV-EC/ED	17-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch
VRC21-HA/H4	21-inch color, 1280 x 1024 refresh rate, 66/72 Hz multi-synch

Note: xA, xC = 120/240 V Northern Hemisphere; x4, xD = 240V Southern Hemisphere; xE = 120/240 V Northern Hemisphere, no US power cord

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 anddocumentation are required for first system on site.

Step 3a—Internal Storage (Factory/Field Installed)

Note: The combination of an RZ25L and a TZK10 is **only** supported if each is used on a separate power supply, i.e., one in system box and one in an external expansion box.

Systems have three internal storage cavities.

Slot 1—Removable media (RX26, RRD43, TLZ06, TLZ07, TZK10)

Slot 2—3.5-inch disk RZ25L, RZ26L, or RZ28

Slot 3—3.5-inch disk RZ25L, RZ26L, or RZ28

Select up to one half-height removable media device.

RX26-ES/UL	2.8-Mbyte 3.5-inch internal diskette drive
RRD43-JM/JL	600-Mbyte internal, dual speed compact disk drive
TLZ06-GF/GG	4.0-Gbyte 4-mm Digital Audio Tape (DAT)
TLZ07-GF/GG	8.0-Gbyte 4-mm Digital Audio Tape (DAT)
TZK10-GF/GG	525-Mbyte Quarter-Inch Cartridge (QIC) tape

Select up to two 3.5-inch half-height disk drives. Factory-installed variants (-EM) include factory-installed software (FIS).

RZ25L-EM/EL	535-Mbyte internal disk drive
RZ26L-EM/EL	1.05-Gbyte internal disk drive
RZ28-EM/EL	2.10-Gbyte internal disk drive

Step 3b—External Storage (Expansion Box)

TZ85-TA	2.6-Gbyte cartridge tape drive; requires SCSI cable
TSZ07-CA	1600/6250-bit/inch 9-track tape drive; requires country kit TSZK7-xx. See Chapter 8, *Storage Devices*, for more information.
TZK11-DA	2-Gbyte Quarter-Inch Cartridge (QIC) tape

For StorageWorks BA350 and BA353 modular storage expansion box information, see Chapter 8, *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 Mbytes (4 x 4-Mbyte SIMMs) or 32* Mbytes (8 x 4-Mbyte SIMMs). Additional memory may be added in 16-or 64-Mbyte increments if four memory slots are available. Eight SIMM memory slots total; 16-and 64-Mbyte modules may be combined.

MS44L-BC	16 Mbytes parity (4 x 4-Mbyte, 100-ns SIMMs)
MS44-DC	64 Mbytes parity (4 x 16-Mbyte, 100-ns SIMMs)

* Increasing memory in 32-Mbyte systems requires removal of 4 x 4-Mbyte 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-FA	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—Video and Keyboard/Mouse Extender Cables

Systems include a 9-foot (2.7-meter) color/monochrome video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/monochrome monitors
VSXXX-KA	10-foot keyboard/mouse extender cable and power cord

Step 8—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 9—Optional Input/Output Devices

The tablet can be used in place of the mouse. The Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. The LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. In addition, each package includes a power supply, cables, and user documentation.

VSXXX-AB	11-inch x 11-inch tablet
VSXXX-GA	Three-button ergonomic rectangular mouse (included with system)
VSXXX-JA	Audio headset
VSX10-AA/A3	Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3	LPFK package, 120 V/240 V
VSX30-AA/A3	PFD package, 120 V/240 V

Step 10—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 11—Hardware Documentation

Information kits ship with every system. Information kits include the following documents: *VAXstation 4000 Model 60 or 90 Quick Installation Card, Owners and System Installation Guide*, and *Options Installation Guide*. Order additional copies from Digital Publishing Services if required.

EK-VAXOG-DK	Model 90 Owner's and System Installation Guide
EK-PMARI-IG	Model 60 and 90 Options Installation Guide
EK-VMSFI-RC	VAXstation Factory-Installed Software Guide

Step 12—Graphics Options (Customer Installable)

- Graphics options are listed with compatible monitors.
- Upgrades include video cables.
- Recommended configurations for SPXg/gt are 24--32 Mbytes of memory and 1-Gbyte internal disk.

Note: Model 90A will not support dual-or quad-monitor configurations.

VAXstation 4000 Model 90A Graphics

Order Number	Description	Compatible Monitor	Hz
PV71G-AA	LCSPX 8-plane 2D color/grayscale graphics 1280 x 1024 resolution, 72 Hz	19-inch M VR319-DA/D4 17-inch C PCXAV-EC/ED 21-inch C VRC21-HA/H4	72 66/72 multi-synch 66/72 multi-synch
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 13—Software Media and Documentation

VAXstation 4000 Model 90A 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 90A systems include the following Base System license PAKs: OpenVMS VAX operating system and NAS 250 for VAXstations (ACA, DECwindows Motif, DECnet/OSI (end-system), extensions to DECnet-VAX, VMS/ULTRIX connection, VAXcluster).

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

NAS 250 Software

QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-H8	NAS 250 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 250 for VAXstations media (magtape) and documentation (CD-ROM)

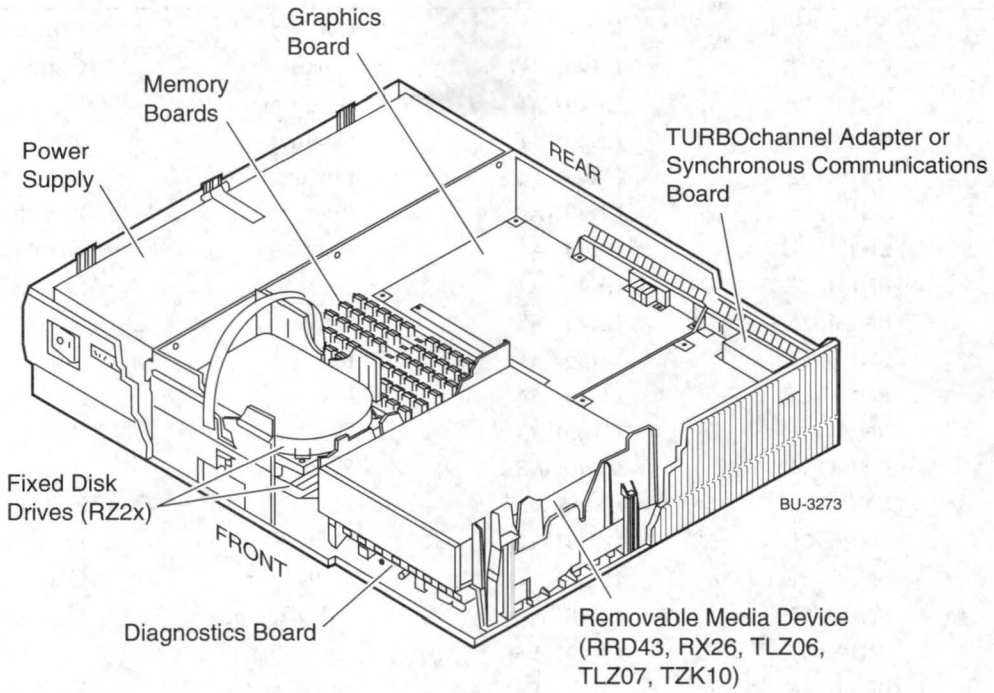
DEC SoftPC

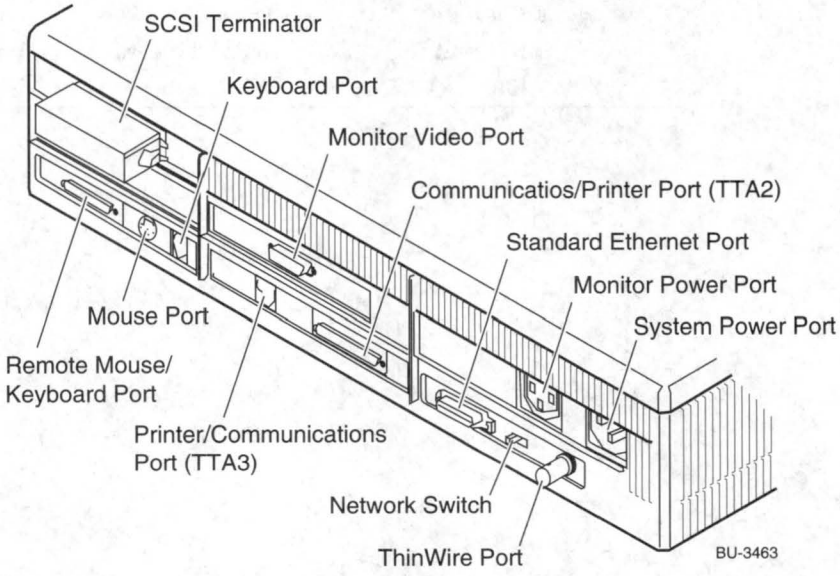
DEC SoftPC, an optional layered product, allows a VAXstation 4000 system to run MS-DOS programs with no added hardware. Order license, media, and documentation.

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 14—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
		LK402-AA	WPS keyboard	English
		LK402-AQ	WPS keyboard	French


Graphics Board
Memory Boards
Power Supply
REAR
TURBOchannel Adapter or Synchronous Communications Board
Fixed Disk Drives (RZ2x)
FRONT
BU-3273
Diagnostics Board
Removable Media Device (RRD43, RX26, TLZ06, TLZ07, TZK10)

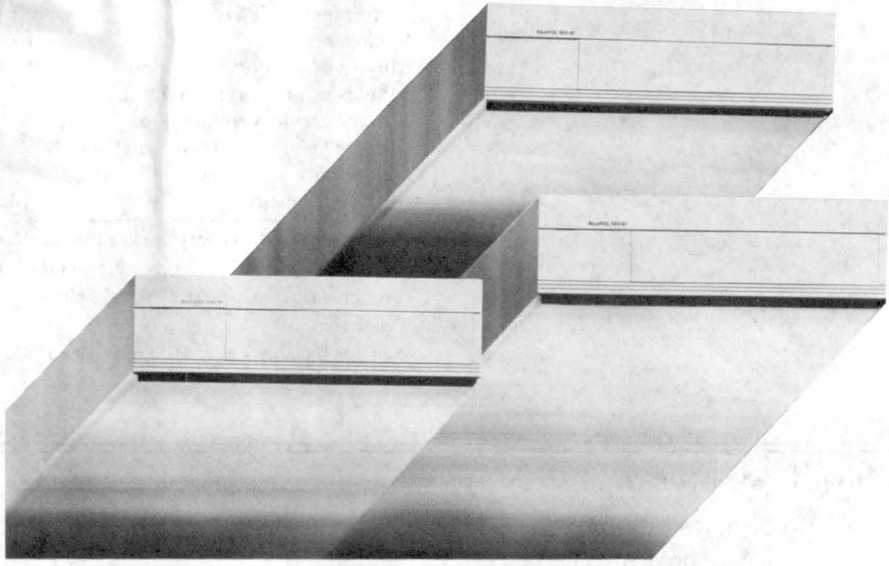

SCSI Terminator
Keyboard Port
Monitor Video Port
Communicatios/Printer Port (TTA2)
Standard Ethernet Port
Monitor Power Port
System Power Port
Mouse Port
Remote Mouse/ Keyboard Port
Printer/Communications Port (TTA3)
Network Switch
ThinWire Port
BU-3463

Specifications

Power Requirements	
	Models 60 and 90A
SPECmark89	12.0/38.5
Line voltage	Same
Voltage tolerance—RMS	Same
Frequency/single phase	Same
Frequency tolerance	Same
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)

Monitor Specifications

	Workstation Color Monitors		Workstation Grayscale Monitors
Product			
N.H.	PCXAV-EC	VRC21-HA	VR319-DA
S.H.	PCXAV-ED	VRC21-H4	VR319-D4
CRT			
Screen size	16 V/17-in. FS	20 V/21-in. FS	19-in.
Dot pitch	0.26 mm	0.31 mm	N/A
Phosphor	P22	EBU type	P192
Surface treatment	Silica	Conductive AR	Mechanical Etch
Resolution/Refresh Rate (Hz)	1280 x 1024 (75) 1280 x 1024 (72) 1280 x 1024 (66) 1280 x 1024 (60) 1024 x 864 (60) 1024 x 768 (72) 1024 x 768 (70) 800 x 600 (72) 640 x 480 (72) 640 x 480 (60)	1280 x 1024 (72) 1280 x 1024 (66) 1280 x 1024 (60) 1152 x 900 (76) 1152 x 900 (66) 1280 x 512 (140 stereo) 1024 x 864 (60) 1024 x 768 (72) 800 x 600 (72) 640 x 480 (72) 640 x 480 (60)	1280 x 1024 (72)
Active display			
Horizontal (max)	293 mm (11.6 in.)	356 mm (14.0 in.)	342 mm (13.5 in.)
Vertical (max)	234 mm (9.2 in.)	285 mm (15.2 in.)	273 mm (10.7 in.)
Connectors			
Signal	BNC (5)	BNC (5)	BNC (1)
Power	IEC receptacle	IEC receptacle	IEC receptacle
Signal cable for VAXstation	Included with system	Included with system	Included with system
Power supply			
AC	90–132, 180–264 V 47–63 Hz	100–120/240V, 47–63 Hz	90–264 V/ 50–60 Hz
Auto ranging	Yes	Yes	Yes
Consumption	140 W maximum	150 W maximum	
Dimensions			
Height	414 mm (16.3 in.)	493 mm (19.6 in.)	457 mm (18.1 in.)
Width	406 mm (16.0 in.)	494 mm (19.6 in.)	495 mm (19.5 in.)
Depth	450 mm (17.7 in.)	543 mm (21.5 in.)	401 mm (15.8 in.)
Weight	22.5kg (49.5 lb)	36 kg (79.2 lb)	21.8 kg (48 lb)
MPRII low-emission monitor		Yes	—
FCC/VDE/VCCI			
Class A	—	—	Yes
Class B	Yes	Yes	—
UL/CSA/TUV	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes



MicroVAX 3100 Systems and Servers

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 offer communications interfaces to support distributed applications. 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 in an organization.

MicroVAX 3100 systems support synchronous and asynchronous SCSI transmission, providing more balanced and higher performance systems.

The 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 95 systems.

The MicroVAX 3100 Model 85 and 95 systems offer enhanced Ethernet perform ance and twice the storage capacity of the Model 40 on an optional SCSI-2 card that provides support for seven additional external SCSI devices. ECC memory can be expanded to 128 Mbytes for additional user and application support.

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 95
Performance (TPS)	32	110	165
Enclosures	BA42-B	BA42-B	BA42-B
Mbytes of memory: Included	8	16 or 64	16 or 64
Mbytes of memory: Maximum	32	80 or 128	80 or 128
Storage Devices (internal maximum)	5	5	5
Storage Devices (total internal and external)	7[1]	14[2]	14[2]
Storage Capacity	14.7 Gbytes[3]	29.4 Gbytes[4]	29.4 Gbytes[4]

[1] Maximum two BA353 expansion enclosures can be configured with Model 40.

[2] SCSI card option (KZDDA-xx) supports seven additional external SCSI devices.

[3] Five internal 2.1-Gbyte (RZ28) disks plus two 2.1-Gbyte disks in BA353 expansion enclosure.

[4] Same as footnote 3, plus SCSI option card (KZDDA) and one BA350-SA expansion shelf with seven 2.1-Gbyte (RZ28) disks.

Step 1—Systems

Select system. Note that disk and tape are not included with base systems and must be ordered separately. OpenVMS user licenses may be ordered as needed.

MicroVAX 3100 Model 40, 85, and 95 Systems include

- BA42 large enclosure with CPU/FPU
- **Model 40**: 8-Mbyte base memory on CPU, maximum 32-Mbyte parity memory
- **Models 85 and 95**: 16-or 64-Mbyte memory in DSIM slot, maximum 128-Mbyte ECC memory
- 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 95)
- OpenVMS base license (with POSIX)
- Factory-installed software*
- One-year product warranty (standard warranty recommended)

* Delivery of the 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.

Advantage-Server Systems

Order Number	MicroVAX 3100	Memory	NAS Software	Disk Drive	CD-ROM
DV-31GCA-CA	Model 40	16 Mbyte	NAS 200	RZ26L (1.05 GB)	RRD43 (600 MB)
DV-31JCA-EA	Model 85	64 Mbyte	NAS 200	RZ26L (1.05 GB)	RRD43 (600 MB)
DV-31RCA-EA	Model 95	64 Mbyte	NAS 200	RZ26L (1.05 GB)	RRD43 (600 MB)

Note: NAS 200 software includes DECnet, TCP/IP, PATHWORKS, Polycenter Software Distribution Client, DECwindows Motif, ObjectBroker, DECmessageQ, and DECprint

OpenVMS Base Servers

Order Number	MicroVAX 3100	Memory
DV-31GAA-B9	Model 40	8 Mbytes
DV-31JAA-C9	Model 85	16 Mbytes
DV-31JAA-E9	Model 85	64 Mbytes
DV-31RAA-C9	Model 95	16 Mbytes
DV-31RAA-E9	Model 95	64 Mbytes

Step 2—Storage

Select storage devices as required. See Chapter 8, *Storage Devices*, for further details.

Step 2a—Internal Storage

Configuration Rules

- System supports maximum of five internal drives in any one of the following combinations:
  - Five RZ2x half-height disk drives, or
  - Four RZ2x half-height disk drives and one TZ30 removable media device
  - Three RZ2x half-height disk drives and two removable media devices (RX26, RRD43, TLZ06, or TZK11)
- One factory-installed RZ26L or RZ28 is required for factory-installed software.
- Order a load device if necessary—OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device. (One TK50Z or RRD43 is required as a load device if TZ30 storage is not present.)
- Field-installed options require Customer Services installation.

Removable Media Devices

RRD43-EN/EK	600-Mbyte CD-ROM drive for Models 40, 80, and 95 systems; factory/field installed
RX26-EN/EL	2.8-Mbyte diskette drive; factory/field installed
TLZ06-HF/HG	4.0-Gbyte 4-mm 3.5-inch DAT drive
TZK11-HF/HG	2-Gbyte cartridge (QIC) tape drive; factory/field installed
TZ30-EK/EL	95-Mbyte streaming tape drive; factory/field installed

Fixed Disk Drives

RZ26L-EN/EK	1.0-Gbyte, 3.5-inch, half-height disk drive
RZ28-EN/EK	2.1-Gbyte, 3.5-inch, half-height disk drive

Step 2b—External Storage

Configuration Rules

- Model 40:
  - Maximum seven SCSI-2 devices
  - Maximum two BA353 expansion boxes or one BA350-SA StorageWorks expansion shelf
- Models 85 and 95:
  - 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 95
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
SZ12	0.6 m (24 inches)
RRD43	0.45 m (18 inches)
TK50Z	0.45 m (18 inches)
TLZ06	0.91 m (36 inches)
TZ85	0.28 m (11 inches)
TLZ6L	0.91 m (36 inches) or 1.82 m (72 inches)
BA353	1.82 m (72 inches)
BA350	1.82 m (72 inches)

Note: Devices include necessary cables except TZ85, which requires BC19J-03/06 cable

Step 2b—External Storage *(continued)*

KZDDA-AA/AF	SCSI controller card supports seven additional external SCSI devices, factory/field installed (Models 85 and 95 only)
TK50Z-GA/G3*	95-Mbyte, 5.25-inch tabletop streaming cartridge tape drive; 120 V/240 V
RRD43-FA/DG*	600-Mbyte, 5.25-inch tabletop CD-ROM drive; 120 V/240 V
TLZ06-FA*	4.0-Gbyte, 3.5-inch tabletop DAT drive with universal power supply; includes 120 V power cord
TLZ6L-DA	TLZ06 tape drive with integrated magazine autoloading
TSZ07-CA*	140-Mbyte, 1600/6250-bit-inch SCSI 9-track tape with universal power supply; requires TSZK7-xx country kit; see Chapter 8, *Storage Devices*, for details.
TZ86-TA*	6.0-Gbyte, 5.25-inch tabletop tape drive; requires BC06P cable
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)

StorageWorks Desktop Expansion Box (BA353)

BA353 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; order country specific power cord for 240 V use. Requires SCSI cable (BC09D-xx).

BA353-AA*	StorageWorks desktop expansion box
BA353-AF*	StorageWorks desktop expansion box with one RRD43 5.25-inch, half-height CD-ROM drive
BA353-AH*	StorageWorks desktop expansion box with TZ30 5.25-inch, half-height tape drive

*Country-specific power cord required for 240 V use.

SCSI devices may be purchased separately and are customer installable.

RZ26L-VA	1.0-Gbyte, 3.5-inch, half-height disk drive
RZ28-VA	2.1-Gbyte, 3.5-inch, half-height disk drive
RZ28B-VA	2.1-Gbyte, 3.5-inch, half-height disk drive
TLZ06-VA	4.0-Gbyte, 3.5-inch, half-height 4-mm DAT drive
TLZ6L-VA	4.0-Gbyte 3.5-inch, half-height 4-mm DAT drive with snap in carrier
TZK11-VA	2.0-Gbyte 5.25-inch QIC tape with snap in carrrier

Refer to Chapter 8, *Storage Devices,* for additional BA35x expansion information.

StorageWorks Deskside Expansion Unit (BA350)

BA350-SA†	StorageWorks single-height shelf, configured for seven 3.5-inch devices, or four 3.5-inch devices and one 5.25-inch full-height device, or one 3.5-inch device and two 5.25-inch full-height devices. Supported devices are RZ26L-VA, RZ28-VA, RZ28B-VA, TLZ06-VA, TLZ6L-VA, TZK11-VA. See Chapter 8, *Storage Devices*, for details.

†One BA350-SA expansion unit is supported per single ended SCSI bus; no other external device can be connected to system with BA350-SA unit.

Step 3—Memory

Model 40 systems include 8 Mbytes of base memory on CPU; systems support maximum 32-Mbyte parity memory.

MS44L-BA	8 Mbytes parity memory modules for Model 40

Model 85 and 95 systems include 16-or 64-Mbyte base memory in first DSIM slot; systems support maximum 128 Mbytes of ECC memory.

MS44L-BC	16 Mbytes ECC memory modules for Models 85 and 95
MS44-DC	64 Mbytes ECC memory modules for Models 85 and 95

Step 3—Memory (*continued*)

MicroVAX 3100 Memory Configuration Chart

		Models 85 and 95	
Required Memory	**Model 40**	**16-Mbyte Base**	**64-Mbyte Base**
16 Mbytes	1 x MS44L-BA	N/A	N/A
24 Mbytes	2 x MS44L-BA	N/A	N/A
32 Mbytes	3 x MS44L-BA	1 x MS44L-BC	N/A
40 Mbytes	N/A	N/A	N/A
48 Mbytes	N/A	N/A	N/A
72 Mbytes	N/A	N/A	N/A
80 Mbytes	N/A	1 x MS44-DC	1 x MS44L-BC
128 Mbytes	N/A	N/A	1 x MS44-DC

Step 4—Networks and Communications

Select devices as required. 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 40/85/95. See Chapter 7, *Networks, Communications, and Cables*, and the *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 Option

Configuration Rules

- 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

QL-VAWA9-AA One-time single-user VAX WAN Device Driver license for use of synchronous port

QA-VAWAA-H5 VAX WAN Device Drivers media (TK50) and documentation

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 description in Chapter 7, *Networks, Communications, and Cables*, for ordering information.

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 descriptions in Chapter 8, *Storage Devices,* for ordering information.

Network Connectivity Products

See Chapter 7, *Networks, Communications, and Cables*, and 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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 7—CPU Upgrade

CPU upgrade for MicroVAX 3100 Models 40 and 80 include 64-Mbytes ECC memory and OpenVMS base license.

31JXR-AA CPU Upgrade: MicroVAX 3100 Model 40 or 80 to MicroVAX 3100 Model 85

Refer to the *ADVANTAGE-UPGRADES* section for MicroVAX 3100 system upgrade ordering information.

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 95 require V5.5-2H4 or V6.1.

Software Processor Code	MicroVAX 3100 = **P**
Clusterwide License Rating	MicroVAX 3100 = **20** (C)

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 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

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 95 require V5.5-2H4 or V6.1.

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

Step 8—Software *(continued)*

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-358AA-Hx	Rdb/VMS Runtime media and documentation
QA-GXXAA-Hx	POSIX media and documentation (with IEEE documentation)
QA-GXXAB-Hx	POSIX media and documentation (without IEEE documentation

NAS Licenses

NAS packaged products do not include hardcopy documentation, (documentation is CD-ROM only).

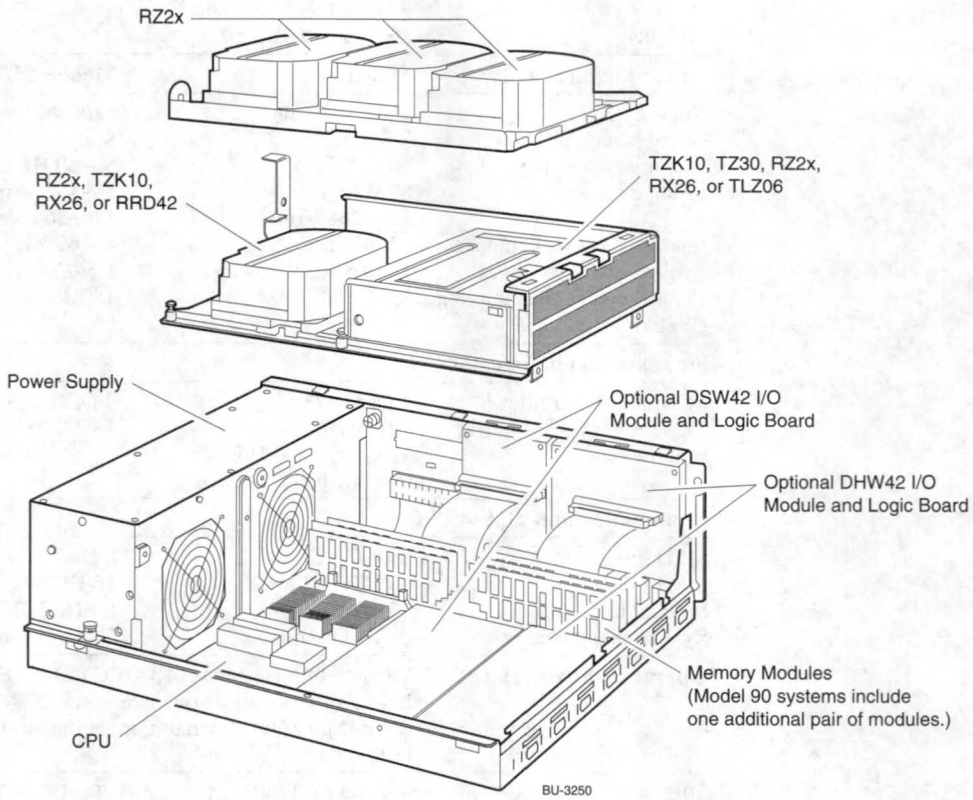
QL-MC1A*-AA	NAS 200 license for OpenVMS VAX systems
QA-MC1AA-Hx	NAS 200 media and documentation kit

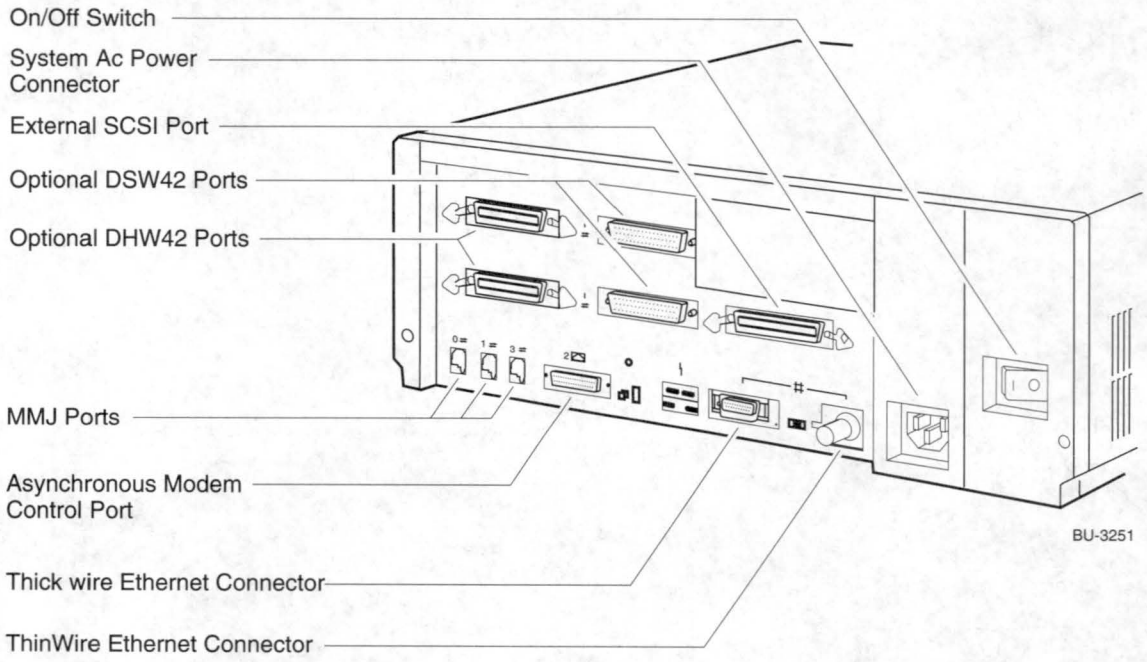
Note: * denotes processor code; x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

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
BN19H-2E	Australia, New Zealand
BN19S-2E	India

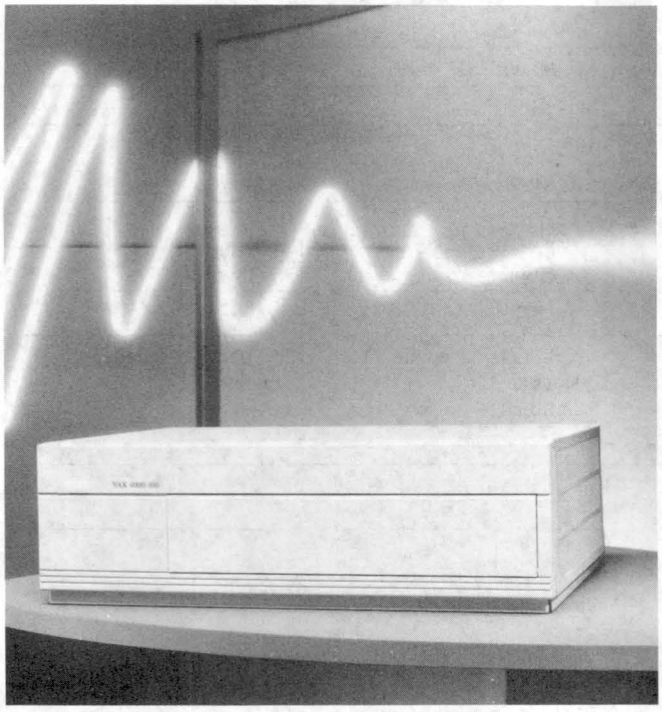

RZ2x
RZ2x, TZK10,
RX26, or RRD42
TZK10, TZ30, RZ2x,
RX26, or TLZ06
Power Supply
Optional DSW42 I/O
Module and Logic Board
Optional DHW42 I/O
Module and Logic Board
Memory Modules
(Model 90 systems include
one additional pair of modules.)
CPU
BU-3250

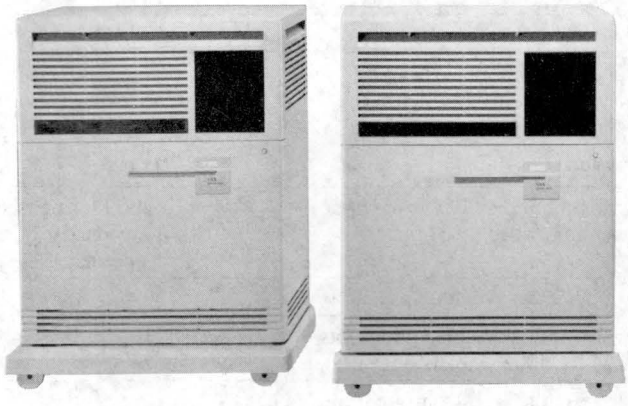

On/Off Switch
System Ac Power
Connector
External SCSI Port
Optional DSW42 Ports
Optional DHW42 Ports
MMJ Ports
Asynchronous Modem
Control Port
Thick wire Ethernet Connector
ThinWire Ethernet Connector
BU-3251

Specifications

Physical Characteristics	Models 40, 85, 95	
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 85/95**
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.





VAX 4000 Systems and Servers

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 Token Ring networks and Q-bus peripherals. VAX 4000 systems offer investment protection through board upgrades, memory and storage expansion, and the ability to create DSSI OpenVMS Cluster systems.

DSSI and Ethernet adapter chips—each driven by a 10-MIP on-chip RISC processor—are tightly integrated on the CPU module and have direct access to memory. Digital's DSSI disk technology offers dedicated cache and an embedded controller on each disk, enabling linear I/O performance as disks are added to the system.

The VAX 4000 Model 105A is a follow-on product to the VAX 4000 Model 100A, offering over a third more performance with a 12-ns NVAX chip. Systems achieve 181 transactions per second (TPS). With external support for connecting to the HSD05, a DSSI-to-SCSI converter, VAX 4000 customers can expand their storage options to access SCSI disks and tapes in open StorageWorks configurations.

VAX 4000 systems are also available in rackmount models. Rackmount systems offer the opportunity to start with a single system in a rackmount chassis and add systems, storage, and other options vertically in a single 19-inch-wide rackmount cabinet to a two-or three-system DSSI OpenVMS Cluster configuration. Three VAX 4000 Model 705A systems with nearly unlimited disk and tape configurations can be housed in 4.5 square feet of floor space.

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.

Multi-host DSSI OpenVMS Cluster systems are commonly used as boot nodes for local area OpenVMS Cluster systems, or as multiuser systems with terminal servers. Packaged DSSI OpenVMS Cluster systems are available. Refer to system ordering menus for ordering information.

VAX 4000 Comparison Chart

	Model 105A(BA42B)	Model 505A(BA440)	Model 705A(BA440)
Minimum supported version of OpenVMS	5.5-2H4 / 6.1	5.5-2H4 / 6.1	5.5-2H4 / 6.1
Performance (TPS)	181	185	280
Maximum memory	128 Mbytes	512 Mbytes	512 Mbytes
Maximum storage (Note 5) System enclosure (internal) Expansion pedestal (external)	 5 Gbytes 70 Gbytes	 14 Gbytes 136 Gbytes	 14 Gbytes 136 Gbytes
Total	75 Gbytes	500 Gbytes	500 Gbytes
Maximum disk I/O throughput per embedded DSSI bus	1200 I/Os per second 1 standard 1 optional	1200 I/Os per second 2 standard 2 optional	1200 I/Os per second 2 standard 2 optional
Q-bus slots available	N/A[3]	7	7
Maximum possible Q-bus slots (with B400X expansion pedestals)	11	17	17
Maximum Tape Configurations:			
TF85	2[3]	8[4]	8[4]
TF86	2[3]	8[4]	8[4]
TLZ06	2	4[2]	4[2]
TK70	1[3]	2[1]	2[1]
TK50	1[3]	2[1]	2[1]
TSV05	1[3]	1[3]	1[3]
TSZ07	1[3]	2[5]	2[5]

[1] One TK70/TK50 in BA4xx (system enclosure), one in B400X.
[2] Supported in tabletop model only.
[3] In separate cabinet or enclosure.
[4] Maximum two per DSSI bus.
[5] One per KZQSA adapter.

The following chart lists tape and CD-ROM devices that can be used as boot[1] and load[2] devices:

Device	Model 105A (BA42B)	Model 505A (BA440)	Model 705A (BA440)
InfoServer 150[3]	Load	Load	Load
RRD43	Boot/Load	Boot/Load	Boot/Load
RWZ01[4]	Boot	Boot	Boot
TF85/TF86[6]	Boot/Load	Boot/Load	Boot/Load
TK50E	Boot/Load	Boot/Load	Boot/Load
TK70E	Boot/Load	Boot/Load	Boot/Load
TLZ06	Boot	Boot	Boot
TSV05	Load[5]	Load[5]	Load[5]
TSZ07	Load[5]	Load[5]	Load[5]
TZ30	Boot/Load	N/A	N/A
TZK10	Boot/Load	N/A	N/A
TZ8x	Boot/Load	Boot/Load	Boot/Load

[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.
[4] Model 105A: supported as boot device when connected to embedded SCSI adapter. Models 505A/705A: supported as boot device when connected to first KZQSA adapter on the Q-bus.
[5] Requires a TK50-compatible tape drive unit in order to support the initial loading of OpenVMS operating system from magtape media. The TK50 media contains a bootable image to install the magtape contents of the consolidated OpenVMS kit, i.e., QA-001AG-HM or QA-09SAG-HM.
[6] OpenVMS V5.5-2H4 operating system does not support standalone backup utility for TF86. OpenVMS V6.1 supports this utility.

Step 1—VAX 4000 Model 105A Systems

Select system.

- VAX 4000 Model 105A systems require OpenVMS V5.5-2H or V6.1. 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 V6.1). 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.
- 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

Systems include

- CPU with single or dual DSSI controller, 802.3/Ethernet (ThinWire/thick wire) controller
- BA42B tabletop enclosure with:
  - Three DSSI slots for RF3x drives
  - 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
- One full-year product warranty (standard warranty recommended)
- Hardware documentation

ADVANTAGE SERVER Systems also include

- 32- or 64-Mbyte memory
- OpenVMS base license
- NAS 200 software license (DECnet, TCP/IP, PATHWORKS, Polycenter Software Distribution Client; DECwindows Motif, ObjectBroker, DECMessageQ, DECPrint)
- *DSSI VMScluster Installation and Troubleshooting Guide* (EK-410AB-MG)

Order Number	Memory	DSSI Controller	RF36E = 1.6 GB*
DV-415CA-D9	32 Mbytes	Single-DSSI	1.6 Gbytes
DV-415CA-E9	64 Mbytes	Dual-DSSI	1.6 Gbytes

OpenVMS Base Servers also include

- 32- or 64-Mbyte memory
- OpenVMS base license

Order Number	Memory	DSSI Controller
DV-415AA-D9	32 Mbytes	Single-DSSI
DV-415AA-E9	64 Mbytes	Dual-DSSI

Step 2—Memory

Base systems include 32 or 64 Mbytes of memory. Select additional memory if required; 64-Mbyte systems can be expanded to 80 or 128 Mbytes.

MS44L-BC	16 Mbytes of memory (4 x 4-Mbyte DSIM modules)
MS44-DC	64 Mbytes of memory (4 x 16-Mbyte DSIM modules)

Note: 32-Mbyte systems require removal of existing DSIMs if memory upgrade is required. Memory modules can be mixed.

Step 3—Storage

Select storage devices if required. Field-installed options require Customer Services installation.

- Single systems support seven ISEs per DSSI adapter; two-system DSSI OpenVMS Cluster configurations support six DSSI ISEs and can be connected between any pair of DSSI adapters (one adapter in each system).
- Order load device if required—OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- Systems ordered with one DSSI disk (ISE) include factory installed software.

Step 3a—Storage Controllers

Configuration rules

Four Q-bus storage adapters are supported per CPU in a Q-bus enclosure; two DSSI (KFQSAs), two SDI (KDA50s), or one of each plus up to two SCSI (KZQSAs)

KFQSA-SE/SG	Q-bus-to-DSSI adapter. Uses one Q-bus slot (in B400X expansion pedestal); factory/field installed.
KDA50-SE/SG	Q-bus-to-SDI adapter. Uses three Q-bus slots (in B400X expansion pedestal); factory/field installed. Supports four external RA-disk drives (except RA70/RA71). Refer to Chapter 8, *Storage Devices*, for RA-disk descriptions and ordering information.
KZQSA-SA/SF	Q-bus-to-SCSI adapter. Uses one Q-bus slot (in B400X expansion pedestal). Supports two SCSI devices (RWZ01, TSZ07, TLZ06, TZ8x, RRD43) in tabletop enclosure.

Step 3b—Internal Storage

Configuration rules

- System enclosure supports up to three 3.5-inch DSSI ISEs (RF36) on top tray and two 5.25-inch SCSI removable media devices (TLZ06, TZ30, TZK11, RX26, RRD43) on bottom tray.
- SCSI hard disk drives are supported in two bottom trays. DSSI ISEs and SCSI hard disks must not exceed maximum of three hard disks.

DSSI Integrated Storage Elements (ISE)

RF36-EN/EK	1.6-Gbyte 3.5-inch full-height embedded DSSI disk drive; factory/field installed

SCSI Removable Media Devices

RX26-EN/EL	2.8-Mbyte diskette drive; factory/field installed
RRD43-EN/EK	600-Mbyte CD-ROM drive; factory/field installed
TLZ06-HF/HG	4.0-Gbyte DAT drive; factory/field installed
TZK11-HF/HG	2.0-Gbyte quarter-inch cartridge (QIC) tape drive; factory/field installed
TZ30-EK/EL	95-Mbyte streaming tape drive; factory/field installed

SCSI Fixed Disk Drives

RZ26L-EN/EK	1.0-Gbyte 3.5-inch x 1.0-inch embedded disk drive, factory/field installed
RZ28-EN/EK	2.1-Gbyte 3.5-inch half-height embedded disk drive, factory/field installed

Step 3c—DSSI External Expansion

Configuration rules

- One Q-bus expansion pedestal (B400X) supported per CPU
- One TKxx tape drive supported in a B400X expansion pedestal
- Two TF8x tape drives supported per DSSI bus

Refer to Chapter 6, *High Availability and High Performance Products,* for DSSI OpenVMS Cluster configuration rules

B400X and R400X 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 ten additional Q-bus slots and supports four RF362 disk drives, or three RF362 disk drives and one TKxx or TF8x tape drive; factory/field installed
R400X-B9	Supports five RF362 disk drives maximum, or four RF362 disk drives maximum and one TF8x tape drive; factory/field installed

DSSI Storage Devices for B400X or R400X Pedestals

RF36E-AA/AF	1.6-Gbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF362-AA/AF	Two 1.6-Gbyte ISEs in full-height assembly; factory/field installed
TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive; factory/field installed. Also available as a tabletop option. Refer to Chapter 8, *Storage Devices,* for ordering information.
TF86E-JA/JF*	6.0-Gbyte embedded cartridge tape drive; factory/field installed. Also available as a tabletop option. Refer to Chapter 8, *Storage Devices,* for ordering information.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive for B400X (not supported in R400X); requires TQK70-SA controller; factory/field installed
TQK70-SA/SF	TK70E controller; factory/field installed
TK50E-AA/AF	95-Mbyte embedded cartridge tape drive for B400X (not supportedin R400X). Requires TQK50 controller; factory/field installed.
TQK50-SA/SF	TK50E controller; factory/field installed.

*OpenVMS V6.1 supports standalone backup. Standalone backup not supported on OpenVMS V5.5-2H4.

DSSI External Storage Devices

SF10X	DSSI Storage Array Pedestal. Refer to Chapter 8, *Storage Devices,* for ordering information.
SF12-CA	DSSI expansion pedestal with one RF36 (1.6-Gbyte) disk SF12 supports four 3.5-inch DSSI disks; includes 9-foot DSSI cable (BC21M-09).
BA46X-AA	Optional floor stand for SF12 expansion pedestal
SF2X0/300/400	DSSI DECarray storage subsystem. Refer to Chapter 8, *Storage Devices,* for ordering information.
TF86-TA*	6.0 Gbyte catridge tape subsystem in tabletop enclosure. Requires CK-SF100-LP cable kit.

*120 V power cord included. Order country specific power cord for 220/240 V use, refer to Chapter 8, *Storage Devices.*

Step 3d—SCSI External Storage expansion

Configuration Rules

- System supports six SCSI devices per CPU on synchronous SCSI controller, two internal, four external in SZ12 enclosure. Maximum two SZ12s per CPU.
- 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.

StorageWorks HSD05 Array Controller

HSD05-AA	StorageWorks HSD05 DSSI-to-SCSI Array Controller supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires DSSI cable (BC29R-xx) for VAX 4000 to HSD05 connection.

StorageWorks Deskside Expansion Unit (BA350)

BA350 deskside expansion unit supports HSD05 DSSI-to-SCSI array controller and six SCSI-2 devices.

BA350-KA	StorageWorks Pedestal expansion units include: BA35-SA basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord.

SCSI devices supported in StorageWorks Pedestal with HSD05 array controller

RZ26L-VA	1.05-Gbyte 3.5-inch half-height disk drive
RZ28-VA	2.1-Gbyte 3.5-inch half-height disk drive
RZ28B-VA	2.1-Gbyte 3.5-inch half-height disk drive
EZ51R-VA	107-Mbyte solid state disk drive
EZ54R-VA	428-Mbyte solid state disk drive
TLZ06-VA	4.0-Gbyte 3.5-inch half-height 4-mm DAT tape drive
TLZ6L-VA	4.0-Gbyte 4-mm DAT tape drive in 5.25-inch carrier
TZ86-VA	6.0-Gbyte tape drive in 5.25-inch carrier
TZ87-VA	20-Gbyte tape drive in 5.25-inch carrier
SZ12	Refer to Chapter 8, *Storage Devices*, for ordering information
RRD43-FA/DG*	600-Mbyte tabletop CD-ROM drive; includes (3-foot)cable (BC06P-03) 120/240 V
RRD43-FB/DH*	600-Mbyte tabletop CD-ROM drive; includes 1.8-meter (6-foot) cable (BC06P-06); 120/240 V.
TK50Z-GA/G3*	95-Mbyte, 5.25-inch streaming cartridge tape drive; 120/240 V
TLZ06-GA*	4.0-Gbyte, 5.25-inch DAT drive with universal power supply, for connection to optional KZQSA; includes 120 V power cord
TLZ06-FA*	4.0-Gbyte, 5.25-inch DAT drive with universal power supply, for connection to embedded SCSI adapter; includes 120 V power cord
TZ86-TA	6.0-Gbyte, 5.25-inch SCSI tape drive; requires BC06P cable; includes 120 V power cord
RWZ01-AA*	5.25-inch rewritable magneto-optical disk drive; includes 120 V power cord
TSZ07-CA*	1600/6250-bit/inch, 9-track magtape; refer to Chapter 8, *Storage Devices,* for ordering information

SCSI Cables

BC06P-2F	2.5-foot (0.8-m) TZxx cable
BC06P-06	6-foot (1.8-m) TZxx cable
BC06P-09	9-foot (2.7-m) TZxx cable

*120 V power cord included. Order country specific power cord for 220/240 V use, refer to Chapter 8, *Storage Devices*.

Step 3d—SCSI External Storage expansion *(continued)*

SCSI Cable Chart

SCSI cabling recommendations. Maximum cable length must not exceed 4.3 m (174.4 in.). The following devices include cables except TZ8x, which requires BC06P-xx cable.

Tabletop Enclosure	Internal Cable Length	External Cable Length
SZ12	0.78 m (31 in.)	0.6 m (24 in.)
RRD43	0.35 m (14 in.)	0.45 m (18 in.)
TK50Z	0.45 m (18 in.)	0.45 m (18 in.)
TLZ06	0.32 m (12.6 in.)	0.91 m (36 in.)
TZ8x	00.15 m (6 in.).28 m (31 in.)	
RWZ01		Depends on length of SCSI cable selected.

Step 4—Networks and Communications

Select communications options as required. See Chapter 7, *Networks, Communications, and Cables,* and the *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 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

QL-VAWA9-AA One-time single-user VAX WAN Device Driver license for use of synchronous port

QA-VAWAA-H5 VAX WAN Device Driver media (TK50) and documentation

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.

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).

Step 4—Networks and Communications *(continued)*

Note: VAX 4000 Model 105A Systems require a B400X Q-bus expander before adding any of the following options:

802.5/Token Ring Communications Controller

DEQRA-CA	DEC TRNcontroller 100 Q-bus 802.5/Token Ring Controller. Includes Digital Token Ring network device driver for VMS. Uses one Q-bus slot.
BN26G-xx	Shielded twisted pair office cable, DB9-to-802.5/Token Ring. xx = -03, -10, -30 (length in feet).

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 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.

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. See Chapter 9, *Terminals, Scanners, Printers,* for ordering information. **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. See Chapter 9, *Terminals, Scanners, Printers,* for ordering information.

Step 7—CPU Upgrades

In cabinet CPU upgrade for VAX 4000 Models 100 and 100A systems.

Order Number	From	To	Includes
53XR-AA	VAX 4000 Models 100, 100A	VAX 4000 Model 105A	**OpenVMS VAX** base license

Note: See the *ADVANTAGE-UPGRADES* section, for VAX 4000 system upgrade ordering information.

Step 7a–Dual-DSSI Adapter Module (field installed)

Select dual-DSSI storage adapter module upgrade for **installed** VAX 4000 Model 100, 100A,or 105A systems. Both options require one additional 9-foot DSSI cable (BC21M-09).

Order Number	From	To	Includes
KFDDA-AF*	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†	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

*For VAX 4000 Model 100A systems with serial numbers KA332ABJ46 and higher, or AY33328925 and higher and all Model 105A systems

†For VAX 4000 Model 100 systems with serial numbers KA332ABJ45 and lower, or AY33328924 and lower

Step 8—Software

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 a 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-XULAS-6A 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 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 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
QL-VBRAP-AA	VAXcluster license for multiuser systems

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-VWJ8B-H8	OpenVMS layered product binaries on CD-ROM with hardcopy base documentation
QA-VWJ8A-H8	OpenVMS layered product binaries on CD-ROM with extended hardcopy documentation
QA-A93AA-Hx	PATHWORKS for OpenVMS media and documentation
QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	POSIX media with IEEE documentation
QA-GXXAB-Hx	POSIX media without IEEE documentation

x denotes media type: 5 = TK50; M = Magtape

NAS Licenses

ADVANTAGE-SERVERS include NAS 200 license, order media and documentation separately

See description of NAS packages in Chapter 11.
Note: NAS packaged products do not include hardcopy documentation (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see Chapter 11 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit

* denotes processor code
x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 9—Power Cords

Select for 220/240 V use.

Step 9a—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

Step 9b—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

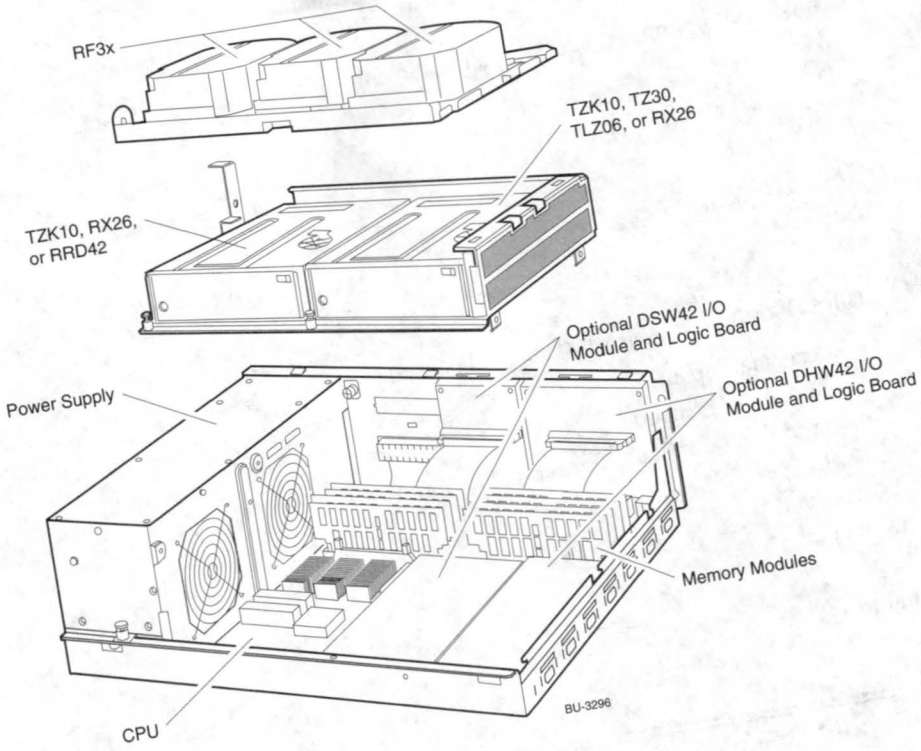
Extended Diagnostics and Documentation

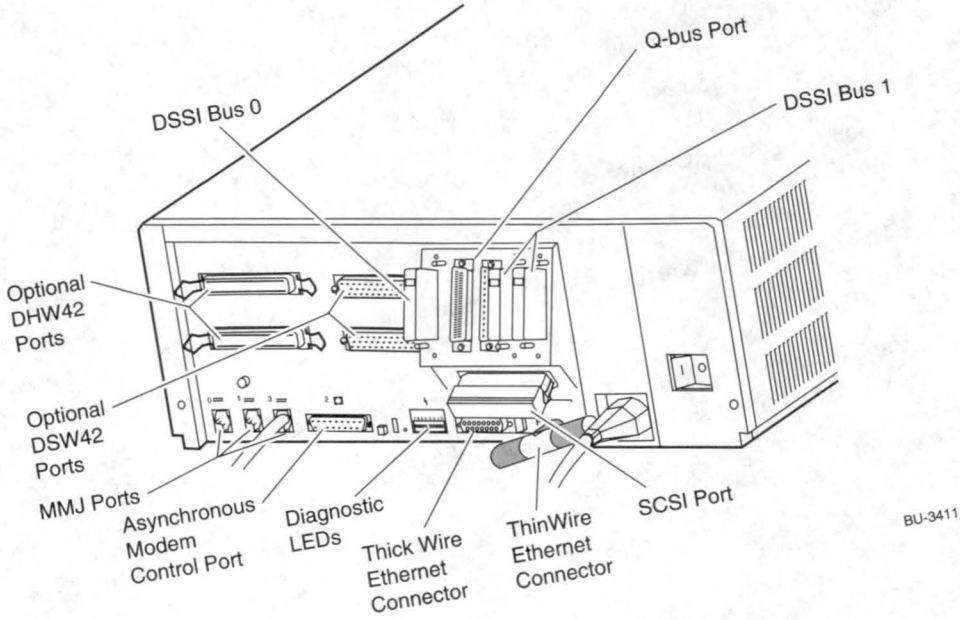
QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation

Hardware Documentation

QZ-K04AB-GZ	English language (included with system)
QZ-00H8A-GZ	Multilingual (English, French, German, Italian)

VAX 4000 Model 105A System Diagrams





VAX 4000 Model 105A System Specifications

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 three disks.

VAX 4000 Model 505A/705A Systems and Servers

Step 1—VAX 4000 Model 505A and 705A Systems

Select system.

- VAX 4000 Model 505A and 705A systems require OpenVMS V5.5-2H or V6.1. 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 V6.1). 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.
- 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

Systems include

- CPU with two embedded DSSI adapters, 802.3/Ethernet (ThinWire/thick wire) controller
- BA440 system pedestal enclosure with
  - Three DSSI slots for RF3x drives and one slot for TK-xx or TF8x tape drive
  - Seven Q-bus slots
  - Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 7.6-meter (25-foot) console terminal cable
- One full-year product warranty (standard warranty recommended)
- Hardware documentation

ADVANTAGE SERVERS also include

- 64- or 128-Mbyte memory
- RRD43 600 Mbyte dual-speed CD-ROM drive
- Q-bus-to-SCSI controller (KZQSA), uses on Q-bus slot
- OpenVMS base license
- NAS 200 software license (DECnet, TCP/IP, PATHWORKS, Polycenter Software Distribution Client, DECwindows Motif, ObjectBroker, DECmessageQ, DECPrint)
- *DSSI VMScluster Installation and Troubleshooting Guide* (EK-410AB-MG)

Order Number	Model	CPU Speed	Memory	Storage RF36E = 1.6 Gbytes
DV-45AFA-EA	Model 505A	83 MHz	64 Mbytes	1.6 Gbytes
DV-47AFA-FA	Model 705A	110 MHz	128 Mbytes	1.6 Gbytes

OpenVMS Base Servers also include

- 64- or 128-Mbyte memory
- OpenVMS base license

Order Number	Model	CPU Speed	Memory
DV-45AEA-E9	Model 505A	83 MHz	64 Mbytes
DV-47AEA-E9	Model 705A	110 MHz	64 Mbytes
DV-47AEA-F9	Model 705A	110 MHz	128 Mbytes

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

Select storage.

- 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).
- Order load device if necessary—OpenVMS Cluster satellite members or systems being loaded over the network do not require a load device.
- Systems ordered with one DSSI disk (ISE) include actory installed software.
- DSSI adapters support two TF85/TF86/TF87 tape drives; one per system enclosure (BA440) and one per expansion cabinet (R400X OR B400X).

Refer to Chapter 8, *Storage Devices*, for further details on devices listed.

Step 3a—Storage Controllers

Configuration rules

Four Q-bus storage adapters are supported per CPU; two DSSI and two SDI or one of each plus 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; factory/field installed. Requires two 9-foot BC21M-09 cables.
KFQSA-SE/SG	Q-bus-to-DSSI adapter, uses one Q-bus slot; factory/field installed. Includes 25-foot BC21M-25 cable.
KDA50-SE/SG	Q-bus-to-SDI controller, uses three Q-bus slots; provides connections for four external RA-disk drives (except RA70/RA71); factory/field installed.
KZQSA-SA/SF	Q-bus-to-SCSI controller, users one Q-bus slot; required for TLZ06, TLZ07. RRD43, RWZ01, TSZ07, or TZ85/86/87 tabletop devices. Provides connections for two storage devices (four devices per CPU); factory/field installed.
HSD05-JA/JF	DSSI-SCSI-2 controller embedded in BA440/BA430/B400X enclosure, supports up to seven SCSI devices; factory/field installed.
HSD05-AA	DSSI-SCSI-2 controller BA350 form factor, supports up to seven SCSI devices.

Step 3b—Internal Storage

Configuration rules

- System enclosure supports up to three RF362 ISEs and one TKxx or TF8x tape drive

DSSI Integrated Storage Elements (ISES)

EF51R-AA/AF	107-Mbyte solid state disk with data retention; factory/field installed
EF52R-AA/AF	214-Mbyte solid state disk with data retention; factory/field installed
RF36E-AA/AF	1.6-Gbyte ISE in full-height assembly, expandable to two ISEs factory/field installed
RF362-AA/AF	Two 1.6-Gbyte ISEs in full-height assembly

SCSI Disk Drives

RZ26L-AA/AF	1.05-Gbyte 3.5-inch disk drive; factory/field installed
RZ262-AA/AF	Two 1.05-Gbyte 3.5-inch disk drives in one storage bay; factory/field installed
RZ28E-AA/AF	2.1-Gbyte 3.5-inch disk drive; factory/field installed
RZ282-AA/AF	Two 2.1-Gbyte 3.5-inch disk drives in one storage bay; factory/field installed

Step 3b—Internal Storage *(continued)*

CD-ROM and Tape Drives

RRD43-JA/JF	600-Mbyte dual-speed CD-ROM drive. Requires Q-bus-to-SCSI controller (KZQSA-SA/SF) or DSSI-SCSI controller (HSD05-JA/JF).
TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive, supported by embedded DSSI adapter; factory/field installed
TF86E-JA/JF	6.0-Gbyte embedded cartridge tape drive, supported by embedded DSSI adapter; factory/field installed
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive. Requires TQK70-SA/SF controller; factory/field installed
TQK70-SA/SF	TK70E controller; factory/field installed
TZ86-JA/JF	6.0-Gbyte, 5.25-inch SCSI cartridge tape drive with HSD05 controller; factory/field installed
TZ87-JA/JF	20-Gbyte, 5.25-inch SCSI cartridge tape drive with HSD05 controller; factory/field installed

Step 3c—DSSI External Storage

Expansion Pedestals

B400X and R400X Expansion Pedestal

- R400X expansion pedestals can be configured with two separate DSSI buses (requires additional BC21M-09 cable).
- B400X/R400X use the same ISEs, DAT drive, and tape drives as listed in Step 3b with the exception of the TK70; TKxx tape drives are not supported in R400X expansion pedestal.
- Refer to Chapter 7, *High Availability and High Performance Products,* for DSSI OpenVMS Cluster configuration rules.

B400X-B9	Provides ten additional Q-bus slots and supports four RF-series disk drives, or three RF-series disk drives and one TKxx or TF85 tape drive. Factory/field installed.
R400X-B9	Supports five RF362 disk drives maximum or four RF362 disk drives maximum and one TF85/TF86 tape drive. Factory/field installed.

SF10X DSSI Storage Array Pedestal

See Chapter 8, *Storage Devices*, for ordering information.

SF12 DSSI Expansion Pedestal

Supports four 3.5-inch DSSI disks; includes 9-foot DSSI cable (BC21M-09) and 120 V power cord; order country-specific power cord for 240 V systems.

SF12 -CA	1.6-Gbyte (RF36) disk in DSSI expansion pedestal

SF2X0/300/400 DSSI DECarray Storage Subsystem

See Chapter 8, *Storage Devices*, for ordering information.

DSSI Tabletop Storage—Require CK-SF100-LP Cable Kit

TF85-TA*	2.6-Gbyte cartridge tape subsystem in tabletop enclosure.
TF86-TA*	6.0-Gbyte cartridge tape subsystem in tabletop enclosure.

Step 3d—SCSI External Storage

StorageWorks HSD05 Array Controller

HSD05-AA StorageWorks HSD05 DSSI-to-SCSI Array Controller supports seven SCSI-2 devices; includes DSSI terminator and trilink adapter; requires DSSI cable (BC29R-xx) for VAX 4000 to HSD05 connection. Maximum DSSI cable length supported is 9 meters (30 feet).

StorageWorks Deskside Expansion Unit (BA350)

BA350 deskside expansion unit supports HSD05 DSSI-to-SCSI array controller and six SCSI-2 devices.

BA350-KB StorageWorks Pedestal expansion units include: BA35-SB basic shelf, BA35X-HA universal ac power supply, pedestal mounting kit, and 120 V power cord.

SCSI devices supported in StorageWorks Pedestal with HSD05 array controller:

RZ26L-VA 1.05-Gbyte 3.5-inch half-height disk drive
RZ28-VA 2.1-Gbyte 3.5-inch half-height disk drive
RZ28B-VA 2.1-Gbyte 3.5-inch half-height disk drive
EZ51R-VA 107-Mbyte solid state disk drive
EZ54R-VA 428-Mbyte solid state disk drive
TLZ06-VA 4.0-Gbyte 3.5-inch half-height 4-mm DAT tape drive
TLZ07-VA 8.0-Gbyte 3.5-inch half height 4-mm DAT tape drive
TLZ6L-VA 4.0-Gbyte 4-mm DAT tape drive in 5.25-inch carrier
TLZ7L-VA 32-Gbyte 4-mm DAT tape loader in BA350 snap-in carrier
TZ86-VA 6.0-Gbyte tape drive in 5.25-inch carrier
TZ87-VA 20-Gbyte tape drive in 5.25-inch carrier

Refer to Chapter 8, *Storage Devices,* for ordering information

SCSI Tabletop Storage

TLZ06-GA* 4.0-Gbyte tabletop DAT drive; includes 1.8-meter (6-foot) cable(BC06P-06); requires KZQSA-SA adapter.
TLZ07-GA* 32-Gbyte tabletop DAT drive, includes 1.8-meter (6-foot) cable (BC06p-06); requires KZQSA-SA adapter.
RRD43-FB/DH* 600-Mbyte tabletop CD-ROM drive; includes 1.8-meter (6-foot) cable (BC06P-06); requires KZQSA-SA adapter; 120/240 V.
TSZ07 1600/6250-bit/inch 9-track magtape. Refer to Chapter 8, *Storage Devices,* for ordering information.

*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 Chapter 7, *Networks, Communications, and Cables,*and the *Network Products Guide* for more information.

FDDI Communications Controller

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 V6.1. 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 V6.1. 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

Step 4—Networks and Communications *(continued)*

802.5 Ethernet Communications Controller

DESQA-SA/SF **802.3/Ethernet/Q-bus controller (ThinWire/thick wire).** Maximum two additional per system (one 802.3/Ethernet/Q-bus controller included with Base System). Uses one Q-bus slot; factory/field installed.

Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3K)or ThinWire BNC connection (e.g., BC16M).

802.5/Token Ring Communications Controller

DEQRA-CA **DEC TRNcontroller 100 Q-bus 802.5/Token Ring Controller.** Includes Digital Token Ring network device driver for VMS. Uses one Q-bus slot.

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 Chapter 7, *Networks, Communications, and Cables*, and 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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information. **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. See Chapter 9, *Terminals, Scanners, Printers,* for ordering information.

Step 7—CPU Upgrades

See *ADVANTAGE-UPGRADES,* for VAX 4000 system upgrade ordering information and In-cabinet CPU upgrades for VAX 4000 Models 300, 400, 500, 600, 500A, 505A and 600A.

Step 8—Software

Licenses required to support additional users beyond those included in Base Systems.

Software Processor Code	VAX 4000 Models 505A, 705A = **2**
Clusterwide License Rating	VAX 4000 Models 505A, 705A = **300**

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-XULA9-BR OpenVMS VAX Interactive 128-user license
QL-XULA2-AA Model 505A and 705A OpenVMS VAX Interactive unlimited user license

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 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

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-GXXAA-Hx POSIX media and documentation with IEEE documentation
QA-GXXAB-Hx POSIX media and documentation without IEEE documentation

Step 8—Software *(continued)*

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-MC1A*-AA	NAS Base Server 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit

* denotes processor code.
x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

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

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QY-K19AA-AW	Annual updates on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation

Hardware Documentation

QZ-00FAA-GZ	English-language (included with base system)
QZ-00F8A-GZ	Multi-lingual (English, French, German)

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—Environmental Products

Select environmental power products if required. Refer to Chapter 10, *Environmental Products*; *Digital's Environmental Power Products Catalog*; and the *DECdirect catalog* for details.

Step 12—Configuring Information

Use the following template in conjunction with the configuring information that follows Rack-mountable VAX 4000 systems to validate the configuration.

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

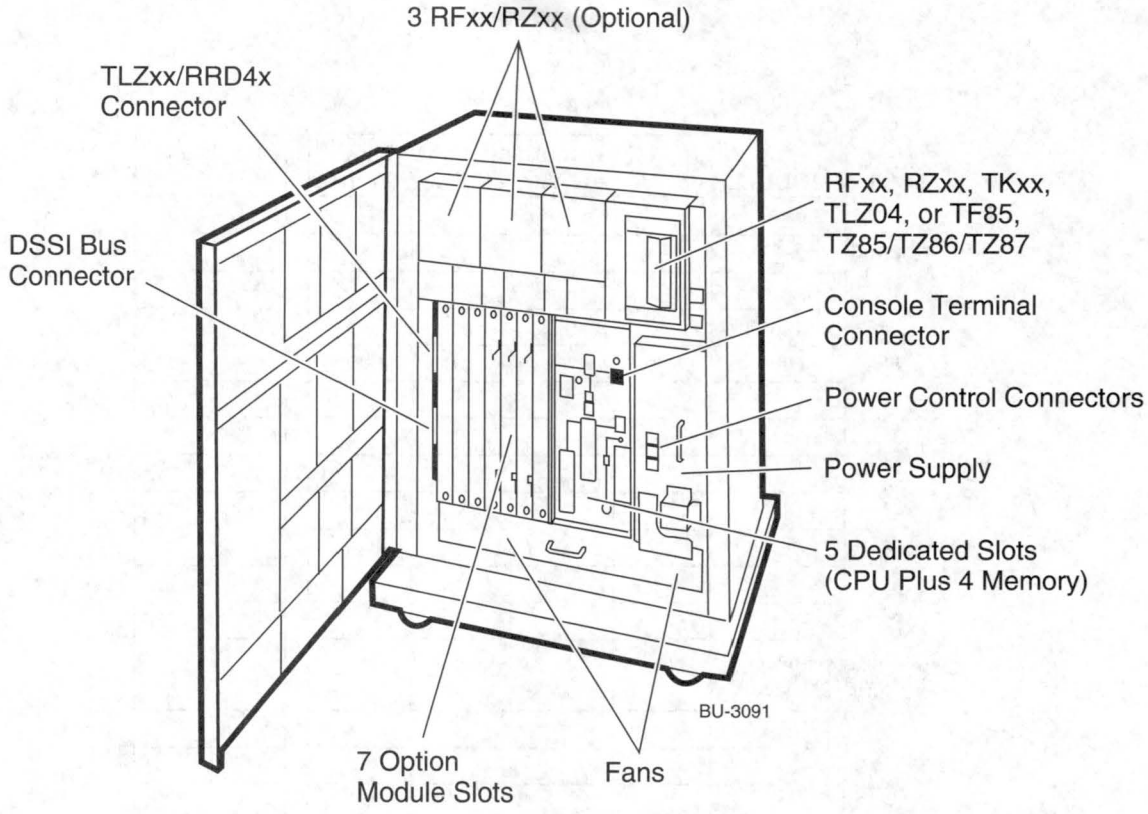
**MS690-BA: +5 Vdc = 5.3 Amps; Watts = 26.5
MS690-CA: +5 Vdc = 4.2 Amps; Watts = 21.0
MS690-DA: +5 Vdc = 6.4 Amps; Watts = 32.0

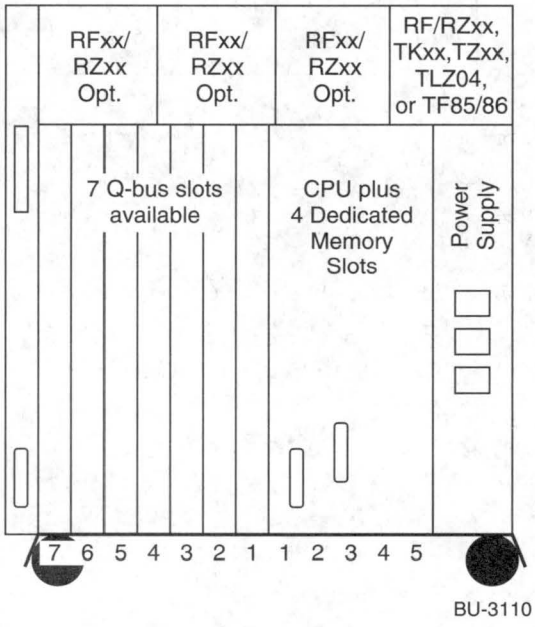
***KA675 (Model 400): +5 Vdc = 3.6; +12 Vdc = 1.6; Watts = 46.0;
ac Bus Loads = 4; dc Bus Loads = 1.

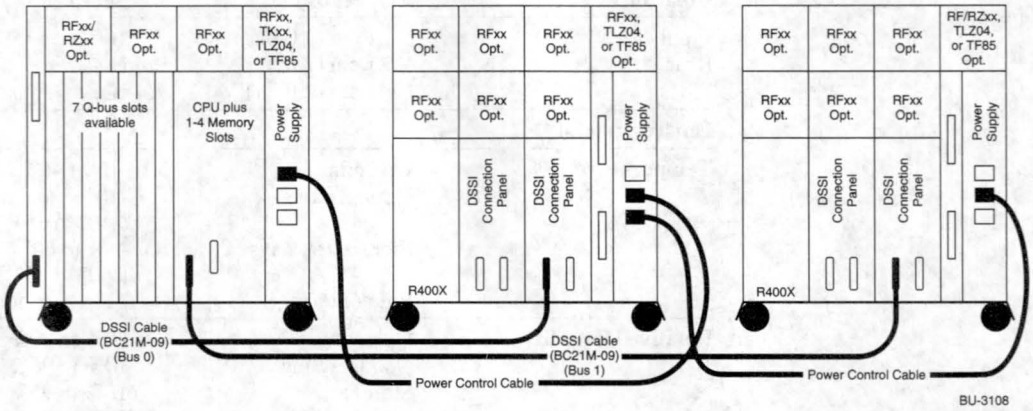
KA680 (Model 500): +5 Vdc = 4.8; + 12 Vdc = 1.6; Watts = 53.8;
ac Bus Loads = 4; dc Bus Loads = 1.

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

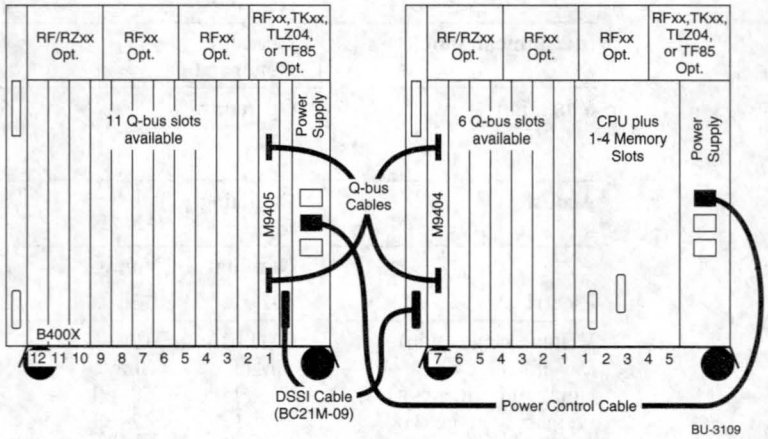

3 RFxx/RZxx (Optional)
TLZxx/RRD4x
Connector
DSSI Bus
Connector
RFxx, RZxx, TKxx,
TLZ04, or TF85,
TZ85/TZ86/TZ87
Console Terminal
Connector
Power Control Connectors
Power Supply
5 Dedicated Slots
(CPU Plus 4 Memory)
BU-3091
7 Option
Module Slots
Fans


RFxx/
RZxx
Opt.
RFxx/
RZxx
Opt.
RFxx/
RZxx
Opt.
RF/RZxx,
TKxx,TZxx,
TLZ04,
or TF85/86
7 Q-bus slots
available
CPU plus
4 Dedicated
Memory
Slots
Power
Supply
7 6 5 4 3 2 1 1 2 3 4 5
BU-3110



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 TLZ04 DAT drive in the R400X.



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 TLZ04 DAT drive in the B400X.

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

Specifications *(continued)*

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 4000 Expansion Pedestals (R400X/B400X)

Storage Expansion Pedestal

R400X-B9	Storage expansion pedestal

R400X-B9 Storage expansion pedestal; supports five dual RF3x disk assemblies (RF3x2). The top right cavity can house one 5.25-inch tape (TF8xE/ TF8xE-Jx). The R400X can be configured with one or two DSSI buses (split bus). In single-bus mode, R400X supports seven DSSI devices—in split bus mode, the top tier (four storage cavities) is dedicated to one bus, and the lower tier (three storage cavities) is dedicated to the other bus. TKxx devices are not supported in R400X enclosure. Included with the enclosure are 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 (order country-specific power for 240 V use). **Note**: Additional BC21M-09 cables may be required for split bus or DSSI OpenVMS Cluster configurations. Refer to Chapter 6, *High Availability and High Performance Products*, for DSSI VAXcluster configuration rules.

Cable Kit

H4010-AA	Required to connect R400X-B9 to BA2xx series enclosures

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

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 RF3x disk or one dual RF3x disk assembly (RF3x2). The right cavity can house one 5.25-inch tape (TF85E-Jx/TKxx). 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 R400X and B400X pedestals.

Cable Kit

H4010-AA	Required to connect B400X-B9 to BA2xx series enclosures

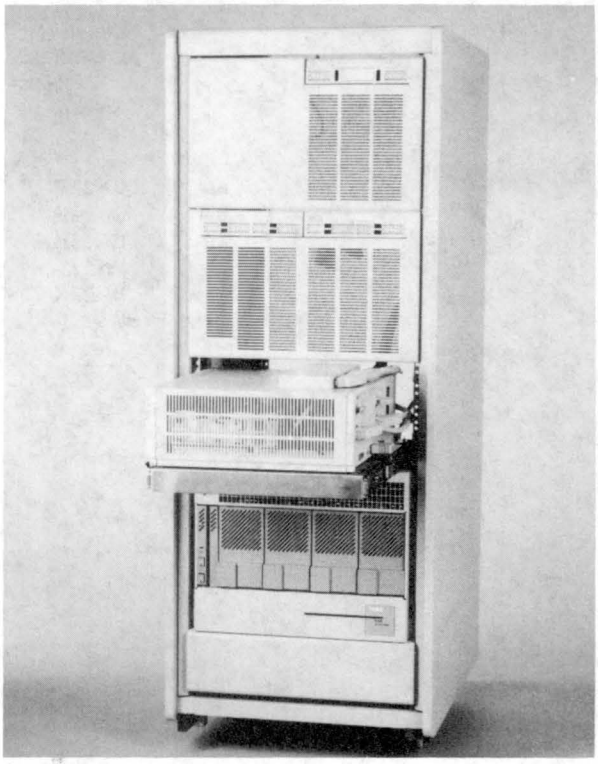
Specifications

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

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, Netherlands, Portugal, Spain,
BN22E-2E	Sweden
BN22F-2E	United Kingdom/Ireland
BN22H-2E	Switzerland
BN22J-2E	Denmark
BN22K-2E	Italy
BN22L-2E	India
	Israel



Rack-Mountable VAX 4000 Model 105A Systems

Product Description

The Rack-mountable VAX 4000 Model 105A system features the same performance and functionality as the VAX 4000 Model 105A desktop system and conforms to industry-standard 19-inch-wide (EIA-RS-210) rackmounting specifications. A top cover modification was made to relocate two Q-bus ports and two DSSI ports to accommodate rackmounting the system sideways. Two Q-bus ports provide for external Q-bus expansion. Two DSSI ports provide external expansion and tri-hosting/shadowing capabilities.

The single or dual DSSI daughter card mounts directly on the CPU module. A slide shelf assembly provides easy access to removable storage devices. Rack-mountable systems are ideally suited where minimum hardware footprint is required and can be configured in cabinets with other peripherals to save floorspace.

The Rack-mountable VAX 4000 Model 105A system has a memory capacity of up to 128 Mbytes. It offers 512 Kbytes of on-board cache with DSSI storage and Q-bus connectivity, in less than 23 cm (9 in.)of vertical rack space.

The Rack-mountable VAX 4000 Model 105A system is mounted "sideways" on a specially designed slide shelf. The slide shelf must be pulled out to access the removable storage devices and for general service access. By turning the VAX 4000 Model 105A sideways, front to rear airflow can be achieved. This allows systems to be stacked, efficiently using vertical rack or cabinet space. Cabinets with front doors are not recommended due to interference with airflow and slide shelf movement.

Ordering Information

Base Systems

DV-41VAA-D9	Model 105A, 32 Mbytes of memory, Single DSSI adapter
DV-41VAA-E9	Model 105A, 64 Mbytes of memory, Dual DSSI adapter

ADVANTAGE-SERVER Systems

DV-41VCA-D9	Model 105A, 32 Mbytes of memory, NAS 200, Single DSSI adapter, RF36, RRD43
DV-41VCA-E9	Model 105A, 64 Mbytes of memory, NAS 200, Dual DSSI adapter, RF36, RRD43

Dual Host System

DV-41VDB-EA	Two system DSSI cluster Model 105A, 2 x 64 Mbytes of memory, 2 x NAS 200, RF36, RRD43, Two Dual DSSI adapters

Timeshare System

DV-41VT1-E9	Model 105A, 64 Mbytes of memory, Dual DSSI adapter, 20-user OpenVMS license

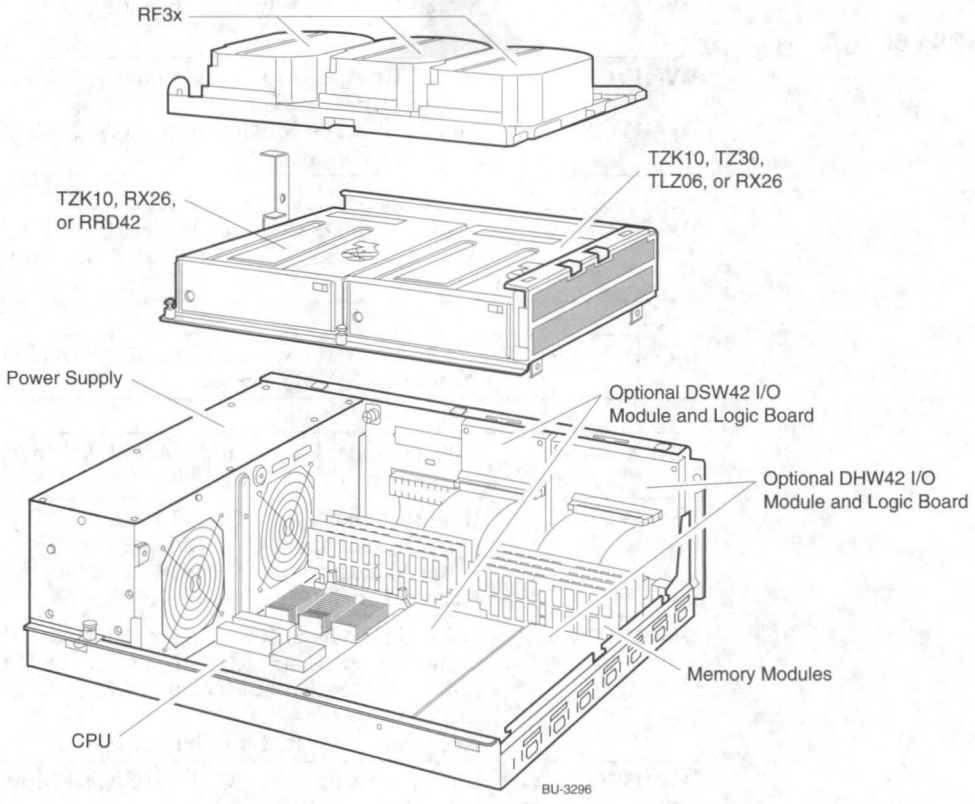
Upgrades

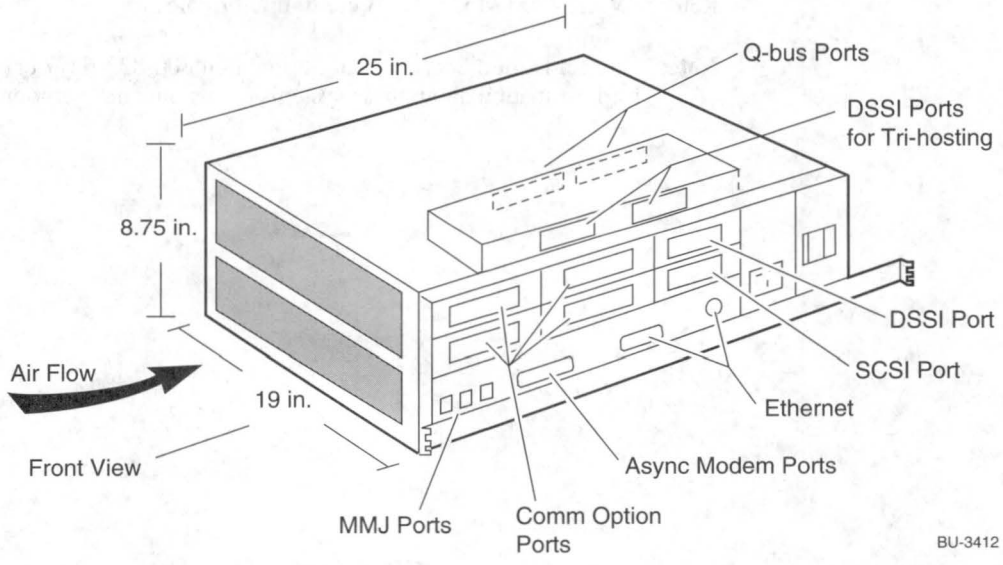
53XRA-AA	CPU upgrade: Rackmount VAX 4000 Model 100A to Rackmount VAX 4000 Model 105A
DV-41VU1-EA	Base system upgrade: Model 105A, 64 Mbytes of memory, Dual DSSI adapter, Q-bus adapter. **Note:** Mandatory return of CPU and memory modules. Keep old enclosure for Q-bus expansion.
DV-41VU1-EB	ADVANTAGE SERVER upgrade: Model 105A, 64 Mbytes of memory, RRD43, RF36, NAS 200, Dual DSSI adapter, Q-bus adapter. **Note:** Mandatory return of CPU and memory modules. Keep old enclosure for Q-bus expansion.
DV-41VV1-EA	Base system upgrade: Model 105A, 64 Mbytes of memory, Dual DSSI adapter. **Note:** Mandatory return of CPU and system enclosure.
DV-41VV1-EB	ADVANTAGE SERVER upgrade: Model 105A, 64 Mbytes of memory, RRD43, RF36, NAS 200, Dual DSSI adapter. **Note:** Mandatory return of CPU and system enclosure.

Configuring Information

Refer to VAX 4000 Model 105A configuration rules.

Note: Contact Digital Services Sales Support at 800-832-6277 or 603-884-8990 for information about these systems or custom configurations

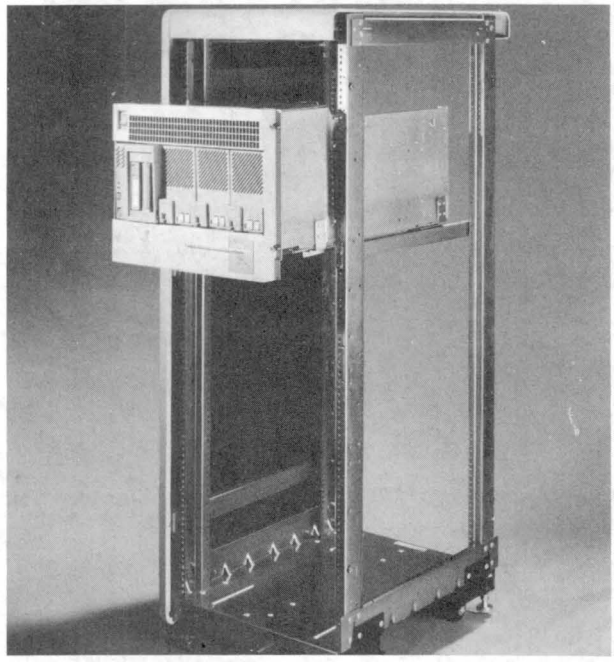

RF3x
TZK10, TZ30,
TLZ06, or RX26
TZK10, RX26,
or RRD42
Power Supply
Optional DSW42 I/O
Module and Logic Board
Optional DHW42 I/O
Module and Logic Board
Memory Modules
CPU
BU-3296


25 in.
Q-bus Ports
DSSI Ports
for Tri-hosting
8.75 in.
DSSI Port
SCSI Port
Air Flow
19 in.
Ethernet
Front View
Async Modem Ports
MMJ Ports
Comm Option
Ports
BU-3412

Specifications

Physical Characteristics		
	Height (on slide shelf)	22.22 cm (8.75 in.)
	Width (on slide shelf)	48.26 cm (19.00 in.)
	Depth (on slide shelf)	63.50 cm (25.00 in.)
	Weight	27.22 kg (60 lb)*
Power Requirements		
	Power source phasing	120/240 Vrms
	Nominal voltage	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)
Mechanical	Side accessible removable storage devices; front doors on cabinets not allowed due to airflow restriction and slide shelf movement.	

* Approximate weight with three disks and sliding shelf.



Rack-Mountable VAX 4000 Model 505A/705A Systems

Product Description

Rack-mountable VAX 4000 systems are mechanically reconfigured VAX 4000 pedestal systems capable of being mounted into a 19-inch-wide ANSI/EIA (formerly RETMA) and MIL-STD-compatible cabinet.

Rack-mountable VAX 4000 systems are ideal for two-or three-system DSSI VMScluster configurations. All models offer the option of doubling the high-speed DSSI capacity by adding two more DSSI adapters via the daughter card that mounts directly on the CPU.

Rack-mountable VAX 4000 Models 505A and 705A are offered in a BA441 chassis. They have identical system functionality and configuration requirements as the pedestal VAX 4000 Model 505A and Model 705A.

Rack-mountable VAX 4000 systems feature front-to-back airflow. This allows systems to be stacked, efficiently utilizing vertical rack or cabinet space. They can also be installed in environmental cabinets for use in harsh environments. Rack-mountable VAX 4000 systems chassis are slide equipped for easy maintenance and configuring. Slides and cable management brackets are included with all VAX 4000 rack-mountable systems.

Configuration Rules

- Each BA441 requires 35.5 cm (14 inches) of vertical rack space
- Power controller as well as voltage and total current requirements must be considered
- Face or filler panel requirements must be considered
- Front door must be louvered in the area of the BA441 chassis to accommodate 180 ft(3)/min of cooling air
- Rear door must be louvered in the area of the BA441 chassis to accommodate 180 ft(3)/min of cooling air
- Front stabilizer leg or bar must be provided to compensate for systems being pulled out for servicing or cabinets must be secured to the floor or to another cabinet in order to prevent overturning

Ordering Information

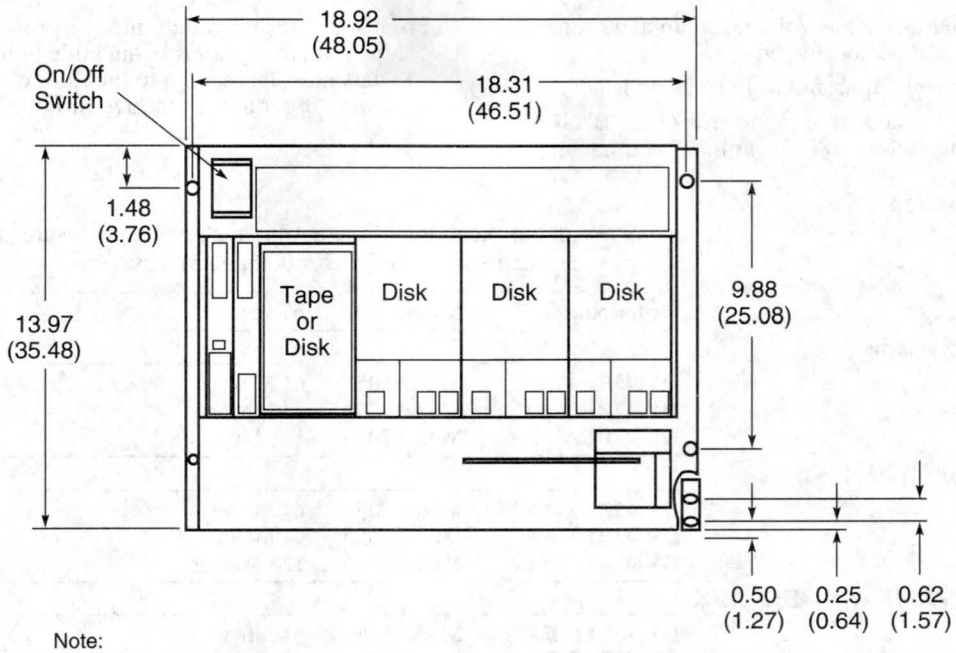
Note: With the exception of the BA441 rackmount enclosure, systems include the same items as the VAX 4000 pedestal systems.

Order Number	Model	Memory
OpenVMS Base Systems		
DV-45REA-E9	Model 505A	64 Mbytes
DV-47REA-E9	Model 705A	64 Mbytes
DV-47REA-F9	Model 705A	128 Mbytes
ADVANTAGE SERVER Systems		
DV-45RFA-EA	Model 505A	64 Mbytes
DV-47RFA-EA	Model 705A	64 Mbytes
DV-47RFA-FA	Model 705A	128 Mbytes
Dual System ADVANTAGE SERVERS		
DV-45RFB-EA	Model 505A	64 Mbytes
DV-47RFB-EA	Model 705A	128 Mbytes
ADVANTAGE UPGRADE Systems		
DV-45RV2-A9	Model 505A	64 Mbytes
DV-47RV2-A9	Model 705A	64 Mbytes
DV-47RV2-B9	Model 705A	128 Mbytes

Configuring Information

Refer to appropriate VAX 4000 Model 505A/705A configuration rules.

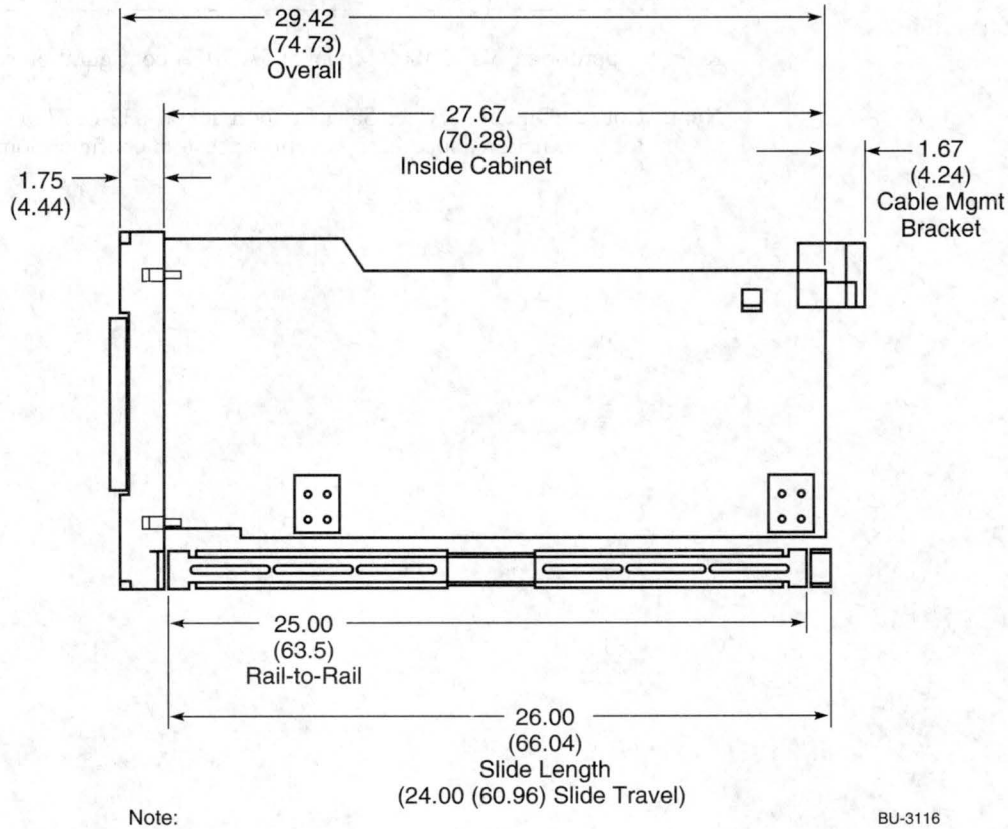
Note: Contact Digital Services Sales Support at 800-832-6277 or 603-884-8990 for information about these systems or custom configurations.



Note:
- Dimensions in inches (cm)

BU-3115

Front View



Note:
- Dimensions in inches (cm)

BU-3116

Side View

Specifications

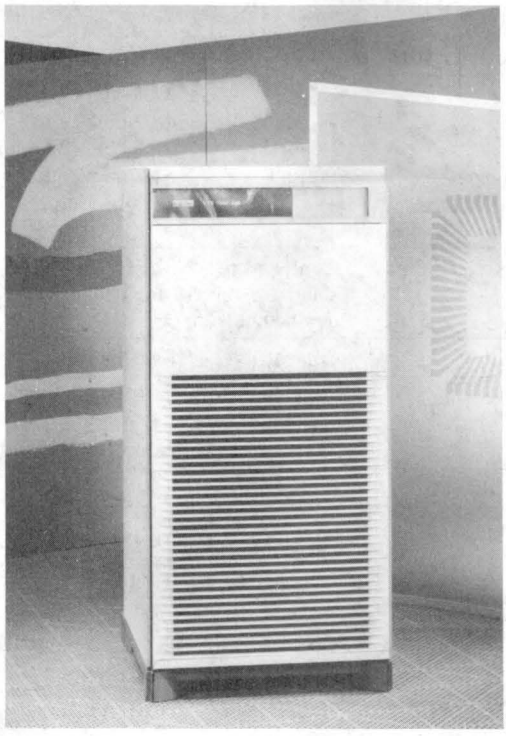
Physical Characteristics		
	Height	35.5 cm (14 in.)
	Width	48.2 cm (19 in.)
	Depth	74.73 cm (29.42 in.)
	Weight†	System weight (approximately) 58 kg (128 lb) Shipping weight (approximately) 64 kg (141 lb)
Mounting Requirements	Conforms to ANSI/EIA ES-310-C-77 and MIL-STD 189 standards for a19-inch panel width and 30-inch minimum depth enclosure.	
Clearances	**Operating**	**Service**
Front	20.3 cm (8 in.)	76.0 cm (30 in.)
Rear	20.3 cm (8 in.)	9.0 cm (36 in.)
Sides	None	None
Environmental		
Temperature		
	Operating	10° to 40° C (50° to 104° F)
	Nonoperating	40° to 66° C (-40° to 151° F)
Relative Humidity		
	Operating	20% to 80% noncondensing
	Nonoperating	10% to 90% noncondensing
Cooling Air Required	306 m(3)/hr (180 ft(3)/min.)	
Altitude		
	Operating	2438 meters (8,000 feet)
	Nonoperating	4877 meters (16,000 feet)
Mechanical Shock		
	Operating	10 g pk for 10 +-3 m/s, 1/2 sine wave all 3 axes
	Nonoperating	Incline impact to 1.75 m/s (5.75 ft/s) all sides; Tilt drop to 20.3 cm (8 inches)
Acoustics		
	Operating	5.5 bels, 40 dBA
	Idle	5.2 bels, 37 dBA

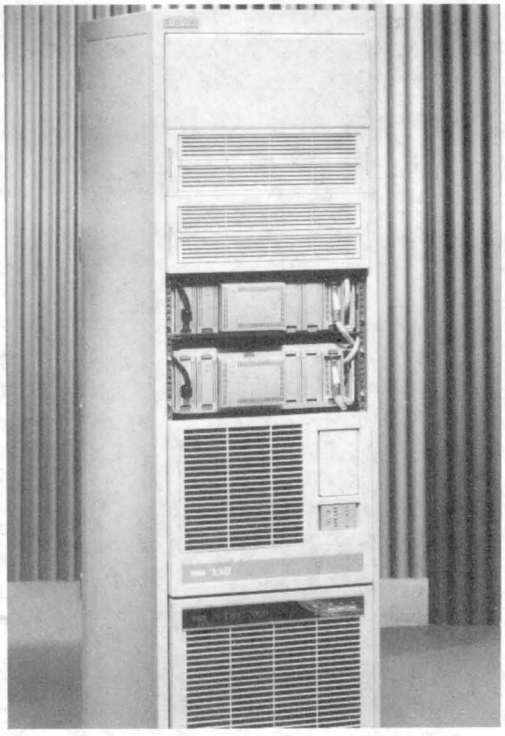
		Nominal AC Voltage Electrical		
Electrical	**101**	**120**	**220**	**240**
Voltage range (Vac)	90–110	104–128	176–242	186–264
Power source phase	Single	Single	Single	Single
Nominal frequency (Hz)	50–60	50–60	50–60	50–60
Frequency range (Hz)	47–63	47–63	47–63	47–63
RMS current (steady state) at nominal voltage (amps)	11.9	11.2	6.1	5.8
Startup current—30 s (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
Heat dissipation (Btu/hr)	2978	2978	2978	2978
Circuit breaker rating (amps)	14	14	14	14
Power supply power connector	IEC 320 C16	IEC 320 C16	IEC 320 C16	IEC 320 C16
U.S. power cord plug††	NEMA 5-15P	NEMA 5-15P	NEMA 5-16P	NEMA 5-16P

Note: Built-in universal power supply automatically selects the correct voltage range for either 120-V or 240-V operation.

† Weight is for typical enclosure fully loaded with module options, power supply, maximum number of Integrated Storage Elements, and one tape drive.

††Standard U.S. 15A 3-pin 120-Vac plug. Power cords for other countries are available.





VAX 7000 Enterprise Servers

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—all while building upon current investments.

VAX 7000 servers support thousands of applications for a wide range of industries. Travel reservation, telephone switching, information-rich imaging, high-value funds transfer, and compute-intensive financial or pharmaceutical modeling applications are only a few examples of the kinds of mission-critical applications that run well on VAX 7000 systems. The systems support large databases, multiple CPUs acting in concert, and high-volume I/O.

In addition, VAX 7000 servers support hundreds of PCs or workstations running a wide range of applications. Because Digital's client/server computing is built on standards-based Network Application Support (NAS) software, VAX 7000 servers support OpenVMS, ULTRIX, UNIX, MS-DOS, OS/2, and Macintosh clients, and both windowing and ASCII terminals.

With as many as six 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. And multiple systems provide even more: 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, assuring that even the most heavily configured systems have sufficient redundant power to keep operating in the event of a single power regulator failure. Optional system-level UPS (Uninterruptible Power System) capability is available to support all elements within the CPU and I/O expansion cabinets. This means that CPU, memory, I/O channels and devices, and in-cabinet disk storage can continue operating in the event of a power loss.

Product Description ***(continued)***

The balanced I/O subsystem on the VAX 7000 Enterprise Server provides substantial I/O capacity initially (one 12-slot XMI I/O channel is standard) and the ability to add up to three more 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, SDI/STI, and DSSI interconnects. Support for up to 16 Ethernet adapters, 10 CI adapters, 12 DSSI adapters, 12 SDI/STI adapters, and eight FDDI adapters demonstrates the large expansion potential of the VAX 7000 systems. StorageWorks controllers enable SCSI-2 devices to provide reliable high-end storage on the CI bus.

Adding a VAX 7000 system to an OpenVMS Cluster configuration enables efficient, economical resource sharing, plus still higher availability and storage capacities.

Digital Storage Systems Interconnect (DSSI) OpenVMS Cluster system configurations offer increased system uptime and availability—if one system goes down, as many as three other systems can continue processing critical data.

When more systems and storage are needed, a CI-based OpenVMS Cluster system offers even greater flexibility and superior system, application, and data availability. There's no disruption to users when the cluster grows—new systems, or disk and tape subsystems can be added without taking the cluster offline.

The high-speed FDDI network allows connection of OpenVMS Cluster systems in separate geographic locations many kilometers apart. If disaster tolerance is a requirement, an OpenVMS Cluster can be duplicated at another site. Then, if one site goes down due to a fire, flood, or power outage, the other site can continue operations. OpenVMS Volume Shadowing ensures full availability of critical data at the other site.

Up to 42 Gbytes of storage and 20 Gbytes of tape capacity can be configured in the VAX 7000 system cabinet to form a complete, compact system where space requirements are critical. Outside the cabinet, storage arrays such as the SW800 offer economical, high-capacity CI and DSSI storage solutions.

A variety of configurations can be created from the VAX 7000 Base Enterprise Server. The VAX 7000 Base Enterprise Server allows users to add memory, I/O controllers, storage, user licenses, database software, and networking support as the data center requires. Enterprise Expansion Packages that provide the hardware and licensing necessary to start an OpenVMS Cluster or add another node to an existing cluster may be ordered with a single part number. Another Enterprise Expansion Package provides additional storage capacity.

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: OpenVMS VAX V6.1 required. Second power regulator required when configuring five-and six-processor systems. 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.

OpenVMS Base Enterprise Server Systems include

- Model 710 CPU, system interconnect bus and 12-slot XMI I/O channel
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- 48 V power regulator
- OpenVMS base license
- NAS 200 V5.0 software
- One year hardware product warranty
- One year software product warranty
- System installation

Order Number	Memory
7JAMC-KA/KB/KC	128 Mbytes (one 128-Mbyte module)
7JAMD-KA/KB/KC	256 Mbytes (one 256-Mbyte module)
7JAME-KA/KB/KC	512 Mbytes (one 512-Mbyte module)
7JAMH-KA/KB/KC	2 Gbytes (one 2-Gbyte 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

7JATA-LE SMP Upgrade. Contains one CPU processor, OpenVMS VAX base license upgrade, and one full-year product warranty. Add up to 5 more 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-Gbyte 3.5-inch disk drives in BA350 shelf

TZ87 20-Gbyte, 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

Step 3—Enterprise Expansion Packages *(continued)*

7YCAA-BX	**Cluster Add-on Package**, includes: CIXCD-AC XMI CI controller BNCIA 10-meter cable VAXcluster License

*When adding storage devices to SW800, customers must order BA350 shelves separately.

Step 4—Memory

Select additional memory if required; maximum 3.5 Gbytes per system.

New systems can be be expanded in any combination of arrays listed below.

MS7AA-BA	128-Mbyte memory array
MS7AA-CA	256-Mbyte memory array
MS7AA-DA	512-Mbyte memory array
MS7AA-FA*	2-Gbyte 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. See description in Chapter 8, *Storage Devices*.

Note: x = B for ThinWire or C for AUI connector; -BA includes 120-V power cord; -BE requires country-specific power cord; see Chapter 8, *Storage Devices*, for listing.

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.
KDM70-AA	**XMI disk/tape controller.** Total three per XMI; maximum 12 per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes.
CK-KDM00-LF	0.9-m (3-ft) cabinet kit. Required with each KDM70-AA.
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 Chapter 8, *Storage Devices*, for complete 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 BA350 modular expansion shelves; each shelf holds a maximum of two 5.25-inch devices or seven 3.5-inch devices.

BA655-AA	**SCSI-2 disk plug-in unit**—includes two BA350-LA modular expansion shelves; each shelf includes a power supply. **Note:** HSD05 or HSD30 required.
HSD05-AA	**StorageWorks array controller.** Supports up to seven SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 and V6.0, OpenVMS AXP V1.5.
HSD30-AA	**StorageWorks array controller.** Supports up to 18 SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 and V6.0, OpenVMS AXP 1.5.
RZ28-VA	2.1-Gbyte, 3.5-inch SCSI disk drive
RZ26L-VA	1.05-Gbyte, 3.5-inch SCSI disk drive
TLZ06-VA	4.0-Gbyte, 3.5-inch SCSI tape drive
TZ87-VA	20-Gbyte, 5.25-inch SCSI tape drive
TZ86-VA	6.0-Gbyte, 5.25-inch SCSI tape drive
EZ54R-VA	428-Mbyte, SCSI solid state disk
EZ51R-VA	107-Mbyte, SCSI solid state disk

Step 7b—External Storage (I/O Expansion Cabinet)

In addition to options described in Step 12, the I/O expansion cabinet provides space for six disk plug-in units; each holds a maximum of three SF73 storage array building blocks. See Step 7a for ordering information.

Step 7c—External Storage

The following list describes available storage devices, capacities, and components included with **initial** offerings; supported options can be added as required. See Chapter 8, *Storage Devices*, for ordering information.

Storage Arrays	**Capacity**	**Storage Array Disk Drive Components**
SW5xx	6–227 Gbytes	RZ26L, RZ28 SCSI disk drives
SW8xx	6–227 Gbytes	RZ26L, RZ28 SCSI disk drives
Storage Array Building Blocks	**Capacity**	**Storage Array Building Block Components**
SF36	3.2–19.2 Gbytes	RF36 DSSI disk drives
Disk Drives	**Capacity**	
RF36 DSSI	1.6 Gbytes	
RZ26L SCSI	1.05 Gbytes	
RZ28 SCSI	2.1 Gbytes	
ESE50 SDI solid state	120–600 Mbytes	
EF5x DSSI solid state	107–267 Mbytes	
EZ5x SCSI solid state	107–856 Mbytes	

Step 7c—External Storage *(continued)*

Tape Drives	
TF85	2.6-Gbyte DSSI cartridge tape subsystem
TF86	6.0-Gbyte DSSI cartridge tape subsystem
TF857	18.2-Gbyte DSSI cartridge tape subsystem
TF867	42.0-Gbyte DSSI cartridge tape subsystem
TZ86	6.0-Gbyte SCSI-2 tabletop cartridge tape subsystem
TZ867	42.0-Gbyte SCSI-2 cartridge tape subsystem
TZ87	20-Gbyte 5.25-inch SCSI tape drive
TZ877	140-Gbyte SCSI-2 cartridge tape subsystem

Note: For additional ordering information, see Chapter 8, *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. See Chapter 6, *High Availability and High Performance Products*, for further configuration information.

HSJ40-AD/AF	**StorageWorks array controller.** Supports up to 42 SCSI-2 devices. Includes 16-or 32-Mbyte Read-Cache and controller-based disk striping. Supported by OpenVMS VAX V5.5-1 and later, OpenVMS AXP V1.5.
HSD05-AA	**StorageWorks array controller.** Supports up to seven SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 and V6.0, OpenVMS AXP V1.5.
HSD30-AA	**StorageWorks array controller.** Supports up to 18 SCSI-2 devices. Supported by OpenVMS VAX V5.5-2 and V6.0, OpenVMS AXP 1.5.
SW5xx/SW8xx	**StorageWorks arrays.** See Chapter 8, *Storage Devices*, for details.
BNCIA-xx	**Computer interconnect cable sets.** Connect 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 Chapter 7, *Networks, Communications, and Cables*, and 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.

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 Chapter 7, *Networks, Communications, and Cables*, for ordering information.

Step 9—Networks and Communications *(continued)*

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 Chapter 7, *Networks, Communications, and Cables*, and 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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

VT510-xx	VT510 terminal.
LA75S-xx	LA75 Plus printer.
LAXXS-AD	VT510/LA75 table for both VT510 and LA75.

Step 11—Terminals and Printers

See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

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 and provides space for one TF8x tape drive, 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

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet) *(continued)*

The **I/O expansion cabinet** includes one power regulator and provides space for one TF8x tape drive, 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.

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.

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.

DWMBB-LB **VAXBI plug-in unit upgrade.** Provides second five-slot VAXBI I/O channel/interface capability for DWMBB-LA option. Maximum one per DWMBB-LA.

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. See description in Chapter 7, *Networks, Communications, and Cables.*

CK-DMB32-LJ **DMB32 cabinet kit**; occupies four panel units in VAXBI plug-in unit

DRB32 **VAXBI parallel interface.** Maximum two per VAXBI I/O channel, total eight per system. CK-DRB32 occupies two panel units in VAXBI plug-in unit. See description in Chapter 7, *Networks, Communications, and Cables.*

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.

H7238-AA **4-pack battery option**; one required per optional 48 V power regulator to support battery backup/UPS capability.

DWMVA-AA **VME adapter option**; maximum eight per XMI and per system.

Step 12—Expansion (System Cabinet and I/O Expansion Cabinet) *(continued)*

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-AA 64 Mbytes of memory	10			–		
MS7AA-BA 128 Mbytes of memory	10			–		
MS7AA-CA 256 Mbytes of memory	10			–		
MS7AA-DA 512 Mbytes 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		
DWMVA-AA XMI VME adapter option	1			1		
KDM70-AA XMI disk/tape adapter	6			6		
KFMSA-BA XMI DSSI adapter	3			3		
DMB32-M VAXBI multifunction controller	3			3		
DRB32-M VAXBI parallel interface	3			3		
DRB32-W VAXBI parallel interface (DR11-W functionality)	4			4		
DRB32-E VAXBI parallel interface (longline)	3			3		
DWMBB-LA VAXBI plug-in unit	4			4		
DWMBB-LB VAXBI plug-in unit	4			4		
EF51R-LA solid-state storage array building block	8			8		
EF52R-LA solid-state storage array building block	8			8		
SF73-LA storage array building block	8			8		
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. See Chapter 10, *Environmental Products*, and *Digital's Environmental Products Catalog*.

Step 13—Software

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-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-XULA5-AA	OpenVMS VAX Interactive unlimited user license

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 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 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

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

Step 13—Software *(continued)*

NAS Software

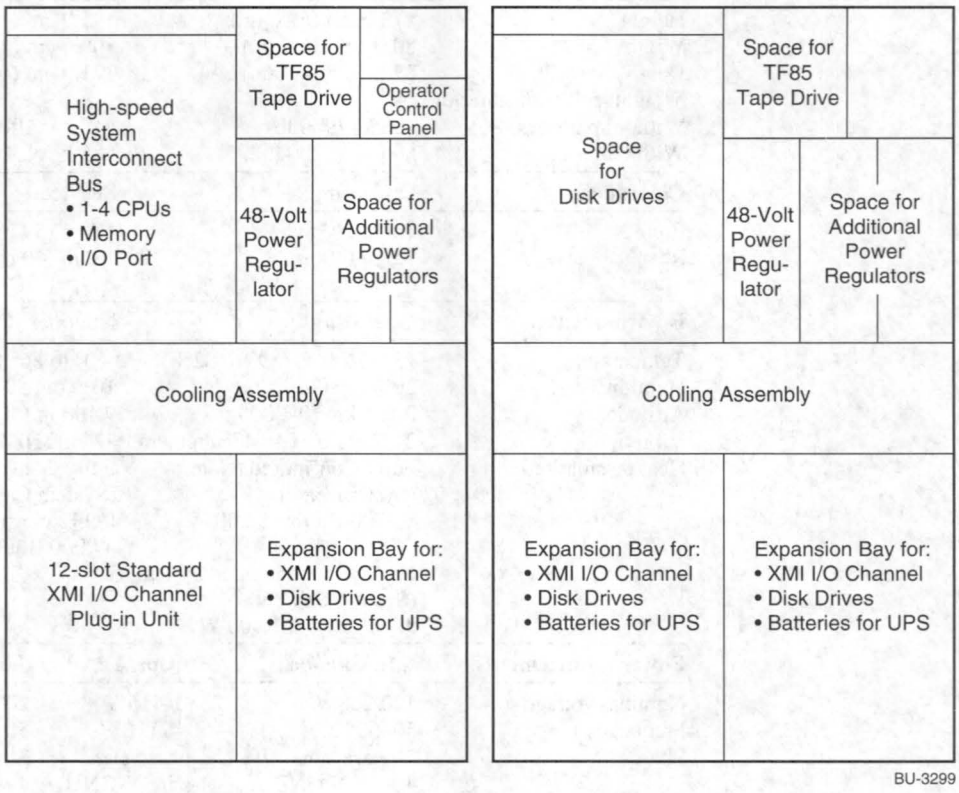
Select the appropriate NAS software. See description of NAS packages in Chapter 11, *Software and Services*. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only).

QL-MC2A5-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A5-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

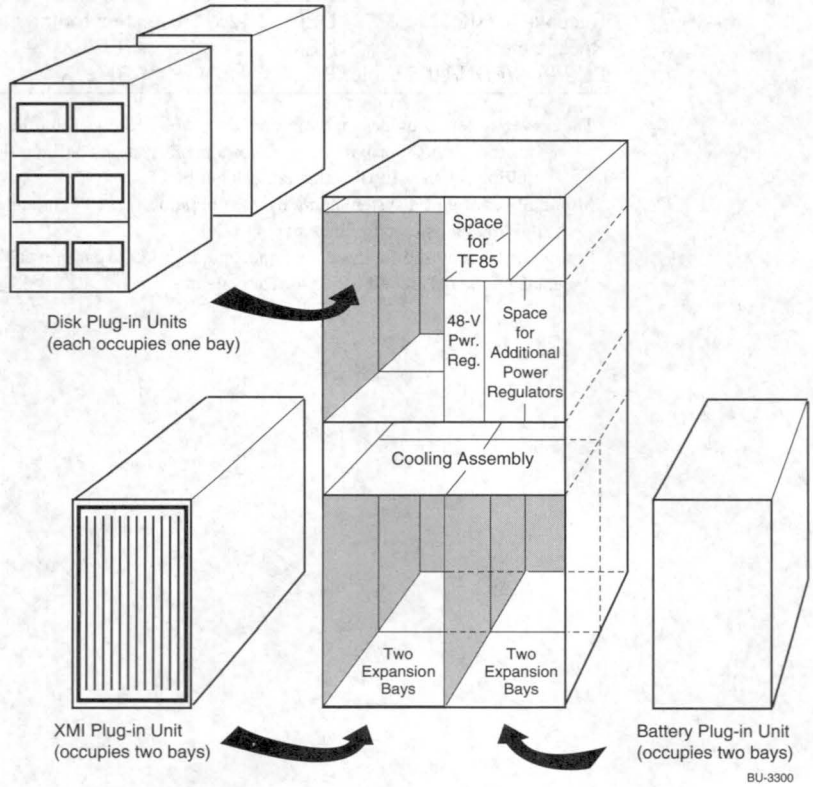
Step 14—Environmental Power Products

Select environmental power products if required. See Chapter 10, *Environmental Products*, and *Digital's Environmental Power Products Catalog*.



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 710 CPU and high-speed system interconnect bus
- 12-slot XMI I/O channel
- DEC LANcontroller 400 (DEMNA)
- 802.3 Ethernet controller
- 128, 256, 512 Mbytes, or 2 Gbytes of memory
- Console cable
- OpenVMS base license
- NAS 200 V5.0 license
- One full-year product warranty (standard warranty recommended)

Order Number	Memory
2T-7JARC-KA	128 Mbytes of memory (one 128-Mbyte module)
2T-7JARD-KA	256 Mbytes of memory (one 256-Mbyte module)
2T-7JARE-KA	512 Mbytes of memory (one 512-Mbyte module)
2T-7JARH-KA	2 Gbytes of memory (one 2-Gbyte module)

Step 2—CPU Symmetric MultiProcessing (SMP) Upgrade

Maximum of three CPU modules supported on Rackmount VAX 7000 systems.

7JATA-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-Mbyte memory module

MS7AA-CA 256 -Mbyte memory module

MS7AA-DA 512-Mbyte memory module

MS7AA-FA* 2-Gbyte 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 Chapter 7, *Networks, Communications, and Cables*, and the *Network Products Guide* for details.

LAN Communications Controllers

DEMNA-M	**802.3/Ethernet controller**—requires one XMI slot. OpenVMS AXP 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. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

VT510-xx	VT510 terminal.
LA75S-xx	LA75 Plus printer.
LAXXS-AD	VT510/LA75 table for both VT510 and LA75.

Step 10—Software

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-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-XULA5-AA	OpenVMS VAX Interactive unlimited user license

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 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 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

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

Step 10—Software *(continued)*

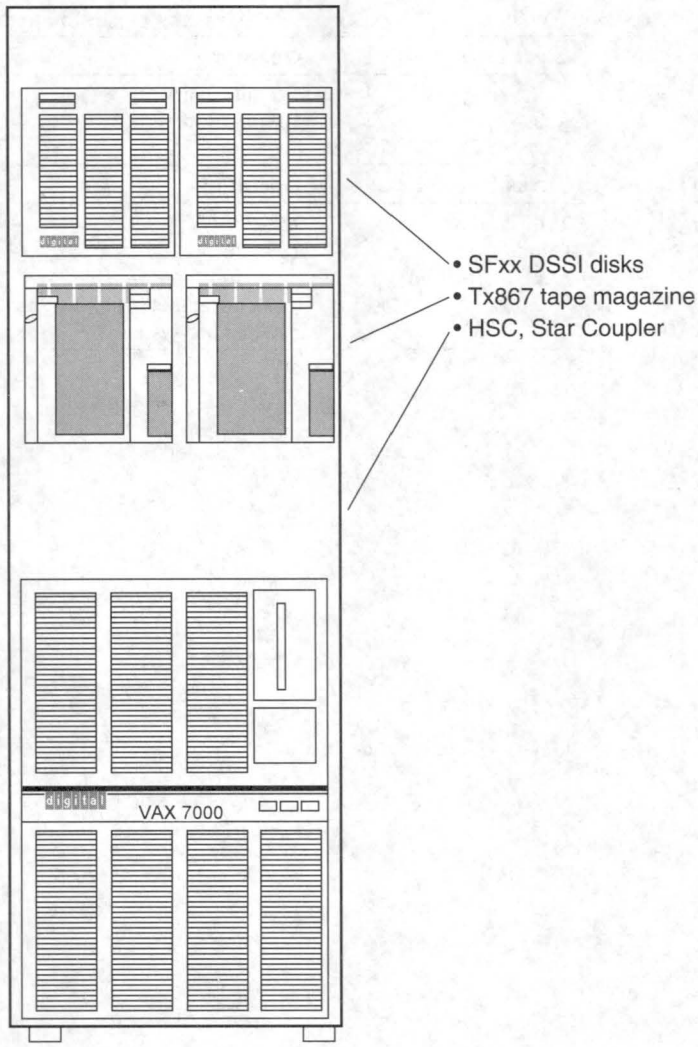
NAS Software

Select the appropriate NAS software. See description of NAS packages in Chapter 11, *Software and Services*. **Note:** The NAS packaged products do not include hardcopy documentation for the components (documentation is CD-ROM only).

QL-MC2A5-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A5-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Rackmount VAX 7000 Enterprise Server Diagram



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	

Chapter 3
DECsystems

DECstations/DECsystem Comparison Chart

DECstation 5000 Model 133

DECstation 5000 Model 240

DECsystem 5000 Model 240

DECstation/DECsystem Comparison Chart

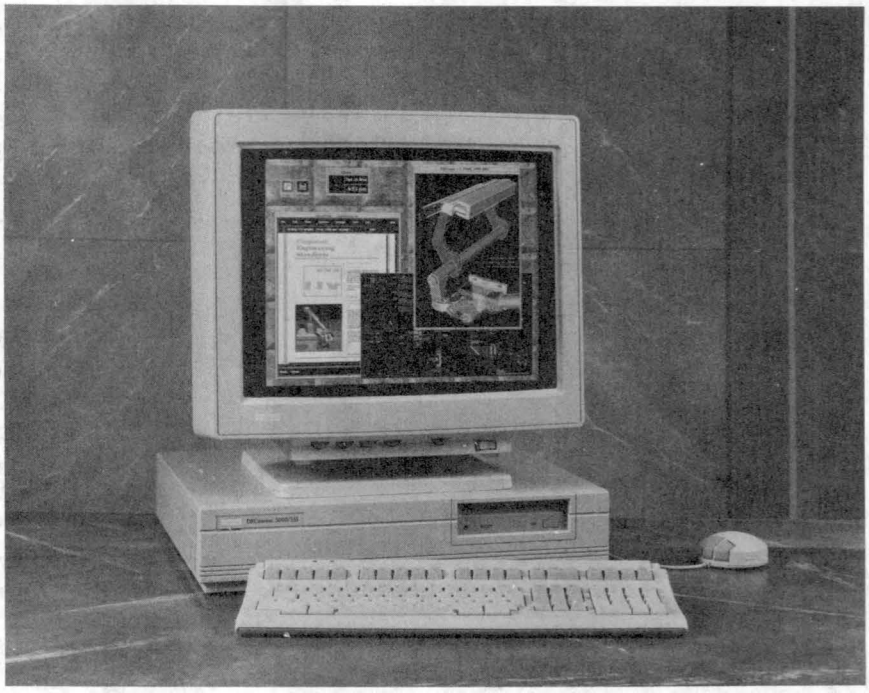
System	DECStation 5000 Model 133	DECstation 5000 Model 240	DECsystem 5000 Model 240
CPU[1]/FPU	R3000A/41010	R3000A/41010	R3000A/41010
SPECmark89[2]	26.5	32.4	32.4
MIPS[3]	34.4	42.9	42.9
Clock Speed	33 MHz	40 MHz	40 MHz
Cache Size (On Chip/On Board)	64 KB (instructions) 128 KB (data)	64 KB (instructions) 64B (data)	64 KB (instructions) 64B (data)
Memory (type)	16–128 Mbytes (parity)	16–480 Mbytes (ECC)	16–480 Mbytes (ECC)
Enclosure	Desktop	Desktop	Desktop
Max Disk Capacity			
Internal	Up to 852-Mbytes	None	None
External	Up to 25.3-Gbytes	Up to 28.9 Gbyte	Up to 33.1 Gbyte (SCSI) Up to 144 Gbyte (SDI) Up to 342 Gbyte (Optical)
I/O Bus Type	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)	TURBOchannel VME (optional)
Peripheral Support	SCSI VME	SCSI VME	SCSI VME CI
Prestoserve	N/A	Optional	Optional
Network Support	TCP/IP (standard) NFS (standard) DECnet/OSI (optional) FDDI (optional) X.25 (optional) SNA (optional) DEC WANcontroller 720 (optional) (high-speed synchronous)	TCP/IP (standard) NFS (standard) DECnet/OSI (optional) FDDI (optional) X.25 (optional) SNA (optional) DEC WANcontroller 720 (optional) (high-speed synchronous)	TCP/IP (standard) NFS (standard) DECnet/OSI (optional) FDDI (optional) X.25 (optional) SNA (optional) DEC WANcontroller 720 (optional) (high-speed synchronous)

[1] From MIPS Computer Systems, Inc.

[2] SPECmark is the geometric mean of ten compute-intensive, public-domain benchmarks compared to performance on a VAX-11/780; SPECmark89

[3] Million instructions per second based on the Dhrystone benchmarks.

[4] Digital and third-party TURBOchannel options are available. Contact a sales representative or Digital reseller for third-party options.



DECstation 5000 Model 133 Workstations

Product Description

The DECstation 5000 Model 133 workstation is a UNIX-based RISC system featuring the MIPS R3000A CPU and R3010 FPU chipset. It places the CPU/FPU chipset on a 3-x 5-inch (7.6-x 12.7-cm) removable daughter card that permits upgrading the processing power easily .

The DECstation 5000 Model 133 runs at 33 MHz (26.5 SPECmark89). Memory modules are available in 16 Mbytes for system totals of 128 Mbytes. Internal storage is provided by three storage cavities. Slot 1 is reserved for one removable media device, and slots 2 and 3 support hard disk drives. Six graphics subsystems are supported via the TURBOchannel I/O bus, providing a range of solutions from simple 2D to complex 3D graphics, and 24-plane true color. Non-accelerated options and multi-screen displays offer increased end-user productivity by providing two or three simultaneous displays for color or high-resolution monochrome monitors.

Two TURBOchannel multimedia options are available: DECvideo/PIP (Picture-in- Picture) video, and an option card to the TX 24-plane color frame buffer, which provides live NTSC, PAL, or SECAM full-motion "video in a window." Video windows can be scaled from full size to icon size, and individual frames can be grabbed for use in documents or presentations. DECaudio provides telephone-grade audio in and out capabilities.

The DECstation 5000 Model 133 supports applications ranging from financial trading and technical publishing to computer-aided software engineering (CASE), mechanical computer-aided design (CAD), electrical computer-aided design (ECAD), scientific modeling, mechanical modeling, scientific visualization, and graphics art design.

Step 1—Systems

Select system.

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord and U.S. keyboard. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Options ordered will be factory installed unless specified as **spares**

DECstation 5000 Model 133 Systems include

- Base module with 33-MHz CPU daughter card
- TURBOchannel I/O interconnect—3 slots total
- Memory 16 Mbytes
- Thick wire Ethernet (AUI) connector and 10BaseT (twisted pair)connector
- Synchronous SCSI controller on base system module
- Three-button mouse
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 1.8-meter (6-foot) power cord (120-V systems only)
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88--132 Vac or 176--264 Vac
- ULTRIX Workstation Software, 2-user base license, DEC C and OSF/Motif
- English-language user documentation

Note: Systems ordered with factory-installed RZxx variant (-FM) include ULTRIX factory-installed software (FIS).

Order Number 120/240 V	Model/CPU	Memory	Monitor	Graphics	Available TURBOchannel Slots
Base Systems—require graphics option and monitor					
PM339-SY/SZ	133/33 MHz	16 MB	Required	Required	Three

Step 2—Memory

Systems support eight memory options for system maximum of 128-Mbytes

MS01-CA 16-Mbyte parity (2 x 8-Mbyte 4-Mbit DRAM)

Step 3—TURBOchannel Graphics Options and Monitors

- Base systems require a graphics option and monitor
- PXG, PXG+ and PXGTurbo+ graphics options ordered with Base systems include DEC PHIGS Runtime license. Z-Buffer is recommended for 3D systems.
- Graphics options include 10-foot (3-meter) video cable. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (BC09M-10).
- TX frame buffer supports optional DECvideo/Picture-in-Picture (PIP) option card; see TURBOchannel Multimedia options.

Order Number Factory Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitor	Hz
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 x 1024, 72 Hz	1	19-inch M VR319-DA/D4 19-inch C VRC21-HA/H4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 x 1024, 72 Hz	1		
PMAGB-DA/DB	PXG+	8-plane 3D, low-to mid-range; 1280 x 1024, 72 Hz	2		
PMAGB-EA/EB	PXG+	24-plane 3D, Z-Buffer, mid-range; 1280 x 1024, 72 Hz	2		
PMAGB-FA/FB	PXG Turbo+	96-plane 3D, high performance; 1280 x 1024,72 Hz	3		
PMAG-GB		8-to 24-plane upgrade; requires Digital Services installation	0		
PMAG-HA		24-bit Z-Buffer option for PXG+ and PXGTurbo+ systems	0		

Step 4—Storage

Select storage devices if required.

- A single RZ25L disk drive is recommended as data/swap device only.
- Recommended configurations for standalone systems are: One RZ26 or RZ25L.
- Maximum seven SCSI devices are supported on the base SCSI controller. Select SCSI TURBOchannel option (PMAZ-AA) if more are required.

Step 4a—Internal Storage

- Slot 1—Removable media, RX26 or RRD42 or TZK10 or TLZ06
- Slot 2—3.5-inch disk, RZ25L or RZ26
- Slot 3—3.5-inch disk, RZ25L or RZ26

Select maximum of one removable media device

RX26-FC	2.8-Mbyte 3.5-inch internal diskette drive
RRD42-FM	600-Mbyte 5.25-inch half-height CD-ROM drive
TLZ06-FM	4.0-Gbyte 5.25-inch half-height 4-mm ditital audio tape (DAT) drive
TZK10-FM	525-Mbyte 5.25-inch half-height quarter inch cartridge (QIC) tape drive

Select maximum of two 3.5-inch half height disk drives

- Factory-installed variants (RZ25-FM) include factory-installed software (FIS).

RZ25L-FM/FL	535-Mbyte 3.5-inch internal disk drive
RZ26-FM/FL	1.05-Gbyte 3.5-inch internal disk drive

Step 4b—External Storage

- Each SZ12, TLZ06, TKZ09, and RRD42 expansion device includes a SCSI cable. NOTE: External expansion boxes for 240 V systems require a country-specific power cord.

SCSI TURBOchannel Option Card

- Base SCSI controller supports seven SCSI devices; maximum of three expansion boxes with one internal device. SCSI TURBOchannel option card supports six additional external SCSI devices in three dual-drive expansion boxes.

PMAZ-AA/AB	SCSI TURBOchannel option card

Single-Drive Expansion Boxes

TLZ06-FA	4.0-Gbyte 4-mm digital audio tape (DAT)
TKZ09-AA	5.0-Gbyte 8-mm tape
RRD42-FA	600-Mbyte compact disc drive

Expansion Boxes—(SZ03, SZ12) AND STORAGEWORKS PEDESTAL EXPANSION UNIT (BA350-KA)

Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations and SZ12 expansion boxes supported.

TURBOchannel Extender (TcE) Expansion Box

See DECstation 5000 Model 240 Step 4a.

Step 4c—Workstand

H9855-AA	Horizontal workstand. Holds one DECstation 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Multi-Screen TURBOchannel Graphics Options (Factory/Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 13.

- Add graphics card for each additional monitor provided there are free TURBOchannel slots. Three monitors are supported per system.
- Maximum of three HX or TX options cards are supported per system
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cable included with each graphics option. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (BC09M-10) for each monitor.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitor	Hz
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 x 1024, 72 HZ	1	19-inch M VR319-DA/D4 19-inch C VRC21-HA/H4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 x 1024, 72 Hz	1		

Step 6—TURBOchannel Multimedia Options (Factory/Field installed)

DECvideo/PIP (PICTURE-IN-PICTURE)—Does not require TURBOchannel slot

- Option card for TX 24-plane color frame buffer attaches to TX TURBOchannel graphic card.
- Provides live NTSC, PAL, or SECAM full-motion "video in a window."
- Includes Xmedia Tools Runtime kit license.

AV10U-AA/DA DECvideo/Picture-in-Picture option card for TX graphic option

DECaudio—Require one TURBOchannel slot

- Audio/signal processing TURBOchannel card
- Provides telephone-grade audio in and out capabilities; hardware ready to support telephony in U.S. and Canada, CD-quality audio and ISDN at V2 of the Xmedia tools software.
- Includes Xmedia Tools Runtime kit license

AV01B-AA/DA DECaudio TURBOchannel card and distribution box

Step 7—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot.

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFTA-FA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)
DSYT1-AB DEC WANcontroller 720 synchronous controller

Step 8—Networking Adapters and Miscellaneous Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (twisted pair)

DETPM-AA 10BaseT (twisted pair) Ethernet adapter
DECXM-AA ThinWire Ethernet station adapter

Step 8—Networking Adapters and Miscellaneous Cables *(continued)*

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

B NE4C-xx	Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 7, Networks, Communications, and Cables, for more information.

B C19J-1E	18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)
BC19J-03	3-foot (0.9-m) SCSI cable, large connector to large connector
BC19J-06	6-foot (1.8-m) SCSI cable, large connector to large connector
BC09D-03	3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06	6-foot (1.8-m) SCSI cable, small connector to large connector (included with each system)

Step 9—Optional Input Devices

Tablet can be used in place of the mouse. Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSXXX-AB	11- x 11-inch (28-x 28-cm) tablet with a two-button stylus and a four-button puck
VSX10-AA/A3	Combination LPFK and PFD package, 120/240 V
VSX20-AA/A3	LPFK package, 120/240 V
VSX30-AA/A3	PFD package, 120/240 V

Step 10—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 11—CPU Daughter Card Upgrade

CPU daughter card upgrades include required upgrade licenses (QL-VV1AB-TA for ULTRIX Workstation Software and QL-YT9AB-GA for DECnet-ULTRIX license)

KN02-DC	33-MHz CPU Upgrade for DECstation 5000 Models 120 and 125

Step 12—Software

ULTRIX V4.2a is required. An ULTRIX media and documentation kit is recommendedfor the first system on site. ULTRIX kits include documentation, ULTRIXsingle-user kit, DECwindows, and OSF/Motif software on tape or compact disc.

QA-VV1AA-H5	ULTRIX workstation media (TK50) and documentation kit
QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit

DEC C License is included with ULTRIX V4.3a; order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX media (TK50)
QA-YSJAA-GZ	DEC C for RISC ULTRIX documentation

Step 12—Software *(continued)*

DEC PHIGS Runtime License is included with PXG Base systems ordered with factory-installed PXG, PXG+ and PXGTurbo+ graphics options. Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime license; order separately. Order media and documentation separately.

QL -VW7AA-AA	DEC PHIGS Runtime license
QL-VW6AA-AA	DEC PHIGS Development license
QA-VW7AA-H5	DEC PHIGS Runtime media (TK50) and documentation kit
QA-VW6AA-H5	DEC PHIGS Development media (TK50) and documentation kit

The Personal Visualizer (TPV) License is included with a PXG Base systems ordered with factory-installed PXG, PXG+ AND PXGTurbo+ graphics options. Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include The Personal Visualizer (TPV) license; order separately. A Z-Buffer is recommended for all systems running TPV. Order media and documentation separately.

QL-GXZA8-AA	The Personal Visualizer (TPV) license
QA-GXZAA-H5	TPV media (TK50) and documentation kit
QA-GXZAA-GZ	TPV documentation only

X media Runtime (Multimedia Software)

Xmedia Runtime license included with DECvideo/PIP and DECaudio options. Media and documentation must be ordered separately.

QP-LBDAA-01	Xmedia Tools Runtime license (audio/video)
QB-MB5AA-AA	Xmedia Tools Runtime license (audio/video) and software (TK50)
QA-MB4AA-H5	Xmedia tools for RISC ULTRIX (TK50)
QB-XUVAA-AA	Xmedia tools full developer's kit (CD-ROM)
QB-XUWAA-AA	Xmedia tools full developer's kit (TK50 and CD-ROM)

The following server kit is required only if serving VAX systems

QA-YL5AA-H5	ULTRIX workstation server media (TK50) and documentation kit
QA-YL5AA-H8	ULTRIX workstation server media (CD-ROM) and documentation kit
QA-YL5AA-HM	ULTRIX workstation server media (magtape) and documentation kit

DECnet ULTRIX License—must be purchased separately

QL-YT9AA-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6AA-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	ULTRIX (RISC) encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

Step 12—Software *(continued)*

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

Multiuser Upgrade Licenses

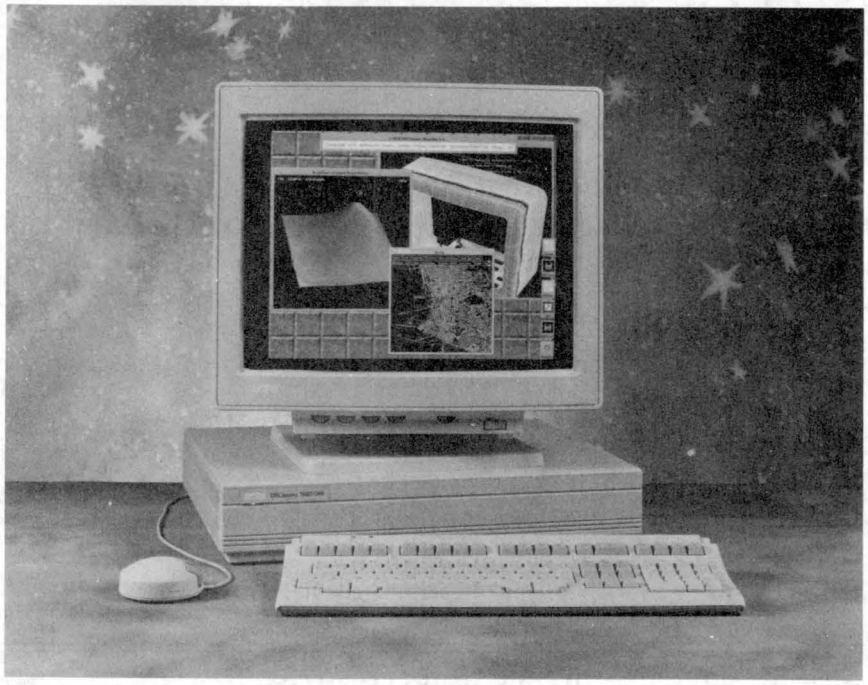
A 2-user license is included with all systems. To increase the maximum number of users, select the appropriate license upgrades below.

QL-VV1A8-B5	3-to 8-user upgrade license
QL-VV1A8-B6	9-to 16-user upgrade license
QL-VV1A8-BS	17-to 32-user upgrade license
QL-VV1A8-BT	33-to 64-user upgrade license
QL-VV1A8-B9	65-to unlimited-user upgrade license

Step 13—Power Cords and Keyboards

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord and U.S. keyboard. Select country specific power cord and keyboard for **all** systems ordered in Europe.

Power Cord	Keyboard	Country	Language
INCLUDED	**LK401-AA**	**U.S.**	English
BN19C-2E	**LK401-AG**	**Austria**	German/Austrian
BN19K-2E	**LK401-AB**	**Belgium**	Flemish
BN19K-2E	**LK401-AD**	**Denmark**	Danish
BN19C-2E	**LK401-AF**	**Finland**	Suomi
BN19C-2E	**LK401-AP**	**France**	French
BN19C-2E	**LK401-AG**	**German**	German
BN19C-2E	**LK401-AH**	**Holland**	Dutch
BN19U-2E	**LK401-AT**	**Israel**	Hebrew
BN19Z-2E	**LK401-AI**	**Italy**	Italian
BN19C-2E	**LK401-AN**	**Norway**	Norwegian
BN19C-2E	**LK401-AV**	**Portugal**	Portuguese
BN19C-2E	**LK401-AS**	**Spain**	Spanish
BN19C-2E	**LK401-AM**	**Sweden**	Swedish
BN19E-2E	**LK401-AK**	**Switzerland**	French
BN19E-2E	**LK401-AL**	**Switzerland**	German
BN19A-2E	**LK401-AA**	**U.K./Ireland**	English
BN19H-2E	**LK401-AA**	**Australia/New Zealand**	English
BN19P-1K	**LK401-AA**	**U.S./Canada**	English
BN19P-1K	**LK401-AC**	**Canada**	French



DECstation 5000 Model 240 Workstations

Product Description

The DECstation 5000 Model 240 RISC/ULTRIX workstation incorporates a CPU daughter card design similar to the DECstation 5000 Model 100 series. NFS performance is increased by up to 300 percent with the addition of a Presoserve option, and DMA I/O controllers substantially improve on-board SCSI and Ethernet performance.

Four graphics options are available HX, TX, PXG+ and PXGTurbo+.

- The HX (Smart Frame Buffer) is a single-width 2D graphics option for color graphics that do not require extensive 3D object manipulation, such as 2D (ECAD, GIS, 2D mechanical design and drafting) and simple 3D applications, such as AutoCAD.
- TX True Color Frame Buffer provides affordable 24-plane color with an optional "video-in-a-window" option card. It is targeted at applications such as dsktop publishing or imaging, which require true color but no graphic acceleration.
- PXG+ is an 8- or 24-plane 3D graphics option with an 8- or 24-plane double buffer. PXG+ supports applications doing simpler 3D design, modeling, and rendering using wireframes and simple 3D solids cost-effectively. AZ-Buffer is standard on the 24-plane option.
- PXGTubro+ is a 96-plane, 3D graphics subsystem designed for customers who need both maximum performance and functionality for applications in advanced 3D solids, animation, and rendering.

All graphics options are supported on 19-inch Sony monitors with 1280 x 1024 resolution, operating at 72 Hz.

The TURBOchannel Extender (TcE) enclosure is a peripheral box designed to contain a TURBOchannel Extender and up to two half-height internal hard disk drives and one half-height removable device. The TURBOchannel Extender allows the use of a dual- or triple-width TURBOchannel card without restricting the use of the two remaining TURBOchannel slots.

Step 1—Systems

Select system.

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord and U.S. keyboard. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Options ordered will be factory installed unless specified as **spares.**

DECstation 5000 Model 240 Systems include

- Base module with 40-MHz CPU daughter card
- TURBOchannel I/O interconnect—3 slots total
- Memory 16 Mbyte (1-Mbit DRAM) or 32 Mbytes (4-Mbit DRAM)
- Thick wire Ethernetconnector on base system module
- Synchronous SCSI controller on base system module
- Three-button mouse
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 1.8-meter (6-foot) power cord (systems order in Americas and Asia Pacific Area only)
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- ULTRIX Workstation Software, 2-user base license, DEC C and OSF/Motif
- English-language user documentation

NOTE: Systems ordered with factory-installed RZxx variant (-FM) include ULTRIX factory-installed software (FIS).

Order Number	Operating System	Memory	Monitor	Graphics	Available TURBO-channel Slots
Base Systems—require graphics option and monitor					
PM390-AY/AZ	240/40 MHz	16 Mbyte[1]	Required	Required	Three
PM390-CY/CZ	240/40 MHz	32 Mbyte[2]	Required	Required	Three

[1] 1-Mbit DRAM memory may be added in 8 Mbyte increments (MS02L-AB **only**)

[2] 4-Mbit DRAM memory may be added in 32 Mbyte increments (MS02-CA **only**)

Step 2—Memory

- Systems support fifteen memory options
- Additional memory may be added to 16 Mbyte systems in 8 Mbyte (1 Mbit DRAM) increments **only**
- Additional memory may be added to 32 Mbyte systems in 32 Mbyte (4-Mbit DRAM) increments only

MS02L-AB 8 Mbyte ECC (1-Mbit DRAM) memory (maximum 120 Mbyte)

MS02-CA 32 Mbyte ECC (4-Mbit DRAM) memory (maximum 480 Mbyte)

Prestoserve Option

- Prestoserve option **must be** place in 15th memory slot (slot number 14). Prestoserve reduces 120 Mbyte maximum memory to 112 Mbytes, and 480 Mbyte maximum memory to 448 Mbyte.

DJ-523PS-AA Includes 1 Mbyte cache Ram module and software license

Step 3—TURBOchannel Graphics Options and Monitors

- Base systems require a graphics option and monitor
- PXG, PXG+ and PXGTurbo+ graphics options ordered with Base systems include DEC PHIGS Runtime license. A Z-Buffer is recommended for 3D systems.
- Graphics options include 10-foot (3-meter) video cable. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (BC09M-10).
- TX frame buffer supports an optional DECvideo/Picture-in-Picture (PIP) option card; see TURBOchannel Multimedia options.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 x 1024, 72 Hz	1	19-inch M VR319-DA/D4 19-inch C VRC21-HA/H4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 x 1024, 72 Hz	1		
PMAGB-DA/DB	PXG+	8-plane 3D, low-to mid-range 1280 x 1024, 72 Hz	2		
PMAGB-EA/EB	PXG+	24-plane 3D, Z-Buffer, mid-range 1280 x 1024, 72 Hz	2		
PMAGB-FA/FB	PXG Turbo+	96-plane 3D, high performance 1280 x 1024,72 Hz	3		
PMAGB-DC/DD	PXG+	8-plane 3D, low-to mid-range 1280 x 1024, 66 Hz	2	19-inch C VRT19-HA/H4 19-inch C VR320-CA/C4	66/72 66/72
PMAGB-EC/ED	PXG+	24-plane 3D, Z-Buffer, mid-range 1280 x 1024, 66 Hz	2		
PMAG-GB		8-to 24-plane upgrade Requires Digital Services installation	0		
PMAG-HA		24-bit Z-Buffer option for PXG+ and PXGTurbo+ systems	0		

Step 4—Storage

- Internal storage is not supported in the DECstation 5000 Model 240.
- Integrated SCSI controller supports up to six external SCSI devices (maximum of three SZ12 expansion boxes).
- Select SCSI TURBOchannel option (PMAZ-AA) if more are required

SCSI TURBOchannel Option Card

PMAZ-AA/AB SCSI TURBOchannel option card

Single Drive Expansion Boxes

Each SZ12, TLZ06, TKZ09, and RRD42 expansion device includes a SCSI cable and 120 V power cord. Order country specific power cord for 240 V use.

TLZ06-FA 4.0 Gbyte 4-mm digital audio top (DAT)
TKZ09-BA 5.0 Gbyte 8-mm tape (requires BC09D-xx SCSI cable
RRD-42-FA 600 Mbyte compact disk drive
TSZ07-CA 40 Mbyte/140, 1600/6250 b/inch 9-track tape . Requires U.S./Canada country kit (TSZK7-AA)
RW100-AA 19 Gbyte StorageServer 100 Deskside Base Option (TK50)
RW100-BA 19 Gbyte StorageServer 100 Deskside Base Option (CD-ROM)
RW100-CA 19 Gbyte StorageServer 100 Deskside Base Option

SZ12 Expansion Boxes and StorageWorks Pedestal Expansion Unit (BA350)

Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations and SZ12 expansion boxes supported.

Step 4—Storage *(continued)*

TURBOchannel Extender (TcE) Expansion Box

TURBOchannel Extender (TcE) box supports TURBOchannel extender and three half-height devices; one half-height removable device and two half-height hard disk drives. TcE includes base connector card and cable, SCSI cable, and 120 V power cord.

- Select TcE expansion box when dual- or triple-width TURBOchannel cards are required
- TcE supports one TURBOchannel option card
- System supports maximum of three TcE boxes, one per TURBOchannel slot
- TcE can be daisychained with other external storage deives but must be last device in chain.
- 240 V devices require a country-specific power cord

PMTCE-AA TcE, no options, no disks

SCSI devices may be purchased separately and are customer installable. The following SCSI devices are suppported in TcE expansion box.

RZ25L-FL 535-Mbyte 3.5-inch half-height hard disk drive

TZK10-FL 525 Mbyte internal quarter-inch catridge (QIC) tape drive

RRD42-FL 600 Mbyte internal compact disk drive

Note: TcE allows for full use of all three TURBOchannel slots while incorporating dual- or triple-width cards. It does not permit the connection of more than three TURBOchannel option cards.

Step 4a—Workstand

H9855-AA Horizontal workstand. Holds one DECstation 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Multi-Screen TURBOchannel Graphics Options (Factory/Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 13.

- Add graphics card for each additional monitor provided there are free TURBOchannel slots. Three monitors are supported per system.
- Maximum of three HX or TX options cards are supported per system
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cable included with each graphics option. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (BC09M-10) for each monitor.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible monitor	Hz
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 x 1024, 72 Hz	1	19-inch M VR319-DA/D4 19-inch C VRT19-HA/H4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer, non-accelerated 1280 x 1024, 72 Hz	1	19-inch C VRT19-HA/H4 19-inch C VR320-DA/D4	72 72
PMAG-JA/JB	TX	24-plane true color frame buffer, non-accelerated 1280 x 1024, 72 Hz	1	19-inch C VRT19-HA/H4 19-inch C VR320-CA	66/72 66

Step 6—TURBOchannel Multimedia Options (Factory/Field installed)

DECvideo/PIP (Picture-in-Picture)—Does not require TURBOchannel slot

- Option card for TX 24-plane color frame buffer attaches to TX TURBOchannel graphic card.
- Provides live NTSC, PAL, or SECAM full-motion "video in a window."
- Includes Xmedia Tools Runtime kit license.

AV10U-AA/DA DECvideo/Picture-in-Picture option card for TX graphic option

Step 6—TURBOchannel Multimedia Options (Factory/Field installed) *(continued)*

DECaudio—Require one TURBOchannel slot

- Audio/signal processing TURBOchannel card
- Provides telephone-grade audio in and out capabilities; hardware ready to support telephony in U.S. and Canada, CD-quality audio and ISDN at V2 of the Xmedia tools software.
- Includes Xmedia Tools Runtime kit license

AV01B-AA/DA DECaudio TURBOchannel card and distribution box

Step 7—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot.

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFTA-FA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)
DSYT1-AB DEC WANcontroller 720 synchronous controller

Step 8—Networking Adapters and Miscellaneous Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (twisted pair)

DETPM-AA 10BaseT (twisted pair) Ethernet adapter
DECXM-AA ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

B NE4C-xx Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 7, *Networks, Communications, and Cables*, for more information.

B C19J-1E 18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)
BC19J-03 3-foot (0.9-m) SCSI cable, large connector to large connector
BC19J-06 6-foot (1.8-m) SCSI cable, large connector to large connector
BC09D-03 3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06 6-foot (1.8-m) SCSI cable, small connector to large connector (included with each system)

Step 9—Optional Input Devices

Tablet can be used in place of the mouse. Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSXXX-AB 11-x 11-inch (28-x 28-cm) tablet with a two-button stylus and a four-button puck
VSX10-AA/A3 Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3 LPFK package, 120 V/240 V
VSX30-AA/A3 PFD package, 120 V/240 V

Step 10—Printers

Refer to Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 11—CPU Daughter Card Upgrade

Upgrade kits are installed by Digital Services. R4000 CPU upgrades include upgrade license. Requires mandatory return of R3000CPU.

	From	To
PM4OU-AA	DECstation 5000 Models 20/25/33 with R3000	DECstation 5000 Model 50 with R4000 50 MHz
PM42U-AA	DECstation 5000 Models 125/133 with R3000	DECstation 5000 Model 150 with R4000 50 MHz
PM48U-AA	DECstation 5000 Models 240 with R3000	DECstation 5000 Model 260 with R4000 60 MHz

Step 12—Software

ULTRIX V4.3a or higher is required for 40 MHz systems. An ULTRIX media and documentation kit is recommendedfor the first system on site. ULTRIX kits include documentation, ULTRIXsingle-user kit, DECwindows, and OSF/Motif software on tape or compact disk.

QA-VV1AA-H5	ULTRIX workstation media (TK50) and documentation kit
QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit

DEC C License is included with ULTRIX V4.3a; order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX media (TK50)
QA-YSJAA-GZ	DEC C for RISC ULTRIX documentation

DEC PHIGS Runtime

DEC PHIGS Runtime License is included with factory-installed PXG+ and PXGTurbo+ graphics options. Field-installable PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime license; order separately. Order media and documentation separately.

QL -VW7AC-AA	DEC PHIGS Runtime license
QL-VW6AC-AA	DEC PHIGS Development license
QA-VW7AA-H5	DEC PHIGS Runtime media (TK50) and documentation kit
QA-VW6AA-H5	DEC PHIGS Development media (TK50) and documentation kit

The Personal Visualizer (TPV)

The Personal Visualizer License is included with factory-installed PXG+ AND PXGTurbo+ graphics options. Field-installable PXG+ and PXGTurbo+ graphics options do not include The Personal Visualizer (TPV) license; order separately. A Z-Buffer is recommended for all systems running TPV. Order media and documentation separately.

QL-GXZA8-AA	The Personal Visualizer (TPV) license
QA-GXZAA-H5	TPV media (TK50) and documentation kit
QA-GXZAA-GZ	TPV documentation only

Step 12—Software *(continued)*

Xmedia Runtime (Multimedia Software)

Xmedia Runtime license included with DECvideo/PIP and DECaudio options. Media and documentation must be ordered separately.

QP-LBDAA-01	Xmedia Tools Runtime license (audio/video)
QB-MB5AA-AA	Xmedia Tools Runtime license (audio/video) and software (TK50)
QA-MB4AA-H5	Xmedia tools for RISC ULTRIX (TK50)
QB-XUVAA-AA	Xmedia tools full developer's kit (CD-ROM)
QB-XUWAA-AA	Xmedia tools full developer's kit (TK50 and CD-ROM)

The following server kit is required only if serving VAX systems:

QA-YL5AA-H5	ULTRIX workstation server media (TK50) and documentation kit
QA-YL5AA-H8	ULTRIX workstation server media (CD-ROM) and documentation kit
QA-YL5AA-HM	ULTRIX workstation server media (magtape) and documentation kit

DECnet ULTRIX License—must be purchased separately

QL-YT9AC-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6AC-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	ULTRIX (RISC) encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

DEC SoftPC

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

Multiuser Upgrade Licenses

A 2-user license is included with all systems. To increase the maximum number of users, select the appropriate license upgrades below.

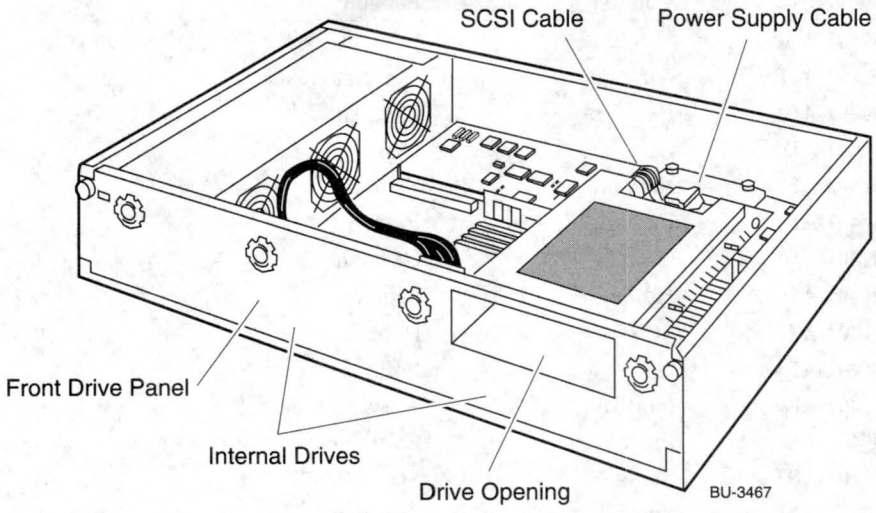
QL-VV1A8-B5	3-to 8-user upgrade license
QL-VV1A8-B6	9-to 16-user upgrade license
QL-VV1A8-BS	17-to 32-user upgrade license
QL-VV1A8-BT	33-to 64-user upgrade license
QL-VV1A8-B9	65-to unlimited-user upgrade license

Step 13—Power Cords and Keyboards

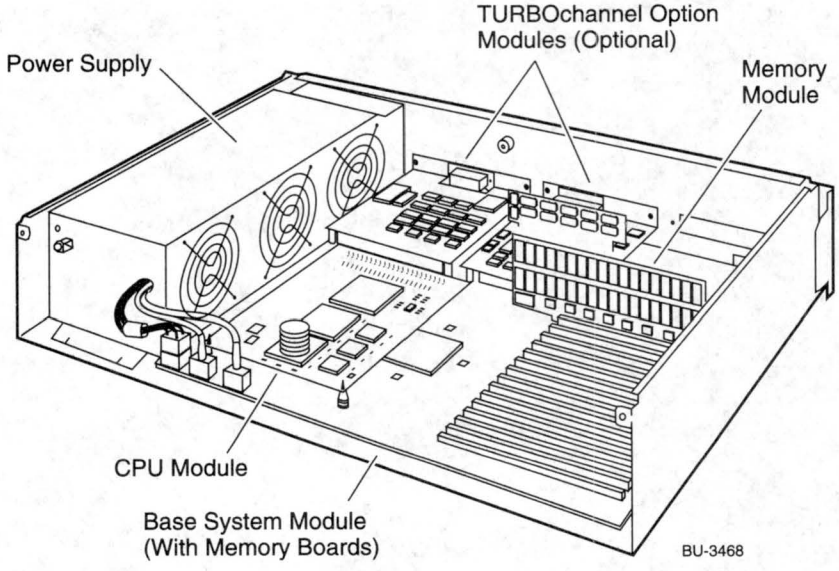
- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord and North American keyboard. Select country specific power cord and keyboard for **all** systems ordered in Europe.

Power Cord	Keyboard	Country	Language
INCLUDED	**LK401-AA**	U.S.	English
BN19C-2E	**LK401-AG**	Austria	German/Austrian
BN19K-2E	**LK401-AB**	Belgium	Flemish
BN19K-2E	**LK401-AD**	Denmark	Danish
BN19C-2E	**LK401-AF**	Finland	Suomi
BN19C-2E	**LK401-AP**	France	French
BN19C-2E	**LK401-AG**	German	German
BN19C-2E	**LK401-AH**	Holland	Dutch
BN19U-2E	**LK401-AT**	Israel	Hebrew
BN19Z-2E	**LK401-AI**	Italy	Italian
BN19C-2E	**LK401-AN**	Norway	Norwegian
BN19C-2E	**LK401-AV**	Portugal	Portuguese
BN19C-2E	**LK401-AS**	Spain	Spanish
BN19C-2E	**LK401-AM**	Sweden	Swedish
BN19E-2E	**LK401-AK**	Switzerland	French
BN19E-2E	**LK401-AL**	Switzerland	German
BN19A-2E	**LK401-AA**	U.K./Ireland	English
BN19H-2E	**LK401-AA**	Australia/New Zealand	English
BN19P-1K	**LK401-AA**	U.S./Canada	English
BN19P-1K	**LK401-AC**	Canada	French

DECstation 5000 Model 133 System



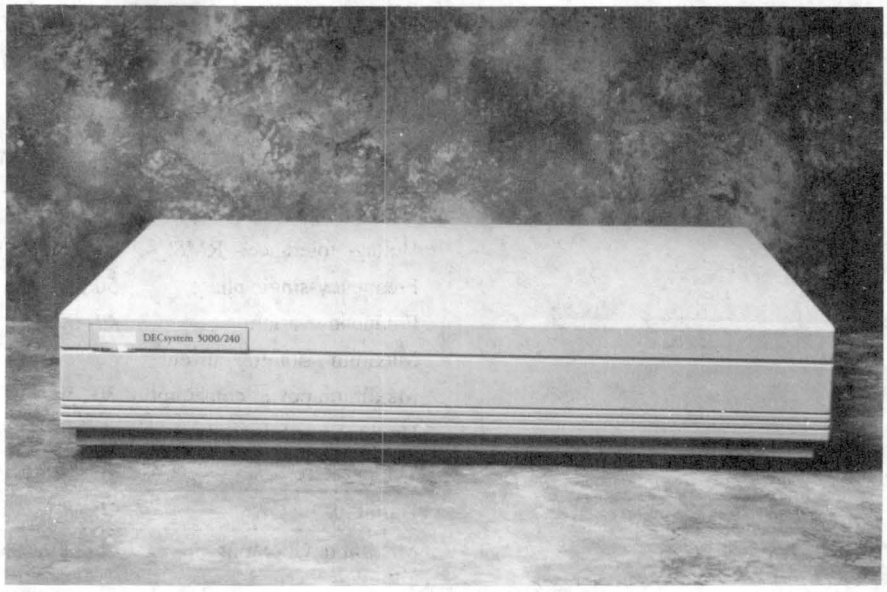
DECstation 5000 Model 240 System



DECstation 5000 System Specifications

Specifications

Physical Characteristics	Model 133	Model 240
Height	10.2 cm (4.0 in.)	9.2 cm (3.6 in.)
Width	51.0 cm (20.1 in.)	51.0 cm (20.1)
Depth	43.5 cm (17.1 in.)	43.5 cm (17.1 in.)
Weight	12.7 kg (28.0 lb)	12.7 kg (28.0 lb)
Power Requirements		
Line voltage	120/240 V	120/240 V
Voltage tolerance—RMS	88–132 V/194–264 V	88–132 V/194–264 V
Frequency-single phase	50/60 Hz	50/60 Hz
Frequency variations	47–69 Hz	47–69 Hz
Maximum running current		9.5 A
Maximum power consumption	302 W	359 W
Environmental		
Temperature	10°–40° C (50°–104° F)	10°–40° C (50°–104° F)
Humidity	10–90%	10–90%
Maximum Operating altitude	2.44 km (8,000 ft.)	2.44 km (8,000 ft.)



DECsystem 5000 Model 240 Servers

Product Description

The DECstation 5000 Model 240 multiuser RISC server provides across the spectrum performance in all areas of computation (I/O, integer and floating point, and network throughput) in a compact, low-cost desktop package.

NFS performance is increased by up to 300 percent with the addition of a Prestoserve option, and DMA I/O controllers substantially improve on-board SCSI and Ethernet performance. The Model 240 is able to take advantage of third-party TURBOchannel device portfolio IPI disk controllers, large frame buffers, and array processors.

Step 1—Systems

Select system.

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord. Select country specific power cord and keyboard for **all** systems ordered in Europe.
- Field installable options ship separately for customer installation.

DECsystem 5000 Model 240 Servers include

- Base module with 40-MHz CPU daughter card
- Three TURBOchannel I/O interconnect
- Memory 32 Mbytes (4-Mbit DRAM)
- Thick wire Ethernetconnector on base system module
- Synchronous SCSI controller on base system module
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 1.8-meter (6-foot) power cord (systems order in Americas and Asia Pacific Area only)
- ULTRIX base license
- ULTRIX 4-user license
- ULTRIX server license
- English-language user documentation

Order Number 120 V / 240 V	Model / CPU	Memory	Available TURBO-channel Slots
PM399-CY/CZ	240/40 MHz	32 Mbyte[1]	Three

[1] 4-Mbit DRAM memory may be added in 32 Mbyte increments (MS02-CA **only**)

Step 2—Memory

- Systems support fifteen memory options
- Additional memory may be added to 32-Mbyte systems in 32-Mbyte (4-Mbit DRAM) increments only

MS02-CA 32-Mbyte ECC (4-Mbit DRAM) memory (maximum 480 Mbyte)

Prestoserve Option

- Prestoserve option **must be** place in 15th memory slot (slot number 14). Prestoserve reduces 120-Mbyte maximum memory to 112 Mbytes, and 480-Mbyte maximum memory to 448 Mbytes.

DJ-523PS-AA Includes 1-Mbyte cache RAM module and software license

Step 3—Storage

- Internal storage is not supported in the DECstation 5000 Model 240
- Integrated SCSI controller supports up to seven external SCSI devices
- Select SCSI TURBOchannel option (PMAZ-AA) if more are required

SCSI TURBOchannel Option Card

PMAZ-AA/AB SCSI TURBOchannel option card

Single Drive Expansion Boxes

Each SZ12, TLZ06, TKZ09, and RRD42 expansion device includes a SCSI cable and 120 V power cord. Order country specific power cord for 240 V use.

TLZ06-FA 4.0 Gbyte 4-mm digital audio top (DAT)
TKZ09-BA 5.0 Gbyte 8-mm tape (requires BC09D-xx SCSI cable
RRD-42-FA 600 Mbyte compact disk drive
TSZ07-CA 40 Mbyte/140, 1600/6250 b/inch 9-track tape . Requires U.S./Canada country kit (TSZK7-AA)

SZ12 Expansion Boxes and StorageWorks Pedestal Expansion Unit (BA350)

Refer to Chapter 8, *Storage Devices*, for additional BA350 modular storage shelf configurations and SZ12 expansion boxes supported.

Step 3—Storage *(continued)*

Step 3a—TURBOchannel Extender (TcE) Expansion Box

TURBOchannel Extender (TcE) box supports TURBOchannel extender and three half-height devices; one half-height removable device and two half-height hard disk drives. TcE includes base connector card and cable, SCSI cable, and 120 V power cord.

- Select TcE expansion box when dual- or triple-width TURBOchannel cards are required
- TcE supports one TURBOchannel option card
- System supports maximum of three TcE boxes, one per TURBOchannel slot
- TcE can be daisychained with other external storage deives but must be last device in chain.
- 240 Vdevices require a country-specific power cord

PMTCE-AA TcE, no options, no disks

SCSI devices may be purchased separately and are customer installable. The following SCSI devices are suppported in TcE expansion box.

RZ25L-FL 535-Mbyte 3.5-inch half-height hard disk drive
TZK10-FL 525 Mbyte internal quarter-inch catridge (QIC) tape drive
RRD42-FL 600 Mbyte internal compact disk drive

Note: TcE allows for full use of all three TURBOchannel slots while incorporating dual- or triple-width cards. It does not permit the connection of more than three TURBOchannel option cards.

Step 3b—Workstand

H9855-AA Horizontal workstand. Holds one DECstation 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 4—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot.

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFTA-FA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)
CITCA-AA TURBOchannel-to-CI adapter, triple width, mounts on TURBOchannel extender
DSYT1-AB DEC WANcontroller 720 synchronous controller

Step 5—Networking Adapters and Miscellaneous Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (twisted pair).

DETPM-AA 10BaseT (twisted pair) Ethernet adapter
DECXM-AA ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Step 5—Networking Adapters and Miscellaneous Cables *(continued)*

Right-angle Ethernet cables are not supported.

BC16M-xx ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 7, Networks, Communications, and Cables, for more information.

B C19J-1E 18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)

BC19J-03 3-foot (0.9-m) SCSI cable, large connector to large connector

BC19J-06 6-foot (1.8-m) SCSI cable, large connector to large connector

BC09D-03 3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)

BC09D-06 6-foot (1.8-m) SCSI cable, small connector to large connector (included with each system)

Step 6—Console Terminal

A console device is necessary for a system to function; select video terminal (e.g., VT420) unless otherwise available. Order console cable separately.

Step 7—Printers

Select serial printers as required. Serial printers can be connected to an asynchronous line. A cable (e.g., BC16E-xx) must be ordered unless otherwise available. See Chapter 9, *Terminals, Scanners, Printers*, for ordering information.

Step 8—CPU Daughter Card Upgrade

Upgrade kits must be installed by Digital Services. R4000 CPU upgrades include upgrade license. Requires mandatory return of R3000CPU.

	From	To
PM4OU-AA	DECsystem 5000 Models 25/33 with R3000	DECsystem 5000 Model 50 with R4000 50 MHz
PM42U-AA	DECsystem 5000 Models 133 with R3000	DECsystem 5000 Model 150 with R4000 50 MHz
PM48U-AA	DECsystem 5000 Models 240 with R3000	DECsystem 5000 Model 260 with R4000 60 MHz

Step 9—Software

ULTRIX V4.3a or higher is required for 40 MHz systems. An ULTRIX media and documentation kit is recommendedfor the first system on site. ULTRIX kits include documentation, ULTRIXsingle-user kit, DECwindows, and OSF/Motif software on tape or compact disc.

Software Processor Code = S

QA-VV1AA-H5 ULTRIX workstation media (TK50) and documentation kit

QA-VV1AA-H8 ULTRIX workstation media (CD-ROM) and documentation kit

DEC C License is included with ULTRIX V4.3a; order media and documentation separately.

QA-YSJAA-H5 DEC C for RISC ULTRIX media (TK50)

QA-YSJAA-GZ DEC C for RISC ULTRIX documentation

DECnet ULTRIX License—must be purchased separately

QL-YT9AS-AA DECnet-ULTRIX/RISC license

QA-YT9AA-H5 DECnet-ULTRIX/RISC media (TK50)

QA-YT9AA-GZ DECnet-ULTRIX/RISC documentation

Step 9—Software *(continued)*

FORTRAN

QL-VV6AS-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	ULTRIX (RISC) encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

DEC SoftPC

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

Multiuser Upgrade Licenses

A 2-user license is included with all systems. To increase the maximum number of users, select the appropriate license upgrades below.

QL-VV1A8-B5	3-to 8-user upgrade license
QL-VV1A8-B6	9-to 16-user upgrade license
QL-VV1A8-BS	17-to 32-user upgrade license
QL-VV1A8-BT	33-to 64-user upgrade license
QL-VV1A8-B9	65-to unlimited-user upgrade license

Step 10—Power Cords

- Systems ordered in the Americas and Asia Pacific Area (APA) include 120 V power cord and North American keyboard. Select country specific power cord and keyboard for **all** systems ordered in Europe.

Power Cord	Country	Language
INCLUDED	U.S.	English
BN19C-2E	Austria	German/Austrian
BN19K-2E	Belgium	Flemish
BN19K-2E	Denmark	Danish
BN19C-2E	Finland	Suomi
BN19C-2E	France	French
BN19C-2E	German	German
BN19C-2E	Holland	Dutch
BN19U-2E	Israel	Hebrew
BN19Z-2E	Italy	Italian
BN19C-2E	Norway	Norwegian
BN19C-2E	Portugal	Portuguese
BN19C-2E	Spain	Spanish
BN19C-2E	Sweden	Swedish
BN19E-2E	Switzerland	French
BN19E-2E	Switzerland	German

Step 10—Power Cords *(continued)*

Power Cord	Country	Language
BN19A-2E	U.K./Ireland	English
BN19H-2E	Australia/New Zealand	English
BN19P-1K	U.S./Canada	English
BN19P-1K	Canada	French

Chapter 4
ADVANTAGE-UPGRADE Program

ADVANTAGE-UPGRADE Program

VAX, DECsystem, and Alpha AXP to Alpha AXP ADVANTAGE-UPGRADES

VAX to VAX ADVANTAGE-UPGRADES

ADVANTAGE-UPGRADE Program

Overview

Digital Equipment Corporation has taken the best attributes of its many upgrade programs and combined them into a single overall ADVANTAGE-UPGRADE Program. Whether upgrading from a VAX-to-VAX, VAX-to-Alpha AXP, MIPS-to-Alpha AXP, or Alpha AXP-to-Alpha AXP system, upgrades are now covered by a single upgrade program from Digital. By offering all upgrade selections under a uniform set of hardware and software business practices, Digital has simplified the process of selecting the proper and most cost-effective upgrade.

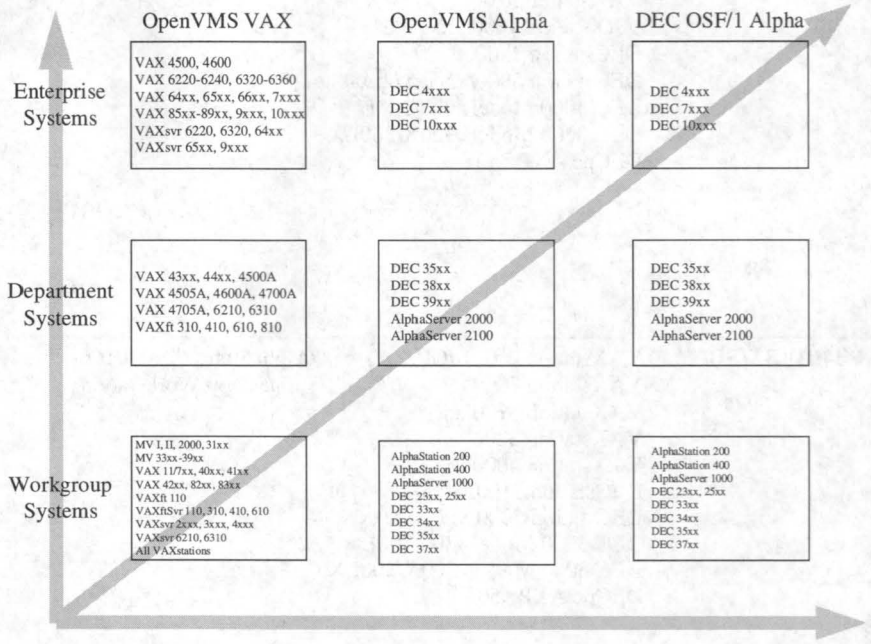
Digital's ADVANTAGE-UPGRADE Program helps to reduce cost of ownership especially when used in conjunction with Digital's aggressive leasing programs. Digital also offers migration assistance in moving business applications to the Alpha AXP platform.

Highlights

- Upgrades are easier to select, configure, and order.
- Generous trade-in value for the existing installed system; includes credit for operating system licenses.
- Single, uniform set of hardware and software business practices which apply to all types of system upgrades.
- Customer is allowed to keep existing installed system (or board) for 60 days to allow a smooth transition to the new system.

Software Business Practices

Digital protects customers' software investments. Standard Software License Trade-in policy applies to the ADVANTAGE-UPGRADE Program.



VAX and Alpha AXP System Classes

Note: No change to tiers for MIPS/RISC software licenses.

Standard Software License Trade-in Policy

Customers receive credit equal to 75% of price (after discount) of software license traded-in towards purchase of a new software license for the same product. Credit *is not to exceed* 75% of price (after discount) of new software license.

- 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 ADVANTAGE-UPGRADE system package price includes credit for the base Operating System license.
- For MIPS license upgrades, Standard Software License Trade-in Policy applies.

For more information, contact a local Software Business Practices Specialist, Digital Sales Representative, or Digital Authorized Distributor/Reseller.

AlphaStation 200 4/166 Workstation Upgrades

Order Number	From	To	Includes
PB4BU-AA/AB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/166 Desktop Workstation	166 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk ZLXp 2D 8-plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **DEC OSF/1 AXP** license NAS 150 license DEC Open3D license Multimedia license DECmigrate license **Note**: Mandatory return of CPU, system box, base memory, and base operating system license
PB4BU-BA/BB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/166 Desktop Workstation	166 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk ZLXp 2D 8-plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **OpenVMS AXP** license NAS 150 license DEC Open3D license DECmigrate license **Note:** Mandatory return of CPU, system box, base memory, and base operating system license
PB4BU-CA/CB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/166 Desktop Workstation	166 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk 600-Mbyte CD-ROM ZLXp 2D 8-plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **Windows NT** license **Note:** Mandatory return of CPU, system box, base memory, and base operating system license

AlphaStation 200 4/233 Workstation Upgrades

Order Number	From	To	Includes
PB4CU-AA/AB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/233 Desktop Workstation	233 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk ZLXp 2D 8-plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **DEC OSF/1 AXP** license NAS 150 license DEC Open3D license Multimedia license DECmigrate license **Note**: Mandatory return of CPU, system box, base memory, and base operating system license
PB4CU-BA/BB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/233 Desktop Workstation	233 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk ZLXp 2D 8-plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **OpenVMS AXP** license NAS 150 license DEC Open3D license DECmigrate license **Note:** Mandatory return of CPU, system box, base memory and base operating system license
PB4CU-CA/CB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000/xxx DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DECpc AXP 150	AlphaStation 200 4/233 Desktop Workstation	233 MHz CPU 32 Mbytes of parity memory 1.44-Mbyte floppy disk 600-Mbyte CD-ROM ZLXp 2D 8-plane graphics PCI Ethernet 16-bit audio, headphone, and microphone Mouse US keyboard/powercord (-xA only) English User Documentation (-xA only) **Windows NT** license **Note:** Mandatory return of CPU, system box, base memory, and base operating system license

AlphaStation 400 4/233 Workstation Upgrades

Order Number	From	To	Includes
PB5BU-AA/AB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DEC 3000 Models 400/600/500/500X DECpc AXP 150	AlphaStation 400 4/233 Mini Tower Workstation	233 MHz CPU, 512 KB cache 32 Mbytes of memory 600-Mbyte CD-ROM 1.44-Mbyte floppy disk ZLXp 2D 8 plane graphics 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **DEC OSF/1 AXP** license NAS 150 license DEC Open3D license Multimedia Services license DECmigrate license **Note**: Mandatory return of CPU, system box, base memory, and base operating system license
PB5BU-BA/BB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DEC 3000 Models 400/600/500/500X DECpc AXP 150	AlphaStation 400 4/233 Mini Tower Workstation	233 MHz CPU, 512 KB cache 32 Mbytes of memory 600-Mbyte CD-ROM 1.44-Mbyte floppy disk ZLXp 2D 8 plane graphics PCI Ethernet 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **OpenVMS AXP** license NAS 150 license Open3D license DECmigrate license **Note:** Mandatory return of CPU, system box, base memory, and base operating system license
PB5BU-CA/CB	VAXstation I, II, II/GPX VAXstation 2000 VAXstation 3100/xx VAXstation 3200, 35xx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000/xx/1xx/2xx DEC 3000 Models 300/300L DEC 3000 Models 300X/300LX DEC 3000 Models 400/600/500/500X DECpc AXP 150	AlphaStation 400 4/233 Mini Tower Workstation	233 MHz CPU, 512 KB cache 32 Mbytes of memory 600-Mbyte CD-ROM 1.44-Mbyte floppy disk ZLXp 2D 8 plane graphics PCI Ethernet 16-bit audio, headphone, and microphone Mouse US keyboard/power cord (-xA only) English User Documentation (-xA only) **Windows NT** license **Note:** Mandatory return of CPU, system box, base memory, and base operating system license

DEC 3000 Model 300X/300LX AXP Workstation Upgrades

Order Number	From	To	Includes
PE32U-BA/BB	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300X AXP Workstation	32 Mbytes of memory Hardware bracket kit 1.05-Gbyte, 3.5-inch SCSI disk drive Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter 21-inch monitor, US keyboard, mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-NA/NB	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300X AXP Workstation	32 Mbytes of memory Hardware bracket kit 1.05-Gbyte, 3.5-inch SCSI disk drive Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter 21-inch monitor, US keyboard, mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-DA	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300X AXP Workstation	32 Mbytes of memory Hardware bracket kit Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter US keyboard and mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-RA	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300X AXP Workstation	32 Mbytes of memory Hardware bracket kit Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter US keyboard and mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory

Note: xA = 120/240 V, xB = 240 V Southern Hemisphere

DEC 3000 Model 300X/300LX AXP Workstation Upgrades (*continued*)

Order Number	From	To	Includes
PE32U-AA	DEC 3000 Models 300L*, 300 AXP	DEC 3000 Model 300X AXP Workstation	175 MHz CPU daughter card **Note:** Mandatory return of old CPU card
PE32U-CA/CB	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300LX AXP Workstation	32 Mbytes of memory Hardware bracket kit 535-Mbyte, 3.5-inch SCSI disk drive Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter 17-inch color monitor, US keyboard, mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-PA/PB	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300LX AXP Workstation	32 Mbytes of memory Hardware bracket kit 535-Mbyte, 3.5-inch SCSI disk drive Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter 17-inch color monitor, US keyboard, mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-EA	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300LX AXP Workstation	32 Mbytes of memory Hardware bracket kit Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter US keyboard and mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE32U-SA	VAXstation 100, 520 VAXstation I, II VAXstation II/GPX VAXstation 2000, 3xxx VAXstation 4000 VLC VAXstation 4000 Models 60, 90, 90A DECstation 2100, 3100 DECstation 5000 Models 20, 25, 33, 50 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260	DEC 3000 Model 300LX AXP Workstation	32 Mbytes of memory Hardware bracket kit Two TURBOchannel slots Integral high-resolution graphics 10BaseT twisted pair Ethernet Ethernet adapter US keyboard and mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory

* No TURBOchannel slots or high resolution graphics for 300L upgrades.
Note: xA = 120/240 V, xB = 240 V Southern Hemisphere

DEC 3000 Model 600 AXP Workstation Upgrades

Order Number	From	To	Includes
PE42U-AB*	VAXstation 4000 Model 60 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Model 200	DEC 3000 Model 600 AXP Workstation	32 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license **Note:** Mandatory return of CPU, system box, and base memory
PE42U-BB*	VAXstation 4000 Model 60 DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Model 200	DEC 3000 Model 600 AXP Workstation	32 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license **Note:** Mandatory return of CPU, system box, and base memory
PE42U-AC*	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260	DEC 3000 Model 600 AXP Workstation	32 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license **Note:** Mandatory return of CPU, system box, and base memory
PE42U-BC*	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260	DEC 3000 Model 600 AXP Workstation	32 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license **Note:** Mandatory return of CPU, system box, and base memory

* Requires graphics controller. See DEC 3000 Models 600/700 AXP Workstation ordering information for details.

DEC 3000 Model 600 AXP Workstation Upgrades *(continued)*

Order Number	From	To	Includes
PE42U-AA†	DEC 3000 Model 400 AXP	DEC 3000 Model 600 AXP Workstation	**DEC OSF/1 AXP** two-user base license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license MME Runtime license DECspin Audio license **Note:** Requires field service installation; Mandatory return of CPU module
PE42U-BA†	DEC 3000 Model 400 AXP	DEC 3000 Model 600 AXP Workstation	**OpenVMS AXP** base license, one-user license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license **Note:** Requires field service installation; Mandatory return of CPU module

† For system documentation order the following:

EK-SNDPL-OG.B01	DEC 3000 Model 600/600S/700 AXP Owner's Guide
EK-SNDPL-OP.B01	DEC 3000 Model 600/600S/700 AXP Options Guide
EK-FLSPC-SV.A01	DEC 300 Model 600/600S/800/800S Service Information

DEC 3000 Model 700 AXP Workstation Upgrades

Order Number	From	To	Includes
PE44U-CA*	VAXstation 4000 Models 60, 90, 90A DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260 DEC 3000 Model 400 AXP	DEC 3000 Model 700 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers 1.05 -Gbyte, 3.5-inch SCSI disk drive ZLX-E1 graphics accelerator 600-Mbyte CD-ROM Thick wire/twisted pair Ethernet 21-inch color monitor (Northern Hemisphere) US keyboard and mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory
PE44U-CB*	VAXstation 4000 Models 60, 90, 90A DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260 DEC 3000 Model 400 AXP	DEC 3000 Model 700 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers 1.05 -Gbyte, 3.5-inch SCSI disk drive ZLX-E1 graphics accelerator 600-Mbyte CD-ROM Thick wire/twisted pair Ethernet 21-inch color monitor (Northern Hemisphere) US keyboard and mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory

* Requires graphics controller. See DEC 3000 Models 600/700 AXP Workstation ordering information for details.

DEC 3000 Model 700 AXP Workstation Upgrades *(continued)*

Order Number	From	To	Includes
PE44U-DA*	VAXstation 4000 Models 60, 90, 90A DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260 DEC 3000 Model 400 AXP	DEC 3000 Model 700 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory
PE44U-DB*	VAXstation 4000 Models 60, 90, 90A DECstation 5000 Models 120, 125, 133, 150 DECstation 5000 Models 200, 240, 260 DEC 3000 Model 400 AXP	DEC 3000 Model 700 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **OpenVMS AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory
PE44U-AA†	DEC 3000 Model 600 AXP	DEC 3000 Model 700 AXP Workstation	**DEC OSF/1 AXP** two-user base license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license MME Runtime license DECspin Audio license **Note:** Requires field service installation; Mandatory return of CPU module
PE44U-BA†	DEC 3000 Model 600 AXP	DEC 3000 Model 700 AXP Workstation	**OpenVMS AXP** base license, one-user license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license **Note:** Requires field service installation; Mandatory return of CPU module

*Requires graphics controller. See DEC 3000 Models 600/700 AXP Workstations ordering information for details.

†For system documentation order the following:

EK-SNDPL-OG.B01	DEC 3000 Model 600/600S/700 AXP Owner's Guide
EK-SNDPL-OP.B01	DEC 3000 Model 600/600S/700 AXP Options Guide
EK-FLSPC-AD	DEC 3000 Model 700/900 AXP Service/Upgrade Information Addendum

DEC 3000 Model 900 AXP Workstation Upgrades

Order Number	From	To	Includes
PE54U-CA	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260 DEC 3000 Models 500, 500X AXP	DEC 3000 Model 900 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers 2.1-Gbyte, 3.5-inch SCSI disk drive ZLX-E1 graphics accelerator 600-Mbyte CD-ROM Thick wire/twisted pair Ethernet 21-inch color monitor (Northern Hemisphere) US keyboard and mouse **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory

DEC 3000 Model 900 AXP Workstation Upgrades *(continued)*

Order Number	From	To	Includes
PE54U-CB	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260 DEC 3000 Models 500, 500X AXP	DEC 3000 Model 900 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers 2.1-Gbyte, 3.5-inch SCSI disk drive ZLX-E1 graphics accelerator 600-Mbyte CD-ROM Thick wire/twisted pair Ethernet 21-inch color monitor (Northern Hemisphere) US keyboard and mouse **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU, system box, base and base memory
PE54U-DA*	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260 DEC 3000 Models 500, 500X AXP	DEC 3000 Model 900 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **DEC OSF/1 AXP** two-user base license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license MME Runtime license DECspin Audio license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory
PE54U-DB*	VAXstation 4000 Models 90, 90A DECstation 5000 Models 240, 260 DEC 3000 Models 500, 500X AXP	DEC 3000 Model 900 AXP Workstation	64 Mbytes of memory Hardware bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **OpenVMS AXP** base license, one-user license NAS 250 license DEC Open3D AXP license DEC PHIGS Runtime license DECmigrate license **Note:** Mandatory return of CPU board, system box, and base memory
PE54U-AA†	DEC 3000 Model 800 AXP	DEC 3000 Model 900 AXP Workstation	**DEC OSF/1 AXP** two-user base license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license MME Runtime license DECspin Audio license **Note:** Requires field service installation; Mandatory return of CPU module
PE54U-BA†	DEC 3000 Model 800 AXP	DEC 3000 Model 900 AXP Workstation	**OpenVMS AXP** base license, one-user license DEC Open3D AXP license NAS 250 license DEC PHIGS Runtime license **Note:** Requires field service installation; Mandatory return of CPU module

* Requires graphics controller. See DEC 3000 Model 900 AXP Workstations ordering information for details.

† For system documentation order the following:

EK-FLMUL-OG.B01	DEC 3000 Model 800/800S/900 AXP Owner's Guide
EK-FLMUL-OP.B01	DEC 3000 Model 800/800S/900 AXP Options Guide
EK-FLSPC-AD	DEC 3000 Model 700/900 AXP Service/Upgrade Information Addendum

DEC 2000 Model 300 AXP Server Upgrades

Order Number	From	To	Includes
PB22U-BA	MicroVAX 3100 Models 30, 40, 80, 85, 90, 95 MicroVAX I, II, 2000 MicroVAX 3300, 3400 VAX 11/7xx VAX 4000 Models 100, 100A, 105A DECsystem 5000 Models 25, 50, 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500	DEC 2000 Model 300 AXP Server	64 Mbytes of memory Hardware upgrade bracket kit 2.88-Mbyte, 3.5-inch floppy disk drive SCSI/EISA Option Ethernet/EISA Option Three-button mouse **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of CPU board, system box, and base memory
PB22U-CA	MicroVAX 3100 Models 30, 40, 80, 85, 90, 95 MicroVAX I, II, 2000 MicroVAX 3300, 3400 VAX 11/7xx VAX 4000 Models 100, 100A, 105A DECsystem 5000 Models 25, 50, 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500	DEC 2000 Model 300 AXP Server	64 Mbytes of memory Hardware upgrade bracket kit 2.88-Mbyte, 3.5-inch floppy disk drive SCSI/EISA Option Ethernet/EISA Option Three-button mouse **OpenVMS AXP** base license **Note:** Mandatory return of CPU board, system box, and base memory

DEC 2000 Model 500 AXP Server Upgrades

Order Number	From	To	Includes
PB30U-BA/BB	MicroVAX 3100 Models 30, 40, 80, 85 MicroVAX 3100 Models 90, 95 MicroVAX 3300,3400, I, II, 2000 VAX 11/7xx VAX 4000 Models 100, 100A VAX 82xx, 83xx DECsystem 5000 Models 25, 50, 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500	DEC 2000 Model 500 AXP Server	64 Mbytes of memory 2.1-Gbyte, 3.5-inch SCSI disk 600-Mbyte CD-ROM 2.88-Mbyte, 3.5-inch floppy disk SCSI/EISA Option Ethernet/EISA Option Three-button mouse **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of CPU board, system box, and base memory
PB30U-AA/AB	MicroVAX 3100 Models 30, 40, 80, 85 MicroVAX 3100 Models 90, 95 MicroVAX 3300,3400, I, II, 2000 VAX 11/7xx VAX 4000 Models 100, 100A VAX 82xx, 83xx DECsystem 5000 Models 25, 50, 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500	DEC 2000 Model 500 AXP Server	64 Mbytes of memory 2.1-Gbyte, 3.5-inch SCSI disk 600-Mbyte CD-ROM 2.88-Mbyte, 3.5-inch floppy disk SCSI/EISA Option Ethernet/EISA Option Three-button mouse **OpenVMS AXP** base license **Note:** Mandatory return of CPU board, system box, and base memory

DEC 2000 Model 500 AXP Server Upgrades *(continued)*

Order Number	From	To	Includes
PB30U-CA/CB	MicroVAX 3100 Models 30, 40, 80, 85 MicroVAX 3100 Models 90, 95 MicroVAX 3300, 3400, I, II, 2000 VAX 11/7xx VAX 4000 VAX 82xx, 83xx Models 100, 100A DECsystem 5000 Models 25, 50, 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500	DEC 2000 Model 500 AXP Server	64 Mbytes of memory 2.1-Gbyte, 3.5-inch SCSI disk 600-Mbyte CD-ROM 2.88-Mbyte, 3.5-inch floppy disk SCSI/EISA Option Ethernet/EISA Option Three-button mouse **Windows NT** advanced server license **Note:** Mandatory return of CPU board, system box, and base memory

AlphaServer 1000 4/200 System Upgrades

Order Number	From	To	Includes
PB70U-FA/FB*	MicroVAX I, II, 2000 MicroVAX 3100/xx MicroVAX 3300, 3400 VAX 82xx, 83xx DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Models 300, 500 DEC 3000 Model 600S, 800S	AlphaServer 1000 4/200	200 MHz, 2-Mbyte cache CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 1.44-Mbyte floppy disk drive 600-Mbyte CD-ROM DE435-AA Ethernet card Mouse North American power cord (-xA only) Documentation **DEC OSF/1 AXP base license** NAS 200 license DECmigrate license **Note**: Mandatory return of CPU, system box, and base memory.
PB70U-MA/MB*	MicroVAX I, II, 2000 MicroVAX 3100/xx MicroVAX 3300, 3400 VAX 82xx, 83xx DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Models 300, 500 DEC 3000 Model 600S, 800S	AlphaServer 1000 4/200	200 MHz, 2-Mbyte cache CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 1.44-Mbyte floppy disk drive 600-Mbyte CD-ROM DE435-AA Ethernet card Mouse North American power cord (-xA only) Documentation **OpenVMS AXP base license** NAS 200 license DECmigrate license **Note:** Mandatory return of CPU, system box, and base memory. OpenVMS 6.1-1H2 required for integrated graphics support
PB70U-AA/AB*	MicroVAX I, II, 2000 MicroVAX 3100/xx MicroVAX 3300, 3400 VAX 82xx, 83xx DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Model 300, 500 DEC 3000 Model 600S, 800S	AlphaServer 1000 4/200	200 MHz, 2-Mbyte cache CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 1.44-Mbyte floppy disk drive 600-Mbyte CD-ROM DE435-AA Ethernet card US keyboard, mouse, and power cord (-xA only) Documentation **Windows NT Server license** and media **Note:** Mandatory return of CPU, system box, and base memory

* Refer to AlphaServer 1000 4/200 menu to order user documentation. SWXBA-BA, fixed media device carrier kit, required to migrate disks.

AlphaServer 2000 4/200 System Upgrades

Order Number	From	To	Includes
DA-241DU-B9	VAX 11/7xx VAX 41xx/A MicroVAX II MicroVAX 3100/xx MicroVAX 3200-3900 DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Model 500 DEC 3000 Model 400S, 600S	AlphaServer 2000 4/200	190 MHz CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse Documentation kit **DEC OSF/1 AXP** base license NAS Base Server 200 for DEC OSF/1 AXP license DECmigrate license **Note**: Mandatory return of CPU, system box, and base operating system license
DY-241DU-B9	VAX 11/7xx VAX 41xx/A MicroVAX II MicroVAX 3100/xx MicroVAX 3200-3900 DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Model 500 DEC 3000 Model 400S, 600S	AlphaServer 2000 4/200	190 MHz CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse Documentation kit **OpenVMS AXP** base license NAS Base Server 200 for OpenVMS AXP license DECmigrate license **Note:** Mandatory return of CPU, system box, and base operating system license
DN-241DU-B9	VAX 11/7xx VAX 41xx/A MicroVAX II MicroVAX 3100/xx MicroVAX 3200-3900 DECsystem 5000/xx DECsystem 5000/xxx DECsystem 3100, 5100 DECsystem 5400, 5500 DEC 2000 Model 500 DEC 3000 Model 400S, 600S	AlphaServer 2000 4/200	190 MHz CPU 64 Mbytes of memory 2.1-Gbyte SCSI disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1280 x 1024 video graphics adapter Keyboard, mouse Documentation kit **Windows NT** license, media, and documentation **Note:** Mandatory return of CPU, system box, and base operating system license

AlphaServer 2100 4/200 System Upgrades

Order Number	From	To	Includes
DA-251PU-F9	MicroVAX 3200-3900 VAX 4000 Models xxx, xxxA VAX 6000 Models 2xx-4xx VAX 82xx, 83xx DECsystem 5400, 5500, 5800 DEC 3000 Models 400S, 600S	AlphaServer 2100 4/200	190 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse **DEC OSF/1 AXP** base license NAS Base Server 200 for DEC OSF/1 AXP license DECmigrate license **Note**: Mandatory return of CPU, system box, and base operating system license

AlphaServer 2100 4/200 System Upgrades *(continued)*

DY-251PU-F9	MicroVAX 3200-3900 VAX 4000 Models xxx, xxxA VAX 6000 Models 2xx-4xx VAX 82xx, 83xx DECsystem 5400, 5500, 5800 DEC 3000 Models 400S, 600S	AlphaServer 2100 4/200	190 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse **OpenVMS AXP** base license NAS Base Server 200 for OpenVMS AXP license DECmigrate license **Note:** Mandatory return of CPU, system box, and base operating system license
DN-251PU-F9	MicroVAX 3200-3900 VAX 4000 Models xxx, xxxA VAX 6000 Models 2xx-4xx VAX 82xx, 83xx DECsystem 5400, 5500, 5800 DEC 3000 Models 400S, 600S	AlphaServer 2100 4/200	190 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse **Windows NT** license, media, and documentation **Note:** Mandatory return of CPU, system box, and base operating system license

AlphaServer 2100 4/275 System Upgrades

Order Number	From	To	Includes
DA-252PU-F9	VAX 9000 VAX 88xx, 86xx, 85xx VAX 65xx, 66xx VAX 42xx-47xx DECsystem 5900 DEC 3000 Models 500S, 600S DEC 3000 Model 800S DEC 4000 Models 610, 710	AlphaServer 2100 4/275	275 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse **DEC OSF/1 AXP** base license NAS Base Server 200 for DEC OSF/1 AXP license DECmigrate license **Note**: Mandatory return of CPU, system box, and base operating system license
DY-252PU-F9	VAX 9000 VAX 88xx, 86xx, 85xx VAX 65xx, 66xx VAX 42xx-47xx DECsystem 5900 DEC 3000 Models 500S, 600S DEC 3000 Model 800S DEC 4000 Models 610, 710	AlphaServer 2100 4/275	275 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1024 x 768 video graphics adapter Keyboard, mouse **OpenVMS AXP** base license NAS Base Server 200 for OpenVMS AXP license DECmigrate license **Note:** Mandatory return of CPU, system box, and base operating system license
DN-252PU-F9	VAX 9000 VAX 88xx, 86xx, 85xx VAX 65xx, 66xx VAX 42xx-47xx DECsystem 5900 DEC 3000 Models 500S, 600S DEC 3000 Model 800S DEC 4000 Models 610, 710	AlphaServer 2100 4/275	275 MHz CPU 128 Mbytes of memory 2.1-Gbyte disk drive 2.88-Mbyte floppy disk drive 600-Mbyte CD-ROM 1280 x 1024 video graphics adapter Keyboard, mouse **Windows NT** license, media, and documentation **Note:** Mandatory return of CPU, system box, and base operating system license

DEC 3000 Model 600S AXP Server Upgrades

Order Number	From	To	Includes
PE43U-AB	VAX 4000 Model 100, 100A MicroVAX 3100/xx DECsystem 5000 Models 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500, 5800	DEC 3000 Model 600S AXP Server	32 Mbytes of memory Hardware upgrade bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **DEC OSF/1 AXP** two-user base license DEC OSF/1 AXP server extension license **Note:** Mandatory return of CPU board, system box, and base memory
PE43U-BB	VAX 4000 Model 100, 100A MicroVAX 3100/xx DECsystem 5000 Models 133, 150 DECsystem 5000 Models 200, 240, 260 DECsystem 3100, 5100 DECsystem 5400, 5500, 5800	DEC 3000 Model 600S AXP Server	32 Mbytes of memory Hardware upgrade bracket kit Two Fast SCSI-2 controllers Thick wire/twisted pair Ethernet **OpenVMS AXP** base license DECnet/OSI end-system license **Note:** Mandatory return of CPU board, system box, and base memory
PE43U-AA†	DEC 3000 Model 400S AXP	DEC 3000 Model 600S AXP Server	**DEC OSF/1 AXP** two-user base license DEC OSF/1 AXP server extension license **Note:** Requires field service installation; Mandatory return of CPU module
PE43U-BA†	DEC 3000 Model 400S AXP	DEC 3000 Model 600S AXP Server	**OpenVMS AXP** base license DECnet/OSI end-system license **Note:** Requires field service installation; Mandatory return of CPU module

† For system documentation order the following:

EK-SNDPL-OG.B01	DEC 3000 Model 600/600S/700 AXP Owner's Guide
EK-SNDPL-OP.B01	DEC 3000 Model 600/600S/700 AXP Options Guide
EK-FLSPC-SV.A01	DEC 300 Model 600/600S/800/800S Service Information

DEC 4000 Model 700 AXP Distributed/Departmental Server Upgrades

Order Number	From	To	Includes
DA-59AU3-A9	DECsystem 5800, 5900	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) Fast SCSI I/O Prestoserve I/O performance enhancement option **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of DECsystem
DY-59AU3-A9	DECsystem 5800, 5900	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory 600-Mbyte CD-ROM (RRD43) Fast SCSI I/O **OpenVMS AXP** base license **Note:** Mandatory return of DECsystem
DA-42AU4-A9	MicroVAX 3500, 3600 MicroVAX 3800, 3900 VAX 4000 Models 200, 300 VAX 6000 Models 2xx, 3xx VAX 82xx, 83xx	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) Prestoserve I/O performance enhancement option **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of MicroVAX/VAX system
DY-42AU4-A9	MicroVAX 3500, 3600 MicroVAX 3800, 3900 VAX 4000 Models 200, 300 VAX 6000 Models 2xx, 3xx VAX 82xx, 83xx	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) **OpenVMS AXP** base license **Note:** Mandatory return of MicroVAX/VAX system

DEC 4000 Model 700 AXP Distributed/Departmental Server Upgrades *(continued)*

Order Number	From	To	Includes
DA-44AU3-A9	VAX 4000 Models 400, 500 VAX 4000 Models 500A, 505A	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) Prestoserve I/O performance enhancement option **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX 4000 system
DY-44AU3-A9	VAX 4000 Models 400, 500 VAX 4000 Models 500A, 505A	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) **OpenVMS AXP** base license **Note:** Mandatory return of VAX 4000 system
DA-46AU7-A9	VAX 4000 Models 600, 600A VAX 4000 Models 700A, 705A	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) Prestoserve I/O performance enhancement option **DEC OSF/1 AXP** two-user base license Note: Mandatory return of VAX 4000 system
DY-46AU7-A9	VAX 4000 Models 600, 600A VAX 4000 Models 700A, 705A	DEC 4000 Model 710 AXP Base Server	128 Mbytes of memory DSSI/SCSI I/O module 600-Mbyte CD-ROM (RRD43) **OpenVMS AXP** base license **Note:** Mandatory return of VAX 4000 system
430XR-CA	DEC 4000 Model 610 AXP	DEC 4000 Model 620 AXP Server	CPU module **DEC OSF/1 AXP** two-user base license DEC OSF/1 AXP SMP extension license
430XR-BA	DEC 4000 Model 610 AXP	DEC 4000 Model 620 AXP Server	CPU module **OpenVMS AXP** base license OpenVMS AXP SMP extension license
431XR-DA	DEC 4000 Model 610 AXP	DEC 4000 Model 710 AXP Server	CPU module **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of 6xx CPU module
431XR-AA	DEC 4000 Model 610 AXP	DEC 4000 Model 710 AXP Server	CPU module **OpenVMS AXP** base license **Note:** Mandatory return of 6xx CPU module
431XR-EA	DEC 4000 Model 620 AXP	DEC 4000 Model 720 AXP Server	Two CPU modules **DEC OSF/1 AXP** two-user base license DEC OSF/1 AXP SMP extension license **Note:** Mandatory return of 6xx CPU modules
431XR-BA	DEC 4000 Model 620 AXP	DEC 4000 Model 720 AXP Server	Two CPU modules **OpenVMS AXP** base license OpenVMS AXP SMP extension license **Note:** Mandatory return of 6xx CPU modules
431XR-FA	DEC 4000 Model 710 AXP	DEC 4000 Model 720 AXP Server	CPU module **DEC OSF/1 AXP** two-user base license DEC OSF/1 AXP SMP extension license
431XR-CA	DEC 4000 Model 710 AXP	DEC 4000 Model 720 AXP Server	CPU module **OpenVMS AXP** base license OpenVMS AXP SMP extension license

DEC 7000 Model 700 AXP Enterprise Server Upgrades

Order Number	From	To	Includes
7KAXA-DA/DB/DC	VAX 6000 Models 4xx, 5xx	DEC 7000 Model 710 AXP Base Server	128 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM DEMNA XMI Ethernet adapter **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX system
7KAXA-FA/FB/FC	VAX 6000 Models 4xx, 5xx	DEC 7000 Model 710 AXP Base Server	128 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM DEMNA XMI Ethernet adapter **OpenVMS AXP** base license **Note:** Mandatory return of VAX system
7KAXB-DA/DB/DC	VAX 6000 Models 6xx	DEC 7000 Model 710 AXP Base Server	128 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM DEMNA XMI Ethernet adapter **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX system
7KAXB-FA/FB/FC	VAX 6000 Models 6xx	DEC 7000 Model 710 AXP Base Server	128 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM (RRD43) DEMNA XMI Ethernet adapter **OpenVMS AXP** base license **Note:** Mandatory return of VAX system
7KAXD-DA/DB/DC	VAX 9000	DEC 7000 Model 710 AXP Server	CPU module 512 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM DEMNA XMI Ethernet adapter XMI CI controller **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX 9000
7KASA-DA/DB/DC	VAX 9000	DEC 7000 Model 710 AXP Server	CPU module 1 Gbyte of memory KZMSA disk controller DEMFA FDDI controller STORME plug-in unit storage subsystem Two 2.1-Gbyte SCSI disk drives RRD43 600-Mbyte CD-ROM **DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX 9000
7KBXA-FA/FB/FC	VAX 9000	DEC 7000 Model 720 AXP Server	Two CPU modules 512 Mbytes of memory KZMSA disk controller RRD43 600-Mbyte CD-ROM DEMNA XMI Ethernet adapter XMI CI controller **OpenVMS AXP** base license OpenVMS AXP SMP extension license **Note:** Mandatory return of VAX 9000
7KBSA-FA/FB/FC	VAX 9000	DEC 7000 Model 720 AXP Server	Two CPU modules 1 Gbyte of memory KZMSA disk controller DEMFA FDDI controller STORME plug-in unit storage subsystem Two 2.1-Gbyte SCSI disk drives RRD43 600-Mbyte CD-ROM **OpenVMS AXP** base license OpenVMS AXP SMP extension license **Note:** Mandatory return of VAX 9000

Note: xA = 208-V, xB = 416-V, xC = 202-V

DEC 7000 and 10000 AXP Symmetric Multiprocessing (SMP) Upgrades

Order Number	From	To	Includes
7KAVA-DC	VAX 7000 Model 610, 710 VAX 10000 Model 610 DEC 7000 Model 610	DEC 7000 Model 710 AXP Server	**DEC OSF/1 AXP** two-user base license **Note:** Mandatory return of VAX CPU module
7KAVA-FC	VAX 7000 Model 610, 710 VAX 10000 Model 610 DEC 7000 Model 610	DEC 7000 Model 710 AXP Server	**OpenVMS AXP** base license **Note:** Mandatory return of VAX CPU module
7KAVA-NC[1]	VAX 7000 Model 6xx/7xx VAX 10000 Model 6xx DEC 7000 Model 6xx SMP Systems	DEC 7000 Model 7xx AXP SMP System	CPU **DEC OSF/1 AXP** two-user base license Note: Mandatory return of VAX CPU modules
7KAVA-MC[2]	VAX 7000 Model 6xx/7xx VAX 10000 Model 6xx DEC 7000 Model 6xx SMP Systems	DEC 7000 Model 7xx AXP SMP System	CPU **OpenVMS AXP** base license **Note:** Mandatory return of VAX CPU modules
9HATA-ND	DEC 10000 Model 6xx	DEC 10000 Model 6xx	One CPU module **DEC OSF/1 AXP** two-user license DEC OSF/1 AXP SMP extension license
9HATA-MD	DEC 10000 Model 6xx	DEC 10000 Model 6xx	One CPU module **OpenVMS AXP** SMP extension license

[1] Use in conjunction with order number 7KAVA-DC to upgrade VAX 7000 Model 6xx SMP systems to DEC 7000 Model 7xx AXP SMP systems. For example, to upgrade from a VAX 7000 Model 640 to a DEC 7000 Model 740 AXP system, order: (1) 7KAVA-DC and (3) 7KAVA-NC.

[2] Use in conjunction with order number 7KAVA-FC to upgrade VAX 7000 Model 6xx SMP systems to DEC 7000 Model 7xx AXP SMP systems. For example, to upgrade from a VAX 7000 Model 640 to a DEC 7000 Model 740 AXP system, order: (1) 7KAVA-FC and (3) 7KAVA-MC.

VAXstation 4000 Upgrades

Upgrade kits must be installed by Digital Services.

Order Number	From	To	Includes
PV31U-D9	VAXstation 3100 with VRT16, VRT19, VR320, VR319 (66 Hz)	VAXstation 4000-VLC 1280 x 1024 (66 Hz)	CPU enclosure and power supply 8 Mbytes of memory 8-plane color/grayscale graphics board 2D graphics accelerator Keyboard and mouse 2.7-m (9-ft) color/monochrome video cable Bracket for one internal RZxxL disk Thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS VAX** base license NAS 250 license
PV31U-C9	VAXstation 3100 with VR320, VRT19 (72 Hz) VRM17, VR319, VRT16,	VAXstation 4000-VLC 1280 x 1024 (72 Hz)	CPU enclosure and power supply 8 Mbytes of memory 8-plane color/grayscale graphics board 2D graphics accelerator Keyboard and mouse 2.7-m (9-ft) color/monochrome video cable Bracket for one internal RZxxL disk Thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS VAX** base license NAS 250 license
PV61U-B9	VAXstation 3100 with VR297, VR299 (60 Hz)	VAXstation 4000 Model 60 2D LCG graphics (60 Hz)	VAXstation 4000 Model 60 CPU BA46 system enclosure and power supply 8 Mbytes of memory 2D LCG 8-plane color graphics board 2.7-m (9-ft) color/monochrome video cable Brackets for three internal SCSI devices (one removable media, two fixed disks) ThinWire/thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS VAX** base license NAS 250 license **Note:** Mandatory return of VAXstation 3100 CPU board and system enclosure
PV61U-A9	VAXstation 3100 with VRT16, VRT19, VR320 (66 Hz)	VAXstation 4000 Model 60 2D LCG graphics (66 Hz)	VAXstation 4000 Model 60 CPU BA46 system enclosure and power supply 8 Mbytes of memory 8-plane color graphics board 2.7-m (9-ft) color/monochrome video cable Brackets for three internal SCSI devices (one removable media, two fixed disks) ThinWire/thick wire Ethernet DEC-423 serial line EIA-232D serial line with modem control Synchronous SCSI controller **OpenVMS VAX** base license NAS 250 license **Note:** Mandatory return of VAXstation 3100 CPU board and system enclosure

VAXstation 4000 Upgrades *(continued)*

Order Number	From	To	Includes
PV71U-A9	VAXstation 3100 with VRT16, VRT19, VR320 (72 Hz)	VAXstation 4000 Model 90A LCSPX 2D graphics (72 Hz)	VAXstation Model 90A CPU System enclosure and power supply 16 Mbytes of memory 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 VAX** base license NAS 250 license **Note:** Mandatory return of VAXstation 3100 CPU board and system enclosure
PV71U-AF†	VAXstation 4000 Model 60 2D LCG graphics (66/72 Hz)	VAXstation 4000 Model 90A LCSPX 2D graphics (66/72 Hz)	VAXstation 4000 Model 90A 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 VAX base license NAS 250 license **Note:** Mandatory return of Model 60 CPU board and LCG graphics card

† VAXstation Model 90A systems require a minimum of 16 Mbytes of main memory; 8-Mbyte memory embedded on Model 60 system board cannot be transferred. See Model 90A memory configurations. 4-Mbyte and 16-Mbyte SIMMs from Model 60 may be transferred to Model 90A in sets of four ONLY (e.g., two MS44L-BA = 4 x 4-Mbyte SIMMs). Model 90A memory modules must be installed in sets of four matching value SIMMs.

MicroVAX 3100 Desktop Server Upgrades

Note: Non-return charge assessed if old system/CPU board is not returned to Digital.

Order Number	From	To	Includes
DV-31GU1-B9	MicroVAX II, 2000, 3100e, 3100	MicroVAX 3100 Model 40 Server	8 Mbytes of memory SCSI controller Ethernet adapter Four asynchronous lines **OpenVMS VAX** base license **Note:** RZ disk required
DV-31JUA-E9	MicroVAX II, 2000 MicroVAX 3100 Models 10, 20, 30 MicroVAX 3100 Models 10e, 20e	MicroVAX 3100 Model 85 Server	64 Mbytes of memory **OpenVMS** base license
DV-31JUA-EA	MicroVAX II, 2000 MicroVAX 3100 Models 10, 20, 30 MicroVAX 3100 Models 10e, 20e	MicroVAX 3100 Model 85 Server	64 Mbytes of memory 1.05-Gbyte SCSI disk drive 600-Mbyte CD-ROM **OpenVMS** base license NAS 200 license
31JXR-AA	MicroVAX 3100 Models 40, 80	MicroVAX 3100 Model 85 Server	CPU 64 Mbytes of memory **OpenVMS** base license
DV-31RU1-E9	MicroVAX II, 2000 MicroVAX 3100e, 3100 VAX 82xx/83xx	MicroVAX 3100 Model 95 Base Server	64 Mbytes of memory SCSI controller Ethernet adapter Four asynchronous lines US power cord Hardware Documentation kit **OpenVMS VAX** base license **Note:** RZ disk required
DV-31RUA-E9	MicroVAX II, 2000 MicroVAX 3100e, 3100 VAX 82xx/83xx	MicroVAX 3100 Model 95 ADVANTAGE-SERVER	64 Mbytes of memory SCSI controller Ethernet adapter Four asynchronous lines 1.05-Gbyte SCSI disk 600-Mbyte CD-ROM US power cord Hardware documentation kit **OpenVMS VAX** base license NAS 200 license
48GAX-C9	MicroVAX 3100 Model 40	MicroVAX 3100 Model 95 Server	16 Mbytes of memory **OpenVMS VAX** base license
48GAX-E9	MicroVAX 3100 Model 40	MicroVAX 3100 Model 95 Server	64 Mbytes of memory **OpenVMS VAX** base license
48HAX-C9	MicroVAX 3100 Model 80	MicroVAX 3100 Model 95 Server	16 Mbytes of memory **OpenVMS VAX** base license
48HAX-E9	MicroVAX 3100 Model 80	MicroVAX 3100 Model 95 Server	64 Mbytes of memory **OpenVMS VAX** base license
48XR-AA	MicroVAX 3100 Model 90	MicroVAX 3100 Model 95 Server	**OpenVMS VAX** base license

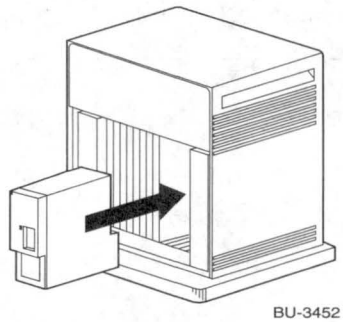
VAX 4000 Model 50 In-Cabinet Upgrades

This upgrade kit is for MicroVAX 3000 series and VAX 4000 Model 200 systems residing in BA213, BA212, BA215, BA211, BA430, or BA431 enclosures, running OpenVMS VAX Version 5.5-2 or 6.1 (6.0 is excluded). The kit mounts into the first four slots of a system backplane, replacing the CPU and memory.

Installed base system upgrades require the mandatory return of the CPU and memory modules.

Order Number	From	To	Includes
2T-V405A-Ax	MicroVAX 3000 Series VAX 4000 Model 200	VAX 4000 Model 50	16 Mbytes of memory Four DEC 423 asynchronous communication ports Two DSSI ports SCSI port ThinWire Ethernet port Q-bus connection to BA200 and BA430 series enclosure backplanes **OpenVMS** base license **Note:** Mandatory return of CPU and memory modules
2T-V405A-Bx	MicroVAX 3000 Series VAX 4000 Model 200	VAX 4000 Model 50	32 Mbytes of memory Four DEC 423 asynchronous communication ports Two DSSI ports SCSI port ThinWire Ethernet port Q-bus connection to BA200 and BA430 series enclosure backplanes **OpenVMS** base license **Note:** Mandatory return of CPU and memory modules
2T-V405A-Cx	MicroVAX 3000 Series VAX 4000 Model 200	VAX 4000 Model 50	64 Mbytes of memory Four DEC 423 asynchronous communication ports Two DSSI ports SCSI port ThinWire Ethernet port Q-bus connection to BA200 and BA430 series enclosure backplanes **OpenVMS** base license **Note:** Mandatory return of CPU and memory modules
2T-V405A-Dx	MicroVAX 3000 Series VAX 4000 Model 200	VAX 4000 Model 50	128 Mbytes of memory Four DEC 423 asynchronous communication ports Two DSSI ports SCSI port ThinWire Ethernet port Q-bus connection to BA200 and BA430 series enclosure backplanes **OpenVMS** base license **Note:** Mandatory return of CPU and memory modules

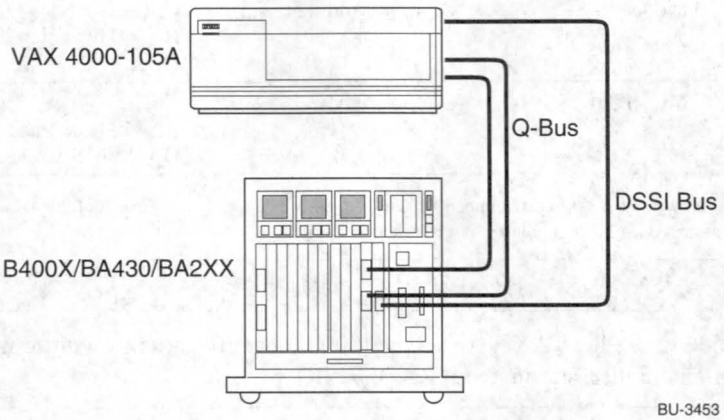
Note: x = user license; 1 = server; 2 = 5-user; 3 = 10-user; 4 = 20-user; 5 = 40-user; 6 = unlimited user



BU-3452

VAX 4000 Model 105A System Upgrades

Note: Q-bus extender upgrades must be installed by Digital Services. The existing BA2xx or BA4xx becomes a Q-bus storage expander box (see diagram below) to continue support of installed communications, storage devices, or third-party options.



Note: KFDDA-BA or KFDDA-AA disk controller required.

CPU Upgrade

Order Number	From	To	Includes
53XR-AA	VAX 4000 Models 100, 100A	VAX 4000 Model 105A	**OpenVMS VAX** base license

System Trade-in Upgrades

Order Number	From	To	Includes
DV-415V1-EA	MicroVAX I, II, 2000, 3100 MicroVAX 3300, 3400, 3500 MicroVAX 3600, 3700, 3800, 3900 VAX 4000 Model 200 VAX 11/780	VAX 4000 Model 105A Base Server	64 Mbytes of memory Dual DSSI controller **OpenVMS VAX** base license
DV-415V1-EB	MicroVAX I, II, 2000, 3100 MicroVAX 3300, 3400, 3500 MicroVAX 3600, 3700, 3800, 3900 VAX 4000 Model 200 VAX 11/780	VAX 4000 Model 105A ADVANTAGE-SERVER	64 Mbytes of memory Dual DSSI controller RF36 1.6-Gbyte DSSI disk **OpenVMS VAX** base license NAS 200 license DECwindows/Motif

Expansion Upgrades

Order Number	From	To	Includes
DV-415U1-EA	MicroVAX 3300, 3400, 3500 MicroVAX 3600, 3700, 3800, 3900 VAX 4000 Model 200	VAX 4000 Model 105A Base Server	64 Mbytes of memory Dual DSSI controller Q-bus expansion kit **OpenVMS VAX** base license
DV-415U1-EB	MicroVAX 3300, 3400, 3500 MicroVAX 3600, 3700, 3800, 3900 VAX 4000 Model 200	VAX 4000 Model 105A ADVANTAGE-SERVER	64 Mbytes of memory Dual DSSI controller RF36 1.6-Gbyte DSSI disk Q-bus expansion slot **OpenVMS VAX** base license NAS 200 license DECwindows/Motif

VAX 4000 Models 505A/705A Board Upgrades

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WFO4899999 or lower, AYO4700100 and lower.

Order Number	From	To	Includes
691XU-AS*	VAX 4000 Model 300	VAX 4000 Model 505A	CPU BA440 backplane **OpenVMS VAX** base license
694XR-AS*	VAX 4000 Model 300	VAX 4000 Model 705A	CPU BA440 backplane **OpenVMS VAX** base license

* Memory must be upgraded to new style memory. Refer to part numbers MS690-UC (64-Mbyte memory upgrade) or MS690-UD (128-Mbyte memory upgrade).
Note: A non-return charge will be assessed if old CPU board is not returned to Digital.

VAX 4000 Models 505A/705A Board Upgrades

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WFO4900000 or higher, AYO4700101 and higher, starting with KAO or NIO.

Order Number	From	To	Includes
691XU-BS*	VAX 4000 Model 300	VAX 4000 Model 505A	CPU **OpenVMS VAX** base license
694XR-BS*	VAX 4000 Model 300	VAX 4000 Model 705A	CPU **OpenVMS VAX** base license

* Memory must be upgraded to new style memory. Refer to part numbers MS690-UC (64-Mbyte memory upgrade) or MS690-UD (128-Mbyte memory upgrade).
Note: A non-return charge will be assessed if old CPU board is not returned toDigital.

VAX 4000 Models 505A/705A Board Upgrades

Order Number	From	To	Includes
691XU-CB	VAX 4000 Models 400, 500 VAX 4000 Model 500A	VAX 4000 Model 505A	**OpenVMS VAX** base license
694XR-CB	VAX 4000 Models 400, 500 VAX 4000 Model 500A VAX 4000 Models 600, 600A VAX 4000 Model 700A	VAX 4000 Model 705A	**OpenVMS VAX** base license
694XR-KB	VAX 4000 Model 505A	VAX 4000 Model 705A	**OpenVMS VAX** base license

Note: A non-return charge will be assessed if old CPU board is not returned to Digital.

VAX 4000 Models 505A/705A System Upgrades

Order Number	From	To	Includes
DV-45AV2-A9	MicroVAX 3300, 3400, 3500, 3600 MicroVAX 3800, 3900 VAX 4000 Model 200 VAX 11/7xx VAX 82xx, 83xx	VAX 4000 Model 505A System	64 Mbytes of memory **OpenVMS VAX** base license
DV-47AV2-B9	MicroVAX 3300, 3400, 3500, 3600 MicroVAX 3800, 3900 VAX 4000 Model 200 VAX 11/7xx VAX 82xx, 83xx, 85xx, 86xx	VAX 4000 Model 705A System	128 Mbytes of memory **OpenVMS VAX** base license

VAX 6000 In-Cabinet Board Upgrades

Order Number	From	To	Includes
66AUA-AA	VAX 6000 Model 210	VAX 6000 Model 610	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66AUN-AA	VAX 6000 Model 210	VAX 6000 Model 610	128 Mbytes of memory **OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license **Note:** Requires return of CPU module and minimum of 64 Mbytes of MS62A memory
66AUA-AC	VAX 6000 Model 310	VAX 6000 Model 610	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66AUN-AC	VAX 6000 Model 310	VAX 6000 Model 610	128 Mbytes of memory **OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license **Note:** Requires return of CPU module and minimum of 64 Mbytes of MS62A memory
66AUA-AF	VAX 6000 Model 410	VAX 6000 Model 610	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66AUN-AF	VAX 6000 Model 410	VAX 6000 Model 610	128 Mbytes of memory **OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license **Note:** Requires return of CPU module and minimum of 64 Mbytes of MS62A memory
66AUA-AK	VAX 6000 Model 510	VAX 6000 Model 610	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66AUD-AK	VAX 6000 Model 510	VAX 6000 Model 610	**OpenVMS VAX**unlimited user license
66BUA-AM	VAX 6000 Model 610	VAX 6000 Model 620	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66CUA-AM	VAX 6000 Model 620	VAX 6000 Model 630	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66DUA-AM	VAX 6000 Model 630	VAX 6000 Model 640	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66EUA-AM	VAX 6000 Model 640	VAX 6000 Model 650	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license
66FUA-AM	VAX 6000 Model 650	VAX 6000 Model 660	**OpenVMS VAX** user license (with rights to Rdb Runtime) DECnet/OSI extended-function license

VAX 7000 System Upgrades

Order Number	From	To	Includes
7JAXB-AA/AB/AC	VAX 6000 Models 4xx, 5xx	VAX 7000 Model 710 System	128 Mbytes of memory VAX 7000 console kit DEMNA XMI Ethernet adapter **OpenVMS VAX** base license NAS 200+ base server license **Note:** Mandatory return of VAX 6000 system
7JAXC-AA/AB/AC	VAX 6000 Model 6xx	VAX 7000 Model 710 System	128 Mbytes of memory VAX 7000 console kit DEMNA XMI Ethernet adapter **OpenVMS VAX** base license NAS 200+ base server license **Note:** Mandatory return of VAX 6000 system
7JBXA-AA/AB/AC	VAX 9xxx	VAX 7000 Model 720 System	512 Mbytes of memory VAX 7000 console kit XMI CI controller Two DEMNA XMI Ethernet adapters **OpenVMS VAX** base license OpenVMS SMP extension license VAXcluster license NAS 200+ base server license **Note:** Mandatory return of VAX 9xxx
7JBSA-AA/AB/AC	VAX 9xxx	VAX 7000 Model 720 System	1 Gbyte of memory VAX 7000 console kit XMI CI controller DEC FDDI controller 400 DSSI cabinet kit DSSI disk/tape adapter DSSI array controller 2.1-Gbyte SCSI disk DSSI I/O 6-ft cable **OpenVMS VAX** base license OpenVMS SMP extension license VAXcluster license NAS 200+ base server license **Note:** Mandatory return of VAX 9xxx

VAX 7000 Symmetric MultiProcessing (SMP) Upgrades

Order Number	From	To	Includes
7FBTA-AA	VAX 7000 Model 610	VAX 7000 Model 620	**OpenVMS VAX** base license
7FCTA-AA	VAX 7000 Model 620	VAX 7000 Model 630	**OpenVMS VAX** base license
7FDTA-AA	VAX 7000 Model 630	VAX 7000 Model 640	**OpenVMS VAX** base license
7FETA-AA	VAX 7000 Model 640	VAX 7000 Model 650	**OpenVMS VAX** base license
7FFTA-AA	VAX 7000 Model 650	VAX 7000 Model 660	**OpenVMS VAX** base license
7JAVA-AA	VAX 7000 Model 610	VAX 7000 Model 710	CPU module VAX 7000 console kit **OpenVMS VAX** base license **Note:** Mandatory return of Model 6xx CPU modules
7JAVA-LA[1]	VAX 7000 Model 6xx SMP System	VAX 7000 Model 7xx SMP System	CPU module **OpenVMS VAX** base license **Note:** Mandatory return of Model 6xx CPU modules

[1] Use in conjunction with order number 7JAVA-AA to upgrade VAX 7000 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 AXP system, order: (1) 7JAVA-AA and (3) 7JAVA-LA.

VAX 10000 Symmetric Multiprocessing (SMP) Upgrades

Order Number	From	To	Includes
9FBTA-JB	VAX 10000 Model 610	VAX 10000 Model 620	**OpenVMS VAX** unlimited license
9FCTA-JB	VAX 10000 Model 620	VAX 10000 Model 630	**OpenVMS VAX** unlimited license
9FDTA-JB	VAX 10000 Model 630	VAX 10000 Model 640	**OpenVMS VAX** unlimited license
9FETA-JB	VAX 10000 Model 640	VAX 10000 Model 650	**OpenVMS VAX** unlimited license
9FFTA-JB	VAX 10000 Model 650	VAX 10000 Model 660	**OpenVMS VAX** unlimited license

Chapter 5
Personal Computing

Network Personal Computing

PC Networking Hardware

DECpc Personal Computers

Network Personal Computing

Overview

Personal computers are a major part of most organizations' information systems strategies. Yet personal computers, even those on PC LANs, frequently remain isolated from mainstream operations. Clearly, the challenge is to link personal computers completely and cost-effectively into the organization's computing environment.

Digital goes beyond simply connecting PCs to offering true networking of PCs into the enterprise-wide information system. Digital's comprehensive approach to network personal computing is based on an organization-wide architecture. This approach illustrates Digital's ability to provide integration and information-management solutions at every level of computing.

Digital's network personal computing products include the PATHWORKS PC networking and integration products and client/server applications, the DECpc series of 80386- and 80486-based personal computers and networking hardware, and a variety of server systems. These solutions allow users to gain the benefits of network personal computing within a powerful and flexible enterprise-wide environment. They enable PC users to share applications, information, and large system resources such as printers, disks, and CD readers. These solutions even allow PATHWORKS users to share data over local-and wide-area networks with any other user on the network.

Digital's PC networking is highly flexible, accommodating small and large user groups that can grow incrementally without disrupting present users. Digital's PATHWORKS network personal computing products allow users to network any number of DOS, Microsoft Windows, Windows NT, OS/2, or Macintosh PCs, and connect them to multiple servers simultaneously.

The following pages describe the PATHWORKS products and network interface cards that link DOS, Windows, Windows NT, OS/2, and Macintosh systems into productive workgroups and to the enterprise; also described are LAN-based applications.

PATHWORKS PC Networks

Overview

The PATHWORKS family of PC networking and multivendor network operating system (NOS) integration products empower PC users to participate in open enterprise networking. It integrates the broadest selection of PC and server platforms with the leading PC networking technologies and PC network operating system software without requiring costly systems integration efforts. And it provides powerful PC LAN management capabilities as well.

PATHWORKS offers an ideal foundation for client-server applications. Distributed applications—such as ObjectBroker and DECmessageQ application-to-application communication software, X.400 electronic mail, SQL Services database access, and Desktop ACMS online transaction processing products—can use PATHWORKS for the reliable network connections between multiple clients and servers.

PATHWORKS Licenses

With new licensing alternatives, your choices are wider than ever.

PATHWORKS products can now be licensed in several ways, providing greater flexibility to meet specific networking needs. All license types can be mixed and used simultaneously with the same server.

The Combination Client and Server (CCS) License gives a single client the right to access file, print, and native NOS transport services on an unlimited number of PATHWORKS servers using the specified NOS technology. CCS also includes the right to run all PATHWORKS Client Network Services software (ManageWORKS, TCP/IP and DECnet transports and utilities, and PATHWORKS applications) from a single workstation.

File and Print Services Licenses

To use only the file, print, and native NOS transport capabilities of PATHWORKS servers two solutions are available:

- A File and Print Server (FPS) License grants the right to run PATHWORKS server software on a single system; allows a specific number of concurrent-use workstations to access the file, print, and native NOS transport services. For use if only a single PATHWORKS server connection will be used by a workstation and if all users do not need access at the same time.
- A File and Print Access (FPA) License grants the right to a single workstation to access file, print, and native NOS transport services on an unlimited number of PATHWORKS server systems running the specified NOS technology; allows PATHWORKS server software to run on an unlimited number of systems with clients that have either PATHWORKS FPA or PATHWORKS CCS licenses. For use in environments where PATHWORKS Client Network Services are not required; where more than one PATHWORKS server connection will be used by a workstation; or where access to services must be assured.

Client Network Services (CNS) License

The Client Network Services (CNS) License grants the right to run PATHWORKS client software on a single workstation. This includes PATHWORKS ManageWORKS, TCP/IP and DECnet transports and utilities, and PATHWORKS applications, but not the right to access file, print, and native NOS transport services from PATHWORKS servers. Use in environments where PATHWORKS management capabilities, transports, or applications are needed, but PATHWORKS FPS license or existing NOS provides sufficient file and print services.

PATHWORKS PC Networks *(continued)*

Client/Server Relationship

A PATHWORKS client receives system software, PC applications, storage, and printer resources from PATHWORKS servers located anywhere on the network. After the network link is established, the PC system software and applications run on the PC while accessing applications and files from virtual disks located on the server system. As far as the PC user is concerned, it's as simple as changing drives for DOS, Windows, Windows NT, and OS/2 users or switching volumes for Macintosh users. It doesn't matter where the server is located or what type of operating system it runs. The networking is totally transparent.

The following table shows the PATHWORKS servers and the clients each supports.

Server	Transport	File Protocol	Client
PATHWORKS for OpenVMS (NetWare)	IPX DECnet TCP/IP	NetWare	PATHWORKS for DOS and Windows or NetWare
PATHWORKS for DEC OSF/1 AXP (LAN Manager)	NetBEUI TCP/IP DECnet	LAN Manager	PATHWORKS for DOS and Windows, PATHWORKS for OS/2, PATHWORKS for Windows NT or LAN Manager
PATHWORKS for OpenVMS (LAN Manager)	NetBEUI DECnet TCP/IP	LAN Manager	PATHWORKS for DOS and Windows, PATHWORKS for OS/2, PATHWORKS for Windows NT or LAN Manager
PATHWORKS for OpenVMS (Macintosh)*	AppleTalk	AFP	PATHWORKS for Macintosh*
Pacer for ULTRIX	AppleTalk	AFP	PATHWORKS for Macintosh
PATHWORKS for Windows NT	DECnet TCP/IP NetBEUI	LAN Manager	PATHWORKS for DOS and Windows, PATHWORKS for OS/2, PATHWORKS for Windows NT or LAN Manager
PATHWORKS for SCO UNIX	DECnet TCP/IP NetBEUI	LAN Manager	PATHWORKS for DOS and Windows, PATHWORKS for OS/2, PATHWORKS for Windows NT or LAN Manager
PATHWORKS for OS/2	DECnet TCP/IP NetBEUI	LAN Manager	PATHWORKS for DOS and Windows, PATHWORKS for OS/2, PATHWORKS for Windows NT or LAN Manager

* This software supports DECnet and AppleTalk communications as well as TCP/IP—with MacX. The file and print services run over AppleTalk.

Enterprise Backbone Transports

Digital offers "multi-lingual" networking software for multivendor connectivity and interoperability for networks of all sizes. Use the protocols best suited for your environment—TCP/IP, DECnet, OSI, and X.25.

Client/Server Application Development

Digital provides standards-based "object-oriented" communications that reliably transfer data and application "objects" between multivendor systems, including legacy systems. Distributed applications support large network environments that allow network resources to be accessed as readily as if they were on a single system.

Note: Third-party products available for Macintosh clients are supported by OS/2, SCO UNIX, ULTRIX, and Windows NT servers.

PATHWORKS Client Software

Overview

PATHWORKS client software allows personal computers to participate in the enterprise network. A user's favorite desktop computer can use file, print, and mail services provided by PATHWORKS server software running on Windows NT, OS/2, UNIX, or OpenVMS platforms. And users don't have to learn anything new. The network services provided by PATHWORKS software are simply an extension of their familiar PC environment.

Each client PC must be licensed to access any PATHWORKS server anywhere on the network as well as use client software.

The following products are included in this section:

- PATHWORKS for DOS and Windows (LAN Manager and NetWare)
- PATHWORKS for DOS (NetWare Coexistence)
- PATHWORKS X.25 (DOS, Windows)
- PATHWORKS ISDN (DOS)
- PATHWORKS for Windows NT (Client)
- PATHWORKS for OS/2 (Client)
- PATHWORKS TCP/IP (OS/2)
- PATHWORKS for Macintosh

PATHWORKS for DOS and Windows (LAN Manager and NetWare)

PATHWORKS V5.0 for DOS and Windows (LAN Manager, NetWare) client software provides Client Network Services—ManageWORKS, TCP/IP, DECnet transports and utilities, and PATHWORKS applications—to Windows and DOS PCs. Combined with PATHWORKS server software, PC users get integration with Macintosh, UNIX, OS/2, and OpenVMS systems on the local and wide area network.

PC users can continue to use the familiar DOS commands or the powerful Microsoft Windows interface to access applications, information, and system and network resources anywhere in the enterprise.

PATHWORKS for DOS and Windows includes:

- Support for both LAN Manager (V2.2) and NetWare technologies, depending on which license you chose
- An advanced, intuitive graphical user interface, which runs
- on Microsoft Windows, simplifies browsing, connecting to, and disconnecting from multivendor NOS services
- Multivendor PC network management with ManageWORKS, a Windows-based application allows PC LAN administrators to—manage retail NetWare (V2.x and V3.x) servers, retail LAN Manager (V2.x) servers, and PATHWORKS (NetWare and LAN Manager) servers and clients from a graphical user—interface on a local or remote Windows PC
- Small, fast TCP/IP transport and utilities, such as file transfer protocol (FTP), PING, NETSTAT, and ARP
- Full DECnet (Phase IV) networking capabilities, including NFT, NCP, and FAL implemented as Microsoft Windows applications and as DOS applications
- Simultaneous multiple transport support—NetBEUI, IPX/SPX, TCP/IP, DECnet lets you connect to various services without having to reconfigure or reboot
- Easy-to-use installation and configuration utilities for NetWare and LAN Manager file and print services access and PATHWORKS services

PATHWORKS for DOS and Windows (LAN Manager and NetWare) *(continued)*

- PATHWORKS applications:
  - Mail utility, including binary file attachments, realtime mail notification, distribution lists, and organizational folders
  - PC DECwindows Motif, an X Window System server for DOS
  - VT320 terminal emulation (character and windowed versions), including NVT (character only), TELNET, CTERM, and LAT protocols, that allow multiple sessions
- Remote boot capabilities using the industry-standard RPL protocol
- APIs and transport interfaces for NetBIOS IOCB, common socket library, and WinSock for simplifying development of network applications
- Support for Expanded Memory Specification Version 4.0

Prerequisite Hardware

- A supported 286-, 386-, or 486-based industry-standard computer for DOS and Windows use
- Minimum 640 KB of system memory—384 KB of EMS, 64 KB of XMS (HMA), and 1 MB of additional memory recommended as the minimum memory configuration for DOS users running PATHWORKS; 384 KB of EMS, 64 KB of XMS (HMA), and 3 MB of—additional memory recommended as the minimal memory—configuration for Windows users running PATHWORKS with ManageWORKS loaded
- PC network interface card accompanied by a network driver:—NDIS V2.0.1; ODI Rev. A; DLC V1.2, V1.3; and native drivers for Digital's EtherWORKS

Prerequisite Software

- MS-DOS or DOS V3.3 or greater
- Microsoft Windows V3.1 or greater (optional)

PATHWORKS for DOS and Windows Licenses

QM-0EKAA-AA	PATHWORKS V5.0 for DOS and Windows (NetWare)CCS License
QM-0TLAA-AA	PATHWORKS V5.0 for DOS and Windows (LAN Manager) CCS License
QM-2CNAA-AA	PATHWORKS V5.0 for DOS and Windows CNS License
QM-2CMAA-AA	PATHWORKS V5.0 for DOS and Windows (NetWare) FPA License
QM-2CLAA-AA	PATHWORKS V5.0 for DOS and Windows (LAN Manager) FPA License
QM-0EMAA-AA	PATHWORKS V5.0 for DOS and Windows(NetWare) CCS Migration License [from V4.x (LAN Manager)to V5 (NetWare)]
QM-2D9AA-AA	PATHWORKS V5.0 for DOS and Windows (LAN Manager) CCS Migration License [from V4.x (LAN Manager) to V5 (LAN Manager)]

See PATHWORKS license description for licensing explanation.

Media and Documentation:

QA-0LTAA-HW	PATHWORKS V5.0 for DOS and Windows Media and Doc (3.5-inch HD diskettes)

PATHWORKS for DOS (NetWare Coexistence)

PATHWORKS for DOS (NetWare Coexistence) software lets PATHWORKS for DOS (LAN Manager) operate concurrently with Novell's NetWare client software (shell) on PCs running the DOS operating system and using a single Ethernet or Token Ring network interface card.

The PATHWORKS for DOS (NetWare Coexistence) client kit includes:

- NetWare driver components that can be used to generate an IPX driver that uses the NDIS interface
- An installation procedure that, together with the documentation, guides a system manager through the entire installation and configuration process
- Documentation describing how to install, configure, and use the PATHWORKS for DOS facilities while retaining access to NetWare capabilities

Prerequisites

To use this product, a PC client platform must:

- Meet the hardware, software, and network topology requirements of PATHWORKS V4.1 for DOS (LAN Manager) client
- Satisfy the network topology requirements of a NetWare DOS client platform for Advanced NetWare V2.15, NetWare V2.2, NetWare 386 V3.1, NetWare V3.11, or NetWare for OpenVMS V2.1
- Have an Ethernet or Token Ring card for which an NDIS-compliant driver is available. All of Digital's EtherWORKS cards meet this requirement

Prerequisite Software

For clients in a Token Ring LAN, PATHWORKS V4.1 for DOS is a prerequisite. For clients in Ethernet networks, PATHWORKS V4.0 or V4.1 for DOS (LAN Manager) is required.

License

The license for this product is included with the license for PATHWORKS V4.0 for DOS (LAN Manager) or later.

Media and Documentation

QA-GLVAA-HW	PATHWORKS for DOS (NetWare Coexistence) media and documentation (3.5 and 5.25 inch)
QA-GLVAA-GZ	PATHWORKS for DOS (NetWare Coexistence) documentation only(included in media and documentation kit)

PATHWORKS X.25 (DOS and Windows)

PATHWORKS X.25 (DOS, Windows) option ties individual remote PCs into corporate wide-area networks (WANs). It is an add-on for DOS and Windows client software. It is a cost-effective software option that utilizes an AT-bus X.25 network interface card to turn a single, remote DOS-based PC into a client on any open, standard X.25 packet-switched data network (PSDN) using the TCP/IP and/or DECnet transport.

Running the PATHWORKS X.25 (DOS, Windows) option, the PC client can take full advantage of network file and print services, terminal emulation and file transfers across a wide-area network. The DOS client can connect to any PATHWORKS server (OpenVMS, DEC OSF/1 AXP, ULTRIX, SCO UNIX, Windows NT, or OS/2) that runs the DECnet or TCP/IP network transport. PC client can also use client-server applications and other Windows-based applications, such as electronic mail, X Window servers (PC DECwindows Motif and eXcursion software), database access (SQL Services and DECquery software), distributed transaction processing (Desktop ACMS software), and third-party applications.

The PATHWORKS X.25 (DOS) software provides full user-configurable communications options as well as X.25 driver software for the EiconCard/PC and DPNA/PC cards. More than 50 PSDN configuration profiles are built into the menu-driven network installation module. The X.25 driver runs on the Eicon Technology card's CPU without impacting the PC's computing power.

Prerequisite Software

PATHWORKS for DOS and Windows (LAN Manager or NetWare software)

Prerequisite Hardware

An Intel 286, 386, or 486 PC with:

- A minimum of 640 Kbytes of memory
- Either a 5.25-inch (360-Kbyte) or 3.5-inch (720-Kbyte)diskette drive
- At least 1 Mbyte of free hard disk space to load PATHWORKS X.25 (DOS) and PATHWORKS for DOS

One X.25 network interface card from Eicon Technology available from Digital in two models:

- DS206-AA EiconCard/PC is a 1-port 8-bit card that features 68008 CPU (10 MHz), up to 64 Kbits per second (Kb/s) rate, and V.24 interface; 1 Mbyte of memory
- DS206-CA DPNA/PC is a 2-port 16-bit HSI card that features 68000 CPU (16 MHz), up to 128 Kb/s per port, and V.24, V.35, X.21 interfaces; 2 Mbytes of memory

A modem cable

A synchronous modem

Ordering Information

The license for this product is included with the license for PATHWORKS for DOS and Windows (LAN Manager or NetWare software).

Media and Documentation

QA-008AA-HC	PATHWORKS X.25 (DOS, Windows) media and documentation

PATHWORKS ISDN (DOS)

The PATHWORKS ISDN (DOS) option addresses the multi-location business where there is a need to integrate remote sites with single PCs into the overall enterprise network using the high-speed ISDN network. PATHWORKS ISDN connects one single, remote PATHWORKS for DOS and Windows client to the ISDN (Integrated Services Digital Network) basic rate access. It provides a DECnet or TCP/IP link by using X.25 over one B-channel.

All PATHWORKS for DOS features, including applications, network services, and networking add-on options, are supported. It supports client/server applications, such as DECquery, eXcursion, and X.400 mail.

PATHWORKS ISDN features include:

- Connects to ISDN basic rate access, supporting CCITT I430, I440, I450, and I451 recommendations
- Uses X.25 (CCITT X.25 1984) to transport DECnet or TCP/IP
- U.S. version supports bi-rate adaption
- Automatic disconnection feature (time cutting) to reduce communications costs
- Supports PATHWORKS services: file and print, disk (through NDU), network file transfer (NFT or FTP), network management, DECnet File Access Listener (FAL)
- Includes ISDN and X.25 drivers for supported ISDN cards
- Menu-driven network configuration (for 11 countries)

Prerequisite Software

PATHWORKS V4.1 or higher for DOS (LAN Manager) software

PATHWORKS TCP/IP (DOS) V2.0 for TCP/IP communications with PATHWORKS V4.1 for DOS

Works with Windows V3.0 and V3.1

Prerequisite Hardware

One ISDN network interface card as identified in SPD

Ordering Information

License included with PATHWORKS for DOS and Windows software

Media and Documentation

For U.S. and Sweden

QA-0H8AA-HB	PATHWORKS ISDN (DOS), U.S. media and documentation (5.25 inch)
QA-0H8AA-GZ	PATHWORKS ISDN (DOS), U.S. documentation only
DI205-AC	ISDN PC card (PCSO)

For Europe

QA-0H8AB-HB	PATHWORKS ISDN (DOS), media and documentation (5.25 inch)
QA-0H8AB-GZ	PATHWORKS ISDN (DOS), documentation only
DI205-AB	ISDN PC card (PCSNET—UK)
DI205-AA	ISDN PC card (PCSNET—other countries)

Note: In Europe the following codes will be applied: End user is Code **N,** OEM is Code **T**

PATHWORKS for Windows NT (Client)

PATHWORKS users now have a unique link to systems running Microsoft's Windows NT operating system. Digital's PATHWORKS for Windows NT software, available for both client (Windows NT desktop) and server (Windows NT Advanced Server) systems, significantly extends the connectivity of Windows NT systems. This software runs on Alpha AXP, Intel, and MIPS R4000 systems.

Seamless integration of DECnet network management support with Windows NT management permits remote management and provides a consistent interface.

Running on Windows NT client systems, PATHWORKS for Windows NT enables enables users to access and share PATHWORKS for Windows NT, OpenVMS, DEC OSF/1 AXP, ULTRIX, SCO UNIX, OS/2 servers.

PATHWORKS for Windows NT:

- Provides FDDI support to client PCs equipped with Digital's EISA FDDI card
- Provides DECnet for Windows NT software that can run on Ethernet, Token Ring, and FDDI topologies; synchronous/asynchronous access is provided through the DDCMP protocol for remote offices and users
- Allows Windows NT users to concurrently use DECnet with the TCP/IP and NetBEUI transports provided by Microsoft
- Allows remote access to networked printers, such as Hewlett Packard's HP3si and Digital's LPS20 printers. PATHWORKS print services will redirect requests over DECnet or TCP/IP from the Windows NT server. A PATHWORKS for Windows NT client can also use a print server directly
- Integrates DECnet events into Windows NT tools such as the Event Viewer, so that network managers can see DECnet events such as router up/router down and protocol violation notices in the same way they see Windows NT security failures and hardware errors
- Integrates DECnet with the Windows NT Performance Monitor so that network managers can track DECnet performance
- Provides DECnet support for WinSock, NetBIOS, LAN Manager, and DCE Remote Procedure Call APIs so applications that use Windows NT APIs can work in DECnet networks

A separate PATHWORKS for Windows NT programmer's kit provides tools for developers to write and port custom applications. It enables porting of DOS/Windows-based, 16-bit applications and ULTRIX-based applications to 32-bit native Windows NT applications. Libraries include PATHWORKS Socket library and the DECnet utility library as dynamic link libraries (DLLs). A helper DLL for WinSock DECnet support is provided, as well as a static library which supports the X/Open Transport Interface (XTI)

Ordering Information

Each PATHWORKS client must have a PATHWORKS for Windows NT client license. The PATHWORKS for Windows NT client license includes the right to use PATHWORKS for Windows NT software on a single Windows NT personal computers and to use the PATHWORKS for OpenVMS (LAN Manager), PATHWORKS for DEC OSF/1 AXP (LAN Manager), and PATHWORKS for UNIX server software on one or more server systems.

Contact a Digital representative for order numbers. In the U.S., call 800-DIGITAL.

PATHWORKS for OS/2 (Client)

PATHWORKS for OS/2 software lets an OS/2 system be a client to an OS/2, UNIX, or OpenVMS system running PATHWORKS server software. OS/2 clients can then use selected resources and services of those systems and access information and services from other PATHWORKS servers on the enterprise network.

PATHWORKS for OS/2 supports multiple concurrent transports: NetBEUI, DECnet, and TCP/IP in Ethernet and 802.5/Token Ring networks, and supports source routing bridges between Token Rings. It also supports the NetBIOS interface (on the PC and on OpenVMS servers) for task-to-task and multitask communication; and the Network Device Interface Specification (NDIS) for network interface cards.

PATHWORKS for OS/2 provides the following client capabilities to OS/2 users:

- Full LAN Manager, including LAN Manager Redirector for access to file and print services on OS/2, DEC OSF/1 AXP, ULTRIX, SCO UNIX, Windows NT, and OpenVMS servers, over local-and wide-area networks
- PATHWORKS mail, including binary file attachment and realtime mail notification
- VT320 terminal emulation that allows multiple sessions to OpenVMS, DEC OSF/1 AXP, and ULTRIX hosts

Users of OS/2 Standard Edition V1.1, V1.21, and V1.3 are supported as clients. OS/2 Extended Edition V1.3 and OS/2 V2.0 users can connect to all PATHWORKS servers via DECnet over Ethernet by using the LAN Requester; to PATHWORKS for OS/2 servers via NetBEUI over Token Ring; and to services of IBM hosts via the IBM Communications Manager as well.

Configuration Requirements

PATHWORKS for OS/2 requires an 286, 386, or 486 processor with 4 Mbytes of system memory for client configurations and 6 Mbytes of system memory for server or peer services configurations. A hard disk with 8 Mbytes of available space and an Ethernet or Token Ring adapter card are also required.

Ordering Information

One media and documentation kit provides both OS/2 client and OS/2 server capabilities. However, there are two separate licenses. Each OS/2 client requires a client license. Each OS/2 server requires a server license.

Licenses

QL-YFWAW-AA	PATHWORKS for OS/2 PATHWORKS for OS/2 client software on a single PC: includes PATHWORKS for OpenVMS (LAN Manager), DEC OSF/1 AXP, ULTRIX, and SCO UNIX server software on multiple systems.
QL-YLXAW-AA	PATHWORKS for OS/2 server license: includes DOS and OS/2 clients access to the licensed server's local storage or print devices. Each client must also be licensed.

Media and Documentation

QA-YFWAA-HC-H7	PATHWORKS for OS/2 client and server media and documentation (3.5-, 5.25-inch)

Note: These kits contain the media and documentation for server and client products.

PATHWORKS for OS/2 (Client) *(continued)*

Additional Documentation

QA-YFWAA-GZ PATHWORKS for OS/2 user documentation: Installation and Configuration Guide, User's Guide, Utilities Guide, LAN Manager User's Guide, LAN Manager's Administrator's Guide, LAN Manager's Administrator's Reference, Mail User's Guide, SEDT User's Guide, SETHOST Terminal Emulation Guide, Network Management Guide, Network Troubleshooting Guide, and DECnet for OS/2 Network Management Guide.

Note: The media and documentation kits listed above contain all of these documents.

QA-YFWAB-GZ PATHWORKS for OS/2 programmer documentation: DECnet for OS/2 Programmer Reference Manual and LAN Manager Programmer Reference Manual.

PATHWORKS TCP/IP (OS/2)

PATHWORKS TCP/IP (OS/2) networking software option enables PATHWORKS for OS/2 clients to participate in a TCP/IP networked environment. Featuring an industry-standard RFC 1001/1002 NetBIOS implementation, PATHWORKS TCP/IP (OS/2) lets users use industry-standard applications.

With this network transport option, PC users in TCP/IP networks can access the file and print services offered by PATHWORKS for OpenVMS, DEC OSF/1 AXP, ULTRIX, SCO UNIX, and OS/2 servers; they can also use the mail services of PATHWORKS for ULTRIX and OS/2 servers.

This networking software also provides:

- Telnet protocol for the PATHWORKS terminal emulators
- File Transfer Protocol (FTP) to perform network file operations
- Various TCP/IP network management tools such as PING, ARP, and NETSTAT

Ordering Information

In addition to being licensed to use the PATHWORKS for OS/2 product as either a client or server, each OS/2 system must also be licensed to use the PATHWORKS TCP/IP (OS/2) product.

License

QL-XV7AW-AA PATHWORKS TCP/IP (OS/2)license: gives users the right to use the TCP/IP network transport on a single OS/2 system.

Media and Documentation

QA-XV7AA-HW PATHWORKS for OS/2 media and documentation (5.25 inch and 3.5 inch).

PATHWORKS for Macintosh

Developed jointly by Digital Equipment Corporation and Apple Computer, Inc., PATHWORKS for Macintosh gives users the best of both worlds: easy access to Digital's enterprise-wide capabilities while using their familiar Macintosh interface.

With PATHWORKS software, Macintosh users can access remote resources—file and print services, databases, electronic mail, and network services—on a local-or wide-area network.

The PATHWORKS software lets Macintosh users communicate with all other users connected to MAILbus. Through terminal emulation and an X Window System server, PATHWORKS provides access to production applications on the network.

PATHWORKS for Macintosh includes the following:

- Macintosh client application software
  - Electronic mail: Mail for Macintosh, an OpenVMS Mail client, and a license for DEC MAILworks for Macintosh, an X.400 mail client
  - MacX (1.2), an X Window System server for access to DECwindows Motif applications and other X Windows applications
  - MacTerminal (V3.1) terminal emulator
  - Data Access Language client software
  - AppleTalk-to-LAT transport gateway
  - PATHWORKS Listener
- Connectivity software components
  - DECnet for Macintosh: Network Control Program (NCP), File Access Listener (FAL)
  - Macintosh Communications Toolbox with ADSP tool for AppleTalk connection; transport gateway access tool for AppleTalk to DECnet gateway; DECnet tool; CTERM tool for LocalTalk and wide-area terminal emulation; LAT tool for high-speed, local-area terminal emulation; MacTCP tool for TCP/IP connection with MacX; direct serial connection tool; modem tool; text transfer tool; and Xmodem file transfer tool, AppleTalk-to-LAT tool for the ATK-LAT gateway
- Developer tools
  - Application Programming Interface (API) for AppleTalk for OpenVMS V3.1
  - API for AppleTalk-to-DECnet transport gateway

Configuration Requirements

Network connections can be handled by Ethernet cards, Token Ring cards, a LocalTalk-to-Ethernet router, or a SCSI-to-Ethernet device. PATHWORKS for Macintosh supports AppleTalk Phase2-compliant Ethernet cards, including the new Apple Ethernet card. LocalTalk-to-Ethernet routers include the FastPath 4 and 5, Cayman GatorBox CS, Webster Multigate, and Apple's Internet Router. Asante's SC/EN SCSI-to-Ethernet adapter is also supported.

Prerequisite Hardware

Macintosh clients can be Macintosh Plus; Macintosh SE and SE/30; Macintosh II, IIx, IIcx, IIci, IIfx, IIvx, IIvi, and IIsi; Classic, ClassicII, Color Classic, and LC, LCII, and LCIII models; Powerbook 100, 140, 145, 160, 160C, 170 and 180; Quadra 700 and 900; and the Portable. Digital recommends a Macintosh with 2 Mbytes or more of RAM. For a complete list, see SPD 31.53, PATHWORKS for Macintosh.

Prerequisite Software

The Macintosh client must be running Macintosh operating system V6.0.5, 6.07, 7.0, 7.0.1, or 7.1. DEC MAILworks for Macintosh requires DEC MAILworks Server for OpenVMS.

PATHWORKS for Macintosh *(continued)*

Ordering Information

Each Macintosh client system requires a PATHWORKS for Macintosh client license, which conveys the right to use the client software and PATHWORKS for OpenVMS (Macintosh) and Pacer for ULTRIX server software.

License

QL-YPH9W-AA PATHWORKS for Macintosh client license

Media and DocumentationPATHWORKS for Macintosh media and documentation are available in OpenVMS and ULTRIX formats. Order the kit appropriate to the server (OpenVMS or RISC ULTRIX) used.

QA-YPHAA-HC PATHWORKS for Macintosh client media and documentation kit (3.5 inch)

Additional Documentation

QA-YPHAA-GZ PATHWORKS for Macintosh documentation

QA-YPHAC-GZ PATHWORKS for Macintosh user documentation

QA-YPCAC-GZ PATHWORKS for Macintosh programmer's documentation

PATHWORKS Server Software

Overview

The PATHWORKS family of server software provides network operating system services (file and print), information access, network management, and flexibility to client PC users. A single PC client can concurrently access any combination of Windows NT, OS/2, UNIX, and OpenVMS server systems. And as users' needs grow, they can add new PCs or new server systems anytime, anywhere, without disrupting their network, buying new software, or changing the way they work.

Some PATHWORKS features are common to all servers. Others are unique to individual operating systems. Common PATHWORKS server features are:

- File and print services
- Local-area and wide-area network capabilities over DECnet and TCP/IP as well as support for a native NOS transport (IPX, NetBEUI, or AppleTalk, depending on the server)
- Electronic mail that lets users communicate with all other users on the network
- Easy PC LAN administration through an advanced GUI on a Windows PC (part of PATHWORKS client software)
- Security for PC files stored on the server
- Broadcast utility, allowing a system administrator to send messages to PC users connected to the local area network
- Date and time services

The following products are included in this section:

- PATHWORKS for OpenVMS (LAN Manager)
- PATHWORKS Desktop Backup
- PATHWORKS for OpenVMS (NetWare)
- PATHWORKS for OpenVMS (Macintosh)
- PATHWORKS for DEC OSF/1 AXP (LAN Manager)
- PATHWORKS for ULTRIX
- Pacer for ULTRIX
- PATHWORKS for SCO UNIX
- PATHWORKS for Windows NT
- PATHWORKS for OS/2

PATHWORKS for OpenVMS (LAN Manager)

PATHWORKS V5.0 for OpenVMS (LAN Manager) server software enables OpenVMS AXP and OpenVMS VAX server systems to deliver networked file and print services not only to PATHWORKS clients, but also to native LAN Manager clients running Windows, Windows NT, Windows for Workgroups, DOS, and OS/2 operating systems. Together with other PATHWORKS products, it also enables those PC users to share mail and information with UNIX and Macintosh users.

With this server software, PC users can take advantage of the unbeatable availability and reliability offered by the clustering capabilities of OpenVMS systems. Meanwhile, the server system can go right on running business-critical client/server and multi-user applications.

Features

- Cluster support for OpenVMS AXP, OpenVMS VAX, and mixed architecture clusters, including a transport-independent cluster alias that allows multiple cluster members to appear to connecting clients as a single server, and a load balancing feature that connects PC clients to the least-busy cluster member
- Key LAN Manager V2.2 capabilities, including domain services and security
- Support for C2 and B1-level security for PC data stored on the server
- Manageable by ManageWORKS (part of PATHWORKS for DOS and Windows client) for easy PC LAN administration; and a server configuration and tuning utility
- The NetBEUI transport for OpenVMS; and support for the TCP/IP and DECnet transports

Ordering Information

QM-A93AA-AB	PATHWORKS V5.0 for OpenVMS (LAN Manager) FPS 10-user license
QM-A93AA-AC	PATHWORKS V5.0 for OpenVMS (LAN Manager) FPS 25-user license
QM-A93AA-AD	PATHWORKS V5.0 for OpenVMS (LAN Manager) FPS 50-user license
QM-A93AA-AE	PATHWORKS V5.0 for OpenVMS (LAN Manager) FPS 100-user license
QM-A93AA-AF	PATHWORKS V5.0 for OpenVMS (LAN Manager) FPS 250-user license
QM-2CLAA-AA	PATHWORKS V5.0 (LAN Manager) FPA license, per PC

See PATHWORKS license description for licensing explanation.

Media and Documentation

QA-03XAA-H8	Digital CD-ROM Software Library for OpenVMS AXP
QA-A93AA-GZ	PATHWORKS V5.0 for OpenVMS documentation only
QA-A93AA-H5	PATHWORKS V5.0 for OpenVMS (LAN Manager) media and documentation (TK50)

PATHWORKS Desktop Backup

PATHWORKS Desktop Backup lets system managers set up schedules for full or incremental backups of every PC across a local or wide area network to already installed VAX tape drives. It lets network managers establish backup routines on PCs organization-wide from a single point in the network. And it lets PC users specify which files they want backed up; prevent a scheduled backup when they plan to work on targeted files; and request unscheduled backups and initiate restores.

- Provides unattended backup and restore-on-demand services for DOS and Windows PCs linked to OpenVMS VAX servers on PATHWORKS LANs
- Supports NetWare and LAN Manager PATHWORKS server software

This powerful yet easy-to-use software comprises server and client components. The VAX-based server component initiates client backups, transmits requested data files to/from standard VAX tape drives, maintains backup schedules, tracks backup history, and provides media management facilities. Installed on each PC, the client component monitors the network and handles the PC portion of the backup when requested by the server.

Prerequisite Hardware

- OpenVMS VAX servers
- IBM or IBM-compatible PCs

Prerequisite Software

- PATHWORKS V4.0 or greater for DOS and Windows clients

Ordering Information

QB-0MKAA-A* PATHWORKS Desktop Backup Media and Documentation Kit

Includes software license for VAX server, 250 DOS Client licenses and documentation.
*A = TK50, B = Magtape, 1600 bits/in.

Refer to the following Software Product Descriptions for more information:

- Software Product Description 41.52 for more information on the Server for—OpenVMS
- Software Product Description 41.55 for more information on the Client for DOS

PATHWORKS for OpenVMS (NetWare)

With PATHWORKS server software, any OpenVMS VAX system can act as a server on a NetWare LAN—while continuing to run business-critical client/server and multi-user applications.

PATHWORKS for OpenVMS (NetWare) server software enables OpenVMS and native NetWare users—as well as PATHWORKS for DOS and Windows (NetWare) users—to share files, data, applications, mail, disks, printers, and other resources. Together with other PATHWORKS products, native NetWare and PATHWORKS for DOS and Windows users can share information with Microsoft LAN Manager, AppleShare, and NFS users—as well as with IBM/SNA users.

PATHWORKS file and print services based on NetWare Core Protocol (NCP)are available directly from the OpenVMS system over the NetWare IPX transport, so the PATHWORKS server "looks" like any other NetWare server to native NetWare and PATHWORKS client systems. Based on NetWare for UNIX, this product has been certified by Novell, Inc.

PATHWORKS for OpenVMS (NetWare) *(continued)*

Features

- File and print services based on NetWare Core Protocol—(NCP) and IPX/SPX transport for OpenVMS
- Ease of data sharing: PC files are stored on the server in native OpenVMS format, Record Management Services (RMS), so they can be shared between PC and OpenVMS users, as well as with users of any other system that can access RMS files, such as Macintosh users
- Familiar management preserves NetWare expertise: PATHWORKS file and print services can be managed using standard NetWare management utilities such as FCONSOLE, PCONSOLE and SYSCON
- Manageable with ManageWORKS (part of PATHWORKS for DOS and Windows client) for easy PC LAN administration
- A combination of NetWare and OpenVMS security allows users to customize system security
- Efficient use of network backbones: The PATHWORKS DECnet/IPX portal or tunnel encapsulates IPX packets in a DECnet packet which enables IPX to travel over DECnet backbone wide area networks to remote services and also minimizes network management chores on the backbone through use of a single transport
- Access to time-share applications: PATHWORKS support Network Virtual Terminal (NVT) allows IPX/SPX-based terminal emulation packages to be run on a PC for direct, interactive connection to PATHWORKS for OpenVMS (NetWare) servers or any other NetWare for UNIX systems
- Support for NetWare and IPX/SPX APIs to facilitate the porting of applications written for NetWare servers to OpenVMS

PATHWORKS (NetWare) client and server are designed for environments where NetWare is the only PC network operating system (NOS) in use. For environments using both the NetWare and LAN Manager technologies, a configuration including PATHWORKS for DOS (NetWare Coexistence) software is well suited.

Ordering Information

QM-0ENAA-AB	PATHWORKS V1.0 for OpenVMS (NetWare) FPS 10-user license
QM-0ENAA-AC	PATHWORKS V1.0 for OpenVMS (NetWare) FPS 25-user license
QM-0ENAA-AD	PATHWORKS V1.0 for OpenVMS (NetWare) FPS 50-user license
QM-0ENAA-AE	PATHWORKS V1.0 for OpenVMS (NetWare) FPS 100-user license
QM-0ENAA-AF	PATHWORKS V1.0 for OpenVMS (NetWare) FPS 250-user license
QM-2CMAA-AA	PATHWORKS V1.0 (NetWare) FPA license, per PC

See PATHWORKS license description for licensing explanation.

Media and Documentation

QA-0ENAA-H5	PATHWORKS V1.0 for OpenVMS (Netware) Software Media and Documentation SPD 41.47

PATHWORKS for OpenVMS (Macintosh)

Developed jointly by Digital Equipment Corporation and Apple Computer, Inc., PATHWORKS for OpenVMS (Macintosh) server software allows VAX systems to provide local- and wide-area network services to Macintosh clients. VAX computers become servers for file and printer sharing, database access, electronic mail, and network services to large groups of Macintosh clients.

PATHWORKS for OpenVMS (Macintosh) provides file services (which are as familiar as AppleShare services to Macintosh users) that offer the benefits of large disks, regular operator backups, and data security. Additionally, PATHWORKS software lets Macintosh users communicate with all other users connected to MAILbus.

PATHWORKS software gives Macintosh users the best of both worlds: easy access to remote resources on a local- or wide-area network without leaving their familiar desktop environment. Macintosh users can select and use Digital and LaserWriter printers in the same way they select LaserWriter printers connected to an AppleTalk network.

PATHWORKS for OpenVMS (Macintosh) includes:

- OpenVMS server software
  - VAXshare file services, based on Apple Filing Protocol (AFP)
  - VAXshare print services for Apple LaserWriter, LaserWriter-PLUS, LaserWriter-II/NT, LaserWriter-II/NTX, and Personal LaserWriter NTR; Digital's LN03R ScriptPrinter; PrintServer 20 and 40; and DEClaser 1150, 1152, 2150, 2250, and 3250 printers
  - Network-based file and print server management
  - Data Access Language server software for OpenVMS systems and adapter for Rdb/VMS relational database
  - PATHWORKS mail server
  - AppleTalk for OpenVMS V3.1, an AppleTalk Phase 2 implementation
  - AppleTalk-to-DECnet transport gateway

Developer tools

- Application Programming Interface (API) for AppleTalk for OpenVMS V3.1
- API for AppleTalk-to-DECnet transport gateway

Prerequisite Software

OpenVMS 5.4-3, 5.5.

Ordering Information

Each Macintosh client requires a PATHWORKS license. The license gives the Macintosh user the right to use the client on a single system and the PATHWORKS for OpenVMS (Macintosh) and Pacer for ULTRIX server software on an unlimited number of systems.

Media and Documentation

QA-YPCAA-H5/HM PATHWORKS for OpenVMS (Macintosh) media and documentation (TK50/magtape)

Additional Documentation

QA-YPCAA-GZ PATHWORKS for OpenVMS (Macintosh) documentation

QA-YPCAC-GZ PATHWORKS for Macintosh programmer's documentation

PATHWORKS for DEC OSF/1 AXP (LAN Manager)

PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) server software lets powerful DEC OSF/1 AXP systems provide Windows, Windows NT, Windows for Workgroups, DOS, and OS/2 clients with fast server performance and easy access to networked file, print, mail, and security services, in local and wide area networks. And it does all this without interfering with a DEC OSF/1 AXP system's ability to run business-critical client/server and multi-user applications.

Integrating PCs into a UNIX environment, this PATHWORKS product offers shared updating of files between PC and UNIX applications, allows transparent file exchange among PC and NFS users, provides SENDMAIL mail addressing, and supports UNIX utilities such as Network Information System (formerly Yellow Pages) and BIND for naming.

Features

- Full LAN Manager V2.2 functionality, including domain services, security, Mail Slots, Named Pipes, and File Replicator Service
- Support for C2-level security for PC data stored on server
- Manageable by ManageWORKS (part of PATHWORKS for DOS and Windows client) for easy PC LAN administration
- NetBEUI transport for DEC OSF/1 AXP; support for TCP/IP and DECnet transports

Prerequisite Hardware

- Any properly configured DEC OSF/1 AXP system
- Minimum of 20 Mbytes of RAM
- DOS/Windows: minimum 3.5 Mbytes (7,000 blocks) storage for installation; only 2.25 Mbytes (5,500 blocks) required for operation

Prerequisite Software

- DEC OSF/1 AXP V2.0
- Optional Software: DECnet/OSI for DEC OSF/1 AXP V2.0

Ordering Information

QM-2CPAA-AB	PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) FPS 10-user license
QM-2CPAA-AC	PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) FPS 25-user license
QM-2CPAA-AD	PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) FPS 50-user license
QM-2CPAA-AE	PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) FPS 100-user license
QM-2CPAA-AF	PATHWORKS V5.0 for DEC OSF/1 AXP (LAN Manager) FPS 250-user license
QM-2CLAA-AA	PATHWORKS V5.0 (LAN Manager) FPA license, per PC

See PATHWORKS License Description for explanation of licensing.

Media and Documentation

QA-054AA-H8	DEC OSF/1 AXP Software Library LP's CD-ROM
QA-054AA-H8	PATHWORKS V5.0 for DEC OSF/1 AXP documentation; SPD 35.10

PATHWORKS for ULTRIX

PATHWORKS for ULTRIX server software allows RISC and VAX systems to provide local- and wide-area server features to Windows, Windows NT, DOS, and OS/2 clients. In addition to delivering the common PATHWORKS server features, PATHWORKS for ULTRIX integrates PCs into the UNIX environment by providing SENDMAIL mail addressing and supporting UNIX utilities such as YP (Yellow Pages) and BIND/Hesiod (Berkley Internet Name Domain)for naming.

PATHWORKS for ULTRIX server software also provides shared update of files among PC and UNIX applications by supporting native ULTRIX byte-range locking. This server also delivers ULTRIX enhanced security and allows unattended backup and provides audit log files.

Ordering Information

Each client accessing a PATHWORKS server requires a PATHWORKS license. The PATHWORKS for DOS and Windows (LAN Manager) CCS license conveys the right to use both client and server software.

Media and Documentation

QA-YNGAA-H5/HM PATHWORKS for ULTRIX VAX media and documentation (TK50/magtape)

QA-YNGAB-H5/HM PATHWORKS for ULTRIX RISC media and documentation (TK50/magtape)

Additional Documentation

QA-YNGAA-GZ PATHWORKS for ULTRIX documentation: Server Installation Guide, Server Administrator's Guide, and Network Troubleshooting Guide

Note: Media and documentation kits contain these documents.

Pacer for ULTRIX

Pacer for ULTRIX provides Macintosh-to-ULTRIX connectivity, developed by Pacer Software and available from Digital.

PacerShare, a network-based file server for Macintosh users, offers AppleTalk Filing Protocol services with the ULTRIX operating system running on RISC systems. For example, with PacerShare, a DECstation 3100 can become a fast AppleShare-compatible file server. Macintosh users can connect to the file server through direct Ethernet connections or through a LocalTalk-to-Ethernet router. PacerShare file service supports standard ULTRIX access control and lets the system manager determine on a per-user basis who has access to a file or directory and the type of access that user receives.

PacerPrint is a standard ULTRIX spooling daemon, providing an interface to the print job queue, status reports, and error handling provided by the ULTRIX system. PacerPrint services allow Macintosh and ULTRIX RISC users to share LaserWriter, LN03R, LPS40, LPS20, and other Digital printers.

Prerequisite Software and Hardware

Pacer for ULTRIX requires any RISC processor with a standard Ethernet controller and ULTRIX V4.2 operating system. Pacer for ULTRIX is compatible with PATHWORKS for Macintosh V1.1 and V1.2.

Ordering Information

The PATHWORKS for Macintosh license grants the right to use Pacer for ULTRIX and to access multiple PATHWORKS and Pacer servers simultaneously.

Media and Documentation

QA-ME9AA-H5/HM Pacer for ULTRIX media and documentation (TK50/magtape)

PATHWORKS for SCO UNIX

PATHWORKS for SCO UNIX is PC networking server software that incorporates Microsoft's LAN Manager V2.2 for UNIX. PATHWORKS for SCO UNIX software enables Microsoft Windows, DOS, and OS/2 PC users to access: file and print services on an Intel 386 or 486 server running the SCO UNIX operating system; PC and SCO UNIX applications; networked peripherals; and local area NetBEUI networking and wide area TCP/IP networking.

PATHWORKS users can transparently access PATHWORKS for DEC OSF/1 AXP, ULTRIX, SCO UNIX, Windows NT, OS/2, and OpenVMS (LAN Manager) servers anywhere on an enterprise-wide network for file and printer sharing, database access, electronic mail, and resource sharing services with large groups of DOS, Windows, and OS/2 clients.

PATHWORKS for SCO UNIX server software includes the following:

- Support for TCP/IP and NetBEUI network transports
- Support for NetBIOS interface for NetBEUI and TCP/IP. NetBIOS support for TCP/IP includes a B-node RFC 1001/1002 implementation. This accommodates SCO UNIX systems with multiple network interface cards installed, as well as support for multiple RFC 1001/1002 NetBIOS scopes
- File services based on Microsoft LAN Manager Extended SMB protocols
- Support of the native SCO UNIX Lock facility which enables SCO UNIX-based applications to share data files with PC-based applications
- Interoperates with NFS file service protocols so that the PATHWORKS for SCO UNIX server can provide a centralized area for making data available bidirectionally between DOS or Windows and OS/2 users, SCO UNIX systems, and remote third-party UNIX systems
- Print services that allow Windows, DOS, OS/2 and SCO UNIX users to share printers connected to 386-486-based servers, both locally and across a wide area
- Server management that includes Domain administration, file replication, and error log and audit log files to identify connections, disconnections, file openings and closings, and failed server access attempts

Prerequisite Software

One of the following SCO UNIX operating systems:

- SCO UNIX System V/386 Release 3.2, V4
- SCO MPX V2.0 and V3.0
- SCO Open DeskTop V2.0 and V3.0

The TCP/IP transport is provided by SCO TCP/IP software. NetBEUI support is provided by PATHWORKS for DOS and Windows software and PATHWORKS for OS/2 software.

Ordering Information

A PATHWORKS for DOS and Windows (LAN Manager) CCS license conveys the right to use both client and server software. See PATHWORKS license description for licensing explanation.

QM-2CLAA-AA	PATHWORKS V5.0 (LAN Manager) FPA license, per PC

Media and Documentation

QA-NC1AA-HC	PATHWORKS for SCO UNIX media and documentation (3.5 inch)
QA-NC1AA-GZ	PATHWORKS for SCO UNIX documentation only: Server Installation and Configuration Guide; Server Administrator's Guide; Server Troubleshooting and Command Reference Guide
QA-NC1AB-GZ	PATHWORKS for SCO UNIX Application Programming Interface Programmer's Reference Guide

PATHWORKS for Windows NT (Server)

PATHWORKS for Windows NT software, available for both client (Windows NT desktop) and server (Windows NT Advanced Server) systems, significantly extends the connectivity of Windows NT systems. This software runs on Alpha AXP, Intel, and MIPS R4000 systems.

Seamless integration of DECnet network management support with Windows NT management permits remote management and provides a consistent interface.

Running on Windows NT server systems, PATHWORKS for Windows NT enables PATHWORKS for DOS, Windows, and OS/2 clients to access and share information, files, and applications on the server.

Macintosh clients can connect to a PATHWORKS for Windows NT server utilizing DECnet services included in PATHWORKS for Macintosh, such as NetCopy and File Access Listener for file transfers.

PATHWORKS for Windows NT does the following:

- Provides FDDI support to PCs equipped with Digital's EISA FDDI card
- Provides DECnet for Windows NT software that can run on Ethernet, Token Ring, and FDDI topologies; synchronous/asynchronous access is provided through the DDCMP protocol for remote offices and users
- Allows Windows NT users to concurrently use DECnet with the TCP/IP and NetBEUI transports provided by Microsoft
- Gives users remote access to networked printers, such as Hewlett Packard's HP3si and Digital's LPS20 printers. PATHWORKS print services redirects requests over DECnet or TCP/IP from the Windows NT server. A PATHWORKS for Windows NT client can also directly use a print server
- Integrates DECnet events into Windows NT tools such as the Event Viewer, so that network managers can see DECnet events such as router up/router down and protocol violation notices in the same way they see Windows NT security failures and hardware errors
- Integrates DECnet with the Windows NT Performance Monitor so that network managers can track DECnet performance
- Provides DECnet support for WinSock, NetBIOS, LAN Manger, and DEC Remote Procedure Call APIs so applications that use Windows NT APIs can work in DECnet networks

A separate PATHWORKS for Windows NT programmer's kit provides tools for developers to write and port custom applications. It enables porting of DOS/Windows-based, 16-bit applications and ULTRIX-based applications to 32-bit native Windows NT applications. Libraries include PATHWORKS Socket library and the DECnet utility library as dynamic link libraries (DLLs). A helper DLL for WinSock DECnet support is provided, as well as a static library which supports the X/Open Transport Interface (XTI).

Ordering Information

Contact a Digital representative for order numbers. In the U.S., call 800-DIGITAL.

PATHWORKS for OS/2

PATHWORKS for OS/2 server software provides full Microsoft LAN Manager capabilities for Windows, Windows NT, DOS, and OS/2 clients in Token Ring and Ethernet networks. OS/2 systems can function as servers and/or clients. PATHWORKS for OS/2 server software includes the common PATHWORKS server features while supporting LAN Manager's Application Programming Interfaces (APIs), such as Named Pipes, for developing and distributing applications between DOS and OS/2 systems and takes advantage of LAN Manager Peer services. The software also supports multiple concurrent transports, including DECnet, TCP/IP, and NetBEUI.

This software supports TCP/IP through the PATHWORKS TCP/IP (OS/2)add-on option. The software also contains DECnet for OS/2 networking software for task-to-task communications, NetBIOS interface support, and network management and diagnostic tools.

PATHWORKS for OS/2 supports OS/2 Standard Edition V1.21 and V1.3, including the High Performance File System (HPFS), and OS/2 V2.0 on servers.

PATHWORKS for OS/2 requires an 80286, 80386, or 80486 processor with 6 Mbytes of system memory for server or peer services configurations. A hard disk with 8 Mbytes of available space is also required. In addition, the server software requires a network interface card—an Ethernet card, such as Digital's EtherWORKS family of cards, or a Token Ring card, also available from Digital. PATHWORKS for OS/2 runs on any industry-standard PC such as DECpc, IBM AT and PS/2, COMPAQ, Olivetti, Toshiba, and Zenith Data Systems models.

Ordering Information

Although there is one media and documentation kit for the server and client, there are two separate licenses. A client or server running the PATHWORKS TCP/IP (OS/2) option requires a TCP/IP license in addition to the base client or server license.

QL-YLXAW-AA	PATHWORKS for OS/2 server license
QL-YFWAW-AA	PATHWORKS for OS/2 client License: gives users the right to use PATHWORKS for OS/2 client software on a single PC as well as PATHWORKS server software.

A server license is required for each OS/2 server system.

Media and Documentation

QA-YFWAA-HC/H7	PATHWORKS for OS/2 client and server media and documentation (RX23/RX33)

Additional Documentation

QA-YFWAA-GZ	PATHWORKS for OS/2 user documentation: Installation and Configuration Guide, User's Guide, LAN Manager User's Guide, LAN Manager's Administrator's Guide, LAN Manager's Administrator's Reference, Mail User's Guide, SEDT User's Guide, SETHOST Terminal Emulation Guide, Network Management Guide, Network Troubleshooting Guide, and DECnet for OS/2 Network Management Guide. NOTE: The media and documentation kits listed above contain all these documents.
QA-YFWAB-GZ	PATHWORKS for OS/2 programmer documentation: DECnet for OS/2 Programmer Reference Manual and LAN Manager Programmer Reference Manual.

Personal Computer Mail Solutions

Overview

Most enterprises today recognize that electronic communication—across computer systems, departments, enterprises, and countries—is vital to competitive health. Yet such organizations also need to ensure that their workers have access to computers and software that support their work styles, personal preferences, job-specific needs, and ranges of technical literacy.

Extending an electronic mail system across such diverse platforms and technologies is the challenge Digital addresses and meets with its DEC MAILworks products for Microsoft Windows, Macintosh, and DOS users and with its Mobilizer for ALL-IN-1 product for portable PCs.

DEC MAILworks for PCs

Taking advantage of Digital's PATHWORKS products for connecting systems, the DEC MAILworks family makes possible a worldwide mail system that supports both X.400-based and proprietary systems. The products implement the CCITT X.400 standards for public and private electronic mail systems.

DEC MAILworks products deliver the following capabilities:

- Full-featured DEC MAILworks capabilities for Microsoft Windows, Macintosh, and DOS systems
- Adherence to CCITT X.400 P1 and P2 User Agent recommendations for multinational, multivendor mail interconnection
- Click-to-Launch feature for starting other applications from within mail on Windows, and Macintosh clients
- Full integration with multivendor mail systems through Digital's MAILbus
- Personal Address Book for easy maintenance of mail addresses and nicknames; easily integrated with the MAILbus Distributed Directory Service for directory support throughout a multivendor network
- Support for any number or type of message attachments
- Sophisticated filing functions for storing messages locally or remotely

Additional features include handling various file formats, configuring messages for maximum readability; online notification of message delivery; priority-based message delivery; message retrieval based on header fields and filing structures; and message redirection to a secondary address.

DEC MAILworks Server

The DEC MAILworks OpenVMS server requires OpenVMS operating system V5.3 or higher, DECnet-VAX V5.3 or greater, PATHWORKS for OpenVMS V4.0, and DEC MAILworks Server for OpenVMS. Optional software includes VAX Message Router, VAX Message Router VMSmail Gateway, or other Message Router gateways. For Macintosh service, PATHWORKS for Macintosh V1.0 (OpenVMS resident component) is required.

QB-YFTA9-AA	DEC MAILworks Server for OpenVMS (single-node server); license, media (TK50), and documentation
QL-YFUA9-JC	DEC MAILworks WAN Server license
QA-YFUAA-H5/HM	DEC MAILworks WAN Server media and documentation (TK50/magtape)

TeamLinks Mail for Microsoft Windows

TeamLinks Mail for Microsoft Windows is a fully functional, graphics-oriented Microsoft Windows application. It features icons, pull-down menus, color, windows, and on-line help. This product allows MAIL to be called from other Windows applications, enabling users to send mail without exiting from the original application. Sample macros for Word for Windows and Microsoft Excel are included.

The Microsoft Windows client connects to the server over local area networks connected by DECnet.

Prerequisite Software and Hardware

PATHWORKS for DOS V4.0 and 4.1 and Microsoft Windows V3.0 or 3.1 configuration that has a minimum of 4 Mbytes of system memory and a hard disk with a minimum of 3.5 Mbytes of free storage in addition to PATHWORKS for DOS requirements; DOS operating system V3.3, 4.0, 4.1 or 5.0; Microsoft Windows V3.0 or 3.1; PATHWORKS for DOS V4.0 or greater; PATHWORKS for Windows includes license.

Ordering Information

QL-0N1AG-2B TeamLinks Mail for Microsoft Windows personal use license

Media and Documentation

QB-0N1AA-AA TeamLinks Mail for Microsoft Windows personal use license, media, and documentation

QA-0N1AA-HC TeamLinks Mail for Microsoft Windows media (RX23) and documentation

Additional Documentation

QA-0N1AA-GZ TeamLinks Mail for Microsoft Windows documentation

The TeamLinks Mail for Macintosh product is a fully functional Macintosh application for use on any Macintosh system supported by PATHWORKS for Macintosh. Like other Macintosh applications, TeamLinks Mail for Macintosh is graphics oriented, using icons, pull-down menus, windows, and on-line help.

The Macintosh client connects to the server through the DECnet network, through the PATHWORKS AppleTalk/DECnet gateway, or remote locations through asynchronous DECnet connections. Mail attachments can include MacBinary files (data fork and resource fork or data fork only), allowing the highest level of interoperability in today's heterogeneous computing environment.

Media and Documentation

QA-YX1AA-HB TeamLinks Mail for Macintosh media (RX24) and documentation

Additional Documentation

QA-YX1AA-GZ TeamLinks Mail for Macintosh documentation (10 sets)

This DEC MAILworks product is a DOS character-cell implementation of the DEC MAILworks client software. It can be used on any industry-standard DOS system supported by PATHWORKS for DOS. The license for this client is packaged with PATHWORKS for DOS.

DEC MAILworks for DOS users can connect to the server over local area networks by way of the DECnet network, by dialing in from remote locations through asynchronous DECnet connections, or through asynchronous connections through LAT, X.25 PAD, or dial-up without benefit of DECnet.

Prerequisite Software and Hardware

Any valid PATHWORKS for DOS configuration with a minimum of 640 Kbytes of memory (420 Kbytes of free memory is required after loading PATHWORKS for DOS); support for 8-bit characters is provided only on EGA and VGA machines; DOS operating system V3.3 or higher; PATHWORKS for DOS V4.0 or higher (contains the license for DEC MAILworks for DOS).

Media and Documentation

QA-VZ8AA-HB DEC MAILworks for DOS media (RX24) and documentation

Additional Documentation

QA-VZ8AA-GZ DEC MAILworks for DOS documentation (one set)

LAN-Based Applications

Conferencing for Windows

PATHWORKS Conferencing for Windows enables Microsoft Windows users to set up an electronic conference for sharing information regardless of time or location. Computer conferencing is a proven, computer supported, electronic messaging technology. Conferencing can be used for a variety of applications such as an electronic bulletin board, collaborative document authoring and review, and internal classes or seminars.

Features

- Distributed Access
  PATHWORKS Conferencing clients can access VAX Notes conferences on any VAX Notes server node in a DECnet network, therefore offering true distributed processing capability.
- Easy to Use
  PATHWORKS Conferencing is layered on Microsoft Windows. All functions can be accessed by easy-to-use pull-down menus or pushbuttons. Dialog boxes are used to input information. PATHWORKS Conferencing is designed for inexperienced users. On-line Help and tutorial documentation assists in familiarizing new users with PATHWORKS Conferencing quickly and easily.
- Built-in Editor
  The PATHWORKS Conferencing client has a built-in editor, so users can create their own topics and replies without leaving the application.
- Imported Text
  PATHWORKS Conferencing allows topics and replies to be created outside of the PATHWORKS Conferencing application (using any editor that can produce ASCII output files) and then later imported into the conference.
- Mail Integration
  PATHWORKS Conferencing supports the DEC MAILworks for Windows or PATHWORKS MAIL to allow users to send notes to other users from within VAX Notes. PATHWORKS Conferencing, one of the components of PATHWORKS Links for Windows is also available separately.

The PATHWORKS Conferencing software is designed or use in a client/server environment. The following server products are required:

- VAX Notes
- PATHWORKS for OpenVMS

A DECnet connection to a VAX Notes server is required. PATHWORKS for DOS communication software is required.

Ordering Information

QL-MCWAG-2B PATHWORKS Conferencing for Windows personal use license

Media and Documentation

QB-MCWAA-SA PATHWORKS Conferencing for Windows personal use license, media, and documentation

QA-MCWAA-HB PATHWORKS Conferencing for Windows media (RX24) and documentation

eXcursion for Windows

eXcursion for Windows enables a Microsoft Windows user to display and control X Window applications on a PC within the Microsoft Windows environment. This product is an implementation of the MIT X Windows server and provides local Microsoft Windows window management and foreign window management control for applications based on DECwindows Motif, Open Look, or other X-11 toolkit implementations.

Components

- eXcursion for Windows server software
- Installation utility
- Program start utility for DECnet
- Dynamic Link Libraries (DLL) for network communications
- eXcursion for Windows User Guide, Quick Start Card plus extensive online help.
- DECwindows Motif, MIT, Open Look, and OSF/Motif fonts
- Keyboard mapping files
- Template initialization file

Features

- Separate application windows for each X application displayed by the X server
- eXcursion Setup Utility for installing eXcursion under Microsoft Windows
- Option to add X application icons to a Microsoft Windows Program Manager group
- eXcursion Control Panel for easy access to X application and customization features
- Extensive online help including answers to questions about setting up or using eXcursion
- Cut and paste text or graphics between X applications and Microsoft Windows applications
- Support for any Microsoft Windows supported video system
- Display up to 256 colors with the appropriate graphics controller
- Complete library of fonts to use with X applications (both 75 and 100 dots per inch)
- Compile new fonts from source files, if needed for a particular application
- Redefine the use of one or more keys on the keyboard
- Specify a personal password for access to eXcursion
- X window applications can be managed by Microsoft Windows or a foreign window manager
- Three-button mouse emulation

eXcursion for Windows application software is layered on Microsoft Windows, creating a unified operating environment in which PC users can take advantage of X applications without learning a new interface.

eXcursion for Windows allows a personal computer running the DOS operating system and Microsoft Windows to use X client applications available from a remote system, using DECnet or TCP/IP protocols.

eXcursion for Windows *(continued)*

Software Requirements

eXcursion for Windows is a layered application on Microsoft Windows; it requires Microsoft Windows V3.0 or V3.1; 2 Mbytes free memory (4 Mbytes is recommended).

The eXcursion for Windows software supports DECnet and TCP/IP communication environments. One of the following communications software packages is required.

Communications Software Supported

- PATHWORKS for DOS V4.0 or higher
- PATHWORKS TCP/IP (DOS) V1.1 or greater
- FTP PC/TCP V2.05
- 3Com3+Open TCP V1.1
- Beame & Whiteside V2.2
- Novell LAN WorkPlace for DOS V4.0D
- HP ARPA Services for DOS V2.1
- Sun PC-NFS V3.1, V3.5, and V4.0
- Wollongong PathWay Access for DOS V1.1
- Microsoft LanManager V2.1
- Ungermann Bass Net/One 16.4

Media and Documentation

QB-MG7AA-5B	eXcursion for Windows, (3.5 inch) media
QB-MG7AA-5A	eXcursion for Windows, (5.25 inch) media

EtherWORKS Comparison Chart

Low-cost EtherWORKS adapters provide leading-edge technology and built-in reliability to network high-performance PCs. A full range of products is available to support ISA, EISA, MicroChannel, and PCI bus types. Also included are pocket adapters for parallel port connections in laptop PCs.

Product	Application	Bus Support/Data Path	Cable Interface	PC LAN Compatibility
EtherWORKS 3 TURBO **DE203-AB**	High-traffic, memory-intensive applications	ISA and EISA compatible / 16-bit	ThinWire (DE203-AB)	PATHWORKS NetWare LAN Manager Windows for Workgroups Windows NT (Alpha and Intel) SCO UNIX OS/2 (NDIS) VINES (client)
EtherWORKS 3 TURBO TP **DE204-AB**			Twisted-pair (DE204-AB)	
EtherWORKS 3 TURBO PLUS **DE205-AB**			ThinWire Thick wire Twisted pair (DE205-AB)	
ETHERWORKS MC **DE210-AB**	High-performance MicroChannel applications	MicroChannel / 16-bit	ThinWire Thick wire (DE210-AB)	PATHWORKS, NetWare, LAN Manager,SCO UNIX, OS/2 (NDIS), VINES (client)
ETHERWORKS MC TP/BNC **DE212-AB**			ThinWire Twisted pair (DE212-AB)	
ETHERWORKS EISA TP/BNC **DE422-SA**	High-performance client/server EISA environments	EISA / 32-bit	ThinWire Twisted pair (DE422-SA)	PATHWORKS, NetWare, LAN Manager, Windows NT (Alpha and Intel), OS/2 (NDIS), VINES (client)
EtherWORKS TURBO EISA **DE425-AA**	Demanding client/server environments requiring high network performance, low CPU utilization. Full duplex ready	EISA / 32-bit (DE425-AA)	ThinWire Thick wire Twisted pair (DE425-AA, DE435-AA)	PATHWORKS, NetWare, LAN Manager, Windows for Workgroups, Windows NT (Alpha and Intel), SCO UNIX, OS/2 (NDIS), VINES (client)
EtherWORKS TURBO PCI **DE434-AA** **DE435-AA-**		PCI / 32-bit DE435-AA	Twisted pair DE434-AA)	
EtherWORKS Pocket Ethernet Adapter **DEPEA-AA**	Low-cost, portable PC connectivity	Parallel port	Twisted pair (DEPEA-AA)	PATHWORKS, NetWare, Windows for Workgroups, VINES (client)
EtherWORKS Pocket Ethernet Adapter **DEPEA-BA**			ThinWire (DEPEA-BA)	

Specifications

Network Buffer RAM	DE203, DE204, DE205, DE422, DEPEA DE210, DE212 DE425, DE435	128 Kbyte 64 Kbyte 2–256 Kbyte
Slot size	DE203, DE204, DE205, DE425 DE210, DE212, DE422 DE435	Half slot Full slot PCI-standard
FCC/VDE	Class B	

EtherWORKS Network Interface Cards

Digital's performance-oriented network interface cards give PCs access to file, disk, application, print, and other services across the network. A complete line of 16-and 32-bit network cards for ThinWire, thick wire, and unshielded twisted pair (10BaseT) Ethernet is available.

EtherWORKS family features:

- Complete software support for both client and server—Novell certified; 100% compliant with LAN Manager, VINES, PATHWORKS, and Streams for SCO UNIX
- FCC and VDE B certified—for worldwide use

EtherWORKS 3 TURBO NICs include the above features plus:

- Parallel processing—outperforms other NICs by processing both transmit and receive packets concurrently
- ASIC technology in a Digital-designed chip
- Dynamic memory management—uses only 2 Kbytes of PC memory; fits into any space in high memory
- Easy to install and set up—uses simple software commands

The members of the EtherWORKS family are:

- EtherWORKS 3 TURBO (DE203-AA)
- EtherWORKS 3 TURBO TP (DE204-AA)
- EtherWORKS 3 TURBO PLUS (DE205-AA)
- EtherWORKS MC (DE210-AB)
- EtherWORKS MC TP/BNC (DE212-AB)
- EtherWORKS EISA TP/BNC (DE422-SA)
- EtherWORKS TURBO EISA (DE425-AA)
- EtherWORKS TURBO PCI (DE434-AA DE435-AA)
- EtherWORKS Pocket Ethernet Adapter (DEPEA-AA)
- EtherWORKS Pocket Ethernet Adapter (DEPEA-BA)

Ordering Information

ISA/EISA 16-bit	
DE203-AB	EtherWORKS 3 TURBO network interface card (ThinWire)
DE204-AB	EtherWORKS 3 TURBO TP network interface card (unshielded twisted pair)
DE205-AB	EtherWORKS 3 TURBO PLUS network interface card (ThinWire, thick wire, and unshielded twisted pair)
ISA/EISA 16-bit Packs—	
DE203-BB	5-pack of DE203-AB, includes one media and documentation kit
DE203-CB	25-pack of DE203-AB, includes one media and documentation kit
DE204-BB	5-pack of DE204-AB includes one media and documentation kit
DE204-CB	25-pack of DE204-AB includes one media and documentation kit
DE205-BB	5-pack of DE205-AB includes one media and documentation kit
DE205-CB	25-pack of DE205-AB, includes one media and documentation kit
MicroChannel 16-bit	
DE210-AB	EtherWORKS MC network interface card (ThinWire and thick wire)
DE212-AB	EtherWORKS MC TP/BNC network interface card (ThinWire and unshielded twisted pair)
EISA 32-bit	
DE422-SA	EtherWORKS EISA TP/BNC network interface card (ThinWire and unshielded twisted pair)
DE425-AA	EtherWORKS TURBO EISA (ThinWire, Tick wire, Twisted pair)
DE435-AA	EtherWORKS TURBO PCI (ThinWire, Tick wire, Twisted pair)
DE434-AA	EtherWORKS TURBO PCI (Twisted pair)
Parallel Port	
DEPEA-AA	EtherWORKS Pocket Ethernet Adapter (Twisted pair)
DEPEA-BA	EtherWORKS Pocket Ethernet Adapter (ThinWire)

DEC FDDIcontroller/EISA

The DEC FDDIcontroller/EISA provides direct connection to a 100 Mb/s FDDI network using unshielded twisted pair (FDDI TP-PMD (UTP)), or multimode fiber optic cable (FDDI Single Attached Station (SAS) and FDDI Dual Attached Station (DAS)).

The UTP version allows the use of Category 5 unshielded twisted pair cabling to connect into a 100 Mb/sec FDDI network. This feature provides network managers the configuration flexibility to offer high-performance network access to users while optimizing existing investments.

Where fiber optic connection to the FDDI ring is practical, Digital provides two options, SAS or DAS. The SAS card is connected either through a concentrator into the FDDI ring, or to Digital's GIGAswitch FDDI switch—bringing dedicated FDDI to the desktop.

The DAS card, which has two ports connected to the FDDI ring, is typically used for high end servers that are kept continuously on-line. The DAS card option can also be used in dual homing configurations for redundant network paths.

Full Duplex (FDX) Protocol—Full duplex FDDI enables data to be transmitted and received simultaneously, reducing latency. FDX, in a point-to-point configuration or when multiple devices are connected in a star topology switched by the GIGAswitch, is a unique feature that enhances the performance of Digital's FDDIcontrollers. In full duplex mode, FDDI NICs can achieve throughputs of up to 160 MB/s.

FDDI Specifications

Standards

Fully compliant with standards-based ANSI X3T9.5

Compliance

ODI 2.0; ODI 3.0; NDIS 2.01; NDIS 3.0; LLI 3.1 revision 2
TP-PMD FDDI Draft Standard–FDDIcontroller/EISA UTP
Modular TP-PMD, for future upgrade to final TP-PMD standard SMT–Version 7.3

Connectors

Multimode fiber optic connector (SAS and DAS)
MIC with FDDI standard key
TP-PMD connector (UTP): RJ-45
Optical by-pass relay (DAS): RJ-12

Ordering Information

DEFEA-AA[1]	DEC FDDIcontroller/EISA Multimode Fiber SAS. Occupies one slot
DEFEA-DA[1]	DEC FDDIcontroller/EISA Multimode Fiber DAS. Occupies two slots
DEFEA-UA[1]	DEC FDDIcontroller/EISA Unshielded Twisted Pair SAS. Occupies one slot

[1] Includes drivers (OpenVMS AXP and DEC OSF/1 AXP for Alpha drivers are included in the operating systems), DEClma, DECblast, SNMP co-agent software, and Installation Manual.

DEC FDDIcontroller/PCI

Overview

Digital's new industry-standard PCI-to-FDDI adapters bring affordable, full performance FDDI connectivity to PCI Local Bus based Pcs, servers, and systems. These new adapters will auto-configure to operate in FDDI full-duplex mode. Options include Single Attachment Station (SAS) adapters supporting multi-mode fiber (MMF), FDDI Dual Attachment Station (DAS) adapters supporting multi-mode fiber (MMF), and FDDI Single Attachment Station (SAS) adapters supporting unshielded twisted pair (UTP) copper cable up to 100 meters between stations.

Features

- MMF options support up to 2KM between stations
- Uses a single PCI busmaster slot
- DAS option includes support for an optional, external, third party, 5 V optical bypass relay (OBR)
- Standards Implemented: PCI Local Bus V2.0; PCI BIOS V2.0; ANSI TP-PMD V2.1; ANSI SMT V7.3

Drivers Supported

- NetWare 3/NetWare 4 server
- NetWare DOS ODI client
- NetWare SFT III MSL
- NDIS 2 (DOS, LAN Manager, PATHWORKS)
- NDIS 2 OS/2 (LAN Manager, PATHWORKS)
- Windows NT V3.5
- Windows for WorkGroups V3.11
- SCO UNIX

Ordering Information

DEFPA-UA	DEC FDDIcontroller/PCI, SAS/UTP, TP-PMD (RJ45)
DEFPA-AA	DEC FDDIcontroller/PCI, SAS/MMF, Duplex SC connectors
DEFPA-DA	DEC FDDIcontroller/PCI, DAS/MMF, Pair Duplex SC connectors

Token Ring Cards

ProNet Family

The ProNET 4/16 family of high-performance Token Ring network interface cards provides a physical connection between a PC and the network.

Features

- Connects PCs using IEEE 802.5/Token Ring standards for 4/16 Mb/s Token Ring networking applications
- Supports Extended Industry Standard Architecture (EISA), MicroChannel, and IBM PC/AT bus architecture
- Supported by PATHWORKS for DOS, PATHWORKS for OS/2, and PATHWORKS for DOS (NetWare Coexistence)software as well as many other network operating systems
- Offers media flexibility with onboard support for shielded twisted-pair (STP), unshielded twisted-pair (UTP), and fiber optic cabling media

Ordering Information

DW110-AA	ProNET-4/16 AT network interface card provides an interface between a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network on IBM PCs, PC/ATs, and ISA compatibles.
DW210-AA	ProNET-4/16 MicroChannel interface card provides an interface between a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network, IBM PS/2, and MicroChannel-compatible PCs.
DW300-AA	ProNET-4/16 EISA network interface card provides an interface between the 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network and the EISA network compatible PCs.
H7014-AA	ProNET-4/16 Unshielded Twisted Pair (UTP) Media Filter enables connectivity between a 100-ohm unshielded twisted pairand older versions of IBM's 16/4 Adapter (ISA) and 16/4 Adapter/A (MCA) on the ProNET-4/16 (MCA) 150-ohm network interface cards.
H7015-AA	ProNET-4/16 Unshielded Twisted Pair (UTP) Media Filter enables connectivity between a 100-ohm unshielded twisted pair cable and IBM's new versions of the 16/4 adapter (ISA) and the 16/4M Adapter/A (MCA) 150-ohm network interface cards.

DEC TRNcontroller 100

The DEC TRNcontroller 100 and the Digital Token Ring Network Device Driver are a Q-bus controller and a software driver that enable MicroVAX/VAXserver 3xxx (except the 3100) and VAX/VAXserver 4000 systems to connect to a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network.

Features

- Digital Token Ring Network Device Driver (TRDRV V/V V1.1 for VMS)
- Supports DECnet VAX
- Includes self-test diagnostics and OpenVMS installation verification procedure kit
- Serial console port can support a console device for debugging purposes (BC29E-15)
- Supports STP connections only
- Microcode-based device
- Supported in BA200 and BA400 series enclosures (MicroVAX VAXserver 3xxx [except 3100], VAX 4000 systems)
- Includes hardware and software documentation
- Source routing as a DECnet datalink service
- Arbitrary Macintosh layer addressing

Hardware Requirements

VAX configuration

Software Requirements

OpenVMS V5.5 operating system

Optional Networking Software

- DECNET VAX IV
- PATHWORKS for OpenVMS 4.1-1

DEQRA-CA DEC TRNcontroller 100

EtherWORKS Router/DECnet

The EtherWORKS Router/DECnet V1.0 addresses the DECnet connectivity needs of small PC local area networks (LANs) in remote branch office locations usually found in retail, banking, service, and insurance businesses.

EtherWORKS Router/DECnet connects PC LANs to a DECnet wide-area network. Users can communicate with other users on DECnet nodes over asynchronous or synchronous connections that support the Digital Data Communications Message Protocol (DDCMP). The DDCMP ensures integrity and correct sequencing of messages between adjacent nodes.

The result is full access to a robust, wide-area network for file and print services and for client/server applications such as mail, conferencing, and browsing. In addition, file and print services will work transparently over the WAN on other servers.

The user can downline load the router software from any PC system running DOS and PATHWORKS for DOS software on the same Ethernet segment with the EtherWORKS Router. This includes the same PC system housing the EtherWORKS Router card as long as that PC has an additional Ethernet interface card.

Features

- Provides cost-effective routing for branch offices within a DECnet area as well as between DECnet areas
- Combines PC-card hardware and routing software to run on personal computers with no performance impact
- Uses asynchronous and synchronous connections, allowing users to choose low-cost services
- Selects the least-cost path and reroutes traffic if there is a line failure in the DECnet network
- Supports up to 2 x 64 Kbits/s, providing full backup-line and growth capabilities plus the opportunity to move from low-to high-speed connections
- Features easy-to-use DOS-based installation and single-box packaging

Hardware Requirements

Note: The hardware and software can be configured on the same system if there is a separate connection to Ethernet in addition to the EtherWORKS Router connection.

- Any PC/AT-compatible personal computer to run the router software and hardware
- A minimum of one drive (3.5-inch 720-Kbyte or 5.25-inch 360-Kbyte) for software installation
- Optional adapter cables for high-speed ports

Software Requirements

Valid configuration of the DOS operating system and PATHWORKS for DOS networking software.

EtherWORKS Router/DECnet *(continued)*

Disk Space Requirements

For local host PC:

- 1250 blocks (640 Kbytes) for installation
- 530 permanent blocks (270 Kbytes) per router for use

Optional Hardware

Modem (Digital's DF196, DF296, or DFD01; Hayes SmartModem 2400, Codex 2233/2260).

A separate license is required for each EtherWORKS Router/DECnet hardware unit on which the EtherWORKS Router/DECnet software product will be used.

DE206-AA	EtherWORKS Router/DECnet includes the hardware module, software media, documentation, software license and associated cables

DECpc Personal Computers

Overview

Wherever PC users work and whatever their applications, Digital has an industry-standard system to meet those needs. DECpc personal computers are perfect for networked or standalone operation. The family includes four types of PCs.

- On-the-go portables
- General-purpose desktop personal computers; most are user-upgradable.
- High-performance networked graphics PCs
- Highly expandable PCs, ideal as PATHWORKS or NetWare PC LAN servers

Based on industry-standard microprocessors, DECpc computers provide high-quality, industry-standard computing, reliability, support services, and a very attractive price—all from a worldwide supplier.

The low-profile, desktop PCs combine Digital-engineered quality with aggressive pricing. These systems offer all the performance and flexibility users want coupled with the integration, reliability, and serviceability MIS managers and PC LAN managers demand. The upgradable members of the family feature advanced motherboard design and graphics acceleration technology that enable these PCs to deliver faster graphics performance, a flexible upgrade path, and more room for RAM expansion than many competing systems. With video and disk-drive controllers built into the motherboard, all three expansion slots are available to the user. Metal clips on SIMMs and reinforcing bars prove that Digital paid attention to reliability when engineering these machines.

With DECpc systems, users can choose the operating system that's right for them—MS-DOS and Microsoft Windows with their rich set of proven applications, OS/2 with its flexibility to meet the increasing performance needs of the future, or SCO UNIX for use in UNIX environments.

The DECpc family participates fully in leading network environments. With these PCs, users can enjoy all of their favorite applications and still have access to group, departmental, and corporate resources through local area network software such as Novell NetWare and the PATHWORKS products from Digital.

Users can order their DECpc personal computers as preconfigured systems or a la carte, creating a customized system for their specific needs.

The following chart helps determine which DECpc personal computer is right for each user. All DECpc systems offer the superior quality users expect from Digital and the dedicated customer support that makes it easy to get—and stay—up and running. The following pages describe each member of the DECpc family in greater detail.

DECpc Personal Computers Comparison Chart

	Notebooks								
	HiNote				HiNote Ultra				
Model	433	CS 433	CS450	CT 450	CT475	433	CS 433	CS 450	CT 450	CT 475
Processor	486SX	486SX	486DX2	486DX2	486DX4	486SX	486SX	486DX2	486DX2	486DX4
Clock speed	33 MHz	33 Mhz	50 MHz	50 MHz	75 MHz	33 MHz	33 Mhz	50 MHz	50 MHz	75 Mhz
Upgradability						Upgradeable CPU	Upgradeable CPU		Upgradeable CPU	
Memory Maximum Cache memory	4 Mbytes 5V 20 Mbytes 8 Kbytes	4 Mbytes 5V 20 Mbytes 8 Kbyte	8 Kbyte	4 Mbytes 5V 20 Mbytes 8 Kbyte	16 Kbyte	4 Mbytes 3.3V 20 Mbytes 8 Kbyte	4 Mbytes 3.3V 20 Mbytes 8 Kbyte	8 Kbyte	4 Mbytes 3.3V 20 Mbytes 8 Kbyte	16 Kbyte
Video 32-bit local bus Simultaneous display Memory	Yes No 512 Kbytes	Yes No 512 Kbytes	1 Mbyte	Yes No 1 Mbyte	1 Mbyte	Yes No 512 Kbytes	Yes No 512 Kbyte	Yes 1 Mbyte	Yes Yes 1 Mbyte	Yes 1 Mbyte
9.5-inch display Resolution, color	Monochrome 640 x 480, 64 gray	DSTN 640 x 480, 256 color	DSTN	TFT 640 x 480, 256 color	TFT	Monochrome 640 x 480, 64 gray	DSTN 640 x 480, 256 color	DSTN	TFT 640 x 480, 256 color	TFT
Max external video resolution	1024 x 768 x 16	CS 433: 1024x768x16 CS 450: 1024x768x256		1024 x 768 x 256		1024 x 768 x 16	CS 433: 1024x768x16 CS 450: 1024x768x256		1024 x 768 x 256	
Keyboard	82 key / 12 function	82 key / 12 function		82 key / 12 function		82 key / 12 function	82 key / 12 function		82 key / 12 function	
Numeric keypad	Embedded	Embedded		Embedded		Embedded	Embedded		Embedded	
Trackball	Integrated	Integrated		Integrated		Integrated	Integrated		Integrated	
PS/2 style keyboard	Optional	Optional		Optional		Optional	Optional		Optional	
Mouse	Optional	Optional		Optional		Optional	Optional		Optional	
Internal floppy diskette drive	Included	Included		Included						
External floppy didkette drive						Included	Included		Included	
Internal PCMCIA Type II / Type III	1/1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
3.5-inch hard disk	120	240	340	240	340	170	240	340	340	340
Ports Parallel ECP/EPP port Serial RS 232C port External video SVGA PS/2 port	Yes Yes Yes Keyboard/mouse	Yes Yes Yes Keyboard/mouse		Yes Yes Yes Keyboard/mouse		Yes Yes Yes Keyboard/mouse	Yes Yes Yes Keyboard/mouse		Yes Yes Yes Keyboard/mouse	
Integrated Infrared						Yes	Yes	Yes	Yes	Yes
Audio in/out Built-in microphone Integrated hidden speaker						No No No	No No No	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Port replicator	Option	Option		Option		Option	Option		Option	
PCMCIA port replicator	Option	Option		Option		Option	Option		Option	
PMCIA floppy dock option						No	No	Yes	Yes	Yes
Battery Type Life Weight	NiCad 2-3 hours 14.1 oz.	NiMH 4-6 hours 5.4 lbs		NiMH 3-5 hours 5.4 lbs		Lithium Ion 4-6 hours 10.7 oz	Lithium Ion 4-6 hours 10.7 oz		Lithium Ion 4-6 hours 10.7 oz	
System Weight Weigh with floppy Dimensions	4.9 lbs 8.5 x 11 x 1.5-inch	5.4 lbs 8.5 x 11 x 1.7-inch		5.4 lbs 8.5 x 11 x 1.7-inch		3.5 lbs 3.9 lbs 8.5 x 11 x 1-inch	3.9 lbs 4.3 lbs 8.5 x 11 x 1.2-inch		3.9 lbs 4.3 lbs 8.5 x 11 x 1.2-inch	
AC adapter Sixe (inches) Weight Auto sensing	Option 4.78 x 2.36 x 1.26 10 oz Yes	Option 4.78 x 2.36 x 1.26 10 oz Yes		Option 4.78 x 2.36 x 1.26 10 oz Yes		Option 4.1 x 1.66 x 1.0 9 ox Yes	Option 4.1 x 1.66 x 1.0 9 ox Yes		Option 4.1 x 1.66 x 1.0 9 oz Yes	
Plug and Play BIOS	Yes	Yes		Yes		Yes	Yes		Yes	
Windows 95 ready	Yes	Yes		Yes		Yes	Yes		Yes	
Warranty	3-year	3-year		3-year		3-year	3-year		3-year	
Operating System	HiNote factory installed software—DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav Internet Navigation S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers, HiNote On-Line Users Guide					HiNote Ultra factory installed software—DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR Software, Microsoft Sound System (50 & 75MHz models) CompuServe, Delphi InterNav Internet Navigation S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers, HiNote Ultra On-Line Users Guide				

DECpc Personal Computers Comparison Chart *(continued)*

	Celebris		DECpc XL Systems		
Features	**Celebris 466**	**Celebris 4100**	**DECpc 466D2**	**DECpc XL 560**	**DECpc XL 566**
Industry Standard	PC/XT, PC/AT	PC/XT, PC/AT	PCI/ISA	PCI/ISA	PCI/ISA
Processor	Intel 486 DX2	Intel 486 DX4	Intel 486d2	Intel 64-bit Pentium Processor	Intel 64-bit Pentium Processor
Clock Speed	66 MHz	100 Mhz	66 MHz	60 MHz	66 MHz
Upgradability	Processor and clock speed (including Pentium Over-Drive processor socket)		—	—	—
System Box Dimensions	4.2" H x 14.4" W x 16.3" D	4.2" H x 14.4" W x 16.3" D			
3.5-IN./1.44-MB Diskette Drive	Included	Included	Included	Included	Included
Memory					
Minimum	8 Mbytes	8 Mbytes	8 or 16 Mbytes	8 or 16 Mbytes	8 or 16 Mbytes
Maximum	128 Mbytes	128 Mbytes	192 Mbytes	192 Mbytes	192 Mbytes
Cache Memory	256 KB external	256 KB external	8 KB internal; 128 KB ext. standard 256 KB ext. optional	16 KB internal; 256 KB external	16 KB internal; 256 KB external
Power Supply	100 Watt	100 Watt	300 Watt	300 Watt	300 Watt
Option Slots	2 PCI 2 ISA 1 PCI/ISA	2 PCI 2 ISA 1 PCI/ISA	PCI, ISA, PCI/ISA	PCI, ISA, PCI/ISA	PCI, ISA, PCI/ISA
Video Controller	Included (S3 864 PCI)	Included (S3 864 PCI)	Option	Option	Option
Vacancy Socket	Included (ZIF)	Included (ZIF)			
Math Coprocessor			Option	Option	Option
IDE Controller	Included	Included	Included	Included	Included
IDE Drive Support	Option: 3.5-inch 270 MB, 540 MB, 1.0 Gbyte	Option: 3.5-inch 270 MB, 540 MB, 1.0 Gbyte	Option: 3.5-inch 340 MB 525 MB drive	Option: 3.5-inch 340 MB 525 MB drive	Option: 3.5-inch 340 MB 525 MB drive
SCSI Adapter	Option: 2940 CF 1540 CF	Option: 2940 CF 1540 CF	Included	Included	Included
SCSI Drive Support	:Option:	Option:	Option:	Option:	Option:
3.5-inch hard disk	270 MB, 540 MB, or 1.0 GB	270 MB, 540 MB, or 1.0 GB	340 MB, 535 MB, or 1 GB	340 MB, 535 MB, or 1 GB	340 MB, 535 MB, or 1 GB
5.25-inch tape drive	525 MB, 2.0/4.0 GB	525 MB, 2.0/4.0 GB	Option	Option	Option
CD-ROM	Option: 600 MB	Option: 600 MB	Option	Option	Option
Ports	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard
Storage Bays	One 5.25-inch, two 3.5-inch front accessible; one 3.5-inch internal		Four front accessible, one 3.5-in. hidden		
Keyboard					
101-key PC-style	Included	Included	Included	Included	Included
PS/2 style					
Mouse	Included	Included	Included	Included	Included
Communications Devices					
Parallel/serial adapter	Option	Option	Option	Option	Option
Ethernet card	Option	Option	Option	Option	Option
Token Ring card	Option	Option	Option	Option	Option
Fax/data modem	Option: 9600 fax/2400 data; 9600 fax/9600 data; 14400 fax/14400 data; 14400 fax/14400 data/voice; 2400data/9600 fax/voic		Option	Option	Option
Operating System					
MS-DOS	Included	Included	Included	Included	Included
OS/2	Option	Option	Option	Option	Option
SCO UNIX	Option	Option	Option	Option	Option

[1] **Available storage bays.**
[2] **Includes MS-DOS V6.0 and Microsoft Windows V3.1.**

DECpc Personal Computers Comparison Chart *(continued)*

	MT Systems			MTE Systems		
Features	**DECpc 433DX MT**	**DECpc 450D2 MT**	**DECpc 466D2 MT**	**DECpc 433DX MTE**	**DECpc 466D2 MTE**	**application-DEC 500XP**
Industry Standard	ISA	ISA	ISA	EISA	EISA	EISA
Processor	Intel 80486 DX	Intel 80486 DX2	Intel 80486 DX2	Intel 80486 DX	Intel 80486 DX2	Intel 64 bit Pentium Processor
Clock Speed	33 MHz	50 MHz	66 MHz	33 MHz	66 MHz	60 MHz
Upgradability	Processor & clock speed	Clock speed		Processor & clock speed (3)	Note 3	
System Box Dimensions	17" H x 7" W x 17" D	17" H x 7" W x 17" D	17" H x 7" W x 17" D	17" H x 7" W x 17" D	17" H x 7" W x 17" D	25" H x 9" W x 24" D
3.5-IN./1.44-MB Diskette Drive	Included	Included	Included	Included	Included	Included
Memory						
Minimum	4 Mbytes	4 Mbytes	4 Mbytes	8 Mbytes	8 Mbytes	8 Mbytes
Maximum	64 Mbytes	64 Mbytes	64 Mbytes	192 Mbytes	192 Mbytes	192 Mbytes
Cache Memory	8 KB internal; 256 KB ext. opt	128 KB external std;	128 KB external std;	8 KB internal; 128 KB ext. std; 256 KB ext. opt	8 KB internal; 128 KB ext. std; 256 KB ext. opt	16 KB int. std; 256 KB ext. std
Power Supply	260 Watt (autosensing)	260 Watt (autosensing)	260 Watt (autosensing)	260 Watt (autosensing)	260 Watt (autosensing)	350 Watt (autosensing)
Option Slots	6 ISA	6 ISA	6 ISA	6 ISA	6 EISA	8 EISA
Video Controller	Included (local bus)	Included (local bus)	Included (local bus)	Included (local bus)	Included (local bus)	Built-in VGA & VESA
Vacancy Socket	Included	Included	Included			
Math Coprocessor						
IDE Controller	Included	Included	Included	Included	Included	Included
IDE Drive Support	Option: 3.5" 85, 127, 245, & 525 MB drive	Option: 3.5" 85, 127, 245, & 525 MB drive	Option: 3.5" 85, 127, 245, & 525 MB drive	Option: 3.5" 127, 245, & 525 MB drive	Option: 3.5" 127, 245, & 525 MB drive	Option: 3.5" 105 MB drive
SCSI Adapter	Option	Option	Option	Option	Option	Option
SCSI Drive Support	Option	Option	Option	Option	Option	Option
3.5-inch hard disk	245 MB, 426 MB, or 1 GB	245 MB, 426 MB, or 1 GB	245 MB, 426 MB, or 1 GB	245 MB, 426 MB, or 1 GB	245 MB, 426 MB, or 1 GB	209 MB 425, 665 MB, or 1, 1.6 GB
5.25-inch tape drive	525 MB	525 MB	525 MB	525 MB	525 MB	320/525 MB
CD-ROM	Option: 600 MB	Option: 600 MB	Option: 600 MB	Option: 600 MB	Option: 600 MB	Option: 600 MB
Ports	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard	Parallel, two serial, mouse, keyboard
Storage Bays(1)	Three available; three 5.25" front accessible, half-height			Three available; three 5.25", Seven front accessible, available (4) half-height		
Keyboard						
101-key PC-style	Included	Included	Included	Included	Included	Included
PS/2 style						
Mouse	Included	Included	Included	Included	Included	Included
Communications Devices						
Parallel/serial adapter	Option	Option	Option	Option	Option	Option
Ethernet card	Option	Option	Option	Option	Option	Option
Token Ring card	Option	Option	Option	Option	Option	Option
Fax/data modem	Option: 9600 fax/2400 data; 9600 fax/9600 data; 14400 fax/14400 data			Option: 9600 fax/2400 data; 9600 fax/9600 data; 14400 fax/14400 data		
Operating System						
MS-DOS(2)	Included	Included	Included	Included	Included	Included
OS/2	Option	Option	Option	Option	Option	Option
SCO UNIX	Option	Option	Option	Option	Option	Option

[1] **Available storage bays.**
[2] **Includes MS-DOS V6.0 and Microsoft Windows V3.1.**
[3] **Both DECpc MTE systems are upgradable to Intel's next generation of OverDrive processors based on Pentium processor technology**
[4] **Three 5.25" front accessible, half-height; four 3.5" half-height, internal**

Digital HiNote and HiNote Ultra Notebook Computers

Product Description

Digital HiNote and HiNote Ultra are notebooks designed to meet the needs of highly mobile professional—the sleekest form factor, lightest weight and highest performance with rich features.

The **HiNote Notebook** is the perfect choice for companies that need a light, powerful notebook to equip their fleet of sales or service personnel with the latest in mobile computing power. Digital HiNote fits the bill for the field professional who needs a bookbook with great features without the weight and size of competitive systems in this class.

The **HiNote Ultra Notebook** revolutionizes current notebook technology with its extremely slim form factor and light weight (3.9 lbs), and unique zero footprint floppy. Designed with mobile executive in mind, the NIHote Ultra has built-in infrared for wireless data transmission and business audio for enhanced presentations, faxes, and memos with sound effects.

Users have maximum selection: Digital HiNote and HiNote Ultra are available in five models, monochrome, dual-scan color, or active-matrix color; processor choices range from SX33 to DX2/50 to DX4/75 and hard disk drives are available in 120, 170, 240 and 340 Mbytes.

Attention to detail is evident in scupted keys, PCMCIA buttons to eject option cards easily, an integrated trackball, a full-size 9.5-inch screen minimizes eye strain and the latest in 32-bit local bus video for lightning fast graphics.

Step 1—Base Systems

HiNote Notebook includes

- Intel i486SX 33-MHz CPU
  8 Kbyte cache memory
  Intel i486DX2 50-MHz CPU
  8 Kbyte cache memory
  Intel i486DX4 75-MHz CPU
  16 Kbyte cache memory
- 4-Mbyte memory standard, expandable to 20 Mbytes
- 3.5-inch 1.44-Mbyte floppy disk drive
- Hard disk drive (120, 240 or 340 Mbyte)
- 32-bit local bus video
- 9.5-inch screen (monochrome, dual-scan color or active-matrix color)
- 82 key, 12 function key keyboard
- Integrated trackball
- Internal PCMCIA
- One parallel (ECP/EPP) port
- One serial (RS 232C) port
- External video (SVGA) port
- PS/2 (external mouse or keyboard)
- Port replicator option
- NiCD battery (mono systems) or NiMH battery (color systems)
- MS-DOS V6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav software, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
- Three-year warranty; Passport

HiNote Ultra Notebook includes

- Intel i486SX 33-MHz CPU
  8 Kbyte cache memory
  Intel i486DX2 50-MHz CPU
  8 Kbyte cache memory
  Intel i486DX4 75-MHz CPU
  16 Kbyte cache memory
- 4-Mbyte memory standard, expandable to 20 Mbytes
- 3.5-inch 1.44-Mbyte floppy disk drive
- Hard disk drive (240 or 340 Mbyte)
- 32-bit local bus video
- 9.5-inch screen (monochrome, dual-scan color or active-matrix color)
- 82 key, 12 function key keyboard
- Integrated trackball
- Internal PCMCIA
- One parallel (ECP/EPP) port
- One serial (RS 232C) port
- External video (SVGA) port
- PS/2 (external mouse or keyboard)
- Port replicator option
- Infrared port
- NiCD battery (mono systems) or NiMH battery (color systems)
- MS-DOS V6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav software, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
- Three-year warranty; Passport

HiNote Notebook	
FR-P60WA-AA	HiNote 433—Intel i486SX SL Enhanced 33MHz microprocessor 9.5-inch Dual Scan monochrome display, 4 Mbyte system memory, 120 Mbyte hard disk drive, integrated trackball, 3.5-inch 1.44 Mbyte floppy disk drive, PCMCIA: 1 type II/III. Pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav Software, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P61WB-AA	HiNote CS 433—Intel i486SX SL Enhanced 33MHz microprocessor 9.5-inch DSTN color display, 4 Mbyte system memory, 240 Mbyte hard disk drive, integrated trackball, 3.5-inch 1.44 Mbyte floppy disk drive, PCMCIA: 2 type II or 1 type III. Pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav Software, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P62WC-AA	HiNote CS 450—Intel i486DX2—SL Enhanced—50MHz microprocessor 9.5 DSTN Color, 4 Mbyte system memory, 340 Mbytye hard disk drive, integrated trackball, 3.5-inch 1.44MB floppy disk drive, PCMCIA: 2 type II or 1 type III. Pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav Software, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P63WB-AA	HiNote CT 450—Intel i486DX2—SL Enhanced—50MHz microprocessor 9.5 Active Matrix TFT Color, 4MB system memory, 240MB HDD, integrated trackball, 3.5 1.44MB floppy disk drive, PCMCIA: 2 type II or 1 type III, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi InterNav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P64WC-AA	HiNote CT 475—Intel i486DX4—SL Enhanced—75MHz microprocessor 9.5 Active Matrix TFT Color, 4MB system memory, 340MB HDD, integrated trackball, 3.5 1.44MB floppy disk drive, PCMCIA: 2 type II or 1 type III, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, CompuServe, Delphi Internav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers

Step 1—Base Systems *(continued)*

HiNote Ultra Notebook

FR-P70WA-AA	HiNote Ultra 433—Intel i486SX—SL Enhanced—33MHz microprocessor 9.5 Dual Scan Monochrome, 4MB system memory, 170MB HDD, integrated trackball, external 3.5 1.44MB floppy disk dock, PCMCIA: 2 type II or 1 type III, Infrared port, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR S/W, CompuServe, Delphi Internav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P71WB-AA	HiNote Ultra CS 433—Intel i486SX - SL Enhanced - 33MHz microprocessor, 9.5 DSTN Color, 4MB system memory, 240MB HDD, integrated trackball, external 3.5 1.44MB floppy disk dock, PCMCIA: 2 type II or 1 type III, Infrared port, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR S/W, CompuServe, Delphi Internav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P72WC-AA	HiNote Ultra CS 450—Intel i486DX2 - SL Enhanced - 50MHz microprocessor 9.5 DSTN Color, 4MB system memory, 340MB HDD, integrated trackball, external 3.5 1.44MB floppy disk dock, PCMCIA: 2 type II or 1 type III, Infrared port, Business Audio, Built-in Microphone & Speaker, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR S/W, Microsoft Sound System, CompuServe, Delphi InterNav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P73WC-AA	HiNote Ultra CT 450—Intel i486DX2 - SL Enhanced - 50MHz microprocessor 9.5 Active Matrix TFT Color, 8MB system memory, 340 MB HDD, integrated trackball, external 3.5 1.44MB floppy disk dock, PCMCIA: 2 type II or 1 type III, Infrared port, Business Audio, Built-in Microphone & Speaker, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR S/W, Microsoft Sound System, CompuServe, Delphi InterNav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers
FR-P74WC-AA	HiNote Ultra CT 475—Intel i486DX4 - SL Enhanced - 75MHz microprocessor 9.5 Active Matrix TFT Color, 8MB system memory, 340 MB HDD, integrated trackball, external 3.5 1.44MB floppy disk dock, PCMCIA: 2 type II or 1 type III, Infrared port, Business Audio, Built-in Microphone & Speaker, pre-installed MS-DOS 6.22, Windows for Workgroups 3.11, Puma TranXit IR S/W, Microsoft Sound System, CompuServe, Delphi InterNav S/W, Lotus Organizer, OAG Flight Disk, Second Nature Screen Savers

Step 2—Memory

Systems include 4 Mbyte of memory. Select additional memory if required.

HiNote system memory (Maximum 20 Mbytes)

FR-PCP7M-AA	4 Mbyte 5V, 70ns memory module
FR-PCP7M-AB	8 Mbyte 5V, 70ns memory module
FR-PCP7M-AC	16 Mbyte 5V, 70ns memory module

HiNote Ultra system memory (Maximum 20 Mbytes)

FR-PCP8M-AA	4 Mbyte 3.3V 70ns memory module
FR-PCP8M-AB	8 Mbyte 3.3V 70ns memory module
FR-PCP8M-AC	16 Mbyte 3.3V 70ns memory module

Step 3—System Options

HiNote system options

FR-PCP7H-AA	Car adapter 12VDC—15VDC slim, universal, 2 wire cord fits lighter socket in cars and boats
FR-PCP7H-AB	Optional NiMH battery (Nickel Metal Hydride) fits all HiNote models including monochrome
FR-PCP7H-AC	NiMH battery charger, includes International AC adapter
FR-PCP7H-AD	Internaltional AC adap ter 15 VAC
FR-PCP7E-AA	Port replicator, quick connect adapter containing SVGA port, parallel port, serial port and PS/2 port for keyboard or mouse)
FR-PCP7E-AB	PCMCIA port replicator, quick connect adapter containing SVGA port, parallel port, serial port, PS/2 port (for keyboard or mouse) and 2 type III PCMCIA slots
FR-PCP7X-AA	Nylon travel case—zippered design with inside and outside pockets, accommodate system, AC adapter and power cord, PCMCIA port replicator and optional battery and optional battery charger

Step 3—System Options *(continued)*

HiNote Ultra system options

FR-PCP8H-AA	Car adapter 12VDC—15VDC slim, universal, 2 wire cord fits lighter socket in cars and boats
FR-PCP8H-AB	Optional LiIon (Lithium Ion) battery
FR-PCP8H-AC	LiIon battery charger includes International AC
FR-PCP8H-AD	International AC adapter 15 VAC
FR-PCP8E-AB	FD/PCMCIA expansion dock
FR-PCP7X-AA	Nylon travel case
FR-PCP8X-AB	Exececutive leather portfolio sized case for HiNote Ultra system (does not accommodate AC adapter)

PCMCIA Options

FR-PCP8E-AB	Floppy Disk/PCMCIA Expansion Dock. Same form factor floppy disk dock, includes PCMCIA bay for additional two Type II or one Type III cards. (Compatible with 50 MHz and 75 MHz HiNote Ultra systems **only**)
FR-PCP78-AA	14.4 Fax modem for North American use
FR-PCP78-LN	14.4 Fax modem for International use
FR-PCP78-AB	28.8 Fax modem for North American use
FR-PCP78-AC	Ethernet 10BaseT adapter, includes card and 10BaseT connector
FR-PCP78-AD	Ethernet 10BaseT / 10Base2 combination adapter, includes card, 10BaseT connector and 10Base2 connector
FR-PCP78-AE	Token Ring, includes card and connector
FR-PCP78-AG	170 Mbyte Type III hard disk drive
FR-PCP78-AH	260 Mbyte Type III hard disk drive
FR-PCP7R-AA	340 Mbyte optional hard disk drive upgrade kit (user installable)
FR-PCP79-DB	SCS II PCMCIA Adapter, includes card and connector
FR-PCP79-DA	16-bit sound adapter, includes card and connector

Digital Celebris Personal Computers

Digital's line of industry-standard desktop PCs includes a full range of slim-profile systems including the newest Celebris PCs which include the 66 MHz and 100 MHz systems.

Celebris 466 and Celebris 4100 PCs feature:

- Flexible upgrade path, including upgrades to Intel's 486 processors and Pentium OverDrive technology
- Plug and Play compatible
- Advanced power management
- Multiple video options
- LBA support for IDE drives in excess of 528 Mbytes
- Room to add memory—up to 64 Mbytes
- High integration and efficient use of space, which packs value and functions onto compact motherboard
- Rugged design
- Video refresh rate of up to 72 Hz reduces eye strain and promotes user comfort

The Celebris models include a motherboard with room for memory expansion, up to 64 Mbytes, leaving system expansion slots free for other uses. The 70-ns memory substantially increases performance of memory-intensive applications.

These PCs are built in facilities that conform to ISO 9000 and MPRII Class A international standards of quality process certification. The family is based on industry-standard processors and has been certified MS-DOS and Windows for Worksgroups compatible by National Software Testing Laboratories, Inc. It is also certified to run Novell NetWare, Digital PATHWORKS, and SCO UNIX with a full complement of network interface options.

Step 1—Base System

Specify **assembly required** and **no partials** on order form if system is to be assembled before delivery.

Celebris PCs include

- Industry-standard microprocessor:
  Celebris 466 66 MHz Intel SL-enhanced 486DX2
  Celebris 4100 100 MHz Intel SL-enhanced 485DX4
- 256 Kbytes cache
- 32-bit Peripheral Controller Interconnect (PCI) bus provides bus longevity, better performance than VL and auto configurability
- Memory expandable up to 64 Mbytes on motherboard
- Supports 36-bit SIMMS with access time of 70 ns or less
- Integrated Graphical User Interface (GUI) accelerators for ultra-fast Windows performance
- 2 Mbyte video RAM supported
- 256 Kbyte cache standard write back
- Integrated Floppy Disk Drive/Integrated Drive Electronics (FDD/IDE controller)
- Five expansion slots: One dedicated PCI video slot, One PCI slot, Two ISA slots and One PCI/ISA combination slot
- Four storage slots
- Parallel port with Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP)
- Two buffered serial ports
- Keyboard and mouse ports
- Advanced Power Management (APM)
- Realtime clock/calendar
- 100 Watt switchable (115 V/230 V) power supply
- 2-button mouse
- Keyboard
- 120-V power cord
- English user documentation
- Three-year limited on-site warranty

Model Number	Model	Speed	Graphics	Memory	Diskette	IDE Drive
FR-821AA-AD	Celebris 466	66 MHz	S3 805	8 Mbytes		
FR-821AA-WB*	Celebris 466	66 MHz	S3 805	8 Mbytes	1.44 MB	270 MB
FR-821AA-WC*	Celebris 466	66 MHz	S3 805	8 Mbytes	1.44 MB	540 MB
FR-822AA-AD	Celebris 4100	100 MHz	S3 805	8 Mbytes		
FR-822AA-WB*	Celebris 4100	100 MHz	S3 805	8 Mbytes	1.44 MB	170 MB
FR-822AA-WC*	Celebris 4100	100 MHz	S3 805	8 Mbytes	1.44 MB	340 MB

*** Packages include MS-DOS and Microsoft Windows for Workgroups preinstalled with no backup media.**

Step 2—Processor Upgrades (Optional)

Celebris 466 and Celebris 4100 systems are designed to accommodate processor upgrades. Contact a Digital sales representative for current availability.

Step 3—Operating System

Celeste 466 and Celebris 4100 operating system (MS-DOS and Microsoft Windows for Workgroups) is preloaded in on FR-821AA-WB, WC and FR-822AA-WB, -WC systems . These operating systems do not include backup media.

QB-MESAA-SA MS-DOS V6.0 operating system with Microsoft Windows V3.1 (English)

Step 4—System Memory

Digital recommends a minimum of 4 Mbytes on systems using MS-DOS and Microsoft Windows for Workgroups together.

Systems support four memory modules for maximum 64 Mbytes of memory. Memory modules can be mixed, e.g., one PC74M-AA and PC74M-AB for total of 20 Mbytes.

FR-PC74M-AA 4 Mbyte 70-ns SIMM memory
FR-PC74M-AB 16 Mbyte 70-ns SIMM memory
FR-PC77M-AC 32 Mbyte 70-ns SIMM memory

Step 5—Monitor and Video Upgrade

Monitors include video cable and country-specific power cord.

Monitors

FR-PCXCV-GC	14-inch SVGA color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, interlaced, Energy Star
FR-PCXBV-PC	15-inch SVGA, multi-sync color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, non-interlaced

Video Upgrade

FR-PC82M-DA	2 Mbyte video upgrade

Step 6—Storage Devices

- Select a maximum of four storage devices.
- Three front-accessible storage bays accommodate one 3.5-inch diskette drive, one 5.25-inch device and one 3.5-inch device.
- One internal storage bay accommodates one 3.5-inch low-profile hard-disk drives.
- SCSI devices require a SCSI adapter.

Diskette Drives

FR-PC7XR-BA	1.2 Mbyte 5.25-inch, diskette drive
FR-PC7XR-AA	1.44 Mbyte 3.5-inch diskette drive
FR-PCTXR-AA	2.88 Mbyte 3.5-inch diskette drive

IDE Hard Disk Drives

FR-PCXAR-CK	270 Mbyte 3.5-inch hard disk drive
FR-PCXAR-CL	540 Mbyte 3.5-inch hard disk drive

SCSI Hard Disk Drives

FR-PCXAR-Al	1.0 Gbyte 3.5-inch low profile SCSI hard disk drive

SCSI Adapter (required for SCSI Devices)

FR-PCTAZ-DA	PCI to SCSI AHA 2940 adapter
FR-PCTAZ-AE	1540 CF SCSI adapter

Step 7—Communications Options

FR-PCXDF-ABA	14,400-bit/s data, 14,400-word/s fax /voice.

Network Adapters

DE205-AB	EtherWORKS 3 Turbo PLUS, 16-bit, ThinWire

Step 8—Accessories (Optional)

FR-PC7XS-AA	PS/2 two-button mouse

Step 9—User's Guide and Installation Card

ER-820WW-UA	Celebris 466 and Celebris 4100 User's Guide (English)
ER-820WW-UG	Same as above in German
ER-820WW-UH	Same as above in Dutch
ER-820WW-UI	Same as above in Italian
ER-820WW-US	Same as above in Spanish
ER-820WW-UP	Same as above in French
ER-820WW-IA	Celebris 466 and Celebris 4100 Installation Card (English)
ER-820WW-IG	Same as above in German
ER-820WW-IH	Same as above in Dutch
ER-820WW-II	Same as above in Italian
ER-820WW-IS	Same as above in Spanish
ER-820WW-IP	Same as above in French

Step 10—Power Cords and Keyboards

Power Cord	Keyboard	Country
PC7XC-AA	**PCXAL-NA**	U.S.
BN22Z-2E	**PCXAL-AA**	India
BN19W-2E	**PC7XL-AS**	Spanish (international)
BN24R-2E	**PCXAL-AA**	New Zealand/Australia
BNE4J-2E	**PCXAJ-AA**	Japan (240 V)
	PC7XL-BI	China
	PC7XL-CB	Thailand
	PC7XL-AE	U.K.

DECpc 4xx MT Personal Computers

Product Description

The DECpc 4xx MT PCs are built-in facilities that conform to ISO 9000 and MPRII Class A international standards of quality process certification. The family is based on industry-standard processors and has been certified MS-DOS and Windows-compatible by National Software Testing Laboratories, Inc. It is also certified to run Novell NetWare and Digital PATHWORKS with a full complement of network interface options.

All models include a motherboard that features advanced local-bus graphics hardware and graphical user interface (GUI) accelerator that run Windows applications up to four times faster than ordinary PCs. The motherboard also includes room for memory expansion—up to 64 Mbytes—leaving system expansion slots free for other uses. And the 70-ns memory substantially increases performance of memory-intensive applications.

The MT line features:

- Flexible upgrade path
- Fast, built-in graphics and Windows acceleration; 512 Kbytes of video RAM, upgradable to 1 Mbyte, provides resolution of up to 640 x 480, 16.7M colors non-interlaced.
- Room to add memory—up to 64 Mbytes of RAM
- High integration and efficient use of space
- Rugged design
- 260-Watt autosensing power supply for use worldwide, automatically adjusting to voltage ranges from 100 to 120 V and from 220 to 240 V
- Video refresh rate of up to 72 Hz, reducing eye strain and promoting usercomfort
- Low noise level, meeting the strictest requirements for noise levels in home or office settings
- Competitive price

Step 1—Base Systems

Specify **assembly required** and **no partials** on order form if system is to be assembled before delivery.

Note: Minimum operational system configuration MUST include system memory (4 Mbytes recommended), one floppy diskette drive, and a hard disk drive.

All systems include: chassis, power supply, motherboard with VL-bus video, 128-Kbyte cache, 512-Kbyte VRAM, diagnostic software, 3-button mouse, U.S. keyboard, user documentation (English), 120-V power cord.

DECpc 4xx MT systems include

- Industry-standard microprocessor
  - DECpc 433dx MT 33-MHz Intel 486DX
  - DECpc 450d2 MT 50-MHz Intel 486DX2
  - DECpc 466d2 MT 66-MHz Intel 486DX2
- Memory expandable up to 64 Mbytes
- 128-Kbyte cache
- 512-Kbyte video RAM expandable to 1 Mbyte
- Integrated FDD/IDE controller (floppy disk drive/integrated drive electronics)
- Integrated SVGA controller (resolution up to 640 x 480, 256 colors)
- Six full-size ISA expansion slots
- Socket for optional overdrive processor
- Parallel port
- Two EIA-232C serial ports
- VGA, keyboard, and mouse ports
- Realtime clock/calendar
- 260-watt autosensing power supply
- One-year limited warranty

PCT62-AB	DECpc 433dx MT Base System—433dx CPU
PCT63-AB	DECpc 450d2 MT Base System—450d2 CPU
PCT64-AB	DECpc 466d2 MT Base System—466d2 CPU

Step 2—Memory

Requirements for system memory are operating system and application dependent. Check guidelines provided in operating system and application literature. Digital recommends a minimum of 4 Mbytes on systems using MS-DOS and Microsoft Windows together.

Order Number (Quantity)	Total memory required	Bank 0	Bank 1	Bank 2	Bank 3
PC74M-AA (1)	4 Mbytes	4 Mbytes			
(2)	8 Mbytes	4 Mbytes	4 Mbytes		
(3)	12 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes	
(4)	16 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes
PC74M-AB (1)	16 Mbytes	16 Mbytes			
PC74M-AA (2) plus **PC74M-AB** (1)	24 Mbytes	4 Mbytes	4 Mbytes	16 Mbytes	
PC74M-AB (2)	32 Mbytes	16 Mbytes	16 Mbytes		
PC74M-AA (2) plus **PC74M-AB** (2)	40 Mbytes	4 Mbytes	4 Mbytes	16 Mbytes	16 Mbytes
PC74M-AB (3)	48 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes	
PC74M-AB (4)	64 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes

Step 3—Cache Memory Upgrade (Optional)

PC74M-BA	128-Kbyte cache upgrade (maximum 256-Kbyte cache

Step 4—Operating System

QB-MESAA-SA	MS-DOS V6.0 operating system with Microsoft Windows V3.1 (English)
QB-MESPA-SA	Same as above in French
QB-MESSA-SA	Same as above in Spanish
QB-MSUAA-SA	MS-DOS V6.0 operating system (English)
QB-MSUPA-SA	Same as above in French
QB-MSUSA-SA	Same as above in Spanish
QB-MRSAA-SA)	OS/2 V1.3 operating system (English only

Step 5—Monitor, Video Adapter, and Video Memory

Monitors include video cable and country-specific power cord.

Monitors

FR-PCXCV-GC	14-inch SVGA color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, interlaced, Energy Star
FR-PCXBV-PC	15-inch SVGA, multi-sync color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, non-interlaced
PCXAV-EA	17-inch SVGA multi-synch color monitor, 1024 x 768 resolution, 0.26-mm dot pitch, will support 1280 x 1024 resolution with additional video adapter
PCXAV-FC/F3/F4	19-inch color Trinitron monitor, 1280 x 1024 resolution Autoscan 30—80 kHz horizontal, 50—160 Hz vertical low emission, 0.31-mm stripe pitch. Switchable high-input impedance allows loop-through connection of additional monitors.

Video Adapters

High-resolution (1280 x 1024) monitors require video adapter.

PCXAG-AG	1024 x 768 Fast Windows with 256 colors, or up to 1280 x 1024 with 16 colors. Compatible with VGA, SVGA, and VESA. Also downward compatible with EGA, CGA, HGC, and MDA.
PCXAG-AH	640 x 480 speed enhancement for Windows, or up to 1024 x 768 resolution non-interlaced. Compatible with VGA, SVGA, and VESA Also compatible with EGA, CGA, HGC, and MDA

Video Memory

Base system includes 512-Kbyte video memory. Additional video memory is required for 256 colors at 1024 x 768 resolution. Add memory to meet user's needs

PC74M-CA	512-Kbyte VRAM (maximum of 1 Mbyte VRAM)

Step 6—Storage Devices

- Select a maximum of four storage devices
- Three front-accessible 5.25-inch storage bays accommodate 5.25-inch diskette drive, tape backup drive, CD-ROM, or 3.5-inch SCSI hard disk drive.
- The front-accessible 3.5-inch diskette drive is for loading software. The other 3.5-inch internal bay is for the IDE hard disk.
- SCSI devices require a SCSI adapter.

Diskette Drives

PC7XR-BA	1.2 Mbyte 5.25-inch diskette drive
PC7XR-AA	1.44 Mbyte 3.5-inch diskette drive

IDE Hard Disk Drives

FR-PCXAR-CH	170 Mbyte, 3.5-inch, 1-inch IDE disk drive
FR-PCXAR-CJ	340 Mbyte, 3.5-inch, 1-inch IDE disk drive

SCSI Hard Disk Drives

FR-PCXAR-AM	340 Mbyte, 3.5-inch, 1.6-inch SCSI drive
FR-PCXAR-AH	535 Mbyte, 3.5-inch, 1.6-inch SCSI drive
PCXAR-AL	1.05 Gbyte, 3.5-inch, 1.0-inch SCSI drive

CD-ROM Drive

FR-PCXCR-AD	600 Mbyte, 5.25-inch CD-ROM SCSI drive
FR-PCXCR-AE	600 Mbyte, 5.25-inch dual speed CD-ROM SCSI drive

Tape Drive

PCXAT-BB	120/250 Mbyte SCSI QIC tape drive
PCXAT-AB	525 Mbyte, 5.25-inch (MS-DOS) SCSI QIC tape drive

Step 6—Storage Devices *(continued)*

SCSI Adapter (Required for SCSI Devices)

FR-PCTAZ-CA	ISA SCSI (16-bit) host adapter (Adaptec 1520B)
FR-PCTAZ-AE	ISA SCSI (16-bit) host adapter (Adaptec 1540B)

Step 7—Communications Options

Modem

PCXBF-AA	2400-bit/s data, 9600-bit/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression, and Quicklink II fax software.
PCXCF-AA	9600-bit/s data, 9600-word/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression, and Quicklink II fax software.
PCXDF-AA	14,400-bit/s data, 14,400-word/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression and Quicklink II fax software.

Network Adapters

DE203-AB	EtherWORKS 3 Turbo network interface card, 16-bit, ThinWire
DE204-AB	EtherWORKS 3 Turbo/TP network interface card, 16-bit, twisted pair
DE205-AB	EtherWORKS 3 Turbo PLUS network interface card, 16-bit, ThinWire

Step 8—Accessories (Optional)

PC7XS-AA	PS/2 two-button mouse

Step 9—Power Cords and Keyboards

PC7XL-AA	U.S.
PC7XL-AS	Spanish (international)
PCXAL-AA	New Zealand/Australia
PCXAJ-AA	Japan (240 V)
PC7XL-BI	China
PC7XL-CB	Thailand
PC7XL-AE	U.K.
PC7XL-AC	Canada (French keyboard)

DECpc 4xx MTE Personal Computers

Product Description

The DECpc 4xx MTE systems provide a fast 486 processor and 32-bit EISA expansion capacity for demanding server, workstation, and Windows NT applications. A VESA VL bus enables one of the six EISA slots to support industry-standard local-bus options for ultimate speed. And all this power comes in a sleek micro-tower enclosure that fits easily on a desk, beside it, or mounted horizontally in a rack.

All systems are upgradable to Intel's OverDrive processor based on Pentium technology. All models include advanced local-bus graphics hardware and a graphical user interface (GUI) accelerator that run Windows applications up to four times faster than ordinary PCs. The motherboard also includes room for memory expansion—up to 128 Mbytes—leaving system expansion slots free for other uses. The 70-ns memory substantially increases performance of memory-intensive applications.

The MTE line features:

- Flexible upgrade path that offers investment protection
- Choice of three video options
- Room to add memory—up to 128 Mbytes—to allow for increased performance
- High integration and efficient use of space which packs value and functions onto an extremely compact motherboard
- Rugged design
- Low noise level, meeting the strictest requirements for noise levels in home or office settings

Step 1—Base Systems

Specify **assembly required** and **no partials** on order form if system is tobe assembled before delivery.

Note: **Minimum operational system configuration** MUST**include system memory (8 Mbytes recommended), one floppy diskette drive, and a hard disk drive.**

All systems include: chassis, power supply, motherboard with VL-bus video, 128-Kbyte cache, diagnostic software, 3-button mouse, U.S. keyboard, user documentation (English), 120 V power cord.

DECpc 4xx MTE Systems include

- Industry-standard microprocessor:
  DECpc 466d2 MTE: 66-MHz Intel 80486DX2
- Memory expandable up to 128 Mbytes
- 128-Kbyte cache expandable to 256-Kbyte
- Integrated FDD/IDE controller (floppy disk drive/integrated drive electronics)
- Three local bus video options (resolution up to 1280 x 1024)
- Six full-size EISA expansion slots including one industry standard VESA VL slot
- Socket for optional Intel overdrive processor based on Pentium technology
- Parallel port
- Two EIA-232C buffered serial ports
- VGA, keyboard, and mouse ports
- Realtime clock/calendar
- 260-watt autosensing power supply
- Three-year limited warranty

PCT73-AB DECpc 466d2 MTE base system—466d2 CPU

Step 2—Memory

Requirements for system memory are operating system and application dependent. Check guidelines provided in operating system and application literature. Digital recommends a minimum of 4 Mbytes on systems using MS-DOS and Microsoft Windows together.

Order Number (Quantity)	Total memory required	Bank 0	Bank 1	Bank 2	Bank 3
PC74M-AA (1)	4 Mbytes	4 Mbytes			
(2)	8 Mbytes	4 Mbytes	4 Mbytes		
(3)	12 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes	
(4)	16 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes
PC74M-AB (1)	16 Mbytes	16 Mbytes			
PC74M-AA (2) plus **PC74M-AB** (1)	24 Mbytes	4 Mbytes	4 Mbytes	16 Mbytes	
PC74M-AB (2)	32 Mbytes	16 Mbytes	16 Mbytes		
PC74M-AA (2) plus **PC74M-AB** (2)	40 Mbytes	4 Mbytes	4 Mbytes	16 Mbytes	16 Mbytes
PC74M-AB (3)	48 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes	
PC74M-AB (4)	64 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes
PCT7M-AA (2)	128 Mbytes	64 Mbytes	64 Mbytes		

Step 3—Cache Memory Upgrade (Optional)

PC74M-BA 128-Kbyte cache upgrade (maximum 256-Kbyte cache)

Step 4—Operating System

QB-MESAA-SA MS-DOS V6.0 operating system with Microsoft Windows V3. (English)
QB-MSUAA-SA MS-DOS V6.0 operating system (English)
QB-MSUPA-SA Same as above in French
QB-MSUSA-SA Same as above in Spanish
QB-MRSAA-SA OS/2 V1.3 operating system (English only)

Step 5—Monitor, Video Adapter, and Video Memory

Monitors

FR-PCXCV-GE/GF	14-inch SVGA color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, interlaced, Energy Star
FR-PCXBV-PC	15-inch SVGA, multi-sync color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, non-interlaced
PCXAV-EA	17-inch SVGA multi-synch color monitor, 1024 x 768 resolution, 0.26-mm dot pitch, will support 1280 x 1024 resolution with additional video adapter
PCXAV-FC/F3/F4	19-inch color Trinitron monitor, 1280 x 1024 resolution Autoscan 30–80 KHz horizontal, 50–160 Hz vertical) low emission, 0.31-mm stripe pitch. Switchable high-input impedance allows loop-through connection of additional monitors.

Note: Monitors include video cable and country specific power cord.

Video Adapters and Video Memory

PCT7H-EA	Local Bus Video Daughter Card (1 Mbyte DRAM). High-resolution, local bus video processor with GUI accelerator. Support for up to 1024 x 768 x 256 colors NI. 1 Mbyte on-board DRAM. Optional1 Mbyte DRAM upgrade, support for 1280 x 1024 x 256 colors interlaced.
PCT7H-EC	VESA BL Bus Video Card (2 Mbyte VRAM). Super fast Windows accelerator. Based on the Weitek Power 9000 graphics controller off-loaded for system CPU. 24-bit True Color displays 16 million brilliant colors in Windows for professional quality photo-realistic images.

Step 6—Storage Devices

- Select a maximum of four storage devices
- Three front-accessible 5.25-inch storage bays accommodate 5.25-inch diskette drive, tape backup drive, CD-ROM, or 3.5-inch SCSI hard disk drive.
- The front-accessible 3.5-inch diskette drive is for loading software. The other 3.5-inch internal bay is for the IDE hard disk.
- SCSI devices require a SCSI adapter.

Diskette Drives

PC7XR-BA	1.2 Mbyte 5.25-inch diskette drive
PC7XR-AA	1.44 Mbyte 3.5-inch diskette drive

IDE Hard Disk Drives

FR-PCXAR-CH	170 Mbyte 3.5-inch, 1-inch IDE disk drive
FR-PCXAR-CJ	340 Mbyte 3.5-inch, 1-inch IDE disk drive

SCSI Hard Disk Drives

FR-PCXAR-AH	535 Mbyte 3.5-inch, 1.6-inch SCSI drive
FR-PCXAR-AL	1.05 Gbyte 3.5-inch, 1.0-inch SCSI drive

CD-ROM Drive

FR-PCXCR-AD	600 Mbyte 5.25-inch SCSI CD-ROM drive

Tape Drive

PCXAT-BB	120/250 Mbyte SCSI QIC tape drive
PCXAT-AB	525 Mbyte 5.25-inch (MS-DOS) SCSI QIC tape drive

SCSI Adapter (Required for SCSI Devices)

FR-PCTAZ-CA	ISA SCSI (16-bit) host adapter (Adaptec 1520B

Step 7—Communications Options

Modem

PCXBF-AA	2400-bit/s data, 9600-bit/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression, and Quicklink II fax software.
PCXCF-AA	9600-bit/s data, 9600-word/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression, and Quicklink II fax software.
PCXDF-AA	14,400-bit/s data, 14,400-word/s fax with CCITT V.42 error control and correction, V.42bis four-to-one data compression and Quicklink II fax software.

Step 7—Communications Options *(continued)*

Network Adapters

DE203-AB	EtherWORKS 3 Turbo network interface card, 16-bit, ThinWire
DE204-AB	EtherWORKS 3 Turbo/TP network interface card, 16-bit, twisted pair
DE205-AB	EtherWORKS 3 Turbo PLUS network interface card, 16-bit, ThinWire

Step 8—Accessories (Optional)

PC7XS-AA	PS/2 two-button mouse

Step 9—Power Cords and Keyboards

PC7XL-AA	U.S., Japan, Austrialia, New Zealan,
PC7XL-AC	Canada (French keyboard)
PC7XL-AP	French
PC7XL-AS	Spanish (international)
PC7XL-AV	Portugese
PC7XL-BI	China
PC7XL-BK	Korean
PC7XL-CB	Thailand
PC7XL-AE	U.K.

DECpc XL Personal Computers

Product Description

The compact DECpc XL systems are based on a wide selection of powerful i486 and Pentium processors ranging from 33 MHz to 66 MHz using a fully configured PCI (Peripheral Component Interconnect) local bus platform. Integrated FDD/IDE and PCI SCSI-2 controllers on the motherboard offer maximum performance while keeping expansion slots free for peripherals such as advanced graphics, full-motion video, and high-speed network options. Through interchangeable processor cards, they can support i486 and Pentium processors now, as well as Alpha AXP and next generation Pentium processors when available.

Step 1—Base Systems

As part of chosen country kid, system includes power cord, keyboard, 3-button mouse and cable, MS-DOS V6.0, Microsoft Windows V3.1, and documentation.

Specify **assembly required** and **no partials** on order form if system is to be assembled before delivery.

DECpc XL systems include

- **DECpc XL 400 series**
  - DECpc XL 466d2: 66-MHz Intel 80486DX2 daughter card
  - Memory: 8 or 16 Mbytes (system maximum 128 Mbytes)
  - Cache: 8 Kbytes internal, 128 Kbytes external (upgradeable to 256 Kbytes)
- **DECpc XL 500 series**
  - DECpc XL 560: 60-MHz Pentium daughter card
  - DECpc XL 566: 66-MHz Pentium daughter card
  - Memory: 8 or 16 Mbytes (system maximum: 192 Mbytes)
  - Cache: 16 Kbytes internal, 256 Kbytes external
- Six expansion slots: two PCI, three ISA, one interleaved
- Five storage bays
- Integrated FDD/IDE controller (Floppy Disk Drive/Integrated Drive Electronics)
- Integrated PCI SCSI-2 controller
- External SCSI-2 port
- Two serial ports, one parallel port, one external SCSI-2 port
- Keyboard port, mouse port
- 101-key industry-standard keyboard*
- Three-button mouse*
- 120-V power cord*
- Realtime clock/calendar
- 300-watt power supply with 5.0-and 3.3-volt support
- Three-year limited on-site warranty

*** Included with U.S. 486 and Pentium country kit.**

DECpc XL 400 Series

Order Number	Model		Memory	Floppy disk	SCSI Disk	Compact Disk
FR-775AA-WH	DECpc XL 466d2	66 MHz	8 MB	1.44 MB	535 MB	600 MB
FR-775AA-WJ	DECpc XL 466d2	66 MHz	16 MB	1.44 MB	535 MB	600 MB
FR-775AA-WK	DECpc XL 466d2	66 MHz	8 MB	1.44 MB	1.0 GB	600 MB
FR-775AA-WL	DECpc XL 466d2	66 MHz	8 MB	1.44 MB	340 GB	

DECpc XL 500 Series

FR-780AA-WH	DECpc XL 560	60 MHz	8 MB	1.44 MB	535 MB	600 MB
FR-780AA-WJ	DECpc XL 560	60 MHz	16 MB	1.44 MB	535 MB	600 MB
FR-780AA-WK	DECpc XL 560	60 MHz	8 MB	1.44 MB	1.0 GB	600 MB
FR-780AA-WL	DECpc XL 560	60 MHz	8 MB	1.44 MB	340 GB	
FR-781AA-WH	DECpc XL 566	66 MHz	8 MB	1.44 MB	535 MB	600 MB
FR-781AA-WJ	DECpc XL 566	66 MHz	16 MB	1.44 MB	535 MB	600 MB
FR-781AA-WK	DECpc XL 566	66 MHz	8 MB	1.44 MB	1.0 GB	600 MB
FR-781AA-WL	DECpc XL 566	66 MHz	8 MB	1.44 MB	340 GB	

Step 2—Memory

- DECpc XL 400 systems support
  - Four 8-, 16-and 32 Mbyte memory modules **or**
  - Two 64 Mbyte memory modules for system maximum of 128 Mbytes
- DECpc XL 500 systems support
  - Six 8-, 16-and 32 Mbyte memory modules **or**
  - Three 64 Mbyte memory modules for maximum of 192 Mbytes

PC77M-AA	8 Mbytes (2 x 4 Mbyte 70-ns memory modules)
PC77M-AB	16 Mbytes (2 x 8 Mbyte 70-ns memory modules)
PC77M-AC	32 Mbytes (2 x 16 Mbyte 70-ns memory modules)
PC77M-AD	64 Mbytes (2 x 32 Mbyte 70-ns memory modules)

Step 3—Cache Memory—Optional for DECpc XL 400 systems only

DECpc XL 400 systems include 128-Kbyte external cache; select 128-Kbyte cache upgrade option if required.

Note: DECpc XL 500 includes systems maximum of 256-Kbyte external cache

PC77M-AE	128-Kbyte cache memory upgrade (system maximum 256 Kbytes)

Step 4—Monitors, Video Adapters and and Video Memory (required for **all** systems)

Monitors

PCXBV-DG	14-inch color SVGA, NI, MPRII, 120V / 240 V Northern
FR-PCXBV-PC/PD	15-inch SVGA, multi-sync color monitor, 1024 x 768 resolution, 0.28-mm dot pitch, non-interlaced
PCXAV-EA	17-inch color SVGA/EVGA MPRII, 1280 x 1024, 120 V--240 V Northern
PCXAV-FC/F3/F4	19-inch color SVGA/EVGA, 1280 x 1024, 120 V Northern/240 V Northern/240 V Southern

Note: Monitors include video cable and power cord.

Video Adapters and Video Memory

PCXAG-AK	S3 928 PCI video adapter, 1 Mbyte VRAM (1024 x 768 resolution)
PCXAG-AM	Viper PCI video adapter, 2 Mbyte VRAM (1280 x 1024 resolution)
PC77M-CA	1 Mbyte video memory upgrade for S3 928 PCI video adapter (PCXAG-AK)

Step 5—Storage

System supports a maximum of five internal storage devices

- Four front-accessable storage bays support 3.5-inch diskette drive (included with system) plus three 5.25-inch or 3.5-inch devices
- One internal storage bay accommodates one 3.5-inch hard disk drive

Diskette Drives

PC7XR-AA	1.44 Mbyte 3.5-inch diskette drive (included with system)
PC7XR-BA	1.2 Mbyte 5.25-inch diskette drive
PCTXR-AA	2.88 Mbyte 3.5-inch diskette drive

IDE Hard Disk Drives

PCXAR-CJ	340 Mbyte 3.5-inch hard disk drive
PCXAR-CG	525 Mbyte 3.5-inch hard disk drive

SCSI Hard Disk Drives

PCXAR-AM	340 Mbyte 3.5-inch hard disk drive
FR-PCXAR-AH	535 Mbyte 3.5-inch hard disk drive
PCXAR-AL	1.05 Gbyte 3.5-inch x 1-inch hard disk drive

Step 5—Storage *(continued)*

Tape Drives

PCXAT-BB	120/250 Mbyte 5.25-inch SCSI QIC tape drive (DOS)
PCXAT-AD	2.0 Gbyte 5.25-inch SCSI internal QIC tape drive
PCXAT-AE	2.0 Gbyte 5.25-inch SCSI external QIC tape drive in tabletop enclosure
PCXAT-AA	525 Mbyte 5.25-inch SCSI internal QIC backup tape drive (SCO)
PCXAT-AB	525 Mbyte 5.25-inch SCSI internal QIC backup tape drive (DOS)
PCXAT-AC	525 Mbyte 5.25-inch SCSI internal QIC backup tape drive (OS/2)
PCXDT-AA	QIC backup tape driver kit for DOS
PCXDT-AB	QIC backup tape driver kit for OS/2
PCXDT-AC	QIC backup tape driver kit for Windows
PCXDT-AD	QIC tape NLM backup for NetWare

Compact Disk Drives

PCXCR-AD	600 Mbyte 5.25-inch SCSI-2 (RRD43) CD-ROM 50 ms
PCXCR-AE	600 Mbyte 5.25-inch SCSI-2 (RRD44) CD-ROM, 200 ms

Step 6—Communication Option

PCXBF-AA	2400/9600 data/fax modem
PCXBF-AB	2400/9600 data/fax/voice modem
PCXDF-AA	14400/14400 data/fax modem
DE203-AB	EtherWORKS 3 Turbo, 16-bit, ThinWire
DE204-AB	EtherWORKS 3 Turbo/twisted pair, 16-bit, ThinWire
DE205-AB	EtherWORKS 3 Turbo PLUS, 16-bit, ThinWire
FR-PCXTN-AB	Proteon 1392+ (DT204 AA)

Step 7—Multimedia Option

PCXBJ-AC	Microsoft sound card, 16-bit stereo

Step 8—Operating System Software and Country Kits

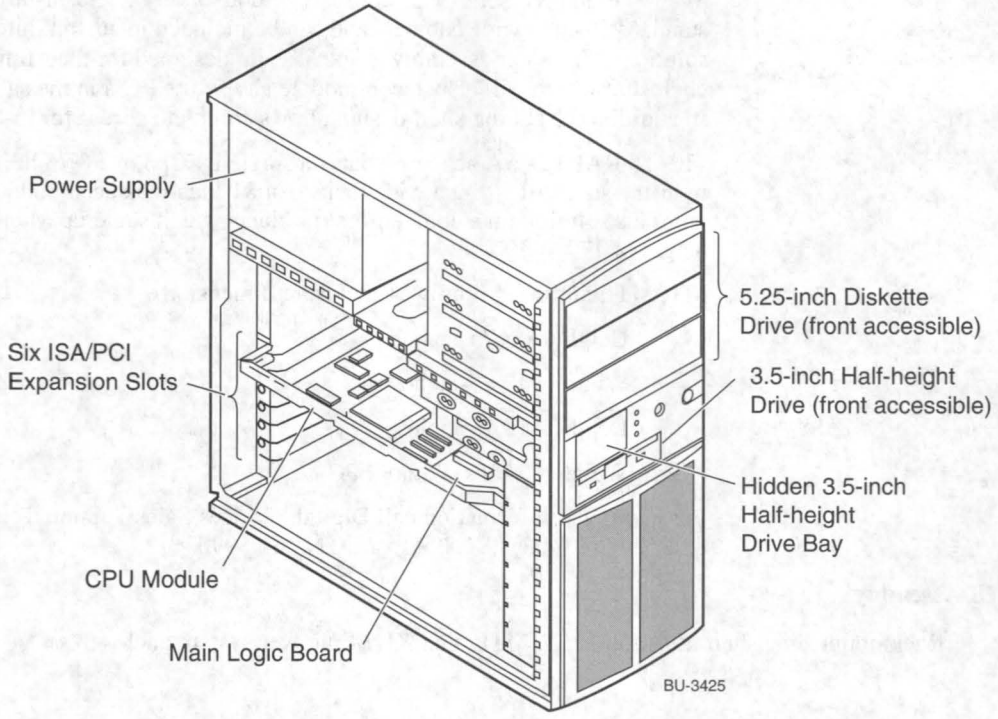
Operating System Software

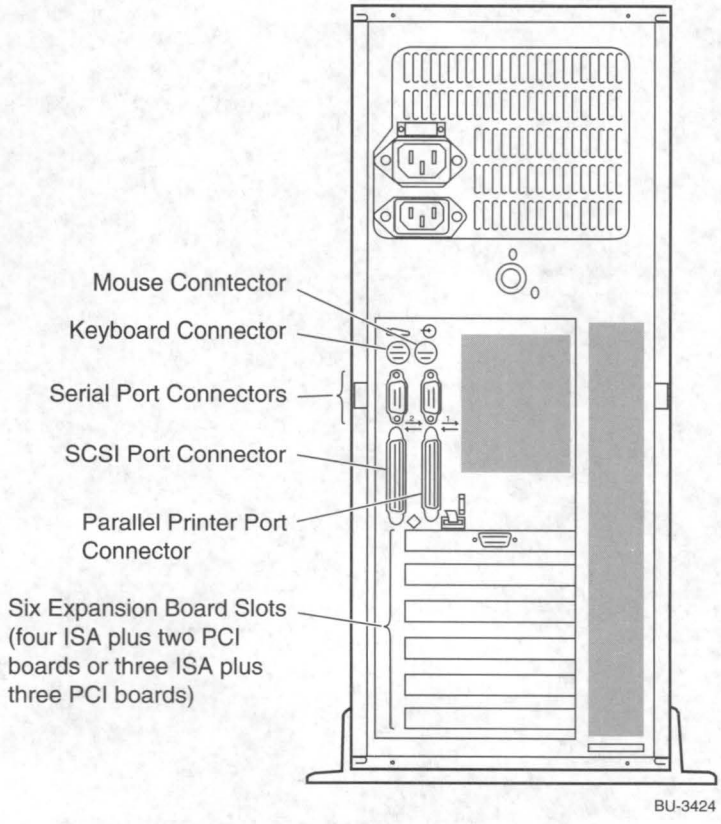
QB-MESAA-SA	MS-DOS V6.0 operating system with Microsoft Windows V3.1 (English)

Country Kits

PC77K-AA	**U.S. 486 Country Kit** U.S. keyboard, 3-button mouse and cable, 120-V power cord, MS-DOS V6.0 operating system with Microsoft Windows V3.1 (English), user guides, 486/PCI users guide and diskettes, NCR SCSI Management User's Manual.
PC78K-AA	**U.S. Pentium Country Kit** U.S. keyboard, 3-button mouse and cable, 120-V power cord MS-DOS V6.0 operating system with Microsoft Windows V3.1 (English), user guides, Pentium/PCI users guide and diskettes, NCR SCSI Management User's Manual.

DECpc XL System Diagram





Rackmountable Slide Shelf Assembly for DECpc MT, MTE and XL Systems

Digital's Rackmountable Slide Shelf Assembly Solution for the DECpc MT/MTE and XL series PCs conserves floor space, is field-installable in standard 19-inch wide cabinets and can be included in custom integration solutions. The shelf assembly is specifically designed for the Minitower enclosure which will also accommodate any future PC's in the same enclosure. In addition the sliding shelf design allows complete access for in-cab service.

The 2T-RAKPC-AA accommodates a single DECpc in a 8.75 height footprint in industry-standard 19-inch wide racks. An 81-inch rack accomodates more PCs with this solution than competitors' products which stand up MicroTowers at a height of 17" to 20".

MT, MTE and XL Minitower enclosure dimensions.

Height	8.75-inches
Width	17.25-inches
Depth	19.19-inches
Weight	25 lbs (without PC)

For additional information call Digital Services Sales Support Team at (800) 832-6277 or (603) 884-8990, or DTN 264-8990.

Rackmount Shelf Assembly

2T-RAKPC-AA Rackmount slide shelf assembly (MT, MTE, and XL Minitower system enclosures)

Chapter 6
High Availability and High Performance Products

OpenVMS Cluster Systems Configurations Details

AdvantageCluster Compute Servers

DECsafe Available Server

POLYCENTER Console Manager

OpenVMS Cluster Options

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 AXP 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 AXP and VAX systems appears as a single system to users and applications, regardless of the composition or physical location of the systems. Multiple Alpha AXP and VAX systems may be linked together, regardless of their size and capacity. Peripherals such as disks, tapes, and 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 or 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 AXP 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 OpenVMS Cluster system—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. Another popular use for clusters is to use one system for application development—it's still tightly linked to those running the current work (e.g., for sharing data), but somewhat removed at the same time.

OpenVMS Clusters can be configured entirely with Alpha AXP systems, or with a mix of VAX and Alpha AXP systems.

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 AXP 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

OpenVMS Cluster Benefits *(continued)*

- Single system management domain, regardless of the 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 AXP, VAX, MicroVAX, or VAXstation system may be configured in an OpenVMS Cluster.
- **Interconnects**—There are four types of interconnects that are currently used in OpenVMS Cluster configurations: CI, DSSI, FDDI, and Ethernet. Access to T3 for OpenVMS Cluster communication is possible using an FDDI in combination with a Gigaswitch configured with a T3 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 a positioning based on the four interconnects.

OpenVMS Cluster Configurations

		DSSI							
	CI	DEC 7000/ 10000 AXP	DEC 4000 AXP	Alpha Server 2000/2100	VAX 10000	VAX 7000	VAX 6000	VAX 4000	Ethernet	FDDI[1]
Maximum distance (meters)	90	27	20	20	25	27	27	20	2K	40K
Systems supported per bus	16	4	4	3	2	4	4	3	96	96
Service CPU online	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service storage online	Yes	Yes	Yes[2]	Yes[2]	Yes	Yes	Yes	Yes[2]	N/A	N/A
Reconfigure cluster while online[3]	Yes	No	No	No	No	No	No	No	Yes	Yes
Maximum and direct shareable storage	7 TB	588 MB	84 GB	84 GB	420 GB	420 GB	242 GB	84 GB	N/A	N/A
			48 GB	48 GB	240 GB	240 GB	144 GB	48 GB		
Bandwidth (aggregate Mbits/s per bus)	140	32	32	32	32	32	32	32	10	100
Aggregate peak (Mbytes/second)		48	16	16	80	80	48	16		
Bandwidth (DSSI only, number of DSSI buses)		24	4	2	20	20	12	4		

[1] Two DEC 4000 AXP systems is the maximum allowed in a DSSI cluster. DSSI buses that include a KFMSB adapter may be configured with a maximum of three systems on the DSSI.

[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 OpenVMS Cluster may require shutting down all or part of the cluster.

Configuring OpenVMS Cluster Systems *(continued)*

The next sections focus on the rules and configuration guidelines for each OpenVMS Cluster interconnect: CI, DSSI, Ethernet, and FDDI. The rules and guidelines included here are to assist in planning purchases. For additional details, refer to the VAXcluster Software for OpenVMS VAX SPD (29.78.xx), the OpenVMS Cluster Software for OpenVMS AXP SPD (42.18.xx), and the *Guidelines for OpenVMS Cluster Configuration Manual* in the OpenVMS manual set.

Note: VAX processors in an OpenVMS Cluster system are licensed with the VAXcluster Software for OpenVMS VAX product (order number = QL-VBRA*-**), and Alpha AXP processors are licensed with the VMScluster Software for OpenVMS AXP product (order number = QL-MUZA*-**). Information describing which charatcers replace the asterisks can be found in the *Systems/Services Price List.*

Digital recommends that all systems run OpenVMS V6.1.

The configuration rules below are condensed from the VAXcluster Software for OpenVMS VAX V6.1 and the VMS Cluster Software for OpenVMS AXP V6.1 Software Product Descriptions.

General OpenVMS Cluster Configuration Rules

These rules apply to all OpenVMS Cluster systems.

- A maximum of 96 Alpha AXP and VAX (combined total) systems can be configured in an OpenVMS Cluster.
- A maximum of 16 AlphaServer 2100/DEC 4000/7000/10000 AXP systems can be configured in an OpenVMS Cluster.
- A maximum of ten CI adapters can be configured on VAX and DEC 7000/10000 AXP systems.
- The number of Star Couplers is limited by the number of CI adapters configured on a system.
- The maximum number of VAX and Alpha AXP systems that can be connected to a Star Coupler is 16, regardless of Star Coupler size.
- A VAX and an Alpha AXP system may not boot from a common system disk.VAX 6000/7000/10000 systems require a system disk that is accessed via a local controller or through a local CI or DSSI connection. OpenVMS Cluster satellite booting is not supported for these systems.
- Every system in an OpenVMS Cluster system must be connected to every other system via any of the supported OpenVMS Cluster interconnects.
- A maximum of four LAN adapters can be configured on an Alpha AXP or VAX system. LAN segments can be bridged to form an extended LAN.
- All LAN paths used for OpenVMS Cluster communication must operate, at a minimum, with approximately 10 Mbits per second throughput and low-latency.
- Cross architecture satellite booting is supported. Alpha AXP satellites may boot from a VAX boot server, and VAX satellites may boot from an Alpha AXP boot server.
- A DECnet communication path must exist between all nodes in an OpenVMS Cluster system.

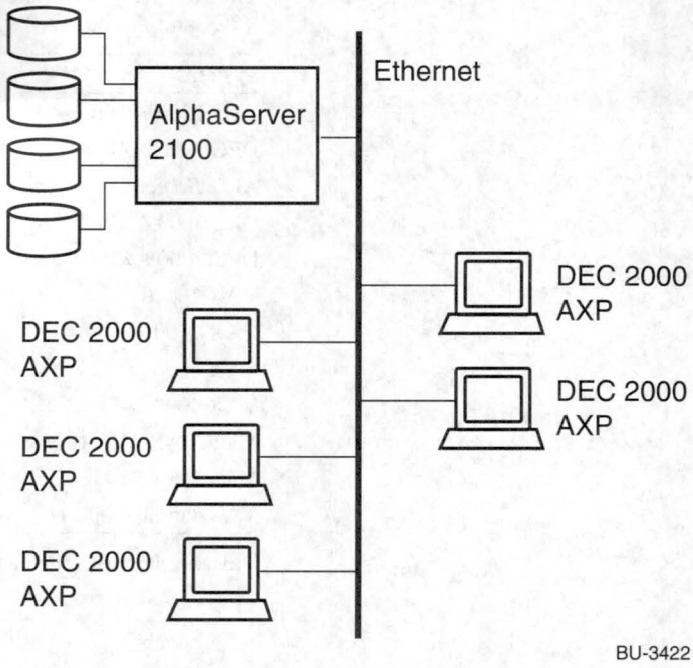
General OpenVMS Cluster Configuration Rules *(continued)*

The following table shows the OpenVMS Cluster interconnects supported for VAX and Alpha AXP systems.

Systems	CI	Ethernet	DSSI	FDDI
DEC 7000/10000 AXP	X	X	X	X1
DEC 4000 AXP		X[1]	X	X
AlphaServer 2100		X[1]	X	X
DEC 3000 AXP		X[1]		X[1]
DEC 2000 AXP		X[1]		X
VAX 10000	X	X	X	X
VAX 7000	X	X	X	X
VAX 6000	X	X	X	X
VAX 4000		X	X	X
MicroVAX 3100 Q-bus		X[1]	X	X
MicroVAX 3100		X	X	X
VAXstation 4000		X[1]		X

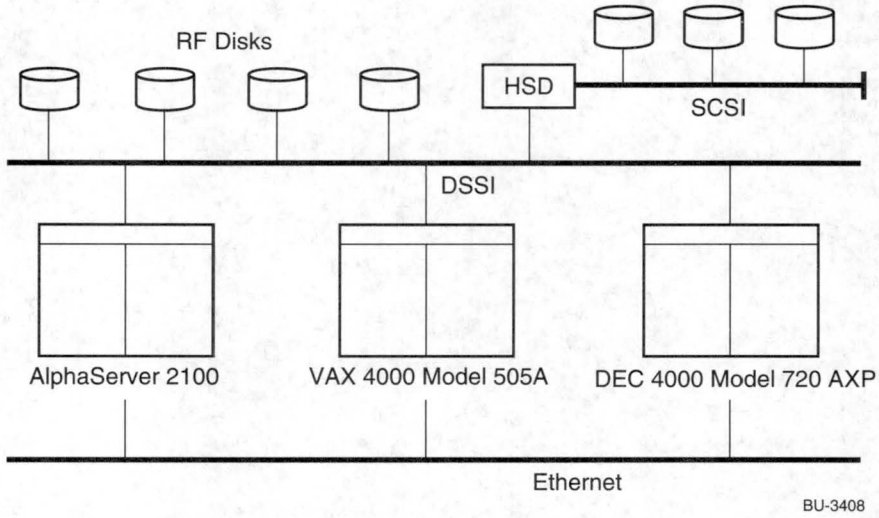
[1] denotes ability to boot over interconnect as satellite node.

Alpha AXP Client/Server OpenVMS Cluster



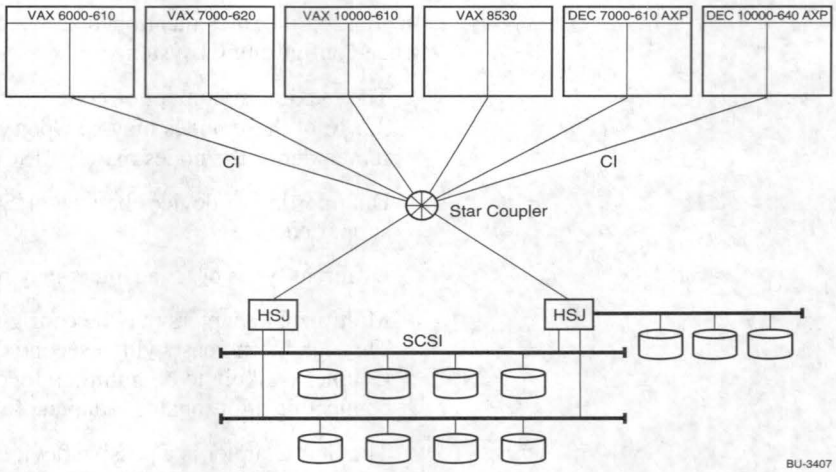
This diagram shows a simple client/server OpenVMS Cluster configuration based on Alpha AXP. The AlphaServer 2100 system acts as a boot node and disk server for the five DEC 2000 AXP satellite clients. Ethernet is used as the OpenVMS Cluster interconnect. Up to 96 Alpha AXP systems can be configured into an OpenVMS Cluster configuration. Using Digital's PATHWORKS software, the OpenVMS Cluster can additionally serve many personal computers and Macintosh systems. Volume Shadowing for OpenVMS AXP software can be used to shadow any disk in the configuration, thereby providing enhanced availability.

Tri-Host Mixed Architecture OpenVMS Cluster



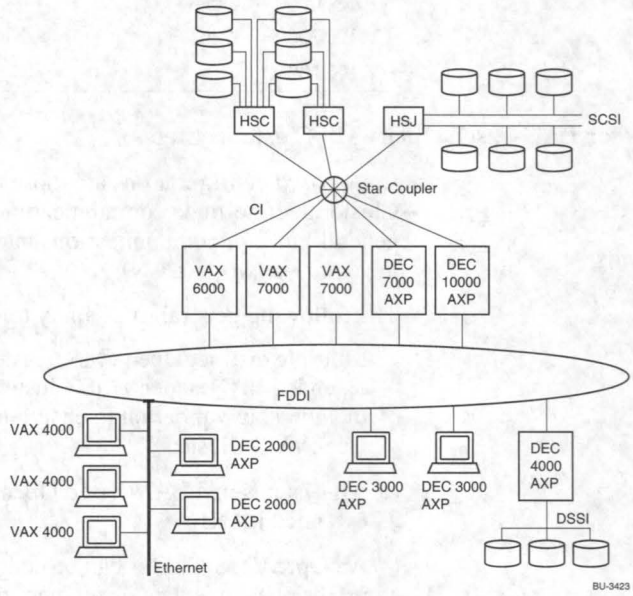
This diagram shows a tri-host mixed architecture OpenVMS Cluster. It consists of one DEC 4000 Model 720 AXP system, an AlphaServer 2100, and a VAX 4000 Model 505A system. The OpenVMS Cluster interconnect is the DSSI, which is also configured with an HSD series storage controller with SCSI disk drives.

CI-based OpenVMS Cluster



This diagram shows a large CI-based OpenVMS Cluster, consisting of four VAX systems and two Alpha AXP systems. Two HSJ storage controllers provide high availability access to the disks. Critical disks are accessible by both of the HSJ controllers. The HSJ storage controllers provide access to StorageWorks SCSI-based disks.

Mixed Interconnect, Mixed Architecture OpenVMS Cluster



This diagram shows a mixed interconnect, mixed architecture OpenVMS Cluster. A VAX 6000 system and two VAX 7000 systems are configured on a CI interconnect with a DEC 7000 AXP and a DEC 10000 AXP system. Two HSC storage controllers provide access to some dual-ported and single-ported RA series disks. A single HSJ storage controller is also configured on the CI, providing access to StorageWorks SCSI-based disks. The CI systems are also connected to an FDDI ring. Configured around the ring is a DEC 4000 AXP system, two DEC 3000 AXP workstations, and a bridge to an Ethernet segment. The DEC 4000 AXP system provides additional storage for the OpenVMS Cluster with some DSSI disks. The Ethernet segment is configured with five additional workstations, two DEC 2000 AXP systems and three VAX 4000 systems. All these systems are configured into a single OpenVMS Cluster, providing high performance and high availability. Volume Shadowing for OpenVMS software layered product may be used by both VAX and AXP systems in order to provide high availability RAID-1 access to storage. The StorageWorks Raid Software for OpenVMS may be used to provide RAID-0 (Striping) and RAID-5 for VAX and Alpha AXP systems.

Configuration Rules for CI OpenVMS Cluster Systems

In addition the rules mentioned above, 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.
- Dual porting of devices between HSC/HSJ and local controllers is not supported.
- Different types of CI adapters may not be mixed in the same CPU.
- Multiple CI adapters may be configured, either for redundancy or throughput. Throughput increase with a second CI adapter connected to the same Star Coupler is likely to be minimal. Increased throughput can be achieved by connecting additional CI adapters to separate Star Couplers.
- The Star Coupler is a passive device, and extremely reliable. It is not a single point of failure. Additional CI adapters and Star Couplers may be installed to improve system bandwidth, total computing power, total storage capacity, and higher availability.

Multiple CI Connections

Maximum CI Adapters per OpenVMS Cluster CPU

CPU	CIBCA-A	CIBCA-B	CIXCD
DEC 7000/10000 AXP			10
VAX 6000 Model xxx	1	4	4
VAX 7000			10
VAX 10000			10

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
- 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 AXP and VAX systems can be configured with any mix of Ethernet or FDDI adapters, up to a maximum of four adapters.

Supported Alpha AXP System LAN Adapters

The following table shows the types of Alpha AXP LAN adapters supported by OpenVMS Cluster Software for OpenVMS AXP, Version 6.1.

OpenVMS AXP	Bus	Ethernet	FDDI
	XMI	DEMNA	DEMFA
	TURBOchannel	PMAD	DEFTA
	Integral	LANCE, TGEC	
	EISA	DE422	DEFEA
	Futurebus+		DEFAA
	PCI	DE435	

Supported VAX System LAN Adapters

The following table shows the types of VAX LAN adapters supported by VAXcluster Software for OpenVMS VAX, Version 6.1.

OpenVMS VAX	Bus	Ethernet	FDDI
	XMI	DEMNA	DEMFA
	BI	DEBNI, DEBNA	
	Q-bus	DELQA, DESQA	DEFQA
	Q-bus	DEQTA (DELQA-YM)	
	Integral	LANCE, SGEC	
	TURBOchannel	PMAD	DEFZA, DEFTA

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, DSSI and FDDI are the preferred interconnects between powerful CPUs.
- 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.

General Recommendations When Configuring OpenVMS Cluster Systems *(continued)*

- 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 DSSI- and HSC-based storage provide higher data availability than singly accessed, local controller-based storage. Additionally, dual pathing of DSA disks between local or HSC 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, DSSI, 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 AXP 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, and 10000 CPUs.
- When using systems with multiple LAN adapters, configure each adapter on a separate LAN segment. This will help 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 CIXCD CI adapters it is recommended that each CIXCD be connected to a different Star Coupler.
- OpenVMS system disks are architecture specific. Alpha AXP systems may share a system disk, and VAX systems may share a system disk. However, Alpha AXP systems cannot share a system disk with VAX systems.

Configuration Rules for DSSI OpenVMS Cluster Systems

The following configuration rules apply to **all** DSSI OpenVMS Cluster configurations:

- There must be a minimum of two and a maximum of four systems in the OpenVMS Cluster configuration with each system having at least one shareable DSSI adapter. See the DSSI Adapters per System table for the type of adapter each system uses.
- The system level configuration rules including maximum numbers of specific systems in a DSSI OpenVMS Cluster are:
  - Alpha AXP-only DSSI OpenVMS Cluster
    - A maximum of three AlphaServer 2100 systems
    - A maximum of three DEC 7000 AXP systems
    - A maximum of two DEC 4000 AXP systems
    - A maximum of three of any combination of AlphaServer 2100 and DEC 4000 AXP systems
  - Alpha AXP and VAX system (combination) DSSI OpenVMS Cluster
    - A maximum of three of any combination of AlphaServer 2100, DEC 4000 AXP, VAX 6000, VAX 7000, VAX 10000, and Q-bus/KFQSA MicroVAX II/3xxx systems.
    - A maximum of three of any combination of DEC 7000 AXP, VAX 4000, VAX 6000, VAX 7000, and VAX 10000 systems.
  - VAX-only DSSI OpenVMS Cluster
    - Up to three Q-bus systems. At least one system must be a VAX 4000 Model 300 or higher or contain a KFQSA Rev. K04 or later, or be a VAX 4000 Model 105A with KFDDA-AA/AF dual-DSSI option.
    - Up to three in any combination, VAX 4000, VAX 6000, and VAX 7000 systems
    - Up to four VAX 6000 systems
    - Up to four VAX 7000 systems
    - Up to two VAX 10000 systems. A single VAX 10000 system can also be included in a VAX-only OpenVMS Cluster with any combination of two VAX 6000 and VAX 7000 systems.
- An OpenVMS Cluster software license is required for each processor in a DSSI OpenVMS Cluster. Specific licensing information is described in the OpenVMS Cluster and VAXcluster Software Product Descriptions.
- 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:
  - DSSI adapter
  - Any RF, TF, or EF ISE (integrated storage element)
  - Any HSD05 or HSD30
- 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.

Configuration Rules for DSSI OpenVMS Cluster Systems *(continued)*

- 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.
    - Outlets do not have power ground connections.
    - Grounding prong missing from computer equipment power cables.
    - Power outlet neutral connections are actual ground connections.
    - 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. The ground offset voltage limits are:

	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.

Configuration Rules for DSSI OpenVMS Cluster Systems *(continued)*

DSSI Adapters per System

System	Embedded	KFQSA[1]	KFESA	KFMSA[2]	KFMSB	Buses
AlphaServer 2100			2			2
DEC 4000 AXP (embedded N710)	4	–		–		4
DEC 7000/10000 AXP					10	20
MicroVAX II and 3500, 3600, 3800, 3900	–	2		–		2
MicroVAX 3300/3400 (embedded EDA640)	1	2		–		3
VAX 4000 Model 105A (embedded SHAC[3])	1 + 1[4]	2[5]		–		3
VAX 4000 Model 200 (embedded SHAC[3])	1	2		–		3
VAX 4000 Model 300, 400, 500, 600	2	2		–		4
VAX 4000 Model 505A/705A (embedded SHAC[3])	2 + 2[4]	2		–		4
VAX 6000	–	–		6		12
VAX 7000/10000	–	–		10		20

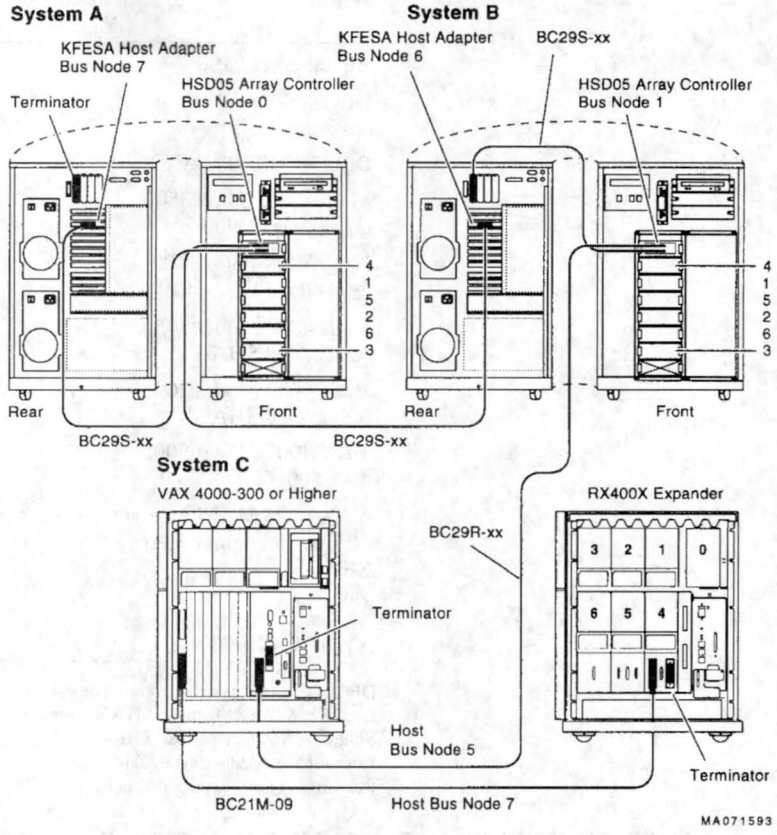
[1] DEC 4000 AXP systems cannot coexist on a DSSI with the KFQSA adapter.
[2] Each KFMSA (XMI-to-DSSI) adapter contains two DSSI VAX system ports.
[3] Single Host Adapter Chip (SHAC)
[4] Additional embedded on daughter card
[5] Requires a Q-bus expansion enclosure

AlphaServer 2100/DEC 4000 AXP/VAX 4000/MicroVAX DSSI OpenVMS Cluster Configurations

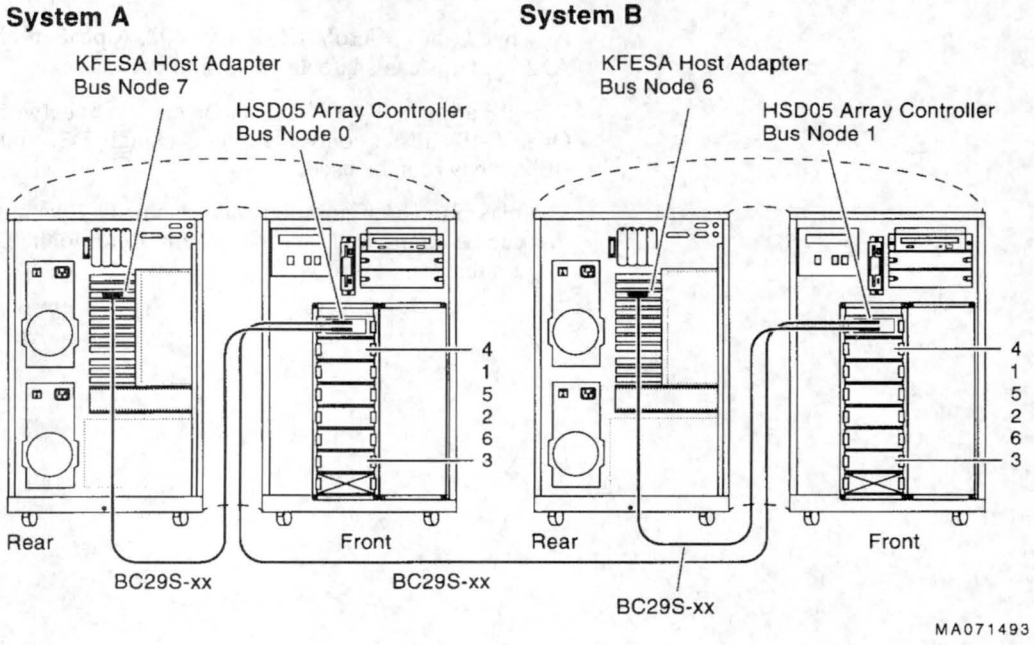
Useful information on AlphaServer2100/DEC 4000 AXP/VAX 4000/MicroVAX DSSI OpenVMS Clusters:

- 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, AlphaServer2100, or DEC 4000 AXP 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.

Dual Architecture DSSI OpenVMS Cluster: AlphaServer 2100 and VAX 4000 systems



Alpha AXP DSSI OpenVMS Cluster: Two AlphaServer 2100 systems

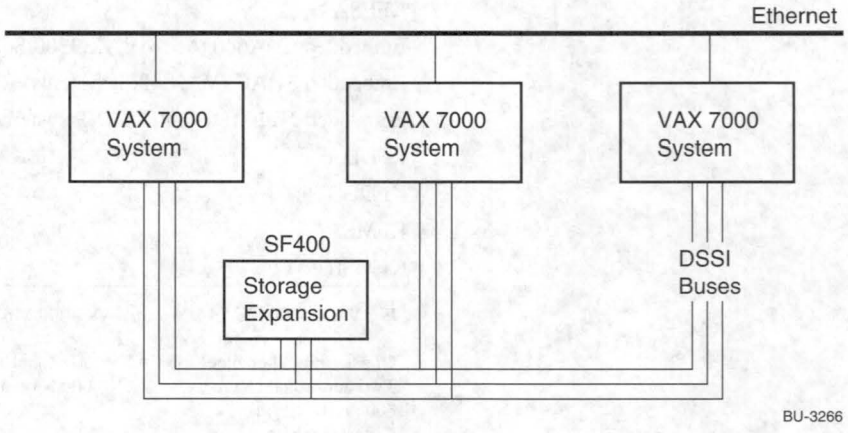


VAX 6000/7000/10000-Based DSSI OpenVMS Cluster Configurations

The following simple rule set may be used for VAX 6000/7000/10000 DSSI OpenVMS Cluster configurations:

- Quad-host or four-system DSSI OpenVMS Cluster configurations are supported on VAX 6000 and VAX 7000 systems only. 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 the end of the DSSI bus and termination at the ISE end of the bus must be implemented at the ISE, not at the bulkhead. If two SF2xx or SF400 cabs are required, one must be placed physically at each end of the 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 the 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 the same DSSI combinations of RFxx ISEs and TF8x ISEs are **not** allowed on the same DSSI bus. All RFxx ISEs on any single DSSI bus must reside in the same SFxx storage array. All TF8x ISEs on any single DSSI bus must reside in the same cabinet.

Three-System VAX 7000 DSSI OpenVMS Cluster



AlphaServer 2100/DEC 4000 AXP/VAX 4000/VAX 6000/VAX 7000 DSSI OpenVMS Cluster Configurations

Useful informa tion on AlphaServer 2100/DEC 4000 AXP/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 AXP 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 AXP systems.
- The VAX 6000/VAX 7000 series system may be added to an existing two-system VAX 4000 family OpenVMS Cluster for applications that require vector processing, where the disk requirements exceed the configurability of the Q-bus OpenVMS Cluster, or where more than three CPUs in the cluster are required to meet future business growth needs—all without losing the investment in the existing Q-bus DSSI OpenVMS Cluster.

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 AXP CPU may not boot from a common system disk.
- VAX 7000 and VAX 6000 systems configured with KFMSA adapters may also be configured with CI adapters, 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
Embedded EDA640 (MicroVAX 3300/3400 systems)	360
Embedded SHAC (VAX 4000 systems)	1200[1]
Embedded N710 (DEC 4000 AXP 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.

Configuration Guidelines for DSSI OpenVMS Cluster Systems *(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 intracabinet 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 intracabinet 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 intracabinet "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 intracabinet 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.

Configuration Guidelines for DSSI OpenVMS Cluster Systems *(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 AXP Model 600 One external PS-BH connector for each of four buses (A-D)	70.9 inches (5.9 ft, 1.8 m)
BA42B embedded storage Has internal terminator VAX 4000 Model 100 One external PS-BH connector	26 inches (2.2 ft, .72 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)

Configuration Guidelines for DSSI OpenVMS Cluster Systems *(continued)*

Electrical Lengths of Embedded DSSI Bus in Enclosures *(continued)*

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)

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 AXP 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) mustbe ordered via cabinet kits.

Configuration Guidelines for DSSI OpenVMS Cluster Systems *(continued)*

For connecting between a DEC 4000 AXP/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 AXP/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**

AdvantageCluster Compute Servers

Overview

High Performance Computing has traditionally been the domain of expensive supercomputer technology. Now, many compute-intensive tasks can be distributed across integrated networks of UNIX systems. There are many advantages to this approach. Workstation farms are far less expensive than traditional high-performance computing platforms such as large servers and supercomputers. Yet they provide faster throughput and turnaround time on compute-intensive applications than is possible with single systems operating alone. Workstation farms are easily extensible and highly customizable, offering users much greater flexibility in adapting systems to specific computational needs.

Product Description

Digital's AdvantageCluster Compute Servers (ACCS), formerly called Alpha AXP Farms, represent state-of-the-art workstation farm hardware and software technology. Farms solutions can be purchased either as ACCS packaged systems in two standard height (70-inch) 19-inch RETMA cabinets, or as Digital custom-built workstation farms using any UNIX workstations and servers in Digital's Alpha AXP family.

AdvantageCluster Compute Servers, packaged or custom, are complete plug-in solutions containing Alpha AXP processors, Digital networking devices (such as Ethernet, FDDI, GIGAswitch), and cluster computing software.

Digital provides server packages that bundle an extensive suite of software tools for batch and parallel processing, application development, application tuning and overall network, and system management.

Memory Recommendations

Each node in a farm can be upgraded independently, or all nodes can be upgraded at once if desired. It is generally recommended that the memory size be consistent across the nodes in the absence of specific customer or application requirements.

Network Connection Recommendations

Two network connections are available as interconnects for AdvantageCluster Compute Servers, Ethernet and FDDI. Due to the demanding requirements on the network for both high bandwidth and low latency, FDDI and GIGAswitch are recommended for maximum farm performance. GIGAswitch is an intelligent, high-speed switching bridge that employs multiple dynamic FDDI links to achieve unprecedented LAN throughput and connectivity. High-aggregate LAN bandwidth is achieved through concurrent transmission on multiple links, providing a flexible, cost-effective way to create high-performance AdvantageCluster Compute Servers. GIGAswitch also provides an easy migration path to future ATM technology.

Software

Software on workstation clusters must handle data and tasks such as message passing between processors in the cluster, batch queuing, load balancing, system monitoring and control, and parallel processing.

Factory-Installed Software

The AdvantageCluster Compute Server packages include the following factory-installed, leadership software:

- LSF—Cluster software (Load Sharing Facility)
- PVM—Message passing software (Parallel Virtual Machine)
- DXML (Digital Extended Math Library)
- KAP FORTRAN and C preprocessor (Kuch-Associates)
- POLYCENTER Console Manager

Software *(continued)*

- POLYCENTER FullSail
- POLYCENTER AdvFS
- POLYCENTER NetWorket Save and Restore
- DEC Fortran 90
- Parallel Software Environment
- C++ Compiler
- F77
- DEC FUSE
- DEC OSF AXP developers extension V1.2

Digital's LSF Compute Share Software provides load leveling and batch processing capability. (**Note:** Three of the packaged systems are available without LSF in order to give customers the choice to order other software, if desired.)

PVM (Parallel Virtual Machine) is included in all packaged systems and allows the use of a heterogeneous network of parallel and serial computers as a single computational resource.

Leadership UNIX software development environments are included for Fortran, C and C++, as well as software to provide automated tuning of serial and parallel applications. The various POLYCENTER tools allow for ease in system and network management.

Additional Third-Party Software

Customers are also able to select from a growing list of third-party software packages to meet their computational needs. Following are some additional software packages available for the AdvantageCluster Compute Server:

- NQS/EXEC (Sterling Software)—widely available network batch queuing system that accommodates systems from multiple vendors
- DQS (public domain software from Florida State University)—supports submission and monitoring of jobs in a queuing system
- CODINE (GENIAS Software)—supports variety of functions (batch, interactive, parallel and checkpointing)
- DNQS (public domain software from McGill university)—enables batch queuing
- Network Linda (Scientific Computing Associates, Inc.)—provides simple, portable, and efficient framework for parallel programming (parallel-language compiler and development system)
- Express (ParaSoft Corp.)—addresses the four major aspects of parallel program development: algorithm design, implementation, debugging, and performance analysis
- p4 (public domain software from the Argonne National Labs)—contains functions for managing processes and clusters, message passing, timing and debugging p4 (Portable Programs for Parallel Processors)
- TCGMSG (public domain software from Pacific Northwest Laboratory)—Theoretical Chemistry Group Message passing system for C and FORTRAN codes
- HeNCE (public domain software from Oak Ridge National Lab)—graphical interface tool and methodology for using PVM
- Mechanical Engineering software including: Pro/Engineer (from Parametric Technology, ABAQUS (from HKSI), Mechanica (from RASNA), ANSYS from SASI, and others from Computervision, Matra, MCS, MSC, PDA, SDRC, and UAI

Additional Third-Party Software ***(continued)***

- Electrical Engineering software incuding: SPICE (from Metasoftware), TSUPREM-4, MEDICI, and DAVINCI (from TMA), and others from CADENCE, EPIC, MENTOR GRAPHICS, Metasoftware, and VIEWLOGIC
- Computational Chemistry/Molecular Modeling software including: CHARMm (from MSI) and others from XPLOR, Gaussian, GAMES, and Amber
- Database software from Oracle, Sybase, Ingres, Informix, and Progess

Service and Support

Digital recommends that all AdvantageCluster Compute Server customers purchase consulting services to assist in optimizing the cluster for their applications environment. A comprehensive service offering can be tailored to meet customer needs, from software development to custom hardware configuration, and on-site training and consulting.

In the U.S., packaged systems include factory loaded software, license installation, parameter set up per customer specification, and functional test of the configured systems.

Note: For assistance in creating a farm solution, contact your local Digital Services Sales Support Team, or call the Digital Custom Systems Professional Services Center at 800-832-6277 or 603-884-8990.

DECsafe Available Server

Overview

Digital offers UNIX High Availability software—DECsafe Available Server—to give customers the high availability advantages of clustering on Digital UNIX client/server systems.

DECsafe V1.0, V1.0A, V1.1 support clusters of up to three Alpha AXP (DEC OSF/1 AXP) systems. These clustered systems support multivendor client workstations and SCSI storage devices as a single, fault-resilient environment. This environment facilitates rapid recovery from hardware failures. Users can count on almost continuous access to data, databases, applications, and network services such as NFS and mail, regardless of hardware computing status.

DECsafe 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.

DECsafe provides high availability by protecting systems from a single point of failure with automated failover capabilities. Hosts or disks can be removed from service—for maintenance, upgrades, or planned shutdowns—without interrupting everyday operations. Also, DECsafe load balancing greatly improves the performance of existing resources.

Systems in a DECsafe Available Server monitor each other through a mechanism that communicates host-to-host via Ethernet or FDDI network. In addition, all systems in the DECsafe Available Server environment are connected by one or more industry-standard SCSI-2 buses. This dual monitoring mechanism ensures reliable failure detection and allows differentiation between network, I/O, and host failures.

DECsafe 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

Upon detection of failure, any host can take over; DECsafe automatically configures each member of a Digital UNIX cluster to run any of the system services. Typical failover time is between one and two minutes.

Customization

DECsafe actions are initiated by system management request or by a detected change in hardware runtime status anywhere in the DECsafe Available Server environment. DECsafe is customizable, enabling users to configure, manage, and relocate services as needed.

System managers can script events they want to occur after a failover, enabling applications to restart automatically, according to desired priority. If a server is removed from the cluster, less critical services and applications can be shut down or given lower processing priority to maintain the response time of more important applications.

DECsafe Available Server provides two modes of operation: Concurrently Active and Master Standby. In the Concurrently Active mode, all members of the cluster share the workload. In the Master Standby mode, one host remains idle and ready to immediately pick up the workload of another member in case it fails. This provides for continuous maximum performance for mission-critical applications.

System Management

A key benefit of Digital UNIX cluster computing is the ability to balance workloads among multiple servers, and to provide maximum performance during peak demand periods.

System managers can prepare for scheduled downtime by using DECsafe to relocate services to other available nodes. DECsafe also allows modifications to service configurations. These can be placed on-or off-line at any time.

Network File Services (NFS)

DECsafe Available Server supports NFS with minor service code modification; all client code remains unchanged. DECsafe supports NFS by creating a virtual NFS host to serve files to users. Users mount services from the virtual host.

The workload is transferred from one server to another in a hardware failure. When such a failure occurs, NFS clients experience a short NFS server timeout, similar to NFS timeouts on busy networks.

DECsafe can combine services, such as NFS and mail, to form new capabilities, such as relocatable mail service. Such combined services are named and managed as though they are single services, simplifying management and configuration tasks.

DECsafe Available Server Configuration Rules and Recommendations

- Up to three supported systems (DEC 3000 AXP and DEC 7000 AXP systems) can be configured in a DECsafe Available Server.
- Maximum SCSI bus length (with BN23G cables) is 3 meters, including internal enclosure cabling for fast mode.
- Maximum differential SCSI bus length with BN21K SCSI cable is 25 meters.
- Total SCSI bus length, single-ended and differential, is 31 meters (including internal enclosure cabling and backplane wiring).
- Only PMAZC controllers are supported in DEC 3000 AXP configurations.
- Fast mode on PMAZC controller is only permitted by using DWZZA (see diagram 2).
- Only KZMSA controllers are supported in DEC 7000 AXP configurations.
- Only RZ26L, RZ28B, and RZ28 disks are supported at this time.
- H8574-A SCSI terminator is required with single-ended SCSI cables.
- H879-AA is the terminator used for differential cabling (BN21K).
- Maximum six disks per bus are supported on DECsafe Available Server shared bus for two systems.
- Maximum five disks per bus are supported on DECsafe Available Server shared bus for three systems.
- Disks should be in separate enclosures to ensure maximum availability.
- Minimum 64 Mbytes of memory is recommended.
- Each system should include a tape for backup.
- In general, device support (such as how many KZMSAs are permitted in a DEC 7000 system) is determined by the relevant DEC OSF/1 SPD.
- Tri-link (H885-AA) connector allows 3-point connection (see diagram 2). This permits "warm swap" of storage devices and/or CPUs, and must be used to allow continuation of SCSI bus to third or fourth enclosure.
- Ethernet or FDDI must be present to complete the DECsafe Available Server configuration.

DECsafe Available Server Configuration Rules and Recommendations *(continued)*

- DEC OSF/1 AXP V2.0 and DECsafe Available Server V1.0 software (CD-ROM distribution only) are required.
- DEC OSF/1 AXP V3.0 and DECsafe Available Server V1.1 software (CD-ROM distribution only) are required.
- DEC OSF/1 AXP V2.0 and DECsafe Available Server V1.0 software (CD-ROM distribution only) are required.
- Follow configuration rules for Storage Building Blocks.
- SZ200 RAID subsystem is supported.
- StorageWorks BA353, BA350, or SW800 are recommended Storage Building Blocks.
- Addition of POLYCENTER Advanced File System Utilities and DEC OSF/1 AXP Logical Store Manager are strongly recommended.

DECsafe Available Server SCSI Cabling Information

DECsafe Available Server supports single-ended and differential "fast mode" SCSI transmission.

PMAZC (TURBOchannel to SCSI interface for DEC 3000 AXP system) and the KZMSA (XMI bus to SCSI interface for DEC 7000 AXP systems) are single-ended adapters.

DWZZA converts single-ended transmission to differential.

When a single-ended cable must run more than 3 meters, it can only run at 5 MB/sec (slow mode).

All SCSI segments must be terminated at both ends. In diagram 2 each end of BN21K and each end of BN23G must be terminated.

For DEC 7000 AXP systems, all cabling which exits the cabinets must be differential.

It is recommended for most DEC 3000 AXP configurations that differential mode be used as well; however, single-ended may be used for limited cable length configurations (see diagram 1).

The total maximum SCSI bus length may be 31 meters, which is the 3 metersallowed to the DWZZA from the bus interface, the total differential cablelength to the next DWZZA, and the subsequent 3 meters from the DWZZA to the bus interface. **Note:** Any SCSI bus lengths needed for SCSI backplanes and other enclosure cabling must also be included.

For a more detailed discussion of the SCSI specification, refer to the *KZMSA Adapter Installation Guide* (EK-KXMSX-IN).

Note: For specific ordering information, see Rackmount DEC 3000 AXP and DEC 7000 AXP system sections in Chapter 1. For custom packages, call Digital Services Sales Support Team at 800-832-6277 or 603-884-8990.

DECsafe Available Server Diagrams

The following diagrams are examples of DECsafe Available Server configurations. All configurations require either Ethernet or FDDI on each system in the cluster.

Diagram 1

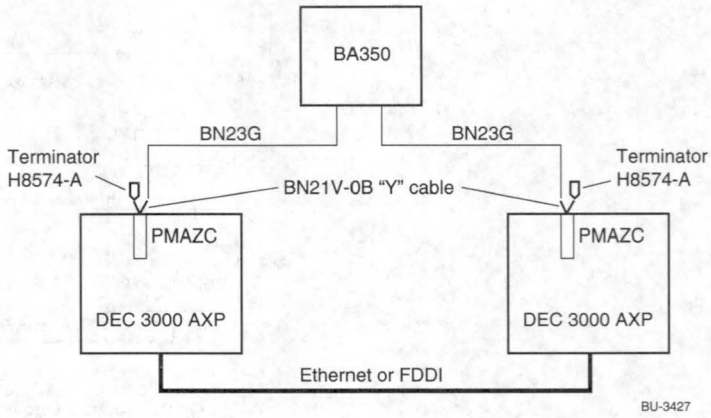
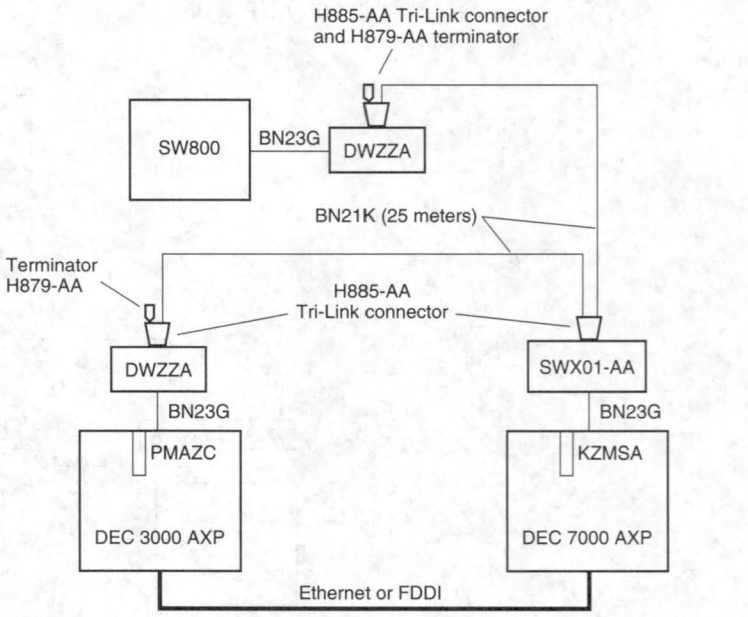


Diagram 1 illustrates a simple single-ended cluster with two DEC 3000 AXP systems. **Note**: Maximum SCSI bus length is 6 meters. This configuration is not permitted for DEC 7000 or 10000 AXP systems and may not be used for fast mode SCSI on the PMAZC controllers.

Diagram 2

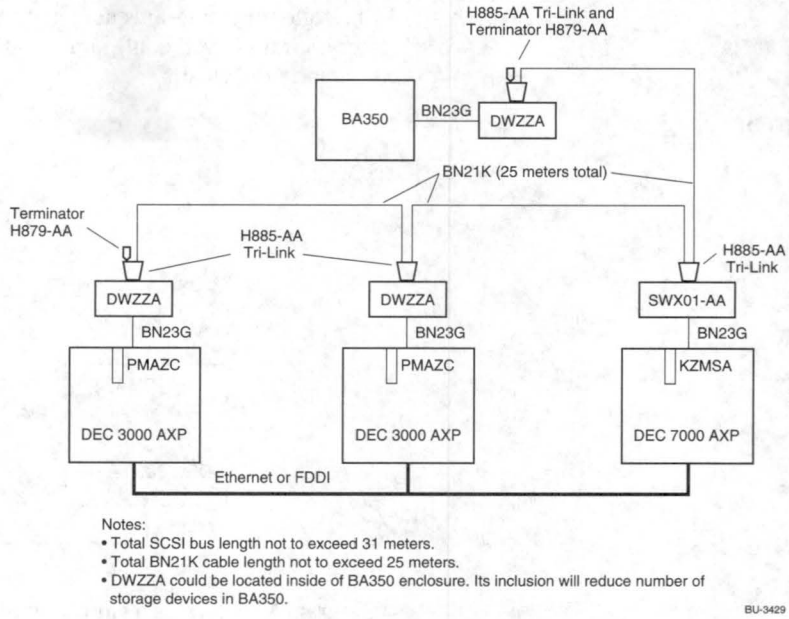


Notes:
- DWZZA should be located inside of SW800 enclosure. Shown here for reference.
- Total BN21K cable length not to exceed 25 meters.
- Total SCSI bus length not to exceed 31 meters including internal enclosure cabling.
- SWX01-AA should be located inside of DEC 7000 AXP enclosure. Shown externally for reference.

BU-3428

Diagram 2 shows a simple two-system cluster utilizing DWZZAs to allow the inter-cabinet cabling to extend to 25 meters. Although a DEC 3000 AXP system and a DEC 7000 AXP system are shown, any other supported system may be substituted. To configure a DEC 7000 AXP system, a differential line driver—DWZZA—must be used.

Diagram 3

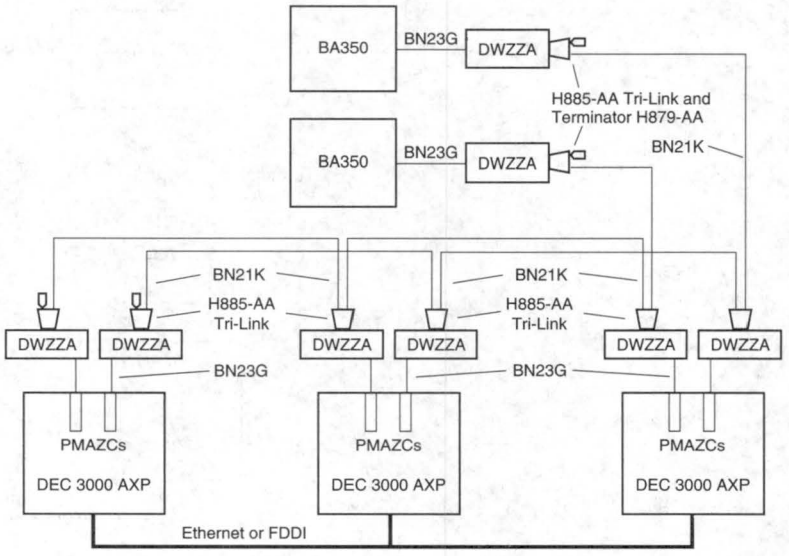


Notes:
- Total SCSI bus length not to exceed 31 meters.
- Total BN21K cable length not to exceed 25 meters.
- DWZZA could be located inside of BA350 enclosure. Its inclusion will reduce number of storage devices in BA350.

BU-3429

Diagram 3 illustrates a three-system cluster with two DEC 3000 AXP systems and one DEC 7000 AXP system. This is the maximum number of systems supported on DECsafe Available Server V1.0. This configuration could support three DEC 3000 AXP systems or two DEC 7000 AXP systems and one DEC 3000 AXP system.

Diagram 4



Notes:
- Three systems with two shared SCSI buses on separate PMAZCs. One PMAZC per system with same configuration also possible.
- Total SCSI bus length not to exceed 31 meters.
- Total BN21K cable length not to exceed 25 meters.

BU-3430

Diagram 4 shows a three-system cluster with two SCSI buses. Up to six shared buses are supported in DECsafe Available Server V1.0.

Note: For specific ordering information, see Rackmount DEC 3000 AXP and DEC 7000 AXP system sections in Chapter 1. For custom packages, call Digital Services Sales Support Team at 800-832-6277 or 603-884-8990.

POLYCENTER Console Manager

Overview

The POLYCENTER Console Manager (PCM) is a system management tool that unifies the console management of system nodes and other devices on a network. PCM enables a host system to manage, monitor, and control client console devices. The host system can be running any of these Digital operating systems:

DEC OSF/1 AXP V1.3 or higher

OpenVMS AXP V1.5 or higher

OpenVMS VAX V6.0 or higher

ULTRIX V4.3a or higher

The POLYCENTER Console Manager Software components include I/O data logger, data scanner, event logger, central control coordinator interface, monitor interface, connect interface, record interface, review interface, access interface, event notification system, configuration editor, configuration file, and log files.

From PCM, a system manager can perform all console functions for all serviced nodes including:

- Shutting down or rebooting the serviced nodes
- Running standalone diagnostics
- Performing standalone backup operations
- Installing layered products
- Viewing console output
- Reviewing historical console data
- Retrieving historical console data for analysis or printing
- Searching for console data
- Logging all data and activities between PCM and serviced nodes
- Scanning incoming messages from serviced nodes for specific text strings that may contain status or error information
- Assembling icons into graphic displays on VAXstation screen representing aerial view of the data center and logical grouping of OpenVMS Cluster configurations
- Providing optional security facility to control access to serviced nodes

Software Features

- All data received from connected devices is logged by PCM and identified by source node name and time received by PCM.
- Security facility allows system manager to restrict access to PCM-controlled devices.
- PCM detects console events by scanning console text messages and comparing with predefined text strings contained in scan files.
- PCM can build icon-based view of all devices connected to it. This graphic layout uses color to indicate severity of an event and allows users to access device's console by clicking with a mouse to activate PCM interface.
- Users are alerted of critical system messages by changing icon colors, by VAXmail, terminal broadcast, notification window on workstations and DECwindows terminals, or user-provided notification system.

Hardware Features

- Support of up to 200 devices: OpenVMS Cluster system nodes, standalone VAX systems, DEC OSF/1 and ULTRIX systems, other systems (e.g., IBM AS400), or any device that sends ASCII data over EIA-232 line, has EIA console port, and supports XON/XOFF with I/O buffering. The maximum supported console terminal speed is 19,200 baud.
- Operators can connect to console port of any device serviced by PCM from any terminal connected to PCM host.
- PCM host systems can connect to serviced devices via direct connections or via host-initiated LAT and TELNET connections using terminal servers.
- Operators can remotely access PCM host system via DECnet, TCP/IP, LAT, or dial-up ports to perform PCM functions.

Step 1—POLYCENTER Console Manager Software

Order POLYCENTER Console Manager software. PCM licenses are user-based; "user" is defined as a device managed by PCM. Each PCM license allows the PCM host system to have one serviced device connected to it.

DEC OSF/1 AXP Systems†	
QL-2PDA*-**	POLYCENTER Console Manager Software Licenses
QA-MU1AA-GZ	POLYCENTER Console Manager Software Documentation
QT-2PDA*-**	POLYCENTER Console Manager Software Product Services
OpenVMS AXP Systems†	
QL-2PCA*-**	POLYCENTER Console Manager Software Licenses
QA-MU1AA-GZ	POLYCENTER Console Manager Software Documentation
QT-2PCA*-**	POLYCENTER Console Manager Software Product Services
OpenVMS VAX Systems	
QL-V01A*-**	POLYCENTER Console Manager Software Licenses
QA-V01A*-**	POLYCENTER Console Manager Software Media
QA-MU1AA-GZ	POLYCENTER Console Manager Software Documentation
QT-V01A*-**	POLYCENTER Console Manager Software Product Services
RISC ULTRIX Systems	
QL-MU1A*-**	POLYCENTER Console Manager Software Licenses
QA-MU1A*-**	POLYCENTER Console Manager Software Media
QA-MU1AA-GZ	POLYCENTER Console Manager Software Documentation
QT-MU1A*-**	POLYCENTER Console Manager Software Product Services

† Software Media available on CD-ROM only.
Note: The QL-V01AA-3B concurrent license for OpenVMS VAX is usable on the OpenVMS AXP platform.

Step 2—Hardware Platform (PCM Host Systems)

For a complete list of hardware platforms that are supported as PCM host systems, please refer to the Software Product Description, 42.90.xx. A variety of systems are supported as serviced devices. Refer to the appropriate chapter for ordering new systems. A minimum of 32 Mbytes of memory is required for hosts.

Step 2a—Direct Connection Method

For managed devices that are directly connected to the PCM host hardware platform, order the appropriate adapters.

H8575-A	MicroVAX 3300, 3400, 3500, 3600, 3800, 3900 (CXY08 interface) VAXstation 3500 (CXY08 interface)
No Adapter Required*	MicroVAX 3300, 3400, 3800, 3900 (CXA16 interface) VAXstation 3200, 3500 (CXA16 interface)

* MMJ connection

Step 2b—Host-Initiated Connection

For managed devices that are elsewhere on the network, use terminal servers and choose appropriate adapters.

No Adapter Required*	DECserver 700-16; DECserver 90L; DECserver 90M

* MMJ connection

Step 3—Cables

Choose appropriate cable length or customize cable length required.

BC16E-25	25-ft (7.6-m) DECconnect cable
BC16E-50	50-ft (15.2-m) DECconnect cable
BC16E-A0	100-ft (30.5-m) DECconnect cable
H8240	1000-ft (300.5-m) unterminated roll of DECconnect cable
H8220	Package of 50 MMP connectors
H8241	Crimping tool

Step 4—Adapters (Serviced Devices)

Order the appropriate adapter for each of the following managed devices.

H8575-A (25-pin)	VAX 10000, VAX 9000, VAX 7000, VAX 6000, VAX 8xxx, VAX-11/750/780/785, HSC40/50/70
H8575-B (9-pin)	MicroVAX II, VAXstation II
No Adapter Required*	MicroVAX 3xxx Series, VAXstation 3xxx (except VAXstation 3200), VAXserver 3xxx

* MMJ connection

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 140-Mbit/second speed on both CI paths. These OpenVMS Cluster systems use OpenVMS Cluster Software on OpenVMS systems with CI hardware:

- CI OpenVMS Cluster hubs—Star Coupler
- CI interfaces—CIXCD-AC, and CIBCA-BA
- CI cables

OpenVMS Cluster configurations have been expanded with support for:

- Multiple Star Couplers in a single OpenVMS Cluster system
- Multiple CI interfaces on processors in a OpenVMS Cluster system

Star Coupler

SC008-AC The SC008-AC is a passive hub device providing dual CI path and electrical isolation between CPU nodes and HSCxx storage controller nodes in a CI OpenVMS Cluster system. Supports up to eight CI ports; includes cabinet

Dimensions:
Width: 54 cm (21.25 in.)
Height: 106 cm (41.75 in.)
Depth: 76 cm (30.00 in.)

SC008-AD Upgrades the SC008-AC from support of 8 to 16 ports and is installed inside the SC008-AC cabinet.

CI Interfaces

CI interfaces are intelligent controllers that connect nodes to the CI. Each interface attaches to the CI Bus, the bus consisting of two transmit and two receive cables (which provides hardware redundancy and fail-over). In the past, traffic on the CI Bus was restricted to transmissions on one available path at a time. With the introduction of the CIXCD, greater utilization of the CI Bus occurs with the controller taking advantage of both paths of the CI Bus for communications. Transmission can now be made across either available path simultaneously. The CI Bus retains its 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.

CIXCD

High-performance, intelligent I/O interface that connects VAX 6000, VAX 7000, and VAX 10000 series processors to the Computer Interconnect (CI) OpenVMS Cluster systems. It uses a method of CI communications that allows the CIXCD to communicate over two CI paths at the same time in any order. It is compatible with existing OpenVMS Cluster systems port interfaces and can be used to enhance existing OpenVMS Cluster systems I/O performance. It is supported by OpenVMS V5.4 or higher. Combining CIXCDs and CIBCAs on the same system is not supported.

CIXCD-AC	CIXCD with cabinet kit for use on VAX 6000, VAX 7000, and VAX 10000 systems.

Option	Mounting Requirements	I/O Panel Units
CIXCD-AC	1 XMI slot	2

OpenVMS Cluster Options *(continued)*

CIBCA

CIBCA-BA Optional CI OpenVMS Cluster interface for VAXBI systems. OpenVMS V5.4 or higher supports the use of multiple CIBCA-BA interfaces on VAXBI-based systems, providing the interfaces are of the same type. OpenVMS restrictsthe use of mixed CI port interface variations, e.g., the CIBCA-BA and theCIBCA-AA cannot be mixed within the same system.

Option	Mounting Requirements	dc Amps Drawn @ V					VAXBI Nodes	I/O Panel Units
		5	12	-12	-5.2	-2		
CIBCA-BA	2 VAXBI slots	9	0	0	2	1	1	2

CI Cables

CI cables are required for each CI interface ordered.

BNCIA-10 CI cable set—10 meters (32 feet)

BNCIA-20 CI cable set—20 meters (65 feet)

BNCIA-45 CI cable set—45 meters (146 feet)

Chapter 7
Networks, Communications, and Cables

Network Interface Cards and Adapters for VAX/DECsystems/Alpha AXP

Hubs, Hub Management, and LAN Monitoring Products

Network Access and Communications Servers

Repeaters, Bridges, Routers, and Brouters

Switches

Concentrators and Multistation Access Units

Channelworks

Tranceivers/Media Access Units

Internetworking Products

Host-Based Communications Controllers

Modems

DECvoice and DECtalk Speech Synthesizers

OPEN DECconnect Products and Cables

VAX/DECsystems LAN Communications Controllers Summary Chart*

LAN Type	Bus	Controller	Number of Lines	Maximum Speed	LAN Connection	Protocol Support	Operating System Support
802.3/ Ethernet	XMI	DEMNA	1	10 Mb/s	Standard AUI	DECnet/OSI for OpenVMS, DECnet/OSI for ULTRIX	OpenVMS ULTRIX
802.3/ Ethernet	VAXBI	DEBNI	1	10 Mb/s	Standard AUI	DECnet/OSI for OpenVMS, DECnet/OSI for ULTRIX	OpenVMS, UTLRIX DEC OSF/1 AXP
802.3/ Ethernet	Q-bus systems in BA2xx-and BA4xx-series enclosures	DESQA	1	10 Mb/s	Standard AUI or ThinWire BNC	DECnet/OSI for OpenVMS, DECnet/OSI for ULTRIX	OpenVMS, ULTRIX
802.5 Token Ring	Q-bus	DEQRA	1	4/16 Mb/s	DB9	DECnet	OpenVMS
FDDI	XMI	DEMFA	1	100 Mb/s	SAS, Fiber MIC	DECnet	OpenVMS
FDDI	Q-bus	DEFQA	1/2	100 Mb/s	SAS/DAS, Fiber MIC	DECnet, OSI, TCP/IP	OpenVMS VAX
FDDI	TURBOchannel	DEFTA	1	100 Mb/s	Fiber: SAS, ST-type	DECnet, OSI, TCP/IP	DEC OSF/1 AXP, OpenVMS

*Additional controllers available; see the *Network Products Guide* for information. For PC LAN controller information, see Chapter 5.

DEC LANcontroller 400 (DEMNA—XMI-to-Ethernet)

The DEC LANcontroller 400 (DEMNA) is a high-performance XMI-to-Ethernet controller. The DEMNA is a single board option. The module uses an onboard CVAX processor to control data flow and 512 Kbytes of memory for packet buffering and processing.

The DEC LANcontroller 400 enables a VAX 6000/7000/10000 system to operate as a boot member of a Local Area OpenVMS Cluster. Additional controllers can be installed in these systems to establish communications with multiple independent Ethernet segments.

Prerequisites

Hardware: DEMNA connects to the network via an Ethernet transceiver and transceiver cable. The cabinet kit, transceiver cable, and transceiver are ordered separately.

Software: The DEC LANcontroller 400 is supported under DECnet Phase IV and IEEE 802.3 software. Refer to the OpenVMS, ULTRIX, LAT, DECnet, and Local Area VAXcluster Software Product Descriptions.

Ordering Information

The DEC LANcontroller 400 is supported on VAX 6000/7000/10000 systems. When purchased as an add-on, a cabinet kit must also be ordered. This option requires Digital Services installation.

DEMNA-M	VAX XMI Ethernet adapter without cables
CK-DEMNA-KD	VAX 6000 cabinet kit, 3-ft (0.91-m) cable
CK-DEMNA-KN	VAX 7000/10000 cabinet kit
CK-DEMNA-AM	VAX 6000/9000 local console cabinet kit

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @				
		5 V	12 V	–12 V	–5.2 V	–2 V
DEMNA-M	1 XMI slot	7.75	0.60	0.10	0.0	0.0

DEC LANcontroller 200 (DEBNI—VAXBI-to-Ethernet)

The DEC LANcontroller 200 (DEBNI) 802.3/Ethernet-to-VAXBI communications controller connects VAXBI systems to 802.3/Ethernet local area networks. An enhanced version of the DEBNA, it offers two to three times more throughput for small Ethernet packets and has ROM-based console functionality to monitor DEBNI and Ethernet use.

The DEC LANcontroller 200, available as a module or as a ROM upgrade kit for the DEBNA, supports one Ethernet port. It sends and receives signals at 10 Mbits per second. Actual device throughput depends on the system configuration, packet sizes, and application in use.

Prerequisites

Hardware: The DEC LANcontroller 200 connects to the Ethernet via an Ethernet transceiver and transceiver cable. The cabinet kit, transceiver cable, and transceiver are ordered separately.

Software: Refer to the OpenVMS, LAT, DECnet, Local Area VAXcluster, VAXELN, and ULTRIX Software Product Descriptions.

Ordering Information

DEBNI-M	Includes base module only. For system installation, order CK- cabinet kits
DEBNI-UA	4-ROM upgrade to the DEBNA-M, no cabinet kit required
CK-DEBNA-LD	For use with VAX 6000 series internal VAXBI channels
CK-DEBNA-LJ	For use with VAX 6000 series external VAXBI channels

Note: Internal channels are built into the CPU cabinet, and external channels are located within the expansion cabinet. Cabinet kit consists of internal cable, I/O connector panel, and console-enable jumper for Ethernet.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					Length Cable		VAXBI Nodes	I/O Panel Units
		5 V	12 V	-12 V	-5.2 V	-2 V	m	[ft]		
DEBNI-M	1 VAXBI slot	6.72	0.00	0.00	0.00	0.00			1	none
CK-DEBNA-LD	none	0.00	0.00	0.00	0.00	0.00	1	[3]	0	1
CK-DEBNA-LJ	none	0.00	0.00	0.00	0.00	0.00	1.5	[5]	0	1

DESQA Controller (Q-bus-to-Ethernet)

The DESQA is an Ethernet-to-Q-bus communications controller that connects VAX, Q-bus, MicroVAX, DECsystems, and MicroPDP-11 systems that use the BA4xx or BA2xx series enclosures to an Ethernet V2.0 or IEEE 802.3 local area network. The DESQA can be connected to standard Ethernet coaxial cable or to ThinWire Ethernet. The DESQA is a combination of DELQA and DECXM on one quad-height BA2xx series form-factor module. DESQA does not require a cabinet kit.

Prerequisites

Hardware: One ThinWire BNC T-connector and two 50-ohm terminators are supplied with the DESQA. The DESQA physically and electrically connects to the IEEE 802.3/Ethernet via transceiver cable—BNE3K or BNE3M series (thick wire) or the BC16M-x series (ThinWire). In the case of ThinWire connections, the DESQA must be connected via a DEMPR or a DESPR. For thick wire baseband connections, DESQA can be connected to an H4005 or DELNI. For broadband connections DESQA can be connected to a DECOM. The H4005, DECOM, DELNI, DEMPR, DESPR, and cable must all be ordered separately.

Software: DESQA is compatible with all DELQA software drivers.

Ordering Information

DESQA-SA/SF	Ethernet-to-Q-bus communications controller for VAX 4000 Q-bus MicroVAX 3000 series, and Q-bus DECsystems. Factory/ field installed
EK-DESQA-TM	*DESQA Technical Manual*

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DESQA-SX	1	2.4	0.22	14.64	3.3	0.5

DEC TRNcontroller 100 (DEQRA—Q-bus-to-Token-Ring)

The DEC TRNcontroller 100 is a Q-bus adapter that enables MicroVAX 3xxx and VAX 4000 systems to connect to a 4-or 16-Mb/s 802.5/Token Ring network. The DEQRA, in combination with the DEC Token Ring Network Device Driver for VMS V1.1 (TRDRV V/V), enables these systems to act as DECnet Phase IV full-function nodes and interoperate with other DECnet Phase IV systems on either 802.5/Token Ring or Ethernet LANs. When configured with PATHWORKS for VMS V4.1-1, these systems can act as PC LAN servers for PATHWORKS clients on either 802.5/Token Ring or Ethernet LANs. The TRDRV V/V driver kit includes online diagnostics, installation verification procedures, and the DEQRA-CA host-loadable microcode. The DEQRA supports shielded twisted-pair connection only, and provides an EIA-232 console port for debugging purposes. The DEQRA supports source routing as a DECnet Phase IV data link service and arbitrary MAC layer addressing for IBM token ring support.

Prerequisites

Software: OpenVMS V5.5 and associated DECnet-VAX

Hardware: The DEQRA physically and electrically connects to the 802.5/Token Ring shielded-twisted pair cable. These connection components are not included with the DEQRA-CA and must be ordered separately.

Ordering Information

Order the DEQRA-CA as a field-installable controller. This controller is not currently available as a factory-installed option.

DEQRA-CA	Field-installed DEQRA (includes OpenVMS device driver license)
BC29E-15	Debugging console cable
QA-GVJAA-GZ	TRDRV V/V documentation

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @		Bus Loads Drawn	
		5 Vdc	12 Vdc	ac	dc
DEQRA	1 quad slot	4.0A	0.1A	5	2

DEC FDDIcontroller/FUTUREBUS+

The DEC FDDIcontroller/FUTUREBUS+ provides Futurebus+ to FDDI connectivity for Digital systems and third-party products equipped with a Profile "B" Futurebus. This adapter can be configured as a single-attachment station (SAS) or dual-attachment station (DAS) option, and supports Multi-Mode Fiber for up to 2 km between stations, and Single-Mode Fiber (SMF) for distances up to 40 km between stations.

Features

- Provides FDDI connectivity for DEC 4000 AXP systems, and alternative FDDI connectivity for DEC 7000/10000 AXP systems with Futurebus+ I/O backplane option
- Provides enhanced reliability and availability via support for dual homing, and an external third-party optical bypass relay (DAS only)
- Provides highest aggregate throughput, over 100 Mbits/second, when operated in full-duplex mode. Full-duplex allows it to connect point-to-point with another Digital FDDI adapter (except DEFZA) or to Digital's GIGAswitch, and operate without a token.

Prerequisites and Configuration Rules

- DEC 4000 AXP or DEC 7000/10000 AXP system equipped with the optional Futurebus+ I/O backplane
- Futurebus Profile "B" Slot
- OpenVMS AXP V1.5 or later, or DEC OSF/1 AXP V1.3 or later
- Number of controllers supported per system = 2
- Patch cables required: use BN24B-xx (MIC to MIC) or BN24D-xx (MIC to ST)
- Optical Bypass Relay for use with MMF only (not available from Digital, reference AMP #501916-3)

Ordering Information

DEFAA-AA	Futurebus+ to FDDI Adapter SAS, MMF with MIC PMD connectors
DEFAA-DA	Futurebus+ to FDDI Adapter DAS, MMF with MIC PMD connectors
DEFAA-YA*	Futurebus+ to FDDI Adapter without PMD connectors
DEFXS-AA	Single-Mode Fiber (SMF) PMD connector, required with DEFAA-YA
DEFXM-AA	Multi-Mode Fiber (MMF) PMD connector, optional with DEFAA-YA

* At least one DEFXS-AA SMF PMD connector must be ordered with each DEFAA-YA. A maximum of two PMD connectors can be installed. The PMD connectors associated with each DEFAA-YA must be listed immediately after the -YA on the order. The first PMD connector listed after the -YA will be installed in the "B" port forming a SAS adapter. The second PMD connector, if listed, will be installed in the "A" port forming a DAS adapter.

DEC FDDIcontroller 400 Controller (DEMFA—XMI-to-FDDI)

The DEC FDDIcontroller 400 enables VAX 6000/7000/10000 systems and servers to operate as native FDDI SAS devices, via an FDDI concentrator, in a high-speed FDDI ring. The DEC FDDIcontroller 400 consists of three components:

- A single XMI module, with the system interface and FDDI logic
- An active I/O bulkhead assembly that houses the fiber optic transceiver and electrical interface
- A woven cable to interconnect the XMI module and bulkhead assembly

The DEC FDDIcontroller 400 uses an ANSI-standard MIC (Media Interface Connector) to provide optical interconnection to a fiber cable attached to any ANSI- compliant FDDI concentrator, such as the DECconcentrator 500.

The DECconcentrator 500 connects Digital's FDDI devices, as well as ANSI-compliant devices from other vendors, in an FDDI physical star or logical ring topology.

Features

- Full-performance FDDI interface—provides necessary speed for support of network-intensive applications
- Firmware downline loadable (retained in non-volatile RAM)—supports currency with FDDI standards and easy upgrades for new features and capabilities

Prerequisites

Hardware

- The DEC FDDIcontroller 400 adapter for VAX 6000/7000/9000/10000 platforms provides a Single Attachment Station (SAS) connection. It requires a concentrator for connectivity to the FDDI LAN.
- The DEC FDDIcontroller 400 must have a corresponding concentrator port card providing the same media interface for 62.5-micron multimode fiber.

Software

OpenVMS Version 5.4-3 provides DECnet Phase IV and LAT support for the DEC FDDIcontroller 400, included is the ability to diagnose network problems and manage the adapter via the Network Control Program (NCP) and System Dump Analyzer (SDA).

Ordering Information

DEMFA-AA	XMI-to-FDDI SAS adapter for use on VAX 6000/7000/10000 systems*

* Includes single-use license for DEC FDDIcontroller 400 software microcode.

Configuring Information

Requires one XMI slot; one I/O panel unit required for VAX 9000 systems, two I/O panel units for VAX 6000/7000/10000 systems.

DEC FDDIcontroller/TURBOchannel (DEFTA)

The DEC FDDIcontroller/TURBOchannel (DEFTA) is a high-performance, FDDI controller that enables the direct connection of DEC OSF/1 AXP and OpenVMS AXP systems (with TURBOchannel support)to FDDI networks. VAXstatoin 4000 Model 90A running OpenVMS and the DEC LAN device driver kit for OpenVMS also support this controller.

DEFTA support on the DEC 3000 AXP systems running DEC OSF/1 AXP V1.2 includes TCP/IP and support of DECnet/OSI V1.0, and LAT.

DEFTA support on the DEC 3000 AXP systems running OpenVMS AXP V1.5 includes DECnet/OSI, TCP/IP for OpenVMS AXP, and LAT.

DEFTA support on the VAXstatoin 4000 Model 90A running OpenVMS VAX V5.5-2 with the DEC LAN device driver kit for OpenVMS includes DECnet, LAT, clusters, and TCP/IP for OpenVMS, LAD, and LAST protocols.

Features

- Approaches full FDDI performance of 100 Mb/s at the TCP/IP protocol layer with DEC OSF/1 AXP and TCP/IP for OpenVMS AXP
- Supports ANSI FDDI SMT V7.2 for multivendor interoperability
- Full-duplex feature supported when connected in point-to-point configurations with another Digital controller
- Network management with SNMP agent in DEC OSF/1 AXP V1.2 and MOP with both DEC OSF/1 AXP V1.2 and OpenVMS AXP V1.5
- Supports easy-to-use local upgrade utility for any future firmware upgrades
- Provides industry-standard 62.5/125 multimode fiber media support

Configuring Information

- Requires one TURBOchannel slot
- TURBOchannel adapter module (DWCTX-BX), which provides one single-width bus slot, is required to support DEFTA on a VAXstatoin 4000 Model 90A system
- Cables not included

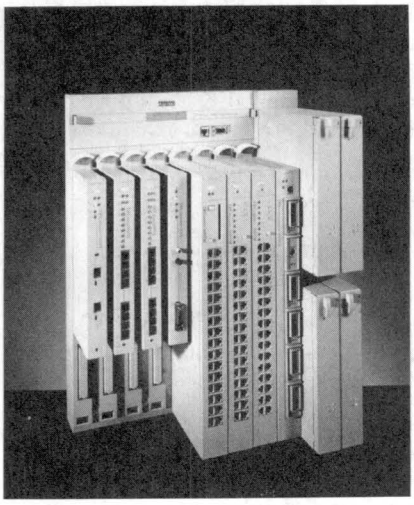
Ordering Information

DEFTA-AA	DEC FDDIcontroller/TURBOchannel SAS/MMF, ST connectors
DEFTA-DA	DEC FDDIcontroller/TURBOchannel DAS/MMF, ST connectors
DEFTA-UA	DEC FDDIcontroller/TURBOchannel SAS/UTP, TP-PMD (RJ45 receptacle)

Note: OpenVMS VAX customers must order following driver kit separate from operating system:

QA-0PAAA-H5	DEC LAN device driver kit for OpenVMS VAX V1.0 on TK50; for use *only* with OpenVMS V5.5-2.

DEChub 900 Multiswitch Family



The DEChub 900 MultiSwitch delivers "next generation" hub functionality to support the largest, most complex networks. The DEChub 900 product set can support multiple Ethernet, Token Ring, and FDDI LAN segments (as well as emerging higher-performance technologies such as ATM) in a broad range of configurations. Easy-to-use management software allows these segments to be reconfigured electronically by switching connections within the hub itself.

The DEChub 900 MultiSwitch complements the DEChub 90 product set with support for workgroups and low-density, Ethernet-only connectivity. Like the DEChub 90 products, all DEChub 900 MultiSwitch modules can work in standalone ("docking-station," "rack and stack") or DEChub 900 configurations. All of the DEChub 90 modules are compatible with the DEChub 900 MultiSwitch.

- Backplane supports aggregate bandwidth >3 GB/s
- Supports multiple, independent LAN segments
- ATM-ready
- Connections reconfigurable through software
- All DEChub 90 modules operate and are manageable in DEChub 900
- Plug-and-play operation
- Graphical user interface
- User installable in offices or wiring closets
- Redundant, high-availability power system

Ordering Information

DEChub 900 MultiSwitch eight-slot intelligent hub with power supply:

DMHUB-AA	U.S., Canada, Japan
DMHUB-AD	Denmark
DMHUB-AE	U.K.
DMHUB-AI	Italy
DMHUB-AK	Switzerland
DMHUB-AT	Israel
DMHUB-AX	Central Europe
DMHUB-AZ	Australia
DMHUB-BJ	India
DEHUA-xx	DEChub ONE single-slot hub ("docking-station," required for standalone use of DEChub 900-series module to provide power and AUI network port)

Configuring Information

The DEChub 900 backplane accommodates up to eight modules. Modules developed for the DEChub 900 include:

- DECrepeater 900TM 32-port Ethernet Repeater (DETMM)
- DECserver 900TM 32-port Network Access Server (DSRVZ)
- DECconcentrator 900MX 6-port FDDI Concentrator (DEF6X/DEF6M)
- DECmau 900TL 8-lobe Token Ring Multistation Access Unit (DTMAU)
- DECrepeater 900SL 150-ohm STP Token Ring Repeater (DTROS)
- DECrepeater 900TL 100-ohm UTP/150-ohm STP Token Ring Repeater (DTROR)
- DECrepeater 900GM 24-port 10BaseT Repeater (DETTM),
- DECswitch 900EE 6-port Ethernet Switch (DEBMP)
- DECswitch 900EF Ethernet/FDDI Switch (DEFBA)
- PEswitch 900TX Personal Ethernet Switch (DESBF)
- DECrepeater 900FP 12-port 10BaseFL Repeater (DEFMM)
- DECpacketprobe 900RRRemote Monitoring (RMON) Probe (DTRMN)

All DEChub 90 series modules are supported.

DEChub 900 Multiswitch Family *(continued)*

Specifications

DEChub 900 MultiSwitch	
Height	57.8 cm (22.75 in.)
Width	5.08 mm (2.0 in.)
Depth (chassis only)	44.5 cm (17.5 in.)
Weight (with power supply)	16.65 kg (37 lb)
DEChub 900 Module	
Length	44.45 cm (17.5 in.)
Width	15.25 cm (6 in.)
Height	4.45 cm (1.75 in.)
Weight	1.8 kg (4 lb)
(in the DEChub ONE)	3.2 kg (7 lb)

DEChub ONE—Ethernet Single-slot Hub

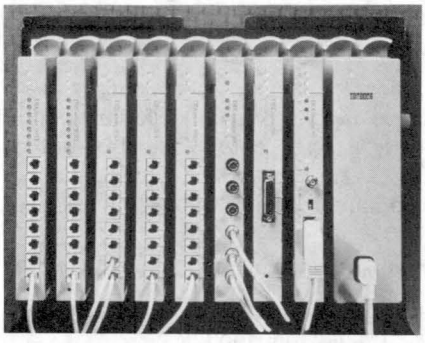
This single-slot docking station provides power and an integral AUI port for DEChub 900 series modules in standalone configurations. A ThinWire (DECXM-AA), Fiber (DEFLM-AA), or Twisted Pair (DETPM-AA)Media Access Unit can be easily attached to the DEChub ONE to provide additional media connectivity options.

Ordering Information

DEChub ONE single-slot docking station:

DEHUA-CA	U.S., Canada, and Japan
DEHUA-CD	Denmark
DEHUA-CE	U.K.
DEHUA-CI	Italy
DEHUA-CK	Switzerland
DEHUA-CT	Israel
DEHUA-CX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEHUA-CZ	Australia
DEHUA-DJ	India

DEChub 90 (Ethernet)



The DEChub 90 provides ThinWire Ethernet connections, power, and mounting for eight plug-compatible DEChub Family modules. The hub's revolutionary design promote easy analysis of the hardware status, hot swap module replacement, and flexible network configurations. Its compact size is ideal for office environments. The DEChub 90 can be used to create and manage an Ethernet LAN from one easy-to-manage unit.

When combined with the optional DEHUX enclosure, the DEChub 90 backplane becomes a mini equipment closet. The DEHUX provides mounting for the backplane and patch panels, and provides a cover that limits access to the equipment for added security.

- Provides workgroup communication center in a multifunction hub
- Integrates active components and passive wiring—acts as a hub for active networking components, and a wiring closet for passive wiring.
- Compact—mounts on a wall or in a rack
- Features hot swap module replacement
- Accommodates dense configurations—two DEChub 90 units can be interconnected and managed as a single unit

DEChub 90 (Ethernet) *(continued)*

- DEChub 90 includes:
  - DECbrouter 90
  - DECwanrouter 90
  - DECserver 90L+, 90TL, 90M
  - DECrepeater 90C, 90T, 90FL, 90FA, 90FS, 90TS
  - DECbridge 90, 90FL
  - DECpacketprobe 90
  - DECagent 90
  - MUXserver 90
  - RoamAbout Access Point

Ordering Information

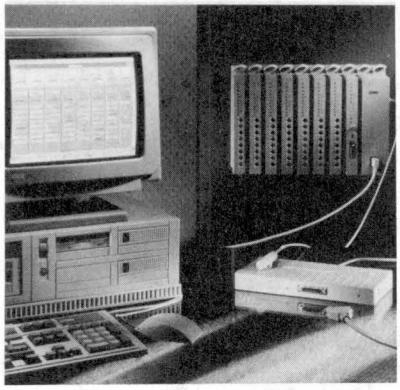
Note: The following order numbers include DEChub 90, country-specific power cord, rackmount brackets, and documentation:

DEHUB-BA	U.S., Canada, and Japan
DEHUB-BD	Denmark
DEHUB-BE	United Kingdom
DEHUB-BI	Italy
DEHUB-BK	Switzerland
DEHUB-BT	Israel
DEHUB-BZ	Australia
DEHUB-CB	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEHUB-CJ	India
DEHUX-AA	Cover assembly, wall-mount brackets, patch panel brackets

Configuring Information

The DEChub 90 backplane accommodates up to eight modules and has an integral power supply. It takes up less than one cubic foot of space. Two DEChub 90 units can be interconnected and managed as a single unit.

DECagent 90



The SNMP-based DECagent 90 hardware module provides a graphical network management solution for the DEChub 90. With HUBwatch software, DEChub family modules can be configured, monitored, and controlled down to the individual port level.

Only Digital offers the flexibility to manage multiple hubs from a single module that works standalone or in the hub. One DECagent 90 can manage up to four interconnected hubs. Up to 480 10BaseT repeater ports can be managed by a single DECagent 90.

The DECagent 90 protects against network downtime in a number of ways. It is designed to eliminate the management module as a single point of failure. If this module fails, only the management function is affected, not the operation of the whole hub. It also features an out-of-band (EIA-232) port with a graphical interface to allow management of an isolated hub if portions of the network fail.

Features

- Easy-to-use, graphical SNMP-based network management
- Manages DEChub 90 modules to the individual port level, multiple hubs with a single management module, and selected standalone modules
- Can be used standalone or in the DEChub 90
- Not a single point of failure
- Provides out-of-band EIA-232 port

DECagent 90 *(continued)*

Ordering Information

Both the DECagent 90 and a HUBwatch product are needed to graphically manage modules in the DEChub 90. DECagent 90 for standalone use; includes power supply

DENMA-AA	U.S., Canada, Japan
DENMA-AD	Denmark
DENMA-AE	United Kingdom
DENMA-AI	Italy
DENMA-AK	Switzerland
DENMA-AT	Israel
DENMA-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DENMA-AZ	Australia, New Zealand
DENMA-BJ	India
DENMA-MA	DECagent 90 for use in DEChub 90 (power supply not included)
H7827-AA	120-V/240-V power supply
H0342-AA	Snap-on cover for the hub-based model of the DECagent 90

DECagent 90 Starter Kits

DH-DENMA-MA	Includes DENMA-MA and DEWGB-MA
DH-DENMA-FL	Includes DENMA-MA and DEWGF-MA

Configuring Information

The DECagent 90 can be configured as a standalone unit or as part of the DEChub backplane. The standalone DECagent 90 uses an external power supply. When installed in a DEChub, the DECagent 90 uses the power supply in the hub.

- Use one DECagent 90 per four double (interconnected) hubs* on the same LAN, or eight separate DEChub 90 units.
- The hub-based DECagent 90 must be installed in slot 7 or 8 of the DEChub 90.
- A DECbridge 90 or DECbridge 90FL must be in slot 7 or 8 of the hub* in order to manage DEChub Family repeaters.

* Two hubs that are interconnected count as one hub.

HUBwatch Management Software

HUBwatch provides native SNMP graphical network management for the DEChub Family. It allows users to access the full power of the DEChub 90 or DEChub 900 by clicking on a mouse. It translates SNMP messages into pictures of DEChub modules. HUBwatch can also be layered on Digital's enterprise management tools to integrate management of other Digital and multivendor networking devices.

HUBwatch offers a wide variety of management capabilities. For example, it can be used to switch modules in the DEChub 900 to different LAN channels in order to balance network traffic and allocate bandwidth. For repeater management, HUBwatch uses easy-to-read gauges to convey statistical information on octets, frames, collisions, and errors. It also provides full security to the port level, preventing network intrusion and eavesdropping.

HUBwatch Management Software *(continued)*

HUBwatch allows users to remotely manage terminal servers with ease. Port, counter, and module detail screens are all available. HUBwatch makes it easy to see the number of active sessions per port. It generates a list of nodes to which each session is connected. It can also list the remote IP addresses for Telnet.

Features

- Offers simple point-and-click commands, descriptive icons, and context-sensitive help for easy management of DEChub Family
- Provides consistent user interface for both in-band and out-of-band access
- Supports full repeater and terminal server management
- Features ease of use–graphical screens help to quickly identify and isolate fault conditions from hub
- Manages to port level
- Provides "LAN hopping" capability for DEChub 900

Prerequisites

DECagent 90 (with V1.1 firmware) for use with the DECbridge 90/90FL and DECserver 90L/L+. **Note:** DECagent 90 does not have to be in DEChub 90/900, but must be installed on same LAN in order to manage devices.)

Refer to the appropriate SPD for system requirements:

- SPD 37.87 HUBwatch for Windows
- SPD 45.74 HUBwatch for OpenVMS VAX
- SPD 46.65 HUBwatch for DEC OSF/1 AXP

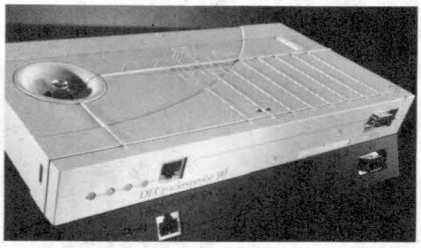
Notes:

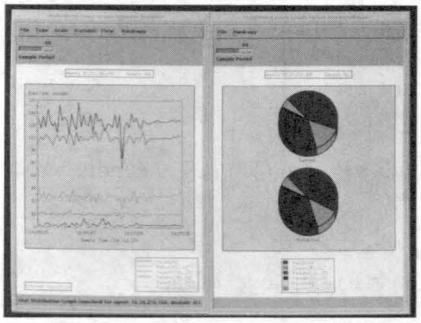
1. HUBwatch can be layered on top of POLYCENTER and other network management platforms.
2. Full graphical management of DEChub 900 is available through out-of-band management using SLIP. DECserver 90TL/90M/900TM or DECserver 700 (non-hub) required. Any of these products can be used to provide SLIP interface to DEChub 900 management module via DECserver port connection to DEChub 900 out-of-band port.

Ordering Information

QB-MQDAW-AA	HUBwatch for Windows media and documentation kit(license included)
QA-MQDAA-GZ	HUBwatch for Windows documentation
QL-0GEA9-AA	HUBwatch for OpenVMS VAX license
QB-32VAB-AA	HUBwatch for OpenVMS VAX media and documentation
QA-0GEAA-GZ	HUBwatch for OpenVMS VAX documentation
QL-0MWA9-AA	HUBwatch for DEC OSF/1 AXP license
QB-32VAC-AA	HUBwatch for DEC OSF/1 AXP media and documentation

DECpacketprobe 90 and PROBEwatch





The DECpacketprobe 90 is a hardware module in the DEChub 90 family form factor that operates as a distributed network performance monitoring probe. It monitors traffic and error levels. This compact module implements the Simple Network Monitoring Protocol (SNMP) and the Remote Monitoring (RMON) Management Information Base (MIB) for monitoring Ethernet networks. It can be used standalone or in a hub.

PROBEwatch is a companion product to the DECpacketprobe 90. This software application provides a graphical user interface to aid the user in viewing and analyzing the data that is reported by the DECpacketprobe 90. Data can be viewed in tables or in a variety of chart formats. PROBEwatch runs from the network map on either POLYCENTER SNMP Manager 300 or POLYCENTER Network Manager 200 on ULTRIX.

This solution increases network availability and optimization while decreasing network support costs. It detects even minor network problems quickly. And, instead of traveling from the physical location of one LAN segment to another to find the source of a problem, network managers can troubleshoot from their desks.

Both products implement all nine groups in the RMON MIB.

DECpacketprobe 90:

- Monitors traffic—allows the network manager to see the impact of moving or adding devices on a network
- Monitors error levels—allows the network manager to set thresholds for error levels
- Unique configuration flexibility—operates standalone or in the DEChub 90/900
- Compact—no extra expensive hardware needed, as is the case for agents designed for PCs or workstations
- Provides out-of-band management via SLIP

PROBEwatch:

- Offers extensive protocol decoding capabilities for Novell, AppleTalk Phase 1 and 2, SUN/NFS, DECnet, LAT, XNS, DoD TCP/IP suite, SNMP, VINES, SNA, and OSI
- Provides predefined setups for many of the common protocol suites and allows users to easily set up a DECpacketprobe 90 to monitor "domains" of interest

Prerequisites

Refer to appropriate SPD for system requirements:

- SPD 46.01 PROBwatch for ULTRIX/RISC
- SPD 46.03 PROBEwatch for Windows

Notes: The DECpacketprobe 90 Software V1.0 is preloaded at the factory. It can accommodate future upgrades via a network downloadable image.

DECpacketprobe 90 and PROBEwatch *(continued)*

Ordering Information

DECpacketprobe 90 for standalone use; includes power supply

DERMN-AA	U.S., Canada, Japan
DERMN-AD	Denmark
DERMN-AE	U.K.
DERMN-AI	Italy
DERMN-AK	Switzerland
DERMN-AT	Israel
DERMN-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DERMN-AZ	Australia, New Zealand
DERMN-BJ	India, South Africa
DERMN-MA	DECpacketprobe 90 (hub-based model; power supply not included)
H7827-AA	120/240 V power supply
H0342-AA	Snap-on cover for the hub-based model of the DECpacketprobe 90
QL-216A9-AA	PROBEwatch for ULTRIX license
QA-216AA-H5	PROBEwatch for ULTRIX media and documentation kit
QB-218AA-SA	PROBEwatch for Windows software kit

802.3/Ethernet Network Access Server Selection Guide

	DECserver 90L+ (DSRVG)	DECserver 90TL (DSRVE)	DECserver 90M (DSRVH)	DECserver 700 (DSRVW)	DECserver 900TM (DSRVZ)	MUXserver 320/380 (DSRZE/DSRZD)	MUXserver 90 (DSRZF)
Applications							
Local Connectivity							
– PC (terminal emulation)	Y	Y	Y	Y	Y	Y	Y
– PC (file transfer)	N	Y	Y	Y	Y	N	N
– Terminal (asynchronous)	Y	Y	Y	Y	Y	Y	Y
– Serial printers	Y	Y	Y	Y	Y	Y	Y
– X Window terminal (E-net interface)	N	N	N	N	N	N	N
– X Window terminal (Asynchronous interface)	Y	Y	Y	Y	Y	Y	Y
Remote Connectivity	N	Y (individuals)	Y (individuals)	Y (individuals)	Y (individuals)	Y (individuals/groups)	Y (individuals/groups)
# of Ports (Asynchronous)	8	8	8	8/16	32	32/128	96
Network Protocol Support	LAT	LAT Telnet SLIP	LAT Telnet SLIP CSLIP TN3270 PPP Kerberos	LAT Telnet SLIP CSLIP TN3270 PPP Kerberos	LAT Telnet SLIP CSLIP TN3270 PPP Kerberos	LAT Telnet	LAT Telnet
Modem Control	N/A	Limited	Limited	Full (8 line) Limited (16 line)	Limited	Full with DB25	Full with DB25
I/O Connectors	MMJ	RJ45/MJ8	RJ45/MJ8	DB25 (8 line) RJ45/MJ8 (16 line)	RJ45/MJ8	DB25/MMJ	DB25/MMJ
Maximum Line Speed/Throughput	38.4 Kb/s 35K char/s	57.6 Kb/s 30K char/s	57.6 Kb/s 30K char/s	115.2 Kb/s 215K char/s	115.2 Kb/s 215K char/s	19.2 Kb/s 19.2K char/s	64 Kb/s
Ethernet Interface	ThinWire DEChub 90/900	ThinWire DEChub 90/900	ThinWire DEChub 90/900 Unshielded Twisted Pair (UTP)	Standard E-net (AUI) Unshielded Twisted Pair (UTP)	DEChub 900 DEChub ONE (standalone)*	Std. E-net (AUI) ThinWire	ThinWire
Load Host Support	N/A (ROM based)	OpenVMS DEC OSF/1 VAX ULTRIX RISC ULTRIX MS-DOS UNIX	OpenVMS DEC OSF/1 VAX ULTRIX RISC ULTRIX MS-DOS UNIX	OpenVMS DEC OSF/1 VAX ULTRIX RISC ULTRIX MS-DOS UNIX†	Optional ROM OpenVMS DEC OSF/1 VAX ULTRIX RISC ULTRIX MS-DOS, UNIX†	OpenVMS DEC OSF/1 ULTRIX	OpenVMS DEC OSF/1 ULTRIX

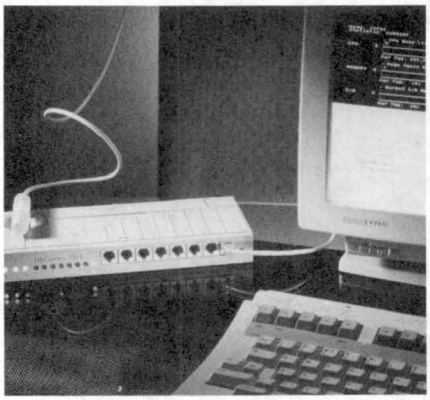
* DEChub ONE provides an integral AUI port. A ThinWire, fiber, or twisted pair media access unit can be easily attached to the DEChub ONE to provide additional media connectivity options.

† Flash card option available for self-loading UNIX.

802.3/Ethernet Network Access Server Selection Guide *(continued)*

	DECserver 90L+ (DSRVG)	DECserver 90TL (DSRVE)	DECserver 90M (DSRVH)	DECserver 700 (DSRVW)	DECserver 900TM (DSRVZ)	MUXserver 320/380 (DSRZE/DSRZD)	MUXserver 90 (DSRZF)
Management	SNMP (via agent), TSM, Remote console	SNMP, TSM, Remote console	HUBwatch, TSM, SNMP, Remote console	SNMP, TSM, Remote console	HUBwatch, TSM, SNMP, Remote console	TSM	SNMP/TSM
Password Protected	Y	Y	Y	Y	Y	Y	Y
Multiple LAT Sessions/Port	4	8	8	8	8	8	Up to 96 users; 384 sessions
VT420/VT330/VT340 Dual Sessions	N	Y	Y	Y	Y	Y	Y
Dedicated/Preferred Service	Y	Y	Y	Y	Y	Y	Y
Group Codes	N	Y	Y	Y	Y	Y	Y
Mounting Options	Tabletop DEChub 90/900	Tabletop DEChub 90/900	Tabletop DEChub 90/900	Tabletop Rack	DEChub 900 DEChub ONE (standalone) Rack	Tabletop Rack	Tabletop DEChub 90/900
Flash	No	No	Yes	Some models	Some models	No	No

DECserver 90TL Telnet/LAT Terminal Server



Designed for high-speed asynchronous connections to UNIX, ULTRIX, OpenVMS, DOS, and multivendor network services, the DECserver 90TL delivers the performance of a mid-range terminal server in a compact, low-cost module. This eight-port Telnet/LAT terminal server offers industry-standard connections at speeds of up to 57.6 Kb/s. It supports TCP/IP, Telnet, LAT, and SLIP protocols and several remote management systems. Like other members of the DEChub Family of Networking Products, it can be used interchangeably as a standalone unit and in the DEChub 90 and DEChub 900 MultiSwitch.

The server's support for TCP/IP-Telnet and Domain Name Service (DNS)protocols provides for multivendor connectivity and wide area terminal service. LAT protocol, a highly efficient local area terminal service, accommodates a variety of host systems from Digital and other vendors.

With TCP/IP-SLIP, the DECserver 90TL becomes a static IP end-node router for PCs connected to the serial ports. The server provides TCP/IP communications to connect these PCs to each other and to any service on the network. These low-cost connections, via a telephone line and modem, are excellent for connecting branch and other remote operations.

The DECserver 90TL can be managed in a variety of network environments using SNMP or MOP, which are integral to the server. Terminal Server Manager (TSM) V1.5, Telnet Remote Console, and MOP Remote Console are useful for checking status or reconfiguring the server remotely.

Several productivity-enhancing features are included. With one server, users can simultaneously access 64 different sessions operating under a mix of protocols. This minimizes the need to log in and out of sessions. The server supports Terminal Device/Session Management Protocol (TD/SMP). Its preferred service feature expedites connections to specific services. On-demand font loading, especially useful for Asian terminals that require dynamic font capabilities, is also included.

Industry-standard MJ8 (RJ45-style) connectors provide data, DSR, and DTR signals to most modems and printers. As an added security feature, system managers can dedicate a port to just one service, or assign group codes to restrict access to network services.

New DECserver software, also used with the DECserver 700 series, can be downline-loaded from ULTRIX, UNIX, OpenVMS, or MS-DOS (via PATHWORKS for DOS)operating systems using BOOTP/TFTP or MOP. The server software license is included with the DECserver 90TL.

Features

- Multiprotocol capabilities—Supports Telnet, LAT, TCP/IP and SLIP protocols
- Configuration flexibility—Operates standalone or in the DEChub 90 or DEChub 900
- Investment protection—Features upgradable software and memory
- Network management—Manageable remotely using SNMP, Terminal Server Manager (TSM) V1.5, MOP Remote Console, and Telnet Remote Console
- High speed—Supports high bandwidth asynchronous devices at speeds of up to 57.6 Kb/s
- Modem/printer/device control—Uses industry-standard MJ8 (RJ45-style)connections that provide data, DSR, and DTR signal capabilities
- Ease of use—Features front panel LEDs to provide port, module, and network status and activity at a glance

DECserver 90TL Telnet/LAT Terminal Server *(continued)*

Ordering Information

DECserver 90TL for standalone use; includes power supply.
Note: Server software license included.

DSRVE-AA	U.S., Canada, Japan
DSRVE-AD	Denmark
DSRVE-AE	U.K.
DSRVE-AI	Italy
DSRVE-AK	Switzerland
DSRVE-AT	Israel
DSRVE-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVE-AZ	Australia
DSRVE-BJ	India
DSRVE-MA	DECserver 90TL for use with DEChub 90/900 (power supply not included)
H7082-AA	120-V power supply with internal power connection
H7082-AB	240-V power supply with IEC connection
H0342-AA	Snap-on cover for hub-based model of the DECserver 90TL
QA-MJPAA-H#	DECserver 90TL media and documentation kit (OpenVMS)
QA-MJPAB-H#)	DECserver 90TL media and documentation kit (ULTRIX
QA-MJPAC-HB	DECserver 90TL media and documentation kit (DOS-RX24)
QA-MJPAD-HC	DECserver 90TL media and documentation kit (UNIX-RX23)
QA-MJPAD-	HP DECserver 90TL media and documentation kit (UNIX-QIC)

Note: # = media; 5 = TK50; M = magtape

Configuring Information

The DECserver 90TL features eight MJ8 (RJ45-style) connectors that support asynchronous device connections. It has an integral BNC for connection to ThinWire Ethernet, a connector for insertion into the DEChub, and a connector for the standalone power supply.

Specifications

Dimensions	3.2 x 27.9 x 14.0 cm (1.25 x 11 x 5.5 in.)
Weight (without power supply)	0.77 kg (1.7 lb)
Connectors	- ThinWire BNC for Ethernet - Eight MJ8 connectors (RJ45-style) for asynchronous lines - Standalone power supply
Software	DECserver downline-loadable software
Load hosts	ULTRIX RISC, ULTRIX VMS, UNIX, OpenVMS, and PATHWORKS for DOS
Protocols	Telnet, TCP, UDP, IP, ARP, SLIP, LAT, BOOTP/TFTP, SNMP, DNS, TD/SMP (initial software release)
Port speeds	Autobaud or user selectable from 75 b/s to 57.6 Kb/s
Characters	7 or 8 bit characters, 1 or 2 stop bits
Parity	None, even, odd, space, mark
Flow control	XON-XOFF or DSR/DTR (2-wire)
Maximum throughput	30K char/s
Operating temperature	5 ° – 50° C (41° – 122° F); convection cooled

DECserver 90M Terminal Server

The DECserver 90M is a powerful multiprotocol server in a compact package. This eight-port multi-session terminal server offers industry-standard connections at speeds of up to 57.6 Kb/s. Designed for use with UNIX, OpenVMS VAX, OpenVMS AXP, ULTRIX, and MS-DOS systems, this product is ideal for connecting asynchronous video terminals, serial printers, modems, and PCs in a LAN. The DECserver 90M supports TCP/IP, Telnet, LAT, SLIP, CSLIP, and PPP protocols as well as several remote management systems. Like other members of the DEChub Family, it can be used standalone or in the hub.

All models include 4 Mbytes of DRAM memory. Selected versions also have 1 Mbyte of non-volatile Flash memory, which provides self-booting capability.

The DECserver 90M supports DECserver Network Access Software. This software features TN3270 support, which allows VT users to interactively access IBM host-based applications; enhanced connectivity to IP networks using CSLIP, PPP, and SLIP; Kerberos authentication service for enhanced security; and a new interface that allows users to customize menus and define commands. The PPP protocol enables the DECserver 90M to support Appletalk and Novell IPX LANs. All DECserver 90M models include a Network Access Software license.

Features

- Multiprotocol server—supports Telnet, LAT, TCP/IP, SLIP, CSLIP, PPP, and TN3270
- DECserver Network Access Software support
- Flash memory eliminates the need for a load host (selected DECserver 90M models)
- Network management via SNMP, TSM V1.5, MOP Remote Console, Telnet Remote Console, HUBwatch, and POLYCENTER products
- Features eight sessions per port; supports TD/SMP
- Configuration flexibility—operates standalone or in the DEChub 90/900
- Investment protection—features upgradeable software
- High speed—supports high-bandwidth asynchronous devices at speeds up to 57.6 Kb/s
- Enhanced security—supports Kerberos Version 4 authentication service
- TR/DSR signals provide out-of-band flow control for printers and modems
- User interface—allows for customized menus and user-defined commands

Configuring Information

The DECserver 90M features eight MJ8 (RJ45-style) connectors that support asynchronous device connections. It has an integral BNC for connection to ThinWire Ethernet and a 10BaseT twisted-pair port for standalone connectivity to a single network backbone. A DEChub connection and a connection to the standalone power supply are also included.

DECserver 90M Terminal Server *(continued)*

Ordering Information

DECserver 90M for standalone use; includes power supply:

DSRVH-AA	U.S., Canada, and Japan
DSRVH-AD	Denmark
DSRVH-AE	U.K.
DSRVH-AI	Italy
DSRVH-AK	Switzerland
DSRVH-AT	Israel
DSRVH-AX,	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVH-AZ	Australia, New Zealand
DSRVH-BJ	India
DSRVH-MA	DECserver 90M hub-based model (power supply not included)

DECserver 90M for standalone use, with 1 Mbyte of non-volatile Flash memory; includes power supply:

DSRVH-DA	U.S., Canada, and Japan
DSRVH-DD	Denmark
DSRVH-DE	U.K.
DSRVH-DI	Italy
DSRVH-DK	Switzerland
DSRVH-DT	Israel
DSRVH-DX,	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVH-DZ	Australia, New Zealand
DSRVH-EJ	India
DSRVH-NA	DECserver 90M hub-based model, with 1 Mbyte of non-volatile Flash memory (power supply not included)

Media Kits

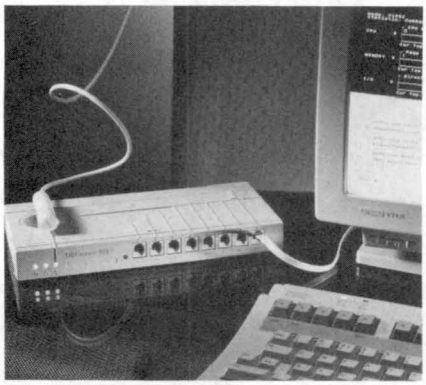
See DECserver Network Access Software, for order information.

H7082-AA	Power supply for DECserver 90M
H0342-AA	Rear cover for DEChub Family modules

Specifications

Dimensions	3.2 cm x 27.9 cm x 14.0 cm, (1.25 in. x 11 in. x 5.5 in.)
Weight (without power supply)	0.77 kg (1.7 lb)
Software	DECserver Network Access Software (downline-loadable)
Load hosts	ULTRIX RISC, UNIX, OpenVMS VAX, OpenVMS AXP, DEC OSF/1 AXP, and PATHWORKS for DOS
Protocols	Telnet, TCP, UDP, IP, ICMP, PING, ARP, SLIP, CSLIP, PPP LAT, BOOTP/TFTP, SNMP, DNS, TD/SMP, TN3270 (initial software release)
Port speeds	Autobaud or user selectable from 75 b/s to 57.6 Kb/s
Maximum throughput	30K characters/second

DECserver 90L+ Terminal Server



The DECserver 90L+ is a feature-enhanced LAT terminal server for 802.3/ Ethernet local area networks. Like other modules in Digital's DEChub Family, it can be used interchangeably in standalone and hub-based configurations to accommodate both small workgroups and large departments. Its high throughput delivers optimal line speed capabilities, up to 38.4 Kb/s, for eight interactive terminals, serial printers, and PCs (in terminal emulation mode).

The DECserver 90L+ can connect to up to four different services per port. It provides both dedicated and preferred services. The dedicated service feature allows a port to be connected to only that service name specified by the system manager. The preferred service feature allows a user to predefine a frequently used service and, thereafter, to connect to that service without specifying its name.

The DECserver 90L+ also offers basic session management and security features. For example, if a terminal is powered off while sessions are still active, the terminal server will disconnect the session on the host, preventing other users from accessing another individual's session. If a printer is powered off, the DECserver 90L+ can notify and stop the print queue on the host system, preventing print jobs from being lost. Also included are diagnostic and management features, including the ability to examine and modify the server and port parameters.

Features

- Multi-session support—Each port can initiate up to four sessions
- Provides dedicated and preferred services
- Features command line recall and edit
- Network management—Supports Terminal Server Manager (TSM)V1.6 for configuring, monitoring and management
- Allows user to initiate connection to any device supporting MOP console carrier
- Easy to use—Features simple commands, preset parameters, and menu-driven setups
- Plug-and-play—Supports autobaud; factory configured for immediate use
- Built-in ROM-based software eliminates the need to downline load server software from a host system
- Ease of management—Front panel LEDs indicate status of power, self-test, network connection, and data flow
- Supports LAT protocol—Performs in widely supported Ethernet environments to provide efficient connections to network services
- Printer support—Supports XON and XOFF, and distributed LAT queuing
- Port customization—Users can set port name, speed, flow control, device type, and action on break; port characters can be set remotely

DECserver 90L+ Terminal Server *(continued)*

Ordering Information

DECserver 90L+ for standalone use; includes power supply:

DSRVG-AA	U.S., Canada, Japan
DSRVG-AD	Denmark
DSRVG-AE	U.K.
DSRVG-AI	Italy
DSRVG-AK	Switzerland
DSRVG-AT	Israel
DSRVG-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVG-AZ	Australia
DSRVG-BJ	India
DSRVG-MA	DECserver 90L+ for use with DEChub 90/900 (power supply not included)
H7082-AA	120 V power supply with internal power connection
H7082-AB	240 V power supply with IEC connection
H0342-AA	Snap-on cover for hub-based model of the DECserver 90L+

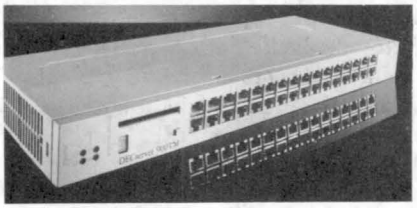
Configuring Information

The DECserver 90L+ has an integral BNC for connection to ThinWire Ethernet and a connector for insertion into the DEChub 90/900. Users can easily connect up to eight asynchronous devices to the MMJ jacks and immediately have communications in operation, without complicated configuration setups or software expertise.

Specifications

Dimensions	3.2 x 27.9 x 14.0 cm (1.25 x 11 x 5.5 in.)
Weight	0.77 kg (1.7 lb)
Input connectors	ThinWire Ethernet and eight MMJ jacks
Resident firmware	LAT
Baud rates	User selectable from 1.2 Kb/s to 38.4 Kb/s
Parity	8-bit characters; 1 stop bit; no parity
Protocol	XON-XOFF
Current	+5 Vdc from ac line transformer
Environmental class	C

DECserver 900TM—32-Port Network Access Server



The DECserver 900TM is a multi-protocol, high-performance Network Access Server for the DEChub 900. It comes with DECserver Network Access Software, which supports LAT, TCP/IP, Telnet, SLIP, CSLIP, Point-to-Point Protocol (PPP), TN3270, and Kerberos security protocols. Support for the PPP protocol enables the DECserver 900TM to support AppleTalk and Novell IPX LANs.

This high-performance hardware platform is configured with 4 Mbytes of memory. Its memory capacity can be expanded to 8 Mbytes with customer-installable SIMM memory cards. The DECserver 900TM is "flash ready." It has an externally accessible socket for a flash card that provides the server with the capability to boot itself.

Features

- 32-port "flash ready" server for DEChub 900 MultiSwitch
- High performance—supports 215,000 character-per-second throughput and line speeds up to 115.2 Kb/s per port
- Flash card option—customer-installable flash card available
- Software-selectable limited modem control signaling—medium to high speed: DTR/DSR/RTS/CTS; low to medium speed: DTR/DSRS/DCD/RI)
- Configuration flexibility—can be mounted in the DEChub 900 or used as a standalone/rack-mounted unit

Ordering Information

DSRVZ-MA	DECserver 900TM, 32-lines, 4 Mbytes, flash ready, DECserver Network Access Software license, for DEChub 900 installation
DEHUA-AA	DEChub ONE single-slot hub ("docking-station," required for standalone use of DEChub 900 modules to provide power and AUI network port)
H0345-AA	Flash card, 2 Mbytes with software

Note: DECserver Network Access Software documentation must be purchased separately.

MS40-WA	1-Mbyte SIMM
MS40-WB	4-Mbyte SIMM

DECserver Network Access Software—for DECserver 90M, DECserver 900TM, and DECserver 700

QL-0LWA9-AA	DECserver Network Access Software license
QA-0LWAA-GZ	Software documentation
QA-0LWAA-H#	Software media kit, OpenVMS VAX
QA-0LWAB-H#	Software media kit, ULTRIX
QA-0LWAC-HB	Software media kit, MS-DOS (RX24)
QA-0LWAC-H7	Software media kit, MS-DOS (RX33)
QA-0LWAD-HC	Software media kit, UNIX (RX23)
QA-0LWAD-HP	Software media kit, UNIX (QIC)
QA-0LWAE-H#	Software media kit, OpenVMS AXP
QA-054AA-H8	Software media kit, DEC OSF/1 AXP (CD-ROM)

# denotes 5 = TK50, M = magtape

DECserver 700 8/16 Port Network Access Server



DECserver 700 Ethernet Network Access Servers offer superior price/performance over their predecessors. They provide the flexibility to adapt new network applications via software enhancements and customer-installable hardware upgrades. The DECserver 700 supports the following industry-standard networking protocols: Telnet, TN3270, PPP, SLIP, CSLIP, LAT, and SNMP. Support for the PPP protocol enables the DECserver 700 to support AppleTalk and Novell IPX LANs. The DECserver 700 implementation of TCP/IP protocols (including Telnet, Serial Line Internet Protocol—SLIP, and Simple Network Management Protocol—SNMP) and LAT demonstrates Digital's commitment to "open" network protocols and to the delivery of information system solutions across any vendor's platforms.

The DECserver 700 comes in two versions: a 16-port limited modem control version and an 8-port full modem control version. The 16-port version uses RJ45/MJ8 connectors and supports most Hayes-compatible modems and Digital's DECmodem V.32 and Scholar Plus modems. Transmit (±) and Receive (±) signaling options are provided, as are the following control signals for low-to medium-speed (<9600-bit/s) asynchronous modems: Data Carrier Detect (DCD), Data Set Rate Selector (DSRS), Data Terminal Ready (DTR), and Ring Indicator (RI). Additionally, for medium-to high-speed (>9600-bit/s) asynchronous modems, the following control signals are supported: Clear-To-Send (CTS), Data Set Ready (DSR), Data Terminal Ready (DTR), and Request-To-Send (RTS).

The DECserver 700 SLIP and CSLIP implementation combined with the hardware platform's superior throughput and line speed makes the DECserver 700 an ideal, low-cost solution for local and remotely connected PCs. A single Ethernet address can support all 16 ports as IP addresses, eliminating the need for costly PC LAN implementations. PCs can access network resources and perform efficient file transfer and virtual terminal operations.

The DECserver 700 8-port version uses EIA-232/DB25 connectors and provides full modem control for modems that meet Bell 103, 212, and CCITT V.21, V.22, and V.32 specifications. This model is recommended for network connection of devices that require full EIA-232 signaling, such as industrial instrumentation.

Features

- Designed for rack, tabletop, or wall-mounting
- Superior performance—115.2 Kbits per second per port speeds, 250K characters per second aggregate throughput
- Flash RAM option allowing self-boot (no load host required)
- New user interface for customized menus and user-defined commands
- Kerberos security for user authentication
- Provides both 15-pin AUI and MJ8 UTP Ethernet ports
- Platform is expandable to 8 Mbytes of memory for future applications

DECserver 700 8/16 Port Network Access Server *(continued)*

Ordering Information

DSRVW-EC	DECserver 700 with Flash RAM, eight EIA-232 ports with DB25 connectors for full modem control, 4-Mbyte memory, accessory kit, software license, manual, U.S. power cord.
DSRVW-FC	DECserver 700 with Flash RAM, eight EIA-232 ports with DB25 connectors for full modem control, 4-Mbyte memory, accessory kit, software license. Manual and power cord not included.
DSRVW-GC	DECserver 700 with Flash RAM, 16 EIA-232 ports with MJ8/RJ-45 connectors (eight wires), 4-Mbyte memory, accessory kit, software license, manual, U.S. power cord.
DSRVW-HC	DECserver 700 with Flash RAM, 16 EIA-232 ports with MJ8/RJ-45 connectors (eight wires), 4-Mbyte memory, accessory kit, software license. Documentation and power cord not included.
DSRVW-xx	DECserver 700 country kit with power cord and manual

xx = LD for Denmark, LE for U.K./Ireland, LG for Germany/Austria, LI for Italy, NJfor Japan, LT for Israel, LZ for Australia/New Zealand, MJ for India, NA for Belgium/ Finland/France/Holland/Norway/Spain/Sweden, NB for Switzerland.

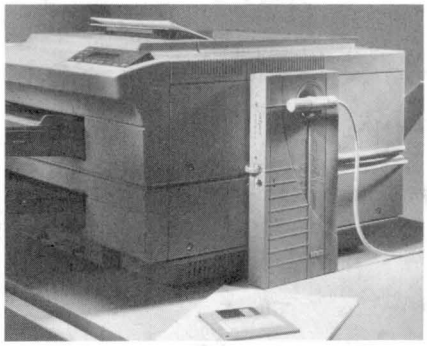
See DECserver Network Access Software ordering information.

DW29-AA AUI-to-ThinWire Media Access Unit (MAU)

For new or rewired installations, use the following adapters and cables with the DECserver 700.

To Connect	To DECserver 700 (16-port)	To DECserver 700 (8-port)
Terminal/printer with MMJ port	**BN24H-xx** cable	**H8575-A** adapter and **BC16E-xx** cable
Terminal/printer with DB25 male port	**H8575-A** adapter and **BN24H-xx** cable	**BC17D-xx** (10 wire) cable or **BC22D-xx** (6-wire) cable
Terminal/printer with DB9 male port	**H8575-B** adapter and **BN24H-xx** cable	**H8575-A** and **H8571-J** adapters and **BC16E-xx** cable
PC communication interface with DB9 male port	**H8585-AA** adapter and **BN25G-xx** cable	**H8575-A** and **H8571-J** adapters and **BC16E-xx** cable
Modem (<9600 b/s) with DB25 female port	**H8585-AB** adapter and **BN25G-xx** cable	**BC22E-xx** (10-wire) cable or **BC22F-xx** (25-wire) cable
Modem (=>9600b/s) with DB25 female port	**H8585-AC** adapter and **BN25G-xx** cable	**BC22E-xx** (10-wire) cable or **BC22F-xx** (25-wire) cable
Non-Digital systems with DB25 male ports (reverse-LAT configuration)	N/A	**BC22R-xx** cable

LATprint ThinWire Ethernet Interface



The user-installable LATprint provides direct network connection for printers having serial ports, and allows these printers to be shared by any system or server in the local area network (LAN). Through server-based print services, LATprint-connected printers are available to every desktop in the network, regardless of system type. Users of PCs, Macintosh computers, UNIX, ULTRIX, or OpenVMS workstations, and VT or VXT terminals can all share the same printer.

LATprint attaches directly to a printer or it can be mounted on a wall or placed in any convenient location near the printer. Alternatively, it can be snapped into a DEChub 90 multifunction Ethernet backplane. LATprint supports OpenVMS and ULTRIX systems and servers, as well as PCs and Macintosh computers, via Digital's PATHWORKS print services.

Features

- Supports OpenVMS, ULTRIX, PCs, and Macintosh computers
- Managed remotely from OpenVMS or ULTRIX via Maintenance Operation Protocol
- Password-based authorization system provides different levels of access and control
- Usable as a terminal server

Ordering Information

LNXXD-AA	U.S./Canada
LNXXD-AD	Denmark
LNXXD-AE	Great Britain, Ireland
LNXXD-AI	Italy
LNXXD-AK	Switzerland
LNXXD-AT	Israel
LNXXD-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
LNXXD-AZ	Australia, New Zealand
LNXXD-BJ	India

Options

H8223	ThinWire Ethernet terminator
H8225	ThinWire Ethernet T-connector
BC16M-15*	ThinWire Ethernet coaxial cable, 4.5 m (15 ft)
H8575-A	MMJ to 25-pin female EIA-232 adapter (LN03-type)
H8571-E	MMJ to 25-pin male EIA-232 adapter (industry standard)
BC16E-10*	MMJ cable, 3 m (10 ft)

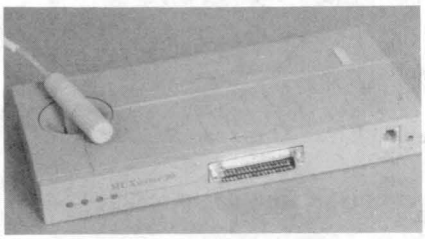
* Additional lengths are available.

LATprint ThinWire Ethernet Interface *(continued)*

Specifications

System	OpenVMS and ULTRIX systems and servers PC and Macintosh via PATHWORKS UNIX via LAT/Telnet Gateway and BSD remote print	
Network	ThinWire Coaxial Ethernet (10Base2) Protocol: Local Area Transport (LAT)	
Ports	Two serial: DECconnect MMJ, EIA-232 via optional adapter	
	Operating mode:	Full-duplex, Xon-Xoff flow control
	Data format:	Asynchronous, 8 data bits, no parity, one stop bit
	Baud rates:	1200, 2400, 4800, 9600, 19.2K, 38.4K
Dimensions	Height	3.18 cm (1.25 in.)
	Weight	27.31 cm (10.75 in.)
	Depth	12.70 cm (5.0 in.)
	Weight	0.77 kg (1.7 lb)
Voltage	100–120 V (-AA) or 200–240 V (international variants)	
Frequency	50–60 Hz	

MUXserver 90/320/380/DECmux 300 Remote Terminal Server



MUXserver 90/320/380 and DECmux 300 Remote Terminal Servers connect remote asynchronous terminals, serial printers, modems, and non-LAT hosts to an 802.3/Ethernet local area network. Phone costs are minimized by concentrating data from multiple users at one site over a pair of modems and one leased phone line.

The MUXserver 90/320/380 connects to the LAN and functions as a terminal server for remote devices. The DECmux 300 connects devices at the remote site and functions with the MUXserver as a statistical multiplexer. Users can access both LAT services and Telnet services (e.g., UNIX hosts) that are available on the Ethernet LAN.

The MUXserver 90 uses the DEChub 90 platform and is available in standalone and DEChub 90/900 mountable versions. The MUXserver 90 connects up to 96 remote users over one phone link running at a maximum speed of 64 Kb/s.

The MUXserver 320 connects up to 32 remote users from up to two remote sites. One phone link runs at a maximum speed of 64 Kb/s and the other phone link runs at a maximum speed of 19.2 Kb/s. Both links can operate at their maximum speeds simultaneously.

The MUXserver 380 connects up to 128 remote users from up to eight remote sites. Two phone links run at a maximum speed of 64 Kb/s and six phone links run at a maximum speed of 19.2 Kb/s, although the total aggregate bandwidth cannot exceed 128 Kb/s.

The MUXserver 90, 320, and 380 can communicate with any DECmux 300 model. Up to three DECmux 300s can be daisychained from the MUXserver 90, with a maximum of six DECmux 300s through the MUXserver 320, and 16 DECmux 300s through the MUXserver 380.

DECmux 300s with EIA-232-D user ports have full modem control to support dialup modems as well as asynchronous connections to non-LAT hosts. Models with EIA-423-A user ports provide open DECconnect wiring for terminals and printers.

MUXserver 90/320/380/DECmux 300 Remote Terminal Server *(continued)*

Prerequisite Hardware

- One MUXserver with the appropriate number of DECmux 300s plus user port cables.
- One 3002 or equivalent leased phone line and one pair of external modems and cables, where needed.
- All 802.3/Ethernet physical channel hardware.
- An 802.3/Ethernet transceiver, DECXM, or DELNI and transceiver drop cable.

Prerequisite Software

MUXserver software must be down-loaded to a MUXserver from an OpenVMS, ULTRIX or DEC OSF/1 AXP host. The MUXserver is supported by Terminal Server Manager (TSM) software. Refer to SPD 32.94.

The MUXserver 90, 320, and 380 are shipped with a software license. 120-V devices include a country kit (U.S. power cord). Each 240-V MUXserver or DECmux requires a country kit from the list below.

Ordering Information

DSRZF-**	MUXserver 90 standalone unit
DSRZF-M*	MUXserver 90 with DEChub 90 mounting kit
DSRZE-AA/AB	MUXserver 320, 120 V/240 V
DSRZD-AA/AB	MUXserver 380, 120 V/240 V
DM308-AA/AB	DECmux 300, 8-channel EIA-232-D, 120 V/240 V
DM316-AA/AB	DECmux 300, 16-channel EIA-232-D, 120 V/240 V
DM316-BA/BB	DECmux 300, 16-channel EIA-423-A, 120 V/240 V; requires two H3104 kits
DM332-BA/BB	DECmux 300, 32-channel EIA-423-A, 120 V/240 V; requires four H3104-B kits
H3104-B	Cable kit; two required for DM316-Bx, four required for DM332-Bx
CK-DM308-A7	8-channel EIA-232-D cabinet kit for DM308-Ax and DM316-Bx
CK-DM316-W7	16-channel EIA-423-A cabinet kit for DM308-Ax and DM316-Bx; order two H3104-B kits separately
QA-YWLAA-H#	MUXserver 90/320/380 media and documentation for OpenVMS
QA-YWLAB-H#	MUXserver 90/320/380 media and documentation for ULTRIX
QA-054AA-H8	MUXserver 90/320/380 media and documentation for DEC OSF/1 AXP

** AA = U.S., Canada, Japan; A3 = Europe; AD = Denmark; AE = U.K.; AI = Italy; AK = Switzerland; AT = Israel; AX = Central Europe; AZ = Australia; BJ = India.
* A = U.S., Canada, Japan; E = Europe
# media type: 5 = TK50, M = magtape

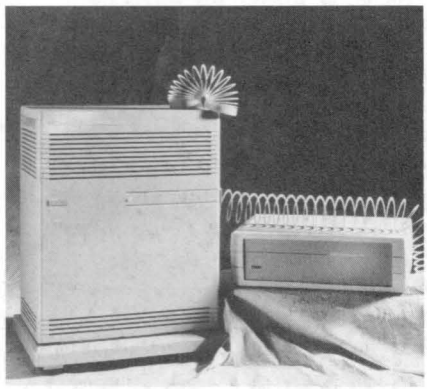
MUXserver 90/320/380/DECmux 300 Remote Terminal Server *(continued)*

Country Kits

DM300-KZ	Belgium, Finland, France, Holland, Norway, Spain, Sweden
DM300-MA	Australia, New Zealand
DM300-KD	Denmark
DM300-KG	Germany
DM300-LJ	India
DM300-KT	Israel
DM300-KI	Italy
DM300-KJ	Japan
DM300-MB	Switzerland
DM300-KE	United Kingdom

Note: Refer to the *Network Products Guide* for additional information. For more information, call Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DEC Commserver 100/150 Network Access Servers



The DEC Commserver 100/150 family of Ethernet servers enables OpenVMS VAX computers to communicate with a wide variety of industry-specific synchronous serial line protocols. Applying the concept of client/server distributed processing to data communication, one server can be utilized by many OpenVMS VAX systems on a local area network (LAN).

The DEC Commserver accepts Q-bus communication modules that appear to the OpenVMS applications running on a host (client) VAX system as though they are connected to the host system bus. By making the server's communication modules independent of the internal bus structure of the host VAX, the DEC Commserver allows communication applications to be migrated "transparently" across all VAX platforms, from a VAXstation to the VAX 10000 system. This transparent access via a common driver interface across the VAX family can significantly reduce the life cycle cost for the development and support of applications. With the DEC Commserver, an application developer or value-added reseller can invest in one communication device and sell it across all OpenVMS VAX platforms.

Using the widely accepted line cards and protocols made by Simpact Associates, the DEC Commserver provides the ability for Digital OpenVMS VAX systems to connect to financial systems such as S.W.I.F.T and CHIPS. Customers with special protocol requirements can create point-to-point links to other systems using 3270, and 2780/3780 protocols.

The DEC Commserver 100/150 for ICP3222 (DEC Commserver 3222) employs Simpact's higher performance ICP3222, for higher baud rates and more usable lines than the previous models which used the IPC1622.

Features

- Provides application migration from VAXstation to VAX 10000 systems running OpenVMS
- Each DEC Commserver can support up to 31 OpenVMS hosts, for savings in communication modules
- Each OpenVMS host can connect up to 31 DEC Commservers, for high line count applications or for support of redundant serial lines
- CPU performance is increased by off-loading line handling from host
- Physical location of the facility's serial lines are independent of the client computer's location within limits of Local Area Network segment
- Existing host-resident Q-bus Simpact cards can be moved to DEC Commserver with no application software changes

DEC Commserver 100/150 Network Access Servers *(continued)*

Features ***(continued)***

- Available in two models to accommodate small/large-line (4–80) configurations

Prerequisites

Hardware: DEC Commserver requires a transceiver drop cable and H4005, DELNI, or DECXM (for ThinWire) for connection to the Ethernet physical channel.

Software: The VAX client should be running OpenVMS V5.4 or later, but does not require DECnet to communicate with the DEC Commserver. At least one node on the local area network must be running DECnet to downline-load the DEC Commserver image.

Step 1—Line Cards

Select line cards. Separate lines by protocol. A DEC Commserver chassis can support multiple protocols (only one protocol per line card). Use Table 1 to select quantity and types of line cards from the 2L-DSPAY-xx family (Simpact ICP3222) line cards. See Step 6 for the protocols available for each line card type.

2L-DSPAY-AA 4-line processor line card (Simpact ICP3222TA-1)
2L-DSPAY-BA 4-line processor line card (Simpact ICP3222TB-1)
2L-DSPAY-CA 12-line expander line card (Simpact ICP3212TA-1)

Table 1—DEC Commserver (2L-DSPAY—ICP3222/EXC3212) Line Card Selection Table

The following table indicates how many lines a single DEC Commserver will support using the 2L-DSPAY line cards and the number of cards required for various speeds and protocols. An "A" or a "B" in Table 2 indicates a 4-line processor card (2L-DSPAY-AA for up to 19.2 Kb/s or 2L-DSPAY-BA above 19.2 Kb/s), and a "C" is a 2L-DSPAY-CA 12-line expansion card (for BSC 3270 protocol only).

		Number of Lines														
Speeds	**Protocols**	**1–4**	**5–8**	**9–12**	**13–16**	**17–20**	**21–24**	**25–28**	**29–32**	**33–36**	**37–40**	**41–48**	**49–52**	**53–64**	**65–68**	**69–80**
2.4K-19.2K	BSC 3270	1A*	1A,1C*	1A,1C*	1A,1C*	2A,1C	2A,2C	2A,2C	2A,2C	3A,2C	3A,3C	3A,3C	4A,3C	4A,4C	5A,4C	5A,5C
	All others	1A*	2A*	3A	4A	5A	6A	7A	8A	9A	10A					
56K/64K	All	1B*	2B*	3B	4B	5B	6B	7B	8B	9B	10B					

* Configurations can be configured in the Commserver 100.
Note: Only one protocol may be run on a 2L-DSPAY-AA/BA or 2L-DSPAY-AA, 2L-DSPAY-CA pair at one time.

DEC Commserver 100/150 Network Access Servers *(continued)*

Step 2—I/O Panel Kits

I/O panel kits contain cables that plug into the line cards and I/O panels that provide the required connector types for the various electrical interfacing standards. Order the appropriate number of I/O panel kits for the desired interfacing standard from Table 2 below that will match the number of usable lines configured with the line cards chosen in Step 1.

Table 2—I/O Panel Kits for 2L-DSPAY (ICP3222) Line Cards

	Desired Electrical Interfacing Standard			
Module Types	**EIA-232**	**Lines**	**EIA-449 (449, 422/EIA-530)**	**Lines**
Processor Card	**2L-DSPAY-AA**	4	**2L-DSPAY-BA**	4
I/O Panel Kit	**CK-DSPAX-BA** (to 19.2K)	4	**2L-PANAY-BA** (EIA-530 to 64K)	4
			2L-PANAY-CA (EIA-449 to 256K)	2
Expander Card (3270 Protocol Only)	**2L-DSPAY-CA**	12	N/A	
I/O Panel Kit 4	**CK-DSPAX-CA**			

Step 3—I/O Panel Brackets

H3132-AA Optional free-standing or rack-mountable 5.25-inch bracket; holds up to four I/O panels

Step 4—Chassis (System Enclosure)

The DEC Commserver chassis is a Q-bus VAX system that runs a VAXELN image of the DEC Commserver transport software that is downline loaded from a host OpenVMS VAX computer on the network. There are two basic DEC Commserver models that are functionally identical and differ only by the number of line card slots provided. Choose a DEC Commserver 100 (contains two line card slots) or a DEC Commserver 150 (contains 10 line card slots) to accommodate the number of line cards selected from Step 1.

The following DEC Commserver models include a host license to support the 2L-DSPAY line cards.

DSPAA-AA Tabletop DEC Commserver 100 Chassis, 120 or 240 V; two line card slots (rackmount bracket included)

DSPAB-BA Rackmount DEC Commserver 150 Chassis (120 V); 10 line card slots

DSPAB-BB Rackmount DEC Commserver 150 Chassis (240 V); 10 line card slots

DSPAB-CA Pedestal DEC Commserver 150 Chassis (120 V); 10 line card slots

DSPAB-CB Pedestal DEC Commserver 150 Chassis (240 V); 10 line card slots

Step 5—DEC Commserver License/Media and Documentation

Each host computer in the network must be licensed to use the DEC Commserver for VMS software (the load host must also be a DECnet node). A license for one host is included with each chassis order. Order a media and documentation kit from the list below. Also order one license for each additional OpenVMS VAX computer in the network that will use the DEC Commserver (additional licenses not required with clusterwide licensing except for alternate load hosts). Use the upgrade licenses to allow support of 2L-DSPAY line cards in a DSPAA/DSPAB chassis.

QL-GCQA9-AA DEC Commserver 100/150 license

QL-GCQA9-H5 DEC Commserver media and documentation kit

DEC Commserver 100/150 Network Access Servers *(continued)*

Step 6—Protocol Licenses and Documentation

Select license(s) for the protocol(s) that will be used. Each protocol license allows that protocol to be run on any number of line cards. Multiple protocols may be used in a DEC Commserver but only one protocol per 4-line card or 4-line/12-line combination. Protocol media are included in the QA-GCQAA-Hx media kit.

	License for 2L-DSPAY (SIMPACT ICP3222)	Documentation
BSC 2780/3780	**QL-264AL-2B**	**AA-PE98A-TE**
BSC 3270	**QL-265AL-2B**	**AA-PE99A-TE**
SWIFT & CHIPS	**QL-266AL-2B**	**AA-PE9FA-TE**

Multiprotocol Router/Bridge Comparison Chart

Product	Hardware Type	Line Interfaces	Data Links	Routing Support	Bridging Support
DECNIS 600 series	9-slot modular	1 x 802.3 8 x 64K 2 x T1/E1 2 x 802.3 1 x FDDI/T3 4 x 128K 14 x Ethernet, or 3 x FDDI, or 48 x 128 Kb/s, or 12 x 2 Mb/s, or 4 x 12 Mb/s, or 2 x 52 Mb/s	Cisco HDLC X.25 PPP Frame Relay DDCMP	DECnet TCP/IP OSI IPX AppleTalk	IEEE 8.2.ID/ Spanning tree
DECNIS 500 series	4-slot modular	1 x 802.3 2 x T1/E1 8 x 64K 2 x 802.3 4 x 128K 4 x Ethernet, or 16 x 128 Kb/s, or 4 x 2 Mb/s, or 2 x 12 Mb/s	Cisco HDLC X.25 PPP Frame Relay DDCMP	DECnet TCP/IP OSI IPX AppleTalk	IEEE 802.ID/ Spanning tree
DEC WANrouter 250	Bounded	1 x 802.3 8 x 19.2K or 2 x 64K	DDCMP HDLC X.25	DECnet TCP/IP OSI	N/A
EtherWORKS router	PC AT/ISA bus card	1 x 64K 1 x 802.3	DDCMP	DECnet	N/A
DECwanrouter 90	DEChub module	1 x 64K 1 x 802.3 and 1 x 64Kb/s or 2 x 64Kb/s or 1 x 64Kb/s + 1 x ISDN BRA	DDCMP HDLC X.25 ISDN Frame Relay	TCP/IP DECnet OSI IPX	N/A
DECbrouter 90	DEChub module	1 x 802.3 and 1 x T1/E1 or 1 x T1/E1 x 64K	HDLC PPP X.25 FR SMDS ISDN	IGRP IS-IS ES-IS RIP, RIP (IPX) EGP BGP OSPF RTMP TCP/IP DECnet OSI IPX XNS VINES AppleTalk SNA/SDLC	IEEE 802.ID

DECNIS 600 Multiprotocol Router/Bridge

The DEC Network Integration Server 600 (DECNIS 600) integrates local and wide area networks. It acts as a high-speed multiprotocol router, remote and local bridge, and X.25 gateway server that fans in traffic from remote sites to high bandwidth backbone networks.

Its modular design allows the customer to "mix-and-match" network interfaces. Up to seven module slots are available for multiple LAN and WAN network interface cards. As new network technologies are required, new network interface cards can be purchased.

The DECNIS 600 is expandable, allowing new network interface cards to be added as required. Live insertion allows these interfaces to be added without powering down the unit, ensuring no disruption of service to network users.

The server's hardware design is based on a distributed processing architecture, with packet forwarding performed on the network interface modules. This means that the overall packet throughput increases as network interfaces are added.

Features

- DECNIS 500-SPX and DECNIS 600-SPX Base Systems provide Out-of-Band Management (OBM), 16-Mbyte DRAM and 4-Mbyte Flash with the new DECNIS MPC-II Processor (available seperately as and upgrade for existing DECNIS systems)
- The DECNIS 600 software fully implements the relevant standards for the following:
  - DECnet routing
  - OSI routing
  - TCP/IP routing
  - Novell certified IPX Router
  - AppleTalk
  - IEEE 802.D Bridging
- Provides FDDI and/or 802.3/Ethernet connectivity over wide area network at T3 data rates
- Reduces costs by allowing multiple virtual LAN-to-LAN interconnections through Frame Relay support
- Supports OSPF protocol providing multivendor interoperability through open routing standard for TCP/IP
- Controls propagation of routes between different protocols, preventing loops and bottlenecks from occurring
- Provides multivendor interoperability at data link level over point-to-point synchronous links
- Provides interoperability with DECrouter and host-based router installed base
- Supports management from multivendor SNMP network management stations
- Configurable and manageable from DOS PCs, OpenVMS, DEC OSF/1, or ULTRIX systems
- Uses BOOTP/TFTP loading to copy DECNIS system files from an ULTRIX or OpenVMS system to multivendor host. DECNIS also accepts downline-loadable system software from multivendor hosts over Ethernet and FDDI
- Improves performance and response times of LAT over WAN using LAT compression and bridge prioritization, allowing more LAT sessions per link
- Uses local dedicated wiring or remote leased lines using HDLC and X.25 PSDN networks

Refer to Software Product Description 36.05.00 for details on all standards implemented.

DECNIS 600 Multiprotocol Router/Bridge *(continued)*

Preconfigured Systems

Preconfigured systems include management processor and memory cards, and two network interface cards. Additional network interface cards may be ordered separately.

- **DECNIS 600-EP**—Standard base preconfigured package for high-speed routing and bridging, includes DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses.
- **DECNIS 600-RP**—Standard base preconfigured package for low-speed routing, includes DEC LANcontroller 601, DEC WANcontroller 618, and routing software license.

Network Interface Cards

- **DEC WANcontroller 622/HS**—Supports two synchronous lines for remote routing and bridging at speeds up to 10 Mb/s per line. Separate adapter cables required.
- **DEC WANcontroller 622**—Supports two synchronous lines for remote bridging and routing at speeds from 56 or 64 Kb/s up to 2.048 Mb/s. Separate physical interface adapter cables are required to connect the two universal 50-way connectors to required physical interface connector.
- **DEC WANcontroller 618**—Supports eight synchronous lines for routing at speeds from 1.2 Kb/s up to 128 Kb/s. Separate distribution panels are provided for connection to EIA-232, V.35, and EIA-422, V.11 services. Remote bridging is not supported on this card.
- **DEC WANcontroller 614**—Supports four synchronous lines for routing at speeds from 1.2 Kb/s up to 128 Kb/s. A multistandard distribution panel with four 50-way connectors is provided for connection of up to four EIA-232, V.35, or EIA-449 services in any combination via adapter cables. Remote bridging is not supported on this card.
- **DEC FDDIcontroller 621**—High-performance, single-port FDDI interface card supporting local and remote routing and bridging. This controller fully supports the ANSI standards for FDDI and provides both DAS and SAS capabilities for single, multi, single/multi and multi/single mode connections.
- **DEC LANcontroller 602**—Two-port IEEE 802.3/Ethernet interface card supporting routing and local bridging.
- **DEC LANcontroller 601**—Single-port IEEE 802.3/Ethernet interface card supporting routing and local bridging.

In addition, the DECNIS 600 can connect to T3 services via a Digital Link Corporation DL3000 T3 Digital Service Multiplexer (DSM) to provide FDDI and/or Ethernet connectivity over the wide area at T3 data rates (45 Mb/s). Digital Link Corporation and Digital Equipment Corporation have implemented a direct FDDI interface into the DL3000 using the DEC FDDIcontroller 621.

DECNIS 600 Multiprotocol Router/Bridge *(continued)*

Routing Services

The DECNIS 600 uses the Integrated Intermediate System-to-Intermediate System (Integrated IS-IS) standard routing protocol for simultaneously routing TCP/IP, DECnet, and OSI. Integrated IS-IS is approved by both ISO and the IETF and offers the following benefits:

- Reduces line utilization and minimizes routing processing overhead
- Uses the newer link state algorithm for faster network convergence and improved stability
- Simplifies network management since only one set of routing parameters needs to be set and monitored

The DECNIS 600 also supports the Open Shortest Path First (OSPF) routing protocol which provides routing information within an IP only environment and functions as an Interior Gateway Protocol (IGP). Information about reachability of end systems can be derived from EGP, RIP or Integrated IS-IS.

DECNIS 600 also supports native Novell NetWare IPX and Apple's AppleTalk protocols over Ethernet and FDDI. Novell IPX and AppleTalk are supported over wide area links via encapsulation within IP.

The DECNIS 600 is able to provide a network routing service for:

- ADVANTAGE-NETWORKS nodes
- TCP/IP end systems
- DECnet Phase IV nodes
- Novell NetWare IPX end systems
- AppleTalk end systems
- OSI-compatible end systems

Routing is supported by all DECNIS LAN and WAN network interface cards.

Bridging Services

The DECNIS 600 supports IEEE 802.1D and/or LANbridge 100 Spanning Tree bridging of IEEE 802.3/Ethernet or ANSI FDDI LAN traffic which cannot be routed by the DECNIS routing service. The DECNIS 600 supports both local and remote bridging:

- **Local Bridging**—LAN traffic can be bridged between LANs connected to the same DECNIS unit using the DEC LANcontroller 601/602 and/or DEC FDDIcontroller 621 network interface cards. Translational bridging is supported when bridging between IEEE 802.3/Ethernet and ANSI FDDI LANs.
- **Remote Bridging**—Remote bridging is supported only between DEC WANcontroller 622 network interface cards using the HDLC or PPP data link protocols at line speeds between 56 Kb/s and 2 Mb/s. LAT compression and multihop remote bridging are both supported.

When providing a remote bridging service, the following restrictions apply:

- Remote bridging is supported, but not recommended, at line speeds less than 56 Kb/s, subject to the limitations in the DECNIS V2.0 Software Product Description. Refer to Software Product Description 36.05.0x for more information.
- Remote bridging is not supported on DEC WANcontroller 614/618 network interface cards.
- Remote bridging is not supported over X.25 data links.

DECNIS 600 Multiprotocol Router/Bridge *(continued)*

Bridging Services *(continued)*

The DECNIS 600 always routes DECnet, IP, and OSI protocols and cannot bridge these protocols except in the following cases:

- IP traffic can either be routed or bridged on a system-wide basis. If IP routing is disabled, IP traffic is bridged on all interfaces. Bridge filtering can be enabled for IP traffic on port-by-port basis.
- OSI null-Internet frames will always be bridged.

Bridge traffic, both local and remote, may be filtered based on a combination of source or destination address and protocol type on a port-by-port basis.

X.25 Services

The DECNIS 600 provides X.25 Gateway services that relay X.25 Level 3 packets to and from:

- Digital and multivendor systems on the LAN
- X.25 Data Terminal Equipment (DTE) connected over an X.25 Packet Switched Data Network (PSDN)
- X.25 Data Terminal Equipment (DTE) connected directly to the unit
- Any of the above connected to another Digital X.25 Gateway service accessible over a routing network

These end systems can be collocated on the same LAN as the router or connected to the synchronous ports of the router. Connections to other routers or end systems can be made

- Locally over the LAN using IEEE 802.3/Ethernet
- Remotely using modem connections over leased lines using the HDLC data link protocol
- Remotely across a PSDN using X.25 protocols

Prerequisites

Hardware: VAX, MicroVAX, VAXstation, VAXserver, DECstation or DECsystem computer for software installation and load host.

Software:

- OpenVMS load host:
  - OpenVMS operating system V5.4 or later
  - DECnet VAX V5.4 or later including extensions kit
- ULTRIX load host:
  - VAX ULTRIX or RISC ULTRIX operating system V4.3
  - ULTRIX Worksystem Software V4.3
  - DECnet OSI for ULTRIX V5.0 or later
- DEC OSF/1 load host
- MS-DOS load host

Licensing

A separate software license is required for Routing and Bridging functions on each hardware unit. The Routing license ships with all base and packaged systems and includes X.25 gateway and relay functionality at no extra cost.

The Bridging licenses ship with some base and packaged systems or may be ordered separately.

A separate software license is required for PCLAN protocol support. This license does not ship with base and packaged systems and must be ordered separately.

DECNIS 600 Multiprotocol Router/Bridge *(continued)*

Ordering Information

Preconfigured Systems

DECNIS 600-EP includes 9-slot DECNIS enclosure (120 V/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses. Three interface options are available:

DNSEA-BC	DECNIS 600-EP X.21 leased line
DNSEB-BC/BD*	DECNIS 600-EP V.35
DNSEC-BC	DECNIS 600-EP EIA-422

*BD version includes U.S. power cord; BC version requires appropriate country kit.

DECNIS 600-RP includes 9-slot DECNIS enclosure (120 V/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 618, and a routing software licenses. Three interface options are available:

DNSED-BC/BD*	DECNIS 600-RP V.35
DNSEE-BC	DECNIS 600-RP EIA-422
DNSEF-BC/BD*	DECNIS 600-RP EIA-232

*BD version includes U.S. power cord; BC version requires appropriate country kit.

SPX Base System

DECNIS 600-SPX Base System includes chassis with power supply; DECNIS MPC-II Processor with OBM, 16-Mbyte DRAM, 4-Mbyte Flash; line cards and software licenses and media must be ordered seperately.

DNSBA-CD	DECNIS 600-SPX

Country Kits

DNSXC-A†	DECNIS country kit

† Replace the † with one of the following codes: A (United States and Canada), D (Denmark), E (United Kingdom and Ireland), I (Italy), K (Switzerland), T (Israel), X (Central Europe), Z (Australia, New Zealand

Network Interface Cards

DNSAB-BA	DEC WANcontroller 622/HS (requires adapters cables)
DNSAE-AA	DEC LANcontroller 601, one port IEEE 802.3
DNSAE-BA	DEC LANcontroller 602, two port IEEE 802.3, thick wire
DNSAE-BB	DEC LANcontroller 602, two port IEEE 802.3, ThinWire
DNSCA-BA	DEC WANcontroller 614 multistandard (requires adapters cables)
DNSCA-AB	DEC WANcontroller 618 V.35 package
DNSCA-AC	DEC WANcontroller 618 422/V.11 package
DNSCA-AD	DEC WANcontroller 618 EIA-232 package
DNSCB-AA	DEC WANcontroller 622-X.21LL/KS
DNSCB-AB	DEC WANcontroller 622-V.35
DNSCB-AC	DEC WANcontroller 622-422/V.11
DNSAF-MN	DEC FDDIcontroller 621 multi-mode SAS
DNSAF-SN	DEC FDDIcontroller 621 single-mode SAS
DNSAF-MM	DEC FDDIcontroller 621 multi-mode DAS
DNSAF-SS	DEC FDDIcontroller 621 single-mode DAS
DNSAF-MS	DEC FDDIcontroller 621 multi/single-mode DAS
DNSAF-SM	DEC FDDIcontroller 621 multi/single-mode DAS
DNSXT-CA	Test loopback, 50-way

DECNIS MPC-II Processor Card

DNSAN-BH	DECNIS MPC-II Processor Card w/ OBM, 16-Mbyte RAM, 4-Mbyte Flash

DECNIS 600 Multiprotocol Router/Bridge *(continued)*

Software Licenses and Media

QL-GX7A9-AA	DECNIS Router update license
QL-GX7A9-RA	DECNIS Router worldwide license
QL-GZNA9-AA	DECNIS Bridge worldwide license
QL-GZNA9-RA	DECNIS Bridge update license
QL-08VA9-AA	DECNIS PCLAN license worldwide
QA-GX7AA-H*	DECNIS OpenVMS VAX media and documentation
QA-GX7AB-H*	DECNIS VAX ULTRIX media and documentation
QA-GX7AC-H*	DECNIS RISC ULTRIX media and documentation
QA-GX7AA-GZ	DECNIS software documentation kit
QA-GX7AF-HC	DECNIS DOS media and documentation kit (RX23)
QA-GX7AE-H8	DECNIS OpenVMS AXP media and documentation (CDROM)
QA-GX7AD-H8	DECNIS OSF/1 for AXP media and documentation (CDROM)
QL-0PDA9-AA	DECNIS VLINK software license

*5 = TK50, M = magtape

Adapter Cables

BC19B-02	V.36/EIA-449/422 adapter cable
BC19E-02	EIA-423 adapter cable
BC19B-02	V.35 adapter cable
BS23V-02	EIA-232 adapter cable

Refer to Software Product Description 36.05.00 and System Support Addendum 36.05.00-A for further information.

DECNIS 600 Specifications

Physical Characteristics	
Height	55.4 cm (21.82 in.)
Width	48.2 cm (19 in.)
Depth	47.2 cm (18.61 in.)
Weight	
Base unit*	33 kg (72 lb)
Network Interface Cards	1 kg (2.2 lb)
Fully loaded unit	40 kg (88 lb) maximum
Power Requirements	
Nominal	100 to 120 Vrms (120 V); 200 to 240 Vrms (240 V)
Range	50 Hz to 60 Hz
Consumption	600 W (maximum)

*Base unit includes: enclosure, power supply, fan tray, processor, and memory modules

DECNIS 500 Multiprotocol Router/Bridge

The DEC Network Integration Server 500 (DECNIS 500) is a smaller version of the DECNIS 600. It acts as a high-speed multiprotocol router and bridge that provides high-bandwidth connections into backbone networks for remote sites.

The DECNIS 500 uses the same modular design and architecture as the larger DECNIS 600, and provides two module slots for LAN and/or WAN network interface cards. These cards are identical to and interchangeable with the DECNIS 600.

Preconfigured Systems

- **DECNIS 500-EP**—Entry-level preconfigured package for high-speed routing and bridging, includes DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses.
- **DECNIS 500-RP**—Entry-level preconfigured package for low-speed routing services, includes DEC LANcontroller 601, DEC WANcontroller 618, and routing software license.

Features

The DECNIS 500 operates the same software as the DECNIS 600 product. Refer to the DECNIS 600 entry in this section for supported features, functions and installation prerequisites.

Ordering Information

Preconfigured Systems

DECNIS 500-EP includes 4-slot DECNIS enclosure (120/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses. Three interface options are available:

DNSDA-BC	DECNIS 500-EP X.21 leased line
DNSDB-BC/BD	DECNIS 500-EP V.35
DNSDC-BC	DECNIS 500-EP EIA-422

DECNIS 500-RP includes 4-slot DECNIS enclosure (120/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 618, and a routing software license. Three interface options are available:

DNSDG-BC/BD*	DECNIS 500-RP V.35
DNSDH-BC/BD*	DECNIS 500-RP RS422
DNSDI-BC/BD*	DECNIS 500-RP EIA-232

*BD version includes U.S. power cord; BC version requires appropriate country kit.

DECNIS 500-LP includes 4-slot DECNIS enclosure (120/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 602, and routing and bridging software licenses.

DNSDK-BC/BD*	DECNIS 500-LP thick wire
DNSDL-BC/BD*	DECNIS 500-LP ThinWire

*BD version includes U.S. power cord; BC version requires appropriate country kit.

DECNIS 500-RP4 includes 4-slot DECNIS enclosure (120/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 614 multi-standard interface, and routing software license.

DNSDJ-BC/BD*	DECNIS 500-RP4 EIA-232, V.35, EIA-449

* BD version includes U.S. power cord; BC version requires appropriate country kit.

DECNIS 500 Multiprotocol Router/Bridge *(continued)*

Ordering Information (continued)

SPX Base System

DECNIS 500-SPX Base System includes chassis with power supply; DECNIS MPC-II Processor with OBM, 16-Mbyte DRAM, 4-Mbyte Flash; line cards and software licenses and media must be ordered seperately.

DNSBE-CD	DECNIS 500-SPX

Country Kits

DNSXD-A†	DECNIS 500 country kit

† Replace the † with one of the following codes: A (United States and Canada), D (Denmark), E (United Kingdom and Ireland), I (Italy), K (Switzerland), T (Israel), X (Central Europe), Z (Australia, New Zealand).

Software Licenses and Media

QL-GX7A9-AA	DECNIS Router worldwide license
QL-GX7A9-RA	DECNIS Router update license
QL-GZNA9-AA	DECNIS Bridge worldwide license
QL-GZNA9-RA	DECNIS Bridge update license
QL-08VA9-AA	DECNIS PCLAN worldwide license
QA-GX7AA-H*	DECNIS OpenVMS VAX media and documentation
QA-GX7AB-H*	DECNIS VAX ULTRIX media and documentation
QA-GX7AC-H*	DECNIS RISC ULTRIX media and documentation
QA-GX7AA-GZ	DECNIS software documentation kit

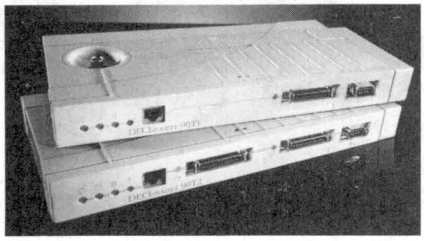
* 5 = TK50, M = magtape

Refer to Software Product Description 36.05.00 and System Support Addendum 36.05.00-A for further information.

Specifications

Physical Characteristics	
Height	20.7 cm (8.15 in.)
Width	2 cm (19 in.)48.
Depth	35.5 cm (13.97 in.)
Weight	16 kg (35.2 lb)
Power Requirements	
Nominal	100 to 120 Vrms (120 V) 200 to 240 Vrms (240 V)
Range	50 to 60 Hz
Consumption	600 W (maximum)

DECbrouter 90—Multiprotocol Bridge/Router



The DECbrouter 90 is a multiprotocol internetworking solution for linking Ethernet networks across a wide area network. The DECbrouter 90 is capable of routing and/or bridging a variety of networking and routing protocols being utilized on local and wide area data networks.

This product supports the networking protocols offered in Cisco Systems, Inc., router products, but, in addition, implements industry-standard protocols such as Integrated IS-to-IS. These unique capabilities provide true multivendor interoperability between Digital and Cisco products.

Features

- Interoperable with Cisco Systems, Inc. and Digital's DECNIS routers
- Available in (1) x T1/E1 or (1) x T1 and (1) x 64K versions; dual-port version supports load sharing and/or failover
- "Flash" memory-based design is upgradable and supports self-booting of network software, eliminating downline loading requirements
- Integral SNMP management
- Bridging and compression of LAT
- AppleTalk and Novell IPX support
- Protocol translation
- Integrated IS-to-IS OSI-based routing protocol offers migration path to international standards-based routing
- SDLC tunneling—allows SDLC devices such as IBM 37 x 4 cluster controller to be directly connected
- Data link support—supports many different datalinks (leased line, frame relay, X.25, SMDS and ISDN) allowing use of most cost-effective and widely available telecom services
- Configuration flexibility—use standalone or in a DEChub 90/900

Ordering Information

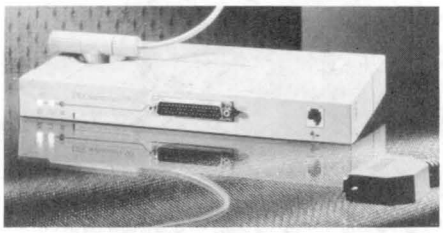
DEWB1-**	DECbrouter 90T1, single T1/E1 port, standalone with power supply, documentation
DEWB1-MA	DECbrouter 90T1, single T1/E1 port, hub-based model, no power supply, with documentation
DEWB2-**	DECbrouter 90, dual-port 1 x T1, 1 x 64K Kbps, standalone with power supply, documentation—serial interface support for 530 A, EIA-422, EIA-423, and X.21
DEWB2-MA	DECbrouter 90, dual-port 1 x T1, 1 x 64K Kbps, hub-based model, no power supply, with documentation—serial interface support for 530 A, EIA-422, EIA0-423, and X.21
DEWBR-**	Same as DEWB2-AA, except serial interface support for V.24/V.28, X21 and V.35
DEWBR-MA	Same as DEWB2-MA, except serial interface support for V24/V.28, X21 and V.35

** denotes AA = U.S., Canada, Japan; AD = Denmark; AE = U.K.; AI = Italy; AK = Switzerland; AT = Israel; AZ = Australia; AX = Central Europe; BJ = India

The DECbrouter 90 module requires a separate serial line cable that provides the desired serial interface service. Since the software is pre-loaded, no additional software kits are required.

BC12F-06	X.21—50-pin to 15-pin D ISO 4903
BC12G-06	V.35—50-pin to 34-pin D ISO 2593
BC12H-06	EIA-422—50-pin to 37-pin D ISO 4902
BC12J-06	EIA-530A—50-pin to 25-pin D
BC12K-06	EIA-423—50-pin to 37-pin D ISO 4902
BC12L-06	EIA-232—50-pin to 25-pin D ISO 2110

DECwanrouter 90 Multiprotocol Router



The DECwanrouter 90 provides low-cost wide area access between remote sites and branch office LANs that have light-to medium-multiprotocol network traffic. It supports TCP/IP, DECnet Phase IV and Phase V OSI, and X.25 routing protocols; and DDCMP, HDLC, and X.25 data link protocols. The router's WAN port accommodates speeds of up to 64 Kb/s. Connections to this port can be made locally using dedicated null modem wiring, or remotely via modem over leased or dial-in PSTN lines. This new router, part of the DEChub Family of Networking Products, can be used standalone or in the DEChub 90.

Features

- Configuration flexibility—operates standalone or in the DEChub 90
- Supports TCP/IP, DECnet Phase IV and Phase V OSI, and X.25 routing protocols; and DDCMP, HDLC, and X.25 data link protocols
- Implements integrated IS-IS backbone routing
- 50-pin connector supports a variety of interface standards
- Router software can be downline-loaded from OpenVMS or ULTRIX system
- Manageable via SNMP (read only) and NCL
- Front-panel LEDs provide ability to manage locally and check port status

Ordering Information

DECwanrouter 90 for standalone use; includes power supply.

DEWAR-AA	U.S., Canada, Japan
DEWAR-AD	Denmark
DEWAR-AE	U.K.
DEWAR-AI	Italy
DEWAR-AK	Switzerland
DEWAR-AT	Israel
DEWAR-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEWAR-AZ	Australia
DEWAR-BJ	India
DEWAR-MA/ME	DECwanrouter 90 for use with DEChub 90 (power supply not included)
H7082-AA	120-V power supply with internal power connection
H7082-AB	240-V power supply with IEC connection
H0342-AA	Snap-on cover for hub-based model of the DECwanrouter 90
QA-GZZAA-H#	Software media and license for OpenVMS
QA-GZZAB-H#	Software media and license for VAX ULTRIX
QA-GZZAC-H#	Software media and license for RISC ULTRIX

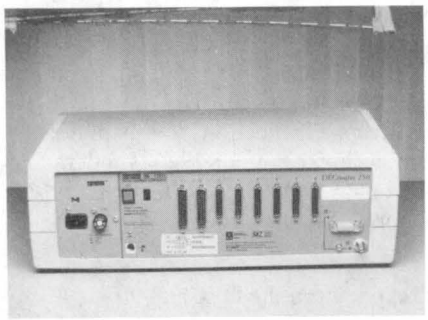
= media; 5 = TK50; M = magtape

Configuring Information

The DECwanrouter 90 has a WAN port and a ThinWire local Ethernet port. The WAN port has a 50-pin connector to enable multiple interfaces with BC19 cables. These interfaces include: V.28/V.24 (EIA-RS232-C/D), V.36/V.11 (EIA-RS422/449), V.35, and V.11 (British Telecom 64 Kb/s). **Note:** The BC19 cable must be ordered separately. The DECwanrouter 90 can be configured as a standalone unit or as part of the

DEChub 90/900 Ethernet backplane. When the DECwanrouter 90 is used as a standalone unit, it uses an external power supply. When installed in the DEChub backplane, power is provided by the backplane power supply

DEC WANrouter 250 8-Port Multiprotocol Router



The DEC WANrouter 250 provides a network routing service for:

- ADVANTAGE-NETWORKS nodes
- DECnet Phase IV nodes
- TCP/IP hosts
- OSI compatible end systems

These nodes can be co-located on the same LAN as the router or connected to the asynchronous/synchronous ports of the router. Connections to other routers or end systems can be made:

- Locally over the LAN using IEEE 802.3/Ethernet.
- Remotely using modem connections over leased and telephone lines using either DDCMP or HDLC data link protocols.

Features

- Fully compatible member of international standards-based multiprotocol router family
- Accepts downline loadable DEC WANrouter 150/250 software from OpenVMS VAX, VAX ULTRIX, and RISC ULTRIX host systems over IEEE 802.3/Ethernet, or remotely over synchronous line from host systems or via DECNIS 500/600
- Uses local dedicated wiring or remote leased lines using DDCMP and HDLC
- Supports synchronous and asynchronous ports
- Switch selectable ThinWire or thick wire IEEE 802.3/Ethernet connection

The DEC WANrouter 250 software fully implements Integrated IS-IS to provide:

- OSI routing
- Internet routing
- DECnet routing

Prerequisites

Hardware:

- VAX, MicroVAX, DECstation or VAXstation configured as specified in the System Software Addendum 32.97.00-A
- DEC X25gateway 100 (DEMSB-H) as specified in the System Software Addendum 32.97.00-A

Software: Either OpenVMS operating system V5.4 software with DECnet-VAX extensions V5.4 software, or ULTRIX operating system V4.2 running DECnet/OSI for ULTRIX V5.0 software.

Ordering Information

DSRVR-Wx	DECrouter 250 basic hardware, DEC WANrouter 150/250 software license, rackmounting kit, (2) EIA-232-C/D adapter cable, power cable, documentation. Order media kits separately

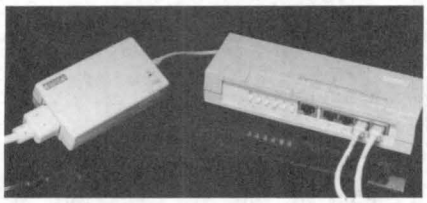
Note: Replace x with one of the following: A (United States, Canada, Japan, Mexico), T (Israel), Z (Australia, New Zealand), D (Denmark), E(United Kingdom, Ireland), I (Italy), K (Switzerland)X (Austria, Belgium, Finland, France, Germany, Netherlands, Portugal, Sweden), Z (Australia, New Zealand)

QA-GZZAA-Hx	OpenVMS software media and documentation
QA-GZZAB-Hx	VAX ULTRIX software media and documentation
QA-GZZAC-Hx	RISC ULTRIX software media and documentation
QL-GZ9A9-AA	Migration License for DECrouter 250

x denotes media type: 5 = TK50, M = Magtape

Note: Refer to Software Product Description 36.24 and System Support Addendum 36.24 for further information.

Digital Ethernet Multiport Office Network Repeater



The Digital Ethernet Multiport Office Network is a five-port, 10BaseT-compatible repeater that offers one of the lowest-cost connectivity options in the industry. It provides four connections for PCs, workstations, printers, or other desktop devices over standard data grade shielded twisted-pair or unshielded twisted-pair cable. This compact repeater is ideal for small offices that do not require managed repeaters. It provides full retiming features plus automatic fault detection and isolation.

Features

- Extremely low-cost connectivity for small LANs
- 10BaseT-compatible—supports both unshielded and shielded environments, including European VDE Class B
- Ease of use—no technical expertise is required to install and operate
- Full port functionality—automatically detects and isolates faults
- Compact—can be used on desktops, or mounted on solid walls or office partitions

Configuring Information

Two DEMON repeaters can be daisychained together by connecting the fifth ports of each repeater. This repeater can also be connected to other types of repeaters in a larger LAN, provided that IEEE/802.3 repeater recommendations are followed.

Ports:	5 twisted-pair connections
Order:	**BN26K-xx** for unshielded twisted-pair cabling **BN26L-xx** for shielded twisted-pair cabling

Ordering Information

Digital Ethernet Multiport Office Network; includes power supply

DEMON-AA	U.S., Canada, and Japan
DEMON-AD	Denmark
DEMON-AE	U.K.
DEMON-AI	Italy
DEMON-AK	Switzerland
DEMON-AT	Israel
DEMON-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEMON-AZ	Australia
DEMON-BJ	India

DECrepeater 900TM—32-port 10BaseT Repeater

The DECrepeater 900TM is an 802.3 10BaseT (twisted pair) 32-port repeater for use with either 100-ohm shielded or unshielded twisted pair wire. The DECrepeater 900TM can be used in the DEChub 900 MultiSwitch or as a standalone repeater in the DEChub ONE single-slot hub ("docking station").

Features

- Backplane access to ThinWire segment or Intermodule Ethernet Bus (IMB) in the DEChub 900 MultiSwitch
- AUI port to the backbone in the DEChub ONE single-slot hub (standard); optional twisted pair, ThinWire, or fiber (10BaseFL)connections to the backbone via MAU
- Integral SNMP agent for remote management via HUBwatch in either the DEChub 900 MultiSwitch or the DEChub ONE
- Configuration flexibility—operates standalone or in the DEChub 900 MultiSwitch
- Per-port-security capability controlled via network management

DECrepeater 900TM—32-port 10BaseT Repeater *(continued)*

Features ***(continued)***

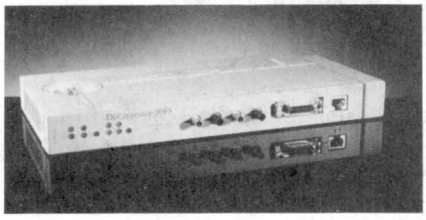
- In-band and out-of-band management capability
- FLASH for firmware upgrades via down-line loading

Ordering Information

DETMM-MA	DECrepeater 900TM, documentation, no power supply
DEHUA-A*	Single-slot Ethernet DEChub ONE with AUI connector, power supply, setup port, OBM port, and power cord

* A = U.S.; D = Denmark; E = U.K.; I = Italy; K = Switzerland; T = Israel; X = Central Europe; Z = Australia; J = India/South Africa

DECrepeater 90FS



The DECrepeater 90FS is a 10BaseFL repeater with one AUI port and two fiber ports that can be configured redundantly. This repeater can be installed in the DEChub 90 or the DEChub 900 MultiSwitch, or used standalone. It features an integral SNMP agent for management in any configuration. The DECrepeater 90FS can take advantage of IRB in the DEChub 900 MultiSwitch.

- Two 10BaseFL/FOIRL ports—ST connectors
- 10Base5 port—AUI connector
- Industry-standard FL with remote link detection
- Two individual fiber ports or one redundant pair with automatic failover
- Configuration flexibility—operates in the DEChub 90/900 and standalone
- OBM and setup in standalone configuration, via RJ45 on front bezel

Configuration Information

The DECrepeater 90FS should be installed in slot 7 or 8 of the DEChub 90.

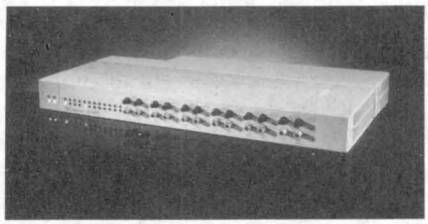
In the DEChub 900, this repeater can be assigned to the DEChub 900 upper connector IMB Ethernet LAN and/or to ThinWire Ethernet channel. It makes full use of the IRB capabilities of the DEChub 900. In addition, a MAU can be connected to the AUI port to provide ThinWire or twisted-pair connection.

Ordering Information

DECrepeater 90FS for standalone use includes power supply.

DEFMI-AA	U.S., Canada, Japan
DEFMI-AD	Denmark
DEFMI-AE	U.K.
DEFMI-AI	Italy
DEFMI-AK	Switzerland
DEFMI-AT	Israel
DEFMI-AX	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
DEFMI-AZ	Australia
DEFMI-BJ	India, S. Africa
DEFMI-MA	DECrepeater 90FS for use with the DEChub 90/900 (power supply not included)
H7827-BA	Power supply
H0342-AA	Snap-on cover for the hub-based model of the DECrepeater 90FS

DECrepeater 900FP



The DECrepeater 900FP is a 10BaseFL fiber repeater with 12 fiber ports that can be configured to have up to six pairs of redundant ports. Per-pair port switching capability is available to allow pairs of ports to be switched to different LANs via network management, such as HUBwatch. The DECrepeater 900FP has an integral SNMP agent to allow remote management in any configuration. Use this repeater in the DEChub 900 MultiSwitch or in a DEChub ONE single-slot hub configuration.

- Provides 12 individual 10BaseFL/FOIRL ports (ST connectors), or six redundant pairs with automatic failover
- Remote link detection
- Configuration flexibility—operates standalone in the DEChub ONE or in the DEChub 900

Configuration Information

In the DEChub 900, each redundant pair can be assigned to one of six IMB Ethernet LANs and/or the ThinWire Ethernet channel of the DEChub 900. The repeater makes full use of the IRB capabilities of the DEChub 900. In a DEChub ONE configuration, a MAU can be added to provide additional types of connection.

Ordering Information

DEFMM-MA	DECrepeater 900FP for use with DEChub 900 (power supply not included)
DEHUA-xx	DEChub ONE

DECrepeater 900GM

The DECrepeater 900GM provides (24) 10BaseT ports (using Telco connectors)and an AUI port. This versatile repeater has an integral SNMP agent to allow remote management in any configuration. It also features port-level security and full retiming per port. The DECrepeater 900GM can be used in the DEChub 900 MultiSwitch or in a DEChub ONE standalone configuration.

Features

- Provides (24) 10BaseT ports (2 x 12 ports) using 50-pin Telco connectors plus one AUI port
- Integrated, port-level SNMP management (using HUBwatch)
- Full repeater per port—no retiming module needed
- Port-level intrusion detection and eavesdropping prevention
- Software/firmware upgradable over the network
- Configuration flexibility—operates in the DEChub 900 and standalone in a DEChub ONE single-slot hub

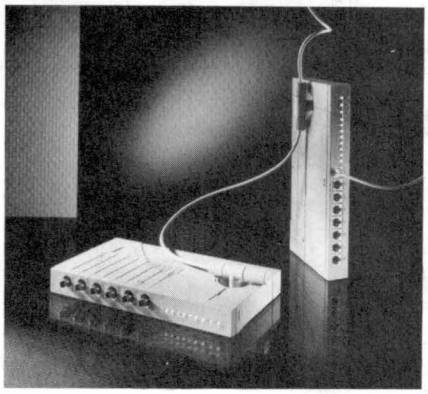
Configuration Information

In the DEChub 900, the DECrepeater 900GM can be assigned to one of six IMB Ethernet LANs and/or the ThinWire Ethernet channel. It makes full use of the IRB capabilities of the DEChub 900. In addition, a MAU can be attached via the DEChub ONE or the AUI port on the repeater to provide additional types of connection.

Ordering Information

DETTM-MA	DECrepeater 900GM for use with the DEChub 900 (power supply not included)
DEHUA-xx	DEChub ONE

DECrepeater 90C/DECrepeater 90T



The DECrepeater 90C (coaxial) and DECrepeater 90T (unshielded twisted-pair) repeaters provide modular and cost-effective Ethernet connections. The DECrepeater 90T offers 10BaseT networking. The DECrepeater 90C complies with the IEEE 802.3 standard for 10Base2 networks and supports up to 185 meters of ThinWire cabling. Both products are part of Digital's DEChub Family of Networking Products.

As standalone units, these repeaters provide a new level of Ethernet connectivity. When installed in the DEChub 90, the repeaters can be remotely managed using the DECbridge 90.

- Full repeater per port—no retiming module needed in the DEChub 90 backplane
- Automatically identifies and isolates faulty ports
- High-speed communications—full 10-Mb/s Ethernet throughput

Ordering Information

DECrepeater 90C/90T for standalone use; includes power supply.

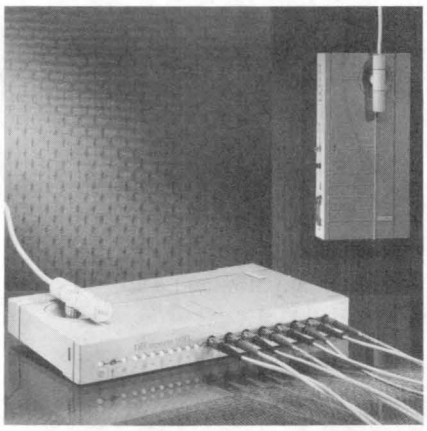
DECrepeater 90C	DECrepeater 90T	Country
DECMR-AA	**DETMR-AA**	U.S., Canada, Japan
DECMR-AD	**DETMR-AD**	Denmark
DECMR-AE	**DETMR-AE**	U.K.
DECMR-AI	**DETMR-AI**	Italy
DECMR-AK	**DETMR-AK**	Switzerland
DECMR-AT	**DETMR-AT**	Israel
DECMR-AX	**DETMR-AX**	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DECMR-AZ	**DETMR-AZ**	Australia
DECMR-BJ	**DETMR-BJ**	India
DECMR-MA	**DETMR-MA**	DECrepeater 90C/90T for use with DEChub 90 (power supply not included)

H7082-AA	120 V power supply with integral power connector
H7082-AB	240 V power supply with IEC connector
H0342-AA	Snap-on cover for hub-based model of the DECrepeater 90T/90C

Configuration Information

Both the DECrepeater 90T and DECrepeater 90C can be configured as standalone units or as part of the DEChub 90. When the DECrepeater 90T or 90C is used as a standalone unit, it uses an external power supply. When installed in the DEChub 90 backplane, power is provided by the backplane power supply.

DECrepeater 90FL



The DECrepeater 90FL is a multiport fiber optic repeater that can interconnect multiple DEChub units or 10BaseFL-compliant products in a star-wired environment. This member of the DEChub Family features four fiber ports and one ThinWire port. The DECrepeater 90FL can be used standalone or in the DEChub. It can be managed when installed in a DEChub 90 backplane with a DECbridge 90 or DECbridge 90FL.

- Provides four 10BaseFL-compliant ports
- Configuration flexibility—operates standalone or in a DEChub
- Offers full repeater functionality per port, including automatic identification and isolation of faulty ports
- Front-panel LEDs indicate power, network activity, and port status at a glance

Ordering Information

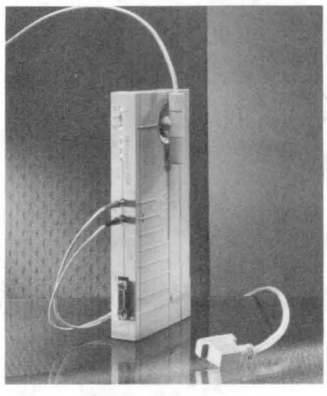
DECrepeater 90FL for standalone use; includes power supply.

DEFMR-AA	U.S., Canada, Japan
DEFMR-AD	Denmark
DEFMR-AE	U.K.
DEFMR-AI	Italy
DEFMR-AK	Switzerland
DEFMR-AT	Israel
DEFMR-AX	Austria, Belgium, France, Germany, Finland, Holland Norway, Sweden, Portugal, Spain
DEFMR-AZ	Australia, New Zealand
DEFMR-BJ	India
DEFMR-MA	DECrepeater 90FL for use with a DEChub (power supply not included)
H7082-AA	120-V power supply with integral power connector
H7082-AB	240-V power supply with IEC connector
H0342-AA	Snap-on cover for hub-based model of the DECrepeater 90FL

Configuration Information

The DECrepeater 90FL has four fiber ports and one ThinWire port. It can be configured as a standalone unit or as part of a DEChub 90 backplane. When used as a standalone unit, this product uses an external power supply. When installed in a DEChub backplane, the DECrepeater 90FL uses the backplane power supply.

DECrepeater 90FA



The DECrepeater 90FA is a versatile DEChub Family repeater that provides low-cost connections to fiber, ThinWire, and thick wire. It features a 10BaseFL fiber port, a 15-pin AUI port, and a ThinWire port. This repeater automatically identifies and isolates faulty ports. It can operate as a standalone module, or as a manageable repeater when installed in a DEChub 90 backplane with a DECbridge 90 or DECbridge 90FL.

- Provides low-cost connectivity to ThinWire, thick wire, and fiber
- Configuration flexibility—operates standalone or in a DEChub
- Offers full repeater functionality per port, including automatic identification and isolation of faulty ports
- Front-panel LEDs indicate power, network activity, and port status at a glance

DECrepeater 90FA *(continued)*

Ordering Information

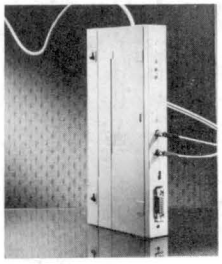
DECrepeater 90FA for standalone use; includes power supply.

DEFAR-AA	U.S., Canada, Japan
DEFAR-AD	Denmark
DEFAR-AE	U.K.
DEFAR-AI	Italy
DEFAR-AK	Switzerland
DEFAR-AT	Israel
DEFAR-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEFAR-AZ	Australia, New Zealand
DEFAR-BJ	India
DEFAR-MA	DECrepeater 90FA for use with a DEChub (power supply not included)
H7827-AA	120/240-V power supply
H0342-AA	Snap-on cover for hub-based model of the DECrepeater 90FA

Configuration Information

The DECrepeater 90FA has three ports: a 10BaseFL fiber port; a 15-pin AUI port; and a ThinWire port to the workgroup. It can be configured as a standalone unit or as part of the DEChub backplane. When used as a standalone unit, this product uses an external power supply. When installed in the DEChub 90 backplane, the DECrepeater 90FA uses the backplane power supply.

DECbridge 90FL



The DECbridge 90FL is a local Ethernet-to-Ethernet 10BaseFL-compliant bridge that combines reliability and high performance in one compact module. It connects a departmental workgroup to the larger LAN backbone. Part of the DEChub Family of Networking Products, this bridge isolates and manages all local traffic for up to 200 node addresses. When there are more than 200 stations in a workgroup, the bridge ensures full connectivity throughout the network. The DECbridge 90FL can be used standalone or in the DEChub 90. Status LEDs per port and DC OK and activity provide local management and port status checks.

Features

- Supports industry standards for 10BaseFL
- Fully auto-configuring—automatically configures itself for operation with other LAN Bridge products or any other IEEE 802.1d-compliant bridge
- High-speed communications—filters 29,694 packets/second and forwards 14,847 packets/second
- Protocol filtering—filters up to 16 protocols in one or in both directions
- Isolates workgroup traffic to optimize overall network performance
- Flexibility—operates standalone or in the DEChub 90/900
- Indicators—power, use, and status LEDs give a continuous display of all key functions

DECbridge 90FL *(continued)*

Ordering Information

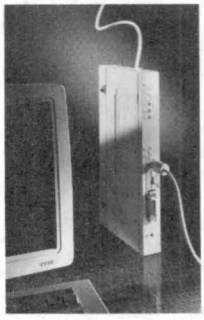
DECbridge 90FL for standalone use; includes power supply.

DEWGF-AA	U.S., Canada, Japan
DEWGF-AD	Denmark
DEWGF-AE	U.K.
DEWGF-AI	Italy
DEWGF-AK	Switzerland
DEWGF-AT	Israel
DEWGF-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEWGF-AZ	Australia, New Zealand
DEWGF-BJ	India
DEWGF-MA	DECbridge 90FL for use with a DEChub (power supply not included)
H7827-BA	120/240 V power supply
H0342-AA	Snap-on cover for hub-based model of the DECbridge 90FL

Configuration Information

The DECbridge 90FL has a fiber-optic and an AUI connection to the backbone, and a ThinWire-only connection to the workgroup. It can be configured as a standalone unit or as part of the DEChub 90/900 backplane. When used as a standalone unit, this product uses an external power supply. When integrated with the DEChub backplane, the DECbridge 90FL uses the backplane power supply.

DECbridge 90



The DECbridge 90 is a high-performance bridge that connects a departmental workgroup to the larger LAN backbone. It keeps local traffic within the workgroup LAN as it forwards traffic that has a destination elsewhere on the backbone. It prevents workgroup traffic from deteriorating overall network performance. As a member of the award-winning DEChub Family of Networking Products, the DECbridge 90 can be used in standalone configurations or in a DEChub. It features a ThinWire and AUI connection to the backbone, and a ThinWire-only connection to the workgroup. It simplifies setup and configuration tasks and manages all LAN traffic for up to 200 node addresses.

Features

- Fully autoconfiguring—automatically configures itself for operation with other LAN Bridge products or any other IEEE 802.1d compliant bridge
- High-speed communications—filters 29,694 packets/second and forwards 14,847 packets/second, giving workgroups full Ethernet bandwidth
- Protocol filtering—filters up to 16 protocols in one or in both directions
- Flexibility—can be used as a standalone bridge or in a DEChub
- Indicators—power, use, and status LEDs give a continuous display of all key functions

DECbridge 90 *(continued)*

Ordering Information

DECbridge 90 for standalone use; includes power supply.

DEWGB-AA	U.S., Canada, Japan
DEWGB-AD	Denmark
DEWGB-AE	U.K.
DEWGB-AI	Italy
DEWGB-AK	Switzerland
DEWGB-AT	Israel
DEWGB-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEWGB-AZ	Australia, New Zealand
DEWGB-BJ	India
DEWGB-MA	DECbridge 90FL for use with a DEChub (power supply not included)
H7827-BA	120/240 V power supply
H0342-AA	Snap-on cover for hub-based model of the DECbridge 90

Configuration Information

The DECbridge 90 has a ThinWire and AUI connection to the backbone and a ThinWire-only connection to the workgroup. It can be configured as a standalone unit or as part of a DEChub Ethernet backplane. When used as a standalone unit, this product uses an external power supply. When integrated with the DEChub backplane, the DECbridge 90 uses the backplane power supply.

RoamAbout Wireless-to-Wired Access Point

Features

- Two-port filtering bridge that provides wireless connectivity to a wired Ethernet LAN (ThinWire or 10BaseT)
- Software support for roaming and wireless protocols
- Integrated SNMP; software upgrade via flash memory
- Line speeds: 2 Mb/s on the wireless port; 10 Mb/s on the wired Ethernet port
- Uses spread-spectrum radio technology, allowing for reliability, security, and operation without a license
- PCMCIA interface supports RoamAbout PCMCIA Wireless network adapter and other wireless network adapters that conform to PCMCIA Type II standard
- Configuration flexibility - operates standalone or in the DEChub 90/900

Specifications

Prerequisite Hardware: Approved PCMCIA Type II wireless network adapter

Dimensions: 11" x 1.25" x 5.5"

Ordering Information

DEIAP-AA	RoamAbout Wireless-to-Wired Access Point (standalone; includes software license, accessory kit, and documentation)
DEIAP-MA	RoamAbout Wireless-to-Wired Access Point (hub-based; includes software license, accessory kit, and documentation)

DECrepeater 900SL



The DECrepeater 900SL is a Ring-In/Ring-Out repeater module. It works as a standalone module, as well as in the DEChub 900 MultiSwitch to provide connection to Token Ring LAN trunk wiring. It allows for extended distances of up to 200 meters between MAUs end stations and hubs. The DECrepeater 900SL has DB9 connectors to support 150-ohm STP cabling.

- Eight-port repeater supports 150-ohm STP cabling
- Repeats and re-times Token Ring LAN signals through ring-in and ring-out network connections
- Automatic speed detection prevents ring failure caused by installing an incorrectly matched station
- Ring autowrap eliminates ring failure due to device or cable failure
- IEEE/802.5 and IBM Token Ring compatible

Ordering Information

DTROS-**	DECrepeater 900SL with DEChub ONE (standalone use)
DTROS-MA	DECrepeater 900SL for DEChub 900

** AA = U.S.; AD = Denmark; AE = U.K.; AI = Italy; AK = Switzerland; AT = Israel; AX = Central Europe; AZ = Australia; BJ = India

DECrepeater 900TL

The DECrepeater 900TL is a Ring-In/Ring Out repeater module. It allows for extended distances of up to 200 meters between MAUs, end stations, and hubs. This repeater can be installed in the DEChub 900 MultiSwitch or used standalone. The DECrepeater 900TL, with RJ45 connectors, supports 100-ohm UTP cabling and 150-ohm STP cabling (150 ohm with the use of BN26T cable).

Features

- Eight-port repeater supports 100-ohm UTP cabling and 150-ohm STP cabling
- IEEE/802.5 and IBM Token Ring compatible
- Accommodates all Token Ring cabling in use today
- Repeats and re-times Token Ring LAN signals through Ring In/Ring Out connections to ensure reliability
- Automatic speed detection prevents ring failure caused by installing an incorrectly matched station
- Ring autowrap eliminates failure from device or cable failure
- Configuration flexibility—operates standalone or in the DEChub 900

Ordering Information

DECrepeater 900TL with DEChub ONE (standalone use)

DTROR-AA	U.S., Canada, Japan
DTROR-AD	Denmark
DTROR-AE	U.K.
DTROR-AI	Italy
DTROR-AK	Switzerland
DTROR-AT	Israel
DTROR-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DTROR-MA	DECbridge 90TL (for use with a DEChub 900)
BN26T-03	100-ohm/150-ohm media filter; RJ45 to IBM data connector adapter

DECswitch 900EE—6-port Ethernet Switch

Overview

The DECswitch 900EE is a six-port Ethernet switch, providing switching capability between each of six Ethernet LANs. The DECswitch 900EE consists of six Ethernets on the front panel (two AUI and four 10BaseT) and provides full speed switching capability among each of the six Ethernet segments. Each of the ports are configurable, via software, to connect to the front panel connector.

The DECswitch 900EE is a true backbone network switch supporting complete filtering capabilities (source address, destination address, protocol type). The product includes a large address table (8,000 entries) and is fully IEEE 802.1 bridge compliant, ensuring full performance and reliability even in large networks.

Key Features

- Filtering between all of its six ports is at full Ethernet speeds (14,880 packets/second/Ethernet).
- Aggregate forwarding rate of 45,000 pps, aggregate with three ports forwarding and three ports receiving, which is the maximum rate that six Ethernets can handle the traffic
- Supports over 8,000 node addresses
- The DECswitch 900EE supports bridge-type filtering between all ports.
- Flash memory provides easy, non-disruptive upgrade—firmware upgrades can be made easily by updating flash memory over the network from DOS, ULTRIX, or OpenVMS systems. This eliminates the necessity of replacing/upgrading hardware and associated cost and disruption to users of the network
- User-settable rate limiting of broadcast and multicast packets by address and specific protocol.
- Native SNMP agent provides in-band and out-of-band management.
- Support for standard and private management information bases (MIBs) for full management and configuration capability through SNMP.

Ordering Information

DEBMP-MA	DECswitch 900EE for use in DEChub 900 or DEChub ONE
DEHUA-CA	DEChub ONE docking station/single slot hub

DECswitch 900EF—7-port Ethernet to FDDI Switch

Overview

The DECswitch 900EF (formerly DECbridge 900MX) is a "line speed" Ethernet-to-FDDI switch for the backbone. It has six Ethernet switched ports and one FDDI switched port, providing full switching capability among each of six Ethernet and FDDI LANs. The DECswitch 900EF has six Ethernet ports on the front panel (two AUI and four 10BaseT) and a DAS FDDI port. Each of these ports are configurable, via HUBwatch software, to connect either through the front panel ports or through one of six backplane Ethernet segments of a DEChub 900 Multi Switch or the network port of a DEChub ONE docking station.

The DECswitch 900EF is a true backbone network switch supporting complete filtering capabilities (source address, destination address, protocol type). The product includes a large address table (8,000 entries) and is fully IEEE 802.1 bridge compliant, ensuring full performance and reliability in large networks.

In the future the DECswitch 900EF can gain additional multiprotocol routing functionality via a simple firmware upgrade, providing robust local routing capability while maintaining customers' hardware investments.

DECswitch 900EF—7-port Ethernet to FDDI Switch *(continued)*

Features

- High Filtering and forwarding rates—Full-speed Ethernet filtering rates of 14,880 packets per second on each Ethernet port and a minimum filtering rate of >460,000 packets per second on the FDDI port. The aggregate forwarding rate of the bridge is 60,000+ pps, which supports six Ethernets to one FDDI at approximately full line rates with packet sizes averaging 64 bytes.
- Supports over 8,000 node addresses.
- The DECswitch 900EF supports bridge filtering between all ports (Ethernet-to-Ethernet as well as Ethernet-to-FDDI). Full translation of packets between Ethernet and FDDI (IEEE 802.1i) is supported as well as IP packet fragmentation and specialized support for Non-Translating Protocols (IEEE 802.1h) like AppleTalk.
- "Flash" memory provides easy, non-disruptive upgrade—firmware upgrades can be made easily by updating the flash memory over the network from DOS, ULTRIX, or OpenVMS systems. This eliminates the necessity of replacing/upgrading hardware and the associated cost and disruption to users of the network.
- User-settable rate limiting of broadcast and multicast packets by address and specific protocol.
- Native SNMP agent provides in-band and out-of-band management.
- Support for standard and private management information bases (MIBs) for full management and configuration capability through SNMP.

Ordering Information

DEFBA-MA	DECswitch 900EF for use in DEChub 900 or DEChub ONE
DEHUA-CA	DEChub ONE docking station/single slot hub

PEswitch 900TX—6-port full speed Ethernet to FDDI Switch

Overview

The PEswitch 900TX is a six port Ethernet (Personal Ethernet PE-dedicated 10 Mb per user)-to-FDDI switch for desktop. The front panel Ethernet ports are all 10BaseT (MJ8-RJ45 type connectors), and each port provides a dedicated, 10Mb/sec connection for desktop devices or servers. The FDDI port provides a dual ring connection through either the DEChub 900Multi Switch backplane or through the new DEF1H-A* FDDI DEChub ONE single slot hub docking station.

The PEswitch 900TX is a full compliant IEEE 802.1 product. As such, it supports full address and protocol filtering between all ports (Ethernet to Ethernet as well as Ethernet to FDDI). In addition, full translation of packets between Ethernet and FDDI (IEEE 802.1i) is supported, as well as IP packet fragmentation and specialized support for Non-Translating Protocols (IEEE 802.1h) like AppleTalk. The resulting product provides high performance network access and robust functionality at a very attractive price per port.

PEswitch 900TX—6-port full speed Ethernet to FDDI Switch *(continued)*

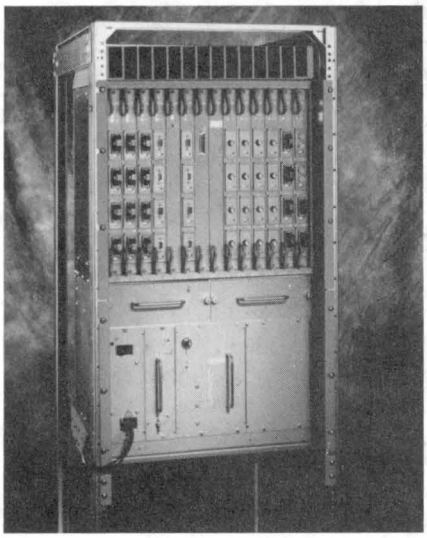
Features

- Seven port bridge, six Ethernet and one FDDI dual attachment station (DAS) backplane port.
- Complete bridge-type filtering capabilities (source address, destination address, protocol type).
- Dedicated 10 Mb/s switched Ethernet connection per port/user.
- Full translation of packets between Ethernet and FDDI (IEEE 802.1i) is supported as well as IP packet fragmentation and specialized support for Non-Translating Protocols (IEEE 802.1h) like AppleTalk.
- "Flash" memory provides easy, non-disruptive upgrade—firmware upgrades can be made easily by updating the flash memory over the network from DOS, ULTRIX, or OpenVMS systems. This eliminates the necessity of replacing/upgrading hardware and the associated cost and disruption to users of the network.
- User-settable rate limiting of broadcast and multicast packets by address and specific protocol.
- Native SNMP agent provides in-band and out-of-band management.
- Support for standard and private management information bases (MIBs) for full management and configuration capability through SNMP.

Ordering Information

DESBF-MA	PEswitch 900TX for use in DEChub 900 only

GIGAswitch/FDDI Networking Switch



The GIGAswitch/FDDI system is a multiport packet-switching platform that creates a switched FDDI network. With an aggregate bandwidth that greatly exceeds the 100 Mb/s limit of a traditional single ring, the GIGAswitch/FDDI system employs a 3.6-Gb/s switching fabric and provides up to 6.25 million connections per second. It can support up to 34 concurrent 100-Mb/s connections, and offers FDDI-to-switched-FDDI connectivity via ATM.

The GIGAswitch/FDDI system features Digital's unique high-speed crossbar switching technology and GIGAnet architecture. These combine to deliver high bandwidth and low latency far beyond that possible with either shared-channel LANs (FDDI, Token Ring, Ethernet), or other switching products. Crossbar switching provides a non-blocking switching matrix instead of the conventional shared backplane found in most networking hardware.

The GIGAswitch/FDDI system supports up to 34 individual, simultaneous FDDI 100-Mb/s point-to-point connections, enabling customers to meet their ever-increasing bandwidth needs. Also, cut-through forwarding can be enabled, eliminating the store-and-forward delay associated with many bridges and all routers. In addition, the GIGAswitch/FDDI system supports full duplex FDDI (100 Mb/s in each direction) for point-to-point links. It has input-to-output latencies of 15 microseconds, which is substantially lower than for routers that are in the milliseconds.

The GIGAswitch/FDDI system offers high availability through optional hardware redundancy and hot swap capabilities for the switch control processor, power supplies, linecards, and fans.

GIGAswitch/FDDI Networking Switch *(continued)*

Features

- Provides up to 6.25 million connections per second
- Compatible with all ISO, ANSI, and IEEE FDDI standards for full interoperability with other vendors' standard FDDI equipment
- Uses Digital's patented crossbar switching architecture, combined with intelligent linecards, to deliver unprecedented performance
- Enables independent connection decisions to be made because each linecard has its own hardware address table
- Employs a 3.6-Gb/s switching fabric
- Provides sophisticated filtering capability in order to define separate traffic, access security, and user domains (e.g., virtual LANs)
- Supports ATM (T3 or SONET) links for local or wide area connectivity between GIGAswitch/FDDI systems
- Easily managed through Digital's HUBwatch and POLYCENTER NetView, or any vendor's SNMP-compliant network management application

Intelligent GIGAswitch/FDDI Linecards

The GIGAswitch/FDDI platform has two- and four-port FDDI, and two-port ATM linecards that provide a variety of connectivity options. Linecards with modular port connections provide choice (on a per-port basis) from a range of connection media—including low-cost UTP and single-mode or multimode optical fiber.

Intelligent linecards utilize hardware-based address tables, port-to-port packet forwarding and filtering independently, thereby eliminating the central processor as a potential bottleneck. Characteristics of the linecards are:

- The two-port FDDI linecard supports either Single-Attachment Station (SAS) devices (connected only to the primary FDDI ring) and/or Dual-Attachment Station (DAS) devices (connected to both primary and secondary FDDI rings). DAS connections support dual homing, providing an additional level of fault tolerance to your FDDI network.
- The four-port FDDI linecard provides four SAS connections.
- The two-port and four-port FDDI linecards support FDDI single-mode fiber (SMF), FDDI multimode fiber (MMF), and Unshielded Twisted-Pair copper (UTP Category 5).
- FDDI dual-homing is supported, enabling a standby path for workstations, servers, or other network devices connected to the GIGAswitch/FDDI system.
- The two-port ATM linecard provides access to ATM, SONET, or T3 (DS3) services for GIGAswitch/FDDI connections.

Filtering Capability for Domain Creation

GIGAswitch/FDDI linecards can restrict traffic based on source address, destination address, protocol type, or any combination of these—on a per-port basis—for the creation of separate access domains. This capability can:

- Define security groupings
- Identify logical management groups
- Isolate network traffic (e.g., ARP storms and broadcast traffic)
- Solve many of the traffic management problems addressed by routers—without the performance throttling typically associated with routers

GIGAswitch/FDDI Networking Switch *(continued)*

ATM Support

GIGAswitch/FDDI-to- GIGAswitch/FDDI links over ATM networks enable high-performance bridged traffic between remote FDDI LAN connections using:

- Clear channel public or private T3 network services*
- SONET STS-3c /SDH STM-1 (OC3)*
- Local and public ATM

* Because the use of ATM protocols is transparent to the operation of T3 or SONET services, there is no requirement for additional ATM service.

Robust Power System

A single AC or DC power supply will handle an entire (fully loaded) GIGAswitch/FDDI system. A second power supply is optional and uses an independent power feed. When a second AC or DC power supply is used, it remains in "hot standby" and will failover with no interruption in service.

The 48-volt DC power system is especially beneficial for connecting to the DC power sources that are common to telephone central offices and as an alternative to the traditional AC powered GIGAswitch/FDDI system with an Uninterruptible Power Supply (UPS).

Hardware Requirements

- Any ISO/ANSI standard-compliant FDDI device can connect to the GIGAswitch/FDDI system
- Fits into a standard 19-inch rack
- Use of out-of-band console port requires an ASCII terminal

Optional Software

- POLYCENTER NetView, HUBwatch V3.0 or later, or any third-party SNMP-compliant network management application
- Firmware and documentation upgrade service is available.

Configuring Rules

- Select the GIGAswitch/FDDI chassis (DEFGA-CA)
- Select at least one SCP module, two if redundancy is desired (maximum ports with redundant SCP = 32 SAS, 20 DAS, or 24 SAS + 8 DAS)
- Select at least one power supply; two if redundancy is desired
- Select appropriate linecards
- Select FDDI PMDs if not included on linecard
- Select SONETor DS3daughter cards for each DEFGT-AA port
- Select country kit if needed
- Select optional software and documentation

GIGAswitch/FDDI Networking Switch *(continued)*

Ordering Information

DEFGA-CA	GIGAswitch/FDDI chassis with no power supply, SCP or linecards
DEFGP-AA	GIGAswitch/FDDI Switch Control Process module
DEFGB-AA/AB	GIGAswitch Family AC power supply
DEFGX-A*/B*/C*.	Country kits for DEFGB-AB
DEFGB-BA	GIGAswitch Family DC power supply
DEFGL-AA	Two-port FDDI SAS or DAS linecard, no PMDs
DEFGL-AB	Two-port FDDI linecard with 2 x DAS MMF (4 PMDs)
DEFGL-BA	Four-port FDDI linecard (SAS only), no PMDs
DEFGL-BB	Four-port FDDI linecard with 4 x SAS MMF PMDs
DEFGL-BC	Four-port FDDI linecard with 4 x SAS UTP PMDs
DEFXU-AA	FDDI TP-UTP MOD PMD
DEFXM-AA	FDDI (MMF) ANSI MIC PMD, 2 km
DEFXS-AA	FDDI (SMF) ANSI PMD, 40 FC/PC
DEFGT-AA	Two-port ATM linecard for DS3/SONET
DEFGE-AA	DS3 (45-Mb/s) daughter card (for DEFGT-AA)
DEFGS-AA	SONET/SDH 155 Mb/s Intermediate reach SMF daughter card (for DEFGT-AA)
DEFGS-BA	SONET/SDH 155 Mb/s Short reach MMF daughter card (for DEFGT-AA)
QB-32VAB-AA	HUBwatch V3.0 (optional software)
QB-0JGAA-SA	GIGAswitch/FDDI firmware/documentation kit
QT-0JGAA-XA	Media and document distribution service (MDDS)

Specifications

Physical Characteristics	
Height	89.5 cm (35.25 in) with plenums included
Width	48.3 cm (19 in) overall; 44.45 cm (17.50) in chassis only, without mounting flanges
Depth	50.8 cm (20 in)
Service space required	91.4 cm (3 ft) in front
Weight	68.2 kg (150 lb) typical; 90.9 kg (200 lb)
Operating Environment	
	Class B
Temperature	10°C to 40°C (50°F to 104°F)
Relative Humidity	10% to 90% with maximum wet bulb temperature 28°C (82°F) and minimum dew point 2°C (36°F)
Power Requirements	
One power supply included in basic system	93-115 VAC 15-amp (50 or 60 Hz) or 186-240 VAC 7.5-amp. Can utilize an uninterruptible power supply (UPS), also 48 VDC power supply.

Note: Absolute minimum operation is guaranteed down to the limits stated above for rated loads. Under some lighter loading configurations, the system may work down to 90 VAC for 120 VAC or 180 VAC for 240 VAC operation.

DECconcentrator 900MX FDDI Concentrator

The DECconcentrator 900MX is a hardware module for the DEChub 900. It allows for the configuration and management of FDDI networks along with Ethernet and Token Ring in a single DEChub 900 MultiSwitch.

The DECconcentrator 900MX supports six front-panel FDDI station connections via multimode fiber, single mode fiber, or unshielded twisted pair (UTP) media. Multiple DECconcentrator 900MX modules may be interconnected via the backplane ports to create either a single "treed" FDDI network or separate independent FDDI networks in a single hub.

The DECconcentrator 900MX comes in two models. The DEF6X-MA allows custom configuration of the media support for each port. The DEF6M-MA has all six front-panel ports preconfigured with ANSI MIC multimode optics.

Features

- Integrates FDDI into a single multi-technology (FDDI, Ethernet, Token Ring) manageable hub platform
- Flexibility to specify media on a per-port basis
- Front panel ports 1 and 6 and both backplane ports are software configurable to support either direct ring connection (A/B ports)or "treeing" (M ports)
- Media changes easily accomplished after initial installation by swapping Modular Media Connectors (MOD-PMD)

The DECconcentrator 900 MX requires a DEChub 900 MultiSwitch or a DEChub ONE docking station for power. The DECconcentrator 900 Software V1.0 comes preloaded in both models (DEF6X-MA and DEF6M-MA)

Ordering Information

DEF6X-MA	DECconcentrator 900MX without MOD-PMDs
DEF6M-MA	DECconcentrator 900MX preconfigured with six ANSI multi- mode MOD-PMDs (6 x DEFXM-AA)

Note: MOD-PMDs must be ordered to be installed in DEF6X-MA box. Order up to six per DEF6X-MA of any of the following:

DEFXM-AA	Multimode fiber ANSI MIC connector supporting up to 2 km
DEFXS-AA	Singlemode fiber ST connector supporting up to 40 km
DEFXU-AA	UTP copper RJ45 connector supporting up to 100 meters

DECmau 900TL

The DECmau 900TL is a Token Ring Multistation Access Unit (MAU)providing eight lobe ports for a star wired topology. Both 100-ohm shielded and unshielded twisted pair cabling are supported, as well as 150-ohm shielded twisted pair cabling (BN26T-03 adapter cable required) using RJ45 connectors. Ring-in/ring-out ports allow easy extension of the Token Ring network. The DECmau 900TL can be configured in a DEChub 900 MultiSwitch or as a standalone module.

Features

- Supports 4 Mb/s and 16 Mb/s Token Ring networks
- Automatic speed detection allows stations to insert into a ring only if at the same ring speed
- Ring Autowrap eliminates ring failure due to device or cable failure
- IEEE/802.5 and IBM Token Ring compatibility
- Standalone version is 19-inch rack-mountable with H9544-MS mounting bracket

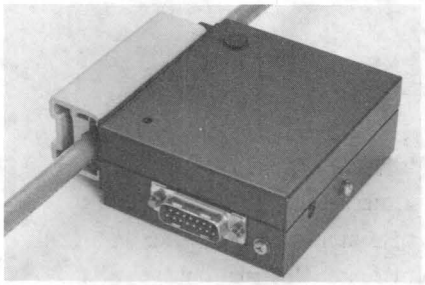
DECmau 900TL *(continued)*

Ordering Information

DTMAU-**	DECmau 900TL with DEChub ONE docking station and power supply
DTMAU-MA	DECmau 900TL for DEChub 900

** AA = U.S.; AD = Denmark; AE = U.K.; AI = Italy; AK = Switzerland; AT = Israel; AX = Central Europe; AZ = Australia; BJ = India

DELNI (Digital Ethernet Local Network Interconnect)



The DELNI (Digital Ethernet Local Network Interconnect) is a complete Ethernet implementation in a single desktop-sized device. The DELNI can take the place of Ethernet coaxial cable and eight separate Ethernet transceivers. It can be used by itself, or as an economical addition to an existing network. It is customer installable. Systems, communications servers, and bridges—up to eight Ethernet devices—can be connected to the coaxial cable through a single Ethernet transceiver. If there are more than eight systems, connect the first DELNI to eight additional DELNI devices and link 64 Ethernet stations in a single data center. If used in this configuration, the DELNIs cannot be connected to an Ethernet backbone cable.

Ordering Information

The U.S. version of the DELNI does not require a country kit. Each non-U.S. version of the DELNI requires one country kit which contains installation instructions and power cord. If the country in which the DELNI is to be used is not listed, select a country kit that uses the same plug configuration. Each node connected to a DELNI requires an 802.3/Ethernet communications controller and transceiver cable. (For DELNI-connected configurations, an H4005 transceiver and transceiver cable are needed.)

DELNI-BA	DELNI U.S./Canada
DELNI-BB	DELNI Non-U.S.

Country Kits

DELNK-AZ	Australia
DELNK-AB	Belgium
DELNK-AQ	Canada (English)
DELNK-AC	Canada (French)
DELNK-AD	Denmark
DELNK-AF	Finland
DELNK-AP	France
DELNK-AH	Holland
DELNK-AI	Italy
DELNK-AN	Norway
DELNK-AS	Spain
DELNK-AM	Sweden
DELNK-AL	Switzerland (German)
DELNK-AK	Switzerland (French)
DELNK-AE	United Kingdom
DELNK-AG	Germany

Ethernet Over Cable TV

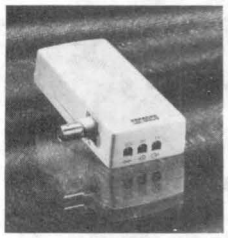
ChannelWorks products are specialized Ethernet bridges and routers that allow computer systems to connect to a standard Ethernet or the Internet over existing cable TV wiring.

- Supports community-wide connection of digital multimedia networks at roundtrip distances of up to 70 miles via cable TV
- Conforms to IEEE 802.1 (D) spanning tree protocol (bridge product)
- Provides Internet Routing (router product)
- Provides SNMP network management for easy configuration and maintenance
- Supports single and dual cable plants
- Offers security to allow multiple users in the same RF channel

Ordering Information

DECTV-AA	ChannelWorks CATV/Ethernet bridge (North America)
DECTV-AB	ChannelWorks CATV/Ethernet bridge (International)
DECTV-CA	ChannelWorks Internet Brouter (North America)
DECTV-CB	ChannelWorks Internet Brouter (International)

H4005 Transceiver (Ethernet)



The H4005 is a nonintrusive tapping transceiver that provides a physical and electrical connection to a 10-Mbit-per-second IEEE 803.2 "thick" local area network coaxial cable. The H4005 connects to the standard Ethernet coaxial cable via a removable tap assembly. This is the same tap assembly used on the older H4000. This product complies with the IEEE 802.3 specification and can interface to both 802.3 and Ethernet station controllers. The H4005 is a less costly, smaller replacement for the H4000 model. It contains the necessary electronics to send and receive signals at 10 Mbits per second, detect the occurrence of collisions and provide electrical isolation between the coaxial cable and the station. The H4005 is compatible with all products except the DEREP, which requires the H4000.

Ordering Information

H4005-00 IEEE 802.3/Ethernet transceiver

Installation Tool Kit (**12-24664-02**). The kit includes all the components necessary to install the H4005.

Twisted-Pair Media Access Unit

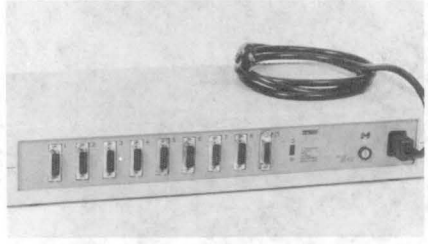
Digital's Twisted-Pair Media Access Unit (MAU) provides twisted-pair connectivity for any device that is equipped with a standard AUI 15-pin interface. This compact MAU can be used to connect a 802.3/Ethernet device to a 10BaseT repeater or to the DEChub 90.

The DETPM-AA connects directly to the AUI port without requiring an AUI cable. It provides extensive diagnostic information via seven LEDs that indicate collision, transmit data, receive data, SQE, power, link integrity test, and receive polarity. This Twisted-Pair MAU also has switches to enable and disable the SQE and link integrity test functions.

Ordering Information

DETPM-AA Twisted-Pair Media Access Unit

ThinWire Media Access Unit



The IEEE 802.3 ThinWire Media Access Unit (MAU) provides ThinWire connectivity for any device that is equipped with a standard AUI 15-pin interface. It can be used to connect an 802.3/Ethernet device to a 10Base2 repeater or to the DEChub 90.

The DECXM-AA connects directly to the AUI port without requiring an AUI cable. It provides extensive diagnostic information via five LEDs that indicate collision, transmit data, receive data, SQE, and power. This ThinWire MAU also has a switch to enable and disable the SQE test function.

Ordering Information

DECXM-AA ThinWire Media Access Unit

Fiber Media Access Unit

Digital's Fiber Media Access Unit (MAU) provides fiber Ethernet connectivity for any device that is equipped with a standard AUI 15-pin interface. This compact MAU can be used to connect an 802.3/Ethernet device to a 10BaseFL or FOIRL-compliant repeater or hub.

The DEFLM-AA connects directly to the AUI port without requiring an AUI cable. It provides extensive diagnostic information via seven LEDs which indicate collision, transmit data, receive data, SQE, power, link integrity test, and jabber. This Fiber Media Access Unit also has a switch to enable and disable the SQE and link integrity test functions.

Ordering Information

DEFLM-AA	Fiber Media Access Unit

DEC SNA Domain Gateway for Channel Transport (-CT)

Digital offers a family of Digital and IBM internetworking products that provide information exchange and resource sharing between DECnet, OSI, TCP/IP, and SNA environments. All family members support Multiple Virtual Storage/System Product (MVS/SP) and Multiple Virtual Storage/Extended Architecture (MVS/XA), Virtual Machine (VM, both /SP and /XA), and Virtual Storage Extended/System Product (VSE/SP) operating systems.

The newest member of the family, the DEC SNA Domain Gateway for Channel Transport (Domain Gateway-CT) is a functional software enhancement to the DECnet/SNA Gateway-CT. Its increased functionality allows IBM 3270 users connected to an IBM SNA environment to access Digital systems, services, and applications as though they were another SNA service.

The Domain Gateway-CT is a Physical Unit (PU) Type 5, while the other DECnet/SNA Gateway family members are PU Type 2.0. Used in conjunction with DEC SNA 3270 Application Services layered software*, the Domain Gateway-CT provides optimum performance in the following situations:

- For high-volume, high-production environments
- When there is a need for IBM 3270 terminal users and PC users to log onto applications on the VAX
- offload IBM mainframe application development and write programs in an
- OpenVMS environment

Features

- As a PU Type 5 SNA node, the Domain Gateway-CT allows OpenVMS-based applications to take on the role of primary logical units when communicating with IBM applications. This effectively enables a 3270 user to log onto an OpenVMS application.
- Provides bidirectional access between DECnet and SNA networks.
- The Domain Gateway supports 1,020 sessions and a maximum of 1,024 logical units.
- High-performance IBM S/370 channel attachment supports greater concurrent sessions and provides the highest throughput of any DEC SNA transport product.

Prerequisites

Hardware

- Any VAX, MicroVAX, or VAXstation configuration as specified in "Ordering Information" can act as the load host)
- S/370 bus and tag cables (terminators if appropriate) for connection into theIBM system.
- A suitable connection to the user's Ethernet LAN.

Software

For the load host that will downline load the DEC SNA Domain Gateway-CT software:

- OpenVMS operating system V5.4 or greater
- DECnet/OSI

DEC SNA Domain Gateway for Channel Transport (-CT) *(continued)*

Ordering information

DESNB-CA	Domain Gateway-CT Package (U.S.), includes: Channel Server II hardware (DESNB-AA), Domain Gateway-CT software license (QL-MKHA9-AA), DEC SNA 3270 Application Services (includes two concurrent-use licenses, QL-MKJAA-3B)
QP-LBRAA-01	DEC SNA Domain Gateway Package, same as above without ChannelServer II hardware (to upgrade DECnet/SNA Gateway-CT to Domain Gateway-CT)
QL-MKHA9-AA	DEC SNA Domain Gateway software license only
QA-MKHAA-Hx	DEC SNA Domain Gateway software media and documentation

x = 5 for TK50, M for 1600-bit/inch magtape

Notes:

- All Digital-to-IBM SNA gateway products require installation of appropriate DECnet/SNA access routine and/or programming interface software on host systems that will use the gateway. These products provide such functions as terminal and printer emulation, bidirectional data transfer, mail exchange, and remote job entry. Refer to the Networks Buyers Guide for more information.
- Gateway orientation and installation service is required with first purchase of any Digital-to-SNA gateway if installation is to be warranted or supported by Digital.
- Digital-to-SNA gateways are configured and managed by the load host or other suitably configured node using the gateway management software which is part of all gateway packages.

Specifications

Physical Characteristics	
Height	67 cm (26.5 in.)
Width	53 cm (21 in.)
Depth	46 cm (18 in.)
Weight	32 kg (80 lb)
Power Requirements	
Input voltage	120 to 240 Vac
Frequency	50 to 60 Hz
Steady state current (maximum)	3.0 to 6.0 A
Power consumption (maximum)	320 to 345 W
Environmental class	A

CX Asynchronous Communications Controllers (Q-bus)

The CX communications controllers provide asynchronous communications for Q-bus systems in BA4xx or BA2xx (VAX 4000, Q-bus MicroVAX 3xxx and Q-bus DECsystems) series system enclosures. The controllers operate at speeds to 38.4 Kbits per second per line, and transmit data using either Direct Memory Access (DMA) or programmed output.

The CXY08 provides eight EIA-232-D communications lines to terminals, modems, or serial printers. All lines support full modem control, which permits point-to-point dial-up or leased-time operation. The CXA16 provides 16 EIA-423 (Digital implementation) lines for data-only connections (no modem control) using the DECconnect modular plug connectors. The CXB16 provides 16 EIA-422 communications lines for data-only connections (no modem control).

Ordering Information

CXY08-AA/AF	8-line EIA-232-D asynchronous controller with modem control; factory/field installed
CXA16-AA/AF	16-line EIA-423 (Digital implementation) asynchronous controller(data only); factory/field installed
CXB16-AA/AF	16-line EIA-422 asynchronous controller (data only); factory/field installed

Configuring Information

Option	Q-Bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
CXY08-AX	1	1.64	40	12.94	3.0	0.5
CXA16-AX	1	1.60	20	10.40	3.0	0.5
CXB16-AX	1	2.00	0.0	10.00	3.0	0.5

Note: For information regarding modules used in systems not listed, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DSV11 Synchronous Controller (Q-bus)

The DSV11 is a two-line synchronous interface that provides up to 256-Kbit-per- second wide area network capability for standalone VAX Q-bus systems. The module supports the DDCMP, HDLC, and SDLC protocols at speeds up to 256 Kbits per second for one-line-only operation, and speeds up to 64 Kbits per second per line for two-line operation. The bisync protocol is also supported at speeds up to 9.6 Kbits per second per line, regardless of whether one or two lines are operating.

For VMS systems, DECnet-VAX, VAX P.S.I., VMS/SNA, VAX 2780/3780 P.E. and VAX 3271 P.E. software products support the DSV11 module. (Refer to the Networks Buyer's Guide for more information about these products.) Several combinations of these software products can share the DSV11, with one product controlling both lines, or one product controlling one line while another product controls the second line.

DSV11 Synchronous Controller (Q-bus) *(continued)*

The following table lists the software combinations that can control the DSV11 and the maximum line speeds they support.

Communications Application (speed/line)	Communications application running on the second line (speed/line)				
	DECnet 64 Kb/s[1]	VMS/SNA 64 Kb/s	VAX P.S.I. 64 Kb/s	VAX 2780/3780 P.E. 9.6 Kb/s	VAX 3271 P.E 9.6 Kb/s[2]
DECnet-VAX 64 Kb/s	Yes	Yes	Yes	Yes	Yes
VMS/SNA 64 Kb/s	Yes	N/S[3]	Yes	Yes	Yes
VAX P.S.I. 64 Kb/s	Yes	Yes	Yes	Yes	Yes
VAX 2780/3780 P.E. 9.6 Kb/s	Yes	Yes	Yes	Yes	Yes
VAX 3271 P.E. 9.6 Kb/s	Yes	Yes	Yes	Yes	Yes
DECnet-ULTRIX 64 Kb/s	Yes	N/A	N/A	N/A	N/A
X.25 NATIVE MODE 64 Kb/s	Yes	N/A	N/A	N/A	N/A

[1] Supports 1-line operation at 256 Kb/s if the second line is unused.
[2] 19.2 Kb/s is supported for some configurations. Refer to VAX 3271 P.E.Software Product Description, 25.21.
[3] VMS/SNA does not support two DSV11 lines.

For ULTRIX systems, DECnet-ULTRIX and X.25 native mode support the DSV11 module through the WAN device drivers for ULTRIX.

Ordering Information

DSV11-SA/SF	Controller for VAX 4000, Q-bus MicroVAX 3xxx and DECsystem 5500 systems. Includes OpenVMS V5.0 driver software kit with TK50 media, software license, one EIA-232 and one V.35 adapter cable, and documentation. Cabinet kit not required. Factory/field installed.
DSV11-SB/SG	Adapter cable option only. No software or documentation. Cabinet kit not required. Factory/field installed.

Note: For multiple DSV11s on one system, order one DSV11-SA/SF for the first DSV11. Order DSV11-SB/SG for additional DSV11s (maximum five DSV11s per system).

Configuring Information

Option	Q-Bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DSV11-SX	1 quad slot	5.43	0.69	35.43	3.9	1.0

DEC WANcontroller 720 Synchronous Controller (TURBOchannel)

The DEC Wide Area Network Controller 720 (DEC WANcontroller 720, DSYT1) is a high-speed synchronous communication processor for Digital's TURBO- channel RISC-based DECstation and DECsystem product set. The DSYT1 enables standalone RISC workstation users to conveniently and economically establish peer-to-peer communications with DECnet OSI, SNA, TCP/IP, and X.25 processing environments.

The DSYT1 contains two synchronous ports that can operate at speeds up to 64 Kbits/second simultaneously (with like or unlike protocols), or one port can operate at up to 2.048 Mbits/second for T1 or E1 clear-channel communications over leased telephone lines (external DSU/CSU required). Both HDLC/LAPB and SDLC protocols are supported at these speeds.

The operation of the DSYT1 is supported by the optional ULTRIX Wide Area Network Device Driver (WANDD). TCP/IP users may interface directly to the ULTRIX WANDD or access X.25 wide area networks with the X.25 Native Mode software. This enables users of Digital's TURBOchannel RISC-based DECstations and DECsystems to use electronic mail, access remote applications, or transfer image files with systems from other vendors such as Sun, HP or IBM who also implement TCP/IP over X.25. Similarly, users can utilize other connectivity and interoperability layered software products available from Digital to connect to DECnet OSI and SNA environments for interactive access, information transfer, database access, or communications between cooperating applications.

Ordering Information

DSYT1-AB	DEC WANcontroller 720. Two-port synchronous communications option for ULTRIX RISC DECsystems and DECstations. Single-width option that requires one TURBOchannel slot.

External Cables

BC19B-02	EIA-232-D/V.24 adapter cable (Extend with BC22F-xx)
BC19D-02	EIA-422-A/V.11 adapter cable (Extend with BC55D-33)
BC19E-02	EIA-423-A/V.10 adapter cable (Extend with BC55D-33)
BC19F-02	V.35 adapter cable (Extend with BC19L-25)

Software

The DSYT1 is supported by the ULTRIX operating system, V2.4A or higher.
Required Layered Software

QL-YMJA8-AA	Software media and documentation kit (* = media type; 5 for TK50, 8 for CD-ROM).
QA-YMJAA-H*	ULTRIX Wide Area Network Device Driver, V2.1 or higher.

DMB32 Multifunction Controller (VAXBI)

The DMB32 is a host-based 8-line multifunction intelligent communications controller that enables a combination of modems and terminals to communicate with Digital's VAXBI processors. The DMB32 operates at speeds up to 38.4 Kbits per second per asynchronous line (under specified conditions) with full modem control. One synchronous line supports message framing, CRC generation, and checking with full modem control of the following protocols: HDLC, SDLC, IBM BISYNC, DDCMP, and GEN BYTE. Parallel printer line supports a wide range of Digital parallel printers. An optional adapter cable is required if the synchronous driver is ordered for use on the DMB32 50-pin D-subminiature connector.

Prerequisite Hardware

Any valid VAXBI system configuration. NOTE: Up to three DMB32s supported in VAX 7000/VAX 10000 VAXBI plug-in unit—total nine per VAX 7000/10000 system (six per VAX 10000 system when battery cabinets are used).

DMB32 Multifunction Controller (VAXBI) *(continued)*

Ordering Information

DMB32-M	Includes base module only.
CK-DMB32-LJ	For use with VAX 6000 series internal and external VAXBI channels and VAX 7000/VAX 10000 VAXBI plug-in units.

Software

QL-VAWA9-AA	ULTRIX WAN Device Driver software license (ULTRIX)
QL-YMKA9-AA	VAX WAN Device Driver software license (VMS)

For systems running OpenVMS V5.0, the VAX Wide Area Network Device Drivers are required to use the DMB32 synchronous port. For ULTRIX systems, the ULTRIX WAN device drivers are required. License options for system device drivers are as follows. A license is required for each CPU.

QA-VAWAA-H5	Media (TK50) and documentation kit (VMS)
QA-YMKAA-H5	Media (TK50) and documentation kit (ULTRIX)
QA-VAWAA-HM	Media (magtape) and documentation kit (VMS)
QA-YMKAA-HM	Media (magtape) and documentation kit (ULTRIX)

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	–12 V	–5.2 V	–2 V		
DMB32	1 VAXBI slot	6.75	0.29	0.42	0.0	0.0	1	4

DRB32 Parallel Interface (VAXBI)

The DRB32 is a high-speed (up to 6.7-Mbyte-per-second)asynchronous DMA parallel interface to the VAXBI. The DRB32 uses a 32-bit half-duplex bidirectional I/O path to transfer data to and from the user device and two 8-bit unidirectional paths for control data. A dual register set permits ``limitless'' data transfers. One version is ``subset'' compatible with the DR11-W providing a UNIBUS migration path to the VAXBI. Supplied software is generic and may be modified for user applications.

Ordering Information

Hardware

DRB32-M	VAXBI parallel interface; connects to user device within the same cabinet system as the VAXBI system.
DRB32-W	Module with subset of DR11-W functionality plus DRB32-M; connects to user device within the same cabinet system as the VAXBI system.
DRB32-E	Longline module plus DRB32-M; connects to user device or another DRB32-E up to 12 meters (40 feet) outside the system cabinet; a BS17Y external cable must be ordered separately.

DRB32s include base option module(s) only and require following cabinet kit.

CK-DRB32-LJ	Cabinet kit with 5-foot (1.5-meter) cables for VAX 6000 series system cabinets, VAX 9000 VAXBI expansion cabinets, H9657 VAXBI expansion cabinets, and VAX 7000/VAX 10000 plug-in units.

DRB32 Parallel Interface (VAXBI) *(continued)*

Ordering Information *(continued)*

Software

DRB32 VMS software is included in one package. Customers need to purchase the package only once in order to modify the code to support their unique devices. No other software or licenses are required.

QB-VF5A9-Yx VMS V5.0 drivers and sources for DRB32-M/-E and DRB32-W and AA-HX25C-TE manual (CPU cross product).

Note: x denotes media type: 5 = TK50; M = magtape
VAX 6000 requires OpenVMS V5.0--V5.5 and DRB32 driver V4.0 or OpenVMS V6.0 and DRB driver V5.0. VAX 7000/VAX 10000 requires OpenVMS V6.0 or later and DRB32 driver V5.0. For testing diagnostics and IVP on VAX 7000/VAX 10000, software is required.

Documentation

The VAXELN V3.1 (or later) toolkit includes DRB32-M/E and DRB32-W drivers. The DRB32 is also supported by VAX Realtime Accelerator (VAX RTA) products.

EK-DRB32-OV Introduction to the DRB32 Adapter; ordered separately. Provides enough information for a make/buy decision.

EK-DRB32-TM DRB32 Technical Manual; ordered separately. Hardware specifications.

EK-DRB32-IN DRB32 Installation Guide; ordered separately.

AA-HZ25C-TE DRB32 Programmer's Reference Manual; ships with VMS drivers, ordered separately. Software specifications.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	–12 V	–5.2 V	–2 V		
DRB32-M	1 VAXBI slot	8.0	0.0	0.0	0.0	0.0	1	N/A
DRB32-E	2 VAXBI slots	9.8	0.0	0.0	0.0	0.0	1	2
DRB32-W	2 VAXBI slots	11.8	0.0	0.0	0.0	0.0	1	N/A

Note: The DRB32-M and DRB32-W must be installed with the user's device in the same Digital-approved cabinet system. The DRB32-E is used to drive signals external from the cabinet. Total cable length must be less than 50 feet (15 meters).

The number of DRB32s that can be put into a system depends on the system configuration and the planned application. For VAX 6000 series systems, two DRB32s are supported on each VAXBI; up to eight DRB32-Ms, DRB32-Es, or DRB32-Ws can be configured. For VAX 7000/VAX 10000 systems, up to two DRB32s supported per VAXBI channel, eight per system.

Many customers need to design interfaces that adapt their unique devices to the DRB32. If these interfaces plug into the VAXBI backplane next to the DRB32, the customer should obtain a VAXBI license and the VAXBI technology tools that will ensure a design with mechanical and electrical integrity.

BS17Y Cable

The BS17Y is a set of three fully shielded cables designed for use with the DRB32-E. Each cable in the set has 25 controlled impedance twisted pairs.

Ordering Information

BS17Y-20 External cable for DRB32-E—20 feet (6 meters)

BS17Y-40 External cable for DRB32-E—40 feet (12 meters)

Specifications

- Conductors: 50 (25 twisted-pair) 50-position, molded, D-subminiature male connector on each end
- Gauge-conductors: 28-AWG-stranded
- Shield: Foil with braid
- Wiring: Point-to-point

DRQ3B Parallel Interface (Q-bus)

The DRQ3B is a high-performance Q-bus parallel I/O interface designed for realtime data collection or for high-speed interprocessor communications between Q-bus systems. With its two independent 16-bit parallel channels, the DRQ3B can receive or send data or do both concurrently at up to 1.2 Megawords per second total throughput (2.4 Mbytes per second) in extended block mode. Its double buffering capability allows the DRQ3B to transfer data continuously up to this maximum rate. To enhance its realtime performance, the DRQ3B provides a 512-word FIFO buffer on each channel. The DRQ3B supports program-controlled transfers and single-cycle, burst-mode, and block-mode DMA (direct memory access)transfers. These features make the DRQ3B perfect for demanding I/O applications such as data telemetry, simulation, structural and performance testing, seismic data collection, and high-speed graphics display and imaging. NOTE: On VAX 4000 platforms, single cycle and block mode transfers are supported. Burst mode, transfer-with-compare, memory-to-memory, chaining and extended block mode transfers are not supported.

Ordering Information

Hardware

DRQ3B-SA/SF High-speed 16-bit parallel DMA interface with documentation. Factory installed in VAX 4000 Model 300 and Q-bus MicroVAX 3000 series systems. Processing constraints may preclude option usage on workstations except when workstations are lightly loaded. Cabinet kit not required. Software driver must be ordered separately. Factory/field installed.

Note: Only one DRQ3B is supported on each VAX 4000 system.

Cables

BC19T-XX Cable for connecting the DRQ3B to a user device or to another DRQ3B. Two BC19T cables must be ordered for each DRQ3B module. Both 25- and 50-foot lengths available(equivalent to 7.6 m and 15 m).

Software

QA-0APAA-H5 MicroVAX/DRQ3B device driver binaries and documentation on TK50 media (license must be ordered separately).

QA-0APAA-GZ MicroVAX/DRQ3B device driver documentation.

QL-0APAx-AA MicroVAX/DRQ3B single-use binaries, license without warranty. x = processor code.

Configuring Information

Option	Q-Bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DRQ3B-SX	1 quad slot	4.5	0.0	22.5	2.0	0.5

Note: For more information contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DRV1J Parallel Interface (Q-bus)

The DRV1J is a parallel line interface with four programmable ports, each containing 16 I/O lines. It will also accept up to 16 external interrupt requests, a capability that makes it useful for realtime response in sensor I/O applications.

Features

- Four 3-state, 16-bit parallel I/O ports
- User-assigned device addresses
- Accepts up to 16 external interrupt requests
- Programmable interrupt vector addresses
- Program-controlled input/output operations
- Programmable operating modes:
  - interrupt controller mode: interrupt-driven
  - priority modes: fixed or rotating
  - vector address selection: individual or common vector
- Can drive up to 25 feet (7.6 meters) of shielded cable and 6 feet (1.8 meters) of unshielded flat or round cable

Ordering Information

DRV1J-SA/SF	64-line parallel interface for VAX 4000 and Q-bus MicroVAX 3000 series systems. Support available in Realtime Test Integrator(RTI). Factory/field installed.
BS04M-12	Cable connecting user devices to the DRV1J-SA/SF.

Configuring Information

Option	Q-Bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DRV1J-SX	1	1.80	0.00	9.0	2.0	1.0

Note: For information regarding modules used in systems not listed, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DRV11 and DRV1W Interfaces (Q-bus)

The DRV11-WA and DRV1W-SA/SF are general-purpose 16-bit parallel direct memory access (DMA) interface modules for Q-bus systems. Each offers 22-bit addressing capability and permits data transfers at rates up to 250K words per second in single cycle mode and up to 400K words in burst mode. Useful for connecting to high-speed user devices or an interprocessor communications link between Q-bus VAX or PDP-11 systems. A device driver is included in VMS V4.4 and later. An ULTRIX driver is also available; see SPD 32.91.

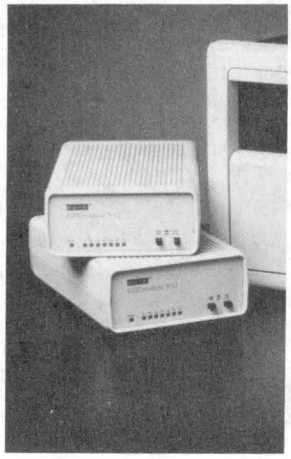
Ordering Information

DRV1W-SA/SF	General-purpose 16-bit parallel DMA Q-22 interface module. Installed in BA4xx or BA2xx series enclosures. Cabinet kit not required. Requires two BC06M-20 or BS06M-21 cables; factory/field installed.
DRV11-WA	General-purpose 16-bit parallel DMA Q-22 interface module for the BA23 or BA123 enclosures. Requires two BC08R (or equivalent) cables to connect to user device. Includes base option module only. Requires one of the following cabinet kits.
CK-DRV1W-KA	Cabinet kit for use with BA23 enclosure; 38-cm (15-inch)cable.
CK-DRV1W-KF	Cabinet kit for use with BA123 enclosure and H9642 cabinet; 91.4-cm (36-inch) cable.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn		
		5 V	12 V		ac	dc	
CK-DRV1W-KX	N/A	N/A	N/A	N/A	N/A	N/A	B
DRV1W-SX	1 quad slot	1.8	0.0	9.0	2.0	1.0	N/A
DRV11-WA	1 dual slot	1.8	0.0	9.0	2.0	1.0	—

DECmodem V32



The DECmodem V32 offers both desktop and rackmount options with asynchronous and synchronous modes of operation at speeds of 9600, 4800, 2400, or 1200 bits/s over dial-up or leased lines. A complete security system, greater adaptable speed capabilities and enhanced error correction make the DECmodem perfect for high-performance communications needs. In addition to the Digital Modem Command Language (DMCL), it supports the Hayes AT command set for more experienced users.

HELP screen displays make operating the DECmodem a simple procedure. By selecting a command, the following features may be activated:

- Modem setup parameters can be uniquely defined and stored
- Remote access option enables Digital Services personnel to examine or change the modem's setup parameters, dial memory, and/or callback memory without an on-site visit
- Access security allows only authorized personnel to access the modem parameters list, dial memory and callback memory locations
- Callback security screens all incoming calls, whether manual or auto-answered before allowing access to the host system
- Enhanced auto-dialing enables storage of up to 99 telephone numbers, including credit card numbers
- Self-test diagnostics allow the modem to check its own internal logic when the power is turned on. It is also equipped with remote diagnostic capability
- Rackmount version provides automatic dial backup capability; if there is a failure in a leased line connection, it switches to a dial-up line

Ordering Information

DF296-DA	DECmodem V32 Desktop
DF196-DM	DECmodem V32 Rackmount Module

Note: For more information, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DSU/CSU (Data Service Unit/Channel Service Unit)

The DSU/CSU is analogous to a modem, but is used to connect to Dataphone Digital Service (DDS) and T1 digital communication facilities. This family of high-speed digital data communication equipment is manufactured by Dowty Information Systems.

The Multirate DSU/CSU operates at switch selectable speeds of 2,400, 4,800, 9,600, 19,200, and 56,000 b/s over DDS lines. This desktop unit is used in synchronous, point-to-point applications through a V.35 interface.

The T1 ESF (Extended SuperFrame) DSU/CSU is a desktop unit that operates at a speed of 1.544M b/s and it uses a DS-1 interface. It provides connection to conventional T1 services or T1 ESF facilities.

Features

- Increased performance with high-speed throughput (DDS or T1 speeds)
- LDM (Limited Distance Modem) capability to enable local connection through customer premise wiring
- Elastic buffering for jitter immunity
- Automatic adaptive equalization to compensate for cable lengths
- Built-in diagnostics to help isolate network problems

Ordering Information

DFD01-AA	Multirate DSU/CSU, desktop
DFD03-AA	T1 ESF DSU/CSU, desktop

DECfax Mail for OpenVMS

DECfax Mail for OpenVMS integrates fax and electronic mail so that users can send and receive fax messages from their preferred mail environment, using their normal mail screens. To send a fax, the user simply sends the message to the addressee's name and fax number. DECfax Mail captures the message and transmits it through the telephone network to the addressee's fax device.

Inbound fax messages are received through a fax modem and placed in the account of a DECfax Mail operator who displays the fax on a terminal to identify the addressee. The operator can then print the fax or forward it as a mail message to the recipient.

Features

- DECfax Mail handles pictures, text, and graphics, including PostScript, WPS-PLUS, DDIF, text, sixel, DX, DOTS, DTIF, TIFF, WordPerfect, Microsoft Word, and RTF files
- Compound Document Architecture (CDA) converts each type of file individually to fax format, incorporates it as a single fax, and then sends it
- Fax files can be sent from ALL-IN-1, DEC MAILworks, VMS Mail and DECwindows Mail, as well as, CC:Mail, Microsoft Mail, and Word for Windows
- Full compliance with MAILbus ensures support for enterprise-wide networks; standalone configurations for small workgroups or LANs are also supported
- Multiple fax lines can be used for redundancy or for ensuring confidentiality for individual groups
- By using the "defer send" feature in electronic mail, DECfax Mail will send messages after hours to take advantage of off-peak telephone rates
- A DCL interface can be used so, as an example, an invoicing application may call DECfax Mail and fax invoices rather than print them
- Installation is simple to implement, and support needs are minimal because the user's environment is hardly affected
- Log files are provided that trace messages and supply accounting information to allocate charges among users

Prerequisites

Hardware: A fax modem connected to a terminal server port with modem control is required. The Dataplex fax modem is supported in the U.S. and the South Pacific. The Hasler fax unit is supported in Europe. The Murata fax machine is supported in some countries.

To receive incoming fax messages by an operator, a workstation or a DECwindows terminal running DECwindows Motif is recommended, although a PC running an X Windows can be used. While the DECwindows environment is preferable, a sixel terminal (VT340) is sufficient. In this case, the operator interface is run from a DCL command line.

Software: Works on any VAX system running OpenVMS V5.5. DECwindows Motif V1.1 required for operator workstation. Refer to SPD 41.69.

Ordering Information

DP311-xx Dataplex fax modem and DECfax Mail initial line license

DP321-xx Dataplex fax modem and DECfax Mail additional line license

xx = AA for U.S./Canada; AZ for Australia; BZ for New Zealand

Software

QA-05TAA-Hx DECfax Mail media and documentation

x = media type: 5 for TK50 and M for magtape.

Cable

BC22E-02 EIA-232-D cable connects Dataplex and Hasler modems to terminal server

DECvoice

Product Description

DECvoice, Digital's voice-processing platform, provides flexible and powerful OpenVMS VAX products for implementing voice response applications that use standard telephone facilities. A DECvoice computer system can answer or originate phone calls, give menu choices, receive or generate Touch-Tone signals, and transfer calls. With DECvoice, applications that incorporate three different voice technologies—digitized voice, synthesized voice, and voice recognition—can be developed to automate telephone handling.

Digitized Voice—DECvoice can record, store, and play back human speech using the same digitizing principles as a high-quality compact disc recording. DECvoice can also create high-quality digitized speech messages from ASCII input by seamlessly joining word or phrase "snippets" drawn from a pre-recorded digitized library.

Speech Synthesis—For voice applications that must compose messages from a set of words that is too large to pre-record, speech synthesis can be employed. DECvoice can access a mainframe database and read the contents of an ASCII file to a caller, using DECtalk, the industry's leading text-to-speech technology. Also, the correct pronunciation of non-English surnames and geographical names, which is a problem for most synthesizers, is enhanced with the DECvoice software. For names that retain foreign pronunciation, DECvoice can analyze the spelling to determine the language of origin and will use the pronunciation rules of that language.

Speech Recognition—DECvoice's numeric speech recognition capability can let a voice application accommodate any caller, including those with rotary-dial phones, by allowing them to speak menu choices or access numbers. DECvoice can recognize and respond to the numbers "zero" through "nine," "oh" (a zero substitute), "yes" and "no" on a speaker-independent basis. Voice recognition can be either isolated-word (a prompt or pause separates each word) or continuous-word with optional software. DECvoice can also be trained to recognize a larger library of words for a specific person or persons.

The basic DECvoice product consists of a Q-bus modular subsystem plus supporting software that is designed to be used with the VAX 4000 family of computers. A DECvoice subsystem contains one telephony card and one or more voice-processing cards, depending on the number of phone lines supported. The telephony card provides the interface to the telephone system (either a PBX or a telephone company Central Office) and can accept up to 72 simultaneous phone conversations in the T1 format. The telephony card also routes each call to one of the voice-processing cards in the DECvoice subsystem which provides the digitization, synthesis, or recognition.

Voice-processing cards can be configured as multiline or single-line voice technology resources. In multiline mode, a voice-processing card can perform the digitized speech portion of an application for up to eight simultaneous calls. In single-line mode, cards can also support voice synthesis or recognition for one call at a time. Applications that require a mixture of these voice technologies usually have a combination of multiline and single-line voice-processing cards in the DECvoice subsystem.

At the direction of the application program, the telephony card will transparently switch a call between different voice-processing card configurations to handle the various voice technology requirements of each segment of the call. The voice-processing cards can be reconfigured by the software to change the mix of resources as load conditions change.

DECvoice requires a T1 interface to the Private Branch Exchange (PBX) or to the telephone company's central office. Signal framing can be either D3/D4 or ESF; selectable under software control. If phone lines are only available from a PBX in analog form, a channel bank is required to convert up to 24 analog lines to a digital T1 line. DECvoice will accept up to three T1 lines for a total of 72 phone lines.

DECvoice *(continued)*

A variety of telephone signaling techniques are available on a per-channel basis under software control, including E&M, FXO/FXS and DPO/DPT. Flash-hook signaling as well as DTMF (Touch-Tone) frequencies, including military extensions, can be generated or detected. DTMF or pulse dialing can be selected on a per-channel basis for outdialing applications.

DEC VOICE:mail is a full-functioned voice messaging system that combines the functionality of a sophisticated voice receiving, sending, and management application with the power of a VAX computer to efficiently manage voice mail services.

Based on VAX 4000 DECvoice platforms, the DEC VOICE:mail system enables customers to consolidate all separate and incompatible departmental voice mail "black boxes" into one powerful system that will serve all users on a single PBX. A single DEC VOICE:mail system can handle up to 72 telephone lines and more than 5000 voice mail users, depending on usage patterns and class of service. Furthermore, the DEC VOICE:mail system is fully compatible with other VAX systems.

DEC VOICE:mail provides users with a personal voice mailbox for:

- 24-hour telephone answering in user's voice, providing a variety of pre-recorded personal greetings
- Easy transmission of messages and other voice information between users, including the creation of distribution lists for group messages
- Worldwide access to messages from any Touch-Tone telephone
- User-defined folders that allow categorizing and saving messages for future use and reference
- Selective review feature that lets users choose type of messages they want to hear, such as messages from a specific caller or messages stored in a particular folder
- Message forwarding to any telephone, including cellular phones and pagers
- DEC VOICE:mail has the ability to call the user at any designated telephone number or pager for notification that a new message has been received
- Message editing, which allows users to review and modify a message before sending it out
- Call management, which allows users to control incoming calls. This feature includes call screening, call blocking, and call forwarding
- Class of Service feature which allows the voice mail manager to selectively enable or disable any features for different users

DECvoice *(continued)*

Step 1—DECvoice Systems/DEC Voice:Mail Systems

DECvoice systems are available as prepackaged platforms for developing and deploying voice response applications. DEC VOICE:mail systems provide complete voice mail solutions which enable messages to be stored, archived, and manipulated.

DECvoice VAX 4000 Prepackaged Systems include

- VAX 4000 processor with embedded DSSI, 802.3/Ethernet (ThinWire/thick wire) and synchronous SCSI adapters
- BA42B desktop enclosure
- B400X-B9 pedestal or B401X-A9 rackmount expansion enclosure
- H9602-MK equipment cabinet (cabinet systems only)
- DTCN5 DECvoice Telephony card plus one or more DTC05 voice-processing cards
- 16, 32, 64, or 80 Mbytes of memory
- RF series 381-Mbyte disk
- Universal power supply; adjusts to 88–132 Vac or 176–264 Vac
- DECvoice on TK50 media
- DECvoice software license
- Hardware and software documentation

For prepackaged DECvoice or DEC VOICE:mail platforms based on the VAX 4000 Processors, contact your local Digital Sales representative.

Step 2—Software

Software media is on TK50; a load device must be ordered separately.

QA-VFUAA-H5	DECvoice software media and documentation
QL-VFUA9-Jx	DECvoice software license
QT-VFUA9-Lx	DECvoice Software Product Services
QL-0WBAA-3B	DEC VOICE:mail software license
QA-0WBAA-H5	DEC VOICE:mail media and documentation
QA-0WBAA-GZ	DEC VOICE:mail software documentation kit
QA-0WBAB-GZ	DEC VOICE:mail end user documentation kit
QT-0WBAA-DB	DEC VOICE:mail Software Product Services

Step 3—Continuous Word Recognition and Optional License

The DECvoice Continuous Word Recognizer is a separately licensed product that supplements the isolated word recognition capabilities of the base DECvoice software. The Continuous Word Recognizer documentation, binaries, and support are integrated into the base DECvoice distribution kit (QA-VFUAA-Hx).

QL-YFCAA-3B	Continuous Word Recognizer License

Step 4—Expansion Information

DECvoice VAX 4000 systems requires the Q-bus expansion box for the DECvoice modules. For pedestal systems use B400X-B9 pedestal enclosure. For rackmounted systems use B401X-A9 rackmount expansion enclosure.

DECvoice *(continued)*

Step 5—Configuration Information

Requirements for adding DECvoice components (field upgrades) to a VAX 4000 system:

- One Mbyte of memory per voice channel required; (e.g., one DTC05 module (eight channels) = 8 Mbytes of memory required.)
- Maximum number of DECvoice modules (DTC05s) and telephone lines supported:
  - VAX 4000 Models 500A/600A/700A: 11 DTC05s (up to nine modules support a maximum of 72 telephone lines in multiline mode)
  - VAX 4000 Models 100A/105A: 10 DTC05s (up to nine modules support a maximum of 72 telephone lines in multiline mode) **Note:** Each DECvoice module requires one Q-bus slot.
- Each system requires one T1 telephony module which requires one Q-bus slot.
- Each system requires a storage device for recorded voice files.
- Each system requires a load device for the DECvoice software.
- To order the DECvoice hardware subsystem, purchase one DTCN5-UG DECvoice starter kit (includes one DTCN5 T1 telephony module plus one DTC05 voice processing module), plus the number of additional DTC05-SA voice processing modules desired.

Prerequisites:

- T1 telephone line (installed by local telephone company)
- OpenVMS Operating System
- DECvoice software license
- DECvoice media and documentation kit
- Monitor/terminal required (order separately)
- Load device required (order separately)
- System integration may be required:
  - Telephone system (e.g., PBX integration)
  - Channel bank
- 64 Kbytes of Q-bus I/O space is required for each T1 module and DTC05 module installed in the system.
- Power and bus loading constraints may reduce the maximum DTC05 configuration.
- The DTC05/DTCN5 modules are not distributed, nor shareable across nodes in the OpenVMS Cluster. The module must reside locally on the processor that performs the calls to the DECvoice libraries.
- The performance of the realtime portions of the system is sensitive to processor, OpenVMS Cluster, and device-interrupt latency. Degradations will be noticed if the DTC05/DTCN5 interrupts are blocked by any other software and/or hardware in the system. A dedicated VAX system is recommended for optimal DECvoice performance.
- The following DECvoice implementation services are available:
  - PBX integration
  - Technical consulting
  - Configuration support
  - Training

DECvoice Configuring Information

	Q-bus Slots	dc Load	ac Load	+5 V	+12 V	Watts
DTC05-SA	1	.75	3.6	4.0	0.0	15.8
DTCN5-UG	2	1.5	7.0	7.17	0.0	35.8

DECvoice *(continued)*

DECvoiceBuilder Software

DECvoiceBuilder Software is a graphical voice application generator that enables users to develop telephone-based voice response applications. It makes it possible for an application to be developed or changed rapidly.

DECvoiceBuilder automates tasks by having the user create an application by building a network of functional objects representing the flow of the application. DECvoiceBuilder provides a low-cost method for producing multiple voice applications. This new capability allows both end user and OEM application developers to develop turnkey voice solutions for themselves or their customers in a short timeframe.

DECvoiceBuilder is a windows-based (Motif) tool that is used to create or modify applications. Objects are used to represent voice processing functions (i.e., answer the phone, collect DTMF keys). These objects are connected together into a network to represent the application. This becomes as simple as creating a flowchart. DECvoiceBuilder also contain its own recording studio. It lets the users record voice using a telephone, a microphone, or professionally recorded tape. The voice data is represented graphically which lets the users edit or cut and paste the voice.

Prerequisites

Hardware: Systems and/or hardware configurations as specified in the System Support Addendum (40.62.00-x).

Software: OpenVMS operating system

Layered products: DECvoice software (SPD 29.97.xx), VMS DECwindows Motif (SPD 36.09.xx), VAX C (SPD 25.38.xx)

Software Licenses

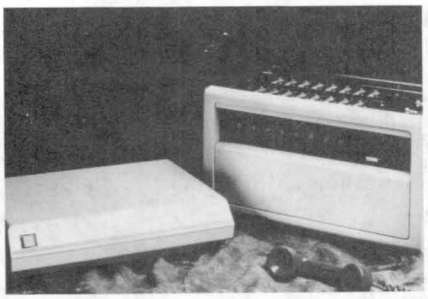
QL-MQ7Ax-xx	DECvoiceBuilder Application Editor
QL-MQAAx-xx	DECvoiceBuilder Recording Studio
QL-MQ9Ax-xx	DECvoiceBuilder Administrator
QL-MQ8A9-xx	DECvoiceBuilder Run-Time Library
QP-LBWAA-xx	DECvoiceBuilder Development and Production Package (includes all four of the above)
QP-LBVAA-xx	DECvoiceBuilder Run-Time Package (includes Administrator and Run-Time)

Software Media and Documentation

QA-MQ7AA-H5	DECvoiceBuilder Application Editor and Recording Studio
QA-MQ8AA-H5	DECvoiceBuilder Administrator and Run-Time

Note: For more information, contact your local Digital Sales representative or authorized reseller.

DECtalk Speech Synthesizers (Voice)



Digital's family of DECtalk speech synthesizers can convert ordinary ASCII text into spoken output, can control a telephone line, and can translate and transmit user DTMF input to the host.

Any ASCII computer can communicate with the DECtalk speech synthesizer using ordinary ANSI escape sequences. VMS-based applications can take advantage of the VMS-provided DECtalk programming interface, and the optional DECvoice Software name pronunciation support.

The DECtalk family includes two complementary products that cover many application and system requirements:

- The DECtalk-I DTC01 is a small, self-contained, single telephone line voice synthesizer intended for desktop use. DECtalk-I is ideal for small business applications that require system annunciators, and for interactive terminals and workstations. DECtalk-I includes a local speaker.
- The DECtalk-III DTC03 is a rackmount system that supports from two to eight telephone lines. DECtalk-III is the system of choice for environments that require dial-out audio call-progress detection capabilities, for computer room environments, and for applications that require a large number or a high density of telephone lines.

Features

- With any Touch-Tone telephone, DECtalk and the telephone keypad function as a terminal keyboard to control a host computer and access information
- Connects to the computer through a standard EIA-232-C serial line
- Ten voices and unlimited vocabulary
- User-defined dictionary with acronyms and industry-specific terms
- Self-contained, onboard diagnostics
- Sophisticated telephone-handling features
- Compatible with the DECvoice software name pronunciation support
- Dial-out audio call progress detection is standard on the DECtalk-III. DECtalk-I supports "blind dialing"

Ordering Information

DTC01-AA	Single-line DECtalk-I text-to-speech unit. One 10-foot(3-meter) BC22D-10 cable included.
DTC03-AA	Multiple-line DECtalk-III, 8-channel text-to-speech unit. Eight serial cables required.
DTC03-SC	Two-line DECtalk-III, 2-channel text-to-speech unit. Two serial cables required.
DTC03-AM	DECtalk-III board, single-channel DECtalk module. No power supply, enclosure or cabling. Can be an add-on for DTC03-SC DECtalk-III rack; can also be integrated into custom customer platforms.
BC16E-xx*	DECconnect serial cable.
H8575-A	One MMJ adapter required for each DECtalk-I used in DECconnect wiring system.
H8571-D	One adapter required for each DTC03-AM module in DECtalk-III rack (DTC03-SC or DTC03-AA) when used in DECconnect wiring system.
BC22D-xx*	Null modem cable, used for DECtalk-I applications.
BC22E-xx*	Modem cable; required for each DTC03-AM module installed in DECtalk-III rack (DTC03-SC or DTC03-AA).

DECtalk Speech Synthesizers (Voice) *(continued)*

Ordering Information *(continued)*

QL-VFUA9-Jx	DECvoice software license for VMS (optional). Supplements general DECtalk pronunciation rules with support tailored specifically to surname pronunciation. See DECvoice section. Requires QA-VFUA9-Hx binaries.
QA-VFUA9-Hx	DECvoice software binaries for VMS. Optional. Requires QL-VFUA9-Jx license.

* Refer to Cables, at the end of this chapter for available lengths.
Note: For ordering assistance contact a local Digital Sales Representative.

Configuring Information

Connect DECtalk to a Digital or other computer with a standard EIA-232 compatible line running from the host computer to DECtalk's communication port—DECconnect cabling system recommended. The host system must support full-duplex connections, standard XON/XOFF flow control, and be able to pass the full ASCII character set.

To connect DECtalk to the telephone system, order standard telephone service. For DECtalk-III installations, request RJ21X service (CA21A in Canada). DECtalk-I installations should request RJ11X service (or CA11A in Canada). If RJ21X/CA21A service is unavailable, for information regarding an RJ21X to RJ11 adapter, contact a local Digital Sales Representative.

All DECtalk synthesizers are approved for connection to the Public Switched Telephone Network (PSTN) in the United States and in Canada.

Note: For additional cabling information, refer to the *Network Products Guide*, and the DECdirect catalog, and the *OPEN DECconnect Building Wiring Components and Applications Catalog.*

Cables

Order Number	Length	Description	Where Used
BCC14-10	10 ft (3.05 m)	16-position EIA-232 peripheral cable	
BC06M-20	20 ft (6.1 m)	37-position D-subminiature to 37-position D-subminiature cable	Connects DRV1W-Sx to Q-bus VAX or PDP-11 systems
BC06P-06 **BC06P-09** **BC06P-2F**	6 ft (1.8 m) 9 ft (2.7 m) 2.5 ft (0.8 m)	SCSI cable	VAX 4000, DECsystem 5500, R400X, B400X
BC12F-06		30 conductor with 50-pin Male IDC connector to 15-pin Male D-connector (X.21 cable)	Connects the synchronous port of the DECbrouter 90T to X.21 devices.
BC12G-06		30 conductor with 50-pin Male IDC connector to 34-pin Male D-connector (V.35 cable)	Connects the synchronous port of the DECbrouter 90T to V.35 devices.
BC12H-06		30 conductor with 50-pin Male IDC connector to 37-pin Male D-connector (V.11 cable, RS-449,RS-422)	Connects the synchronous port of the DECbrouter 90T to V.11, RS-449,RS-422 devices.
BC12J-06		30 conductor with 50-pin Male IDC connector to 25-pin Male D-connector (EIA-530A cable)	Connects the synchronous port of the DECbrouter 90T to EIA-530A devices.
BC12K-06		30 conductor with 50-pin Male IDC connector to 37-pin Male D-connector (RS-449,RS-423, and V.10 device cable)	Connects the synchronous port of the DECbrouter 90T to RS-449,RS-423,and V.10 devices.
BC12L-06		30 conductor with 50-pin Male IDC connector to 25-pin Male D-connector (RS-232 and V.28 cable.)	Connects the synchronous port of the DECbrouter 90T to RS-232 and V.28 devices
BC16D-50 **BC16D-A0**	50 ft (15.24 m) 100 ft (30.5 m)	36-position, right-angle, male-to-male, shielded, 18 twisted-pair extension cable	DECconnect, EIA-423-A Q-bus products
BC16E-02 **BC16E-10** **BC16E-25** **BC16E-50** **BC16E-A0**	2 ft (0.6 m) 10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	Six-conductor cable for terminal connection MMP to MMP with crossover pinning	DECconnect standard terminal connection cable
BC16K-02 **BC16K-10**	2 ft (0.6 m) 10 ft (3.05 m)	ThinWire patch cord	Patches ThinWire patch panel to DEMPR
BC16M-06 **BC16M-15** **BC16M-30**	6 ft (1.8 m) 15 ft (4.6 m) 30 ft (9.2 m)	ThinWire 802.3/Ethernet PVC cable with BNC connectors and boots	ThinWire 802.3/Ethernet products
BC16U-10	10 ft (3.1 m)	Cross-connect for 8-pin MP DETPR 10BaseT repeater to existing DECconnect wiring.	
BC17C-10 **BC17C-25**	10 ft (3.1 m) 25 ft (7.6 m)	Full EIA-232C/CCITT V.28 modem cable, round 17-wire, fully shielded, male-to-female molded connectors	802.3/Ethernet Communications Servers (DCSAX-LA line cards)
BC17D-10 **BC17D-25** **BC17D-50** **BC17D-A0**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	EIA-232C/CCITT V.28, fully shielded, null modem, 10-wire, female-to-female molded connectors)	802.3/Ethernet Communications Servers (DCSAX-LB line cards
BC17E-25	25 ft (7.6 m)	CCITT V.35, fully shielded, modem cable (Note: This cable has an EIA-449 connector on the CPU end, and a V.35 connector on the modem end.)	802.3/Ethernet Communications Servers (DCSAX-LB line cards), DMR
BC17N-24	24 ft (7.3 m)	Connectors: One female and one male 50-position D-subminiature	Connects TU80/TU81 tape with CPU
BC19B-02		28 conductor with 50-pin Female connector to 37-pin Male D-connector (RS-422 cable.)	Connects the synchronous port of the DECwanrouter 90 to RS-422 devices
BC19C-02		7 conductor with 50-pin Female connector to 15-pin Male D-connector (X.21 cable.)	Connects the synchronous port of the DECwanrouter 90 to X.21 devices
BC19D-02		16 conductor with 50-pin Female connector to 25-pin Male D-connector (RS-232, V.24 cable.)	Connects the synchronous port of the DECwanrouter 90 to RS-232/V.24 devices

Cables *(continued)*

Order Number	Length	Description	Where Used
BC19E-02		24 conductor with 50-pin Female connector to 37-pin Male D-connector (RS-423 cable.)	Connects the synchronous port of the DECwanrouter 90 to RS-423 devices
BC19F-02		16 conductor with 50-pin Female connector to 34-pin Male D-connector (V.35 cable.)	Connects the synchronous port of the DECwanrouter 90 to V.35 devices
BC19M-10	10 ft (3.1 m)	Parallel printer cable	Connects parallel printers to PCs
BC19V-02		16 conductor with 50-pin Female connector to 25-pin Male D-connector (RS-232, V.24 cable.)	Connects the synchronous port of the DECwanrouter 90 to RS-232/V.24 devices
BC22D-10 **BC22D-25** **BC22D-50** **BC22D-A0** **BC22D-B0** **BC22D-B5**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m) 250 ft (76.2 m)	Null modem cable, round, 6-wire, fully shielded, EIA-232C/CCITT V.28, female-to-female molded connectors	Local connection of asynchronous terminals
BC22E-02 **BC22E-10** **BC22E-25** **BC22E-50** **BC22E-A0** **BC22E-B0** **BC22E-B5**	2 ft (0.6 m) 10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m) 250 ft (76.2 m)	Modem cable, round, 16-wire, fully shielded, EIA-232C/CCITT V.28, male-to-female molded connectors	Connection of asynchronous modems
BC22F-02 **BC22F-10** **BC22F-25** **BC22F-50** **BC22F-A0** **BC22F-B0**	2 ft (0.6 m) 10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m)	Full, EIA-232C/CCITT V.28 modem cable, round, 25-wire, fully shielded, male-to-female molded connectors	Connections of synchronous modems
BC22H-02	2 ft (0.6 m)	Female-to-male converter	
BC22J-02	2 ft (0.6 m)	Male-to-female converter	
BC22U-10 **BC22U-25** **BC22U-50**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m)	Full, EIA-232C/CCITT V.28 modem cable, D-subminiature connector, fully shielded, male-to-female molded connectors	KMV1A configuration in BA2xx enclosure
BC22W-25 **BC22W-50**	25 ft (7.6 m) 50 ft (15.2 m)	EIA-422/423 communications cable, 37-conductor D-subminiature connector, fully shielded, molded connectors	KMV1A configuration in BA2xx enclosure
BC23T-10 **BC23T-25**	10 ft (3.1 m) 25 ft (7.6 m)	ISDN communications cable	DIV32 ISDN interface
BC23V-02		16 conductor with 50-pin Female connector to 25-pin Male D-connector (RS-232, V.24 cable.)	Connects the synchronous port of the DECwanrouter 90 to RS-232/V.24 devices
BC25U-01 **BC25U-02** **BC25U-03**		EIA/TIA Category 5 8-pin MJ to an 8 position 110 punch down plug.	Category 5 Patch cable. Connects a H3117-LA/LC or 110 connector block to either an active device or to another patching insert that has 8-pin MJs.
BC25V-01 **BC25V-02** **BC25V-03**		EIA/TIA Category 5, Eight position 110 punch down plug to another 110 punch down plug.	Category 5 Patch cable.Connects a H3117-LA/LC or110 connector block to either another 110 punch down block or another H3117-LA/LC.
BC26V-6D **BC26V-12** **BC26V-25** **BC26V-50** **BC26V-80**	6 ft (1.85 m) 12 ft (3.7 m) 25 ft (7.6 m) 50 ft (15.2 m) 80 ft (24.4 m)	Connectors: Two 8-position, 2 by 4 (four signal, four ground)	Interfaces between controllers and storage interconnect (SI) ype storage devices
BC27A-30 **BC27A-50**	30 ft (9.3 m) 50 ft (15.2 m)	37-position female D-connector to 50-position male D-connector shielded cable	Parallel printer cable
BC29P-10		Modem Cable with 25-pin D-sub to 9-pin D-sub	Connects the DEChub 900 OBM(Out of Band Management) port to modem
BC29Q-10		Null-modem Cable with 9-pin D-sub to 9-pin D-sub	Connects the DEChub 900 OBM(Out of Band Management) port to PCs

Cables *(continued)*

Order Number	Length	Description	Where Used
BC55D-50	50 ft (15.2 m)	EIA-423-A/EIA-449 interface connectors	Connection of DMR, DMP, DMV options
BC55T-25 **BC55T-50** **BC55T-A0** **BC55T-B5**	25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 250 ft (76.2 m)	Integral modem, twinaxial cable with BNC connectors	Connects fully shielded DMR, DMP, DMV options
BCC05-10 **BCC05-25** **BCC05-50** **BCC05-A0**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	Connectors: One 9-position female D-subminiature and one 25-position female D-subminiature	Fully shielded printer cable
BN24A-2E **BN24A-3E**	8.2 ft (2.5 m) 11.8 ft (3.6 m)	Daisychain office cable	Daisychain faceplate connector is required
BN24B-01 **BN24B-03** **BN24B-4E** **BN24B-10** **BN24B-20** **BN24B-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	FDDI x FDDI cable assembly with crossover	Connects FDDI-compatible devices where a transmit/receive crossover is required
BN24D-01 **BN24D-03** **BN24D-4E** **BN24D-10** **BN24D-20** **BN24D-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	FDDI x 2.5-mm bayonet connection cable assembly	
BN24E-01 **BN24E-03** **BN24E-4E** **BN24E-10** **BN24E-20** **BN24E-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	Dual 2.5-mm bayonet connection cable assembly	
BN24F-03 **BN24F-04** **BN24F-0E** **BN24F-07**	9.8 ft (3 m) 13.1 ft (4 m)	Two twisted-pair cable configured with 8-pin modular plugs and crossover pinning	Connects 10BaseT workstation to 8-pin faceplate connector; used in conjunction with DETPR or other repeaters that do not implement an internal crossover
BN24G-01 **BN24G-03** **BN24G-04** **BN24G-07**	3.3 ft (1 m) 9.8 ft (3 m) 13.1 ft (4 m) 23.0 ft (7 m)	Four twisted-pair cable configured with 8-pin modular plugs and wired pin to pin	Used as OPEN DECconnect patch cord to connect H3107-L/M/N patch panel inserts; also used as an office cable for ISDN or as an office cable for 10BaseT workstations where the crossover is internal to the repeater
BN24H-03 **BN24H-04**	9.8 ft (3 m) 13.1 ft (4 m)	Three twisted-pair cable configured with one 6-pin modified modular plug, one standard 8-pin modular plug, and crossover pinning	Connects the 6-pin MMJ port of a terminal or printer to the 8-pin MJ faceplate outlet jack
BN24J-01 **BN24J-03** **BN24J-07**	3.2 ft (1 m) 9.8 ft (3 m) 22.9 ft (7 m)	Three twisted-pair cable configured with one 6-pin modified modular plug and one standard 8-pin modular plug (pin-to-pin wiring)	Connects the 6-pin MMJ port of EIA-423 server to the 8-pin MMJ patch panel insert jack
BN24K-03	9.8 ft (3 m)	Shielded 18 twisted-pair cable configured with one male 36-position right angle connector and one male 50-position straight connector	Connects the 36-position port of a DECserver 200/DL or CXA16 terminal server to the50-position port of the H3107-M patch panel insert
BN24L-03	9.8 ft (3 m)	Octopus cable configured with eight 6-pin modified modular plugs and one male 50-position straight connector	Connects the 6-pin MMJ port of an EIA-423 server to the 50-position port of the H3107-M patch panel insert
BN24M-03	9.8 ft (3 m)	Octopus cable configured with eight-position standard modular plugs and one male 50-position straight connector	Connects the 8-pin MMJ ports of a10BaseT server to the 50-position port of the H3107-M patch panel insert

Cables *(continued)*

Order Number	Length	Description	Where Used
BN24N-03	9.8 ft (3 m)	Octopus cable configured with eight-position standard modular plugs and one male 36-position	Connects the 36-position port of DECserver 200/DL or CXA16 terminal right-angle connector server to the 8-pin MMJ ports of the H3107-N patch panel insert
BN25G-0E **BN25G-01** **BN25G-03** **BN25G-04** **BN25G-07**	1.6 ft (0.5 m) 3.3 ft (1.0 m). 9.8 ft (3 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP high performance grade 4-pair cable. This cable is wired pin to pin	DECconnect patch cord or 10BaseT or Token Ring office cable
BN25J-10 **BN25J-20** **BN25J-50** **BN25J-A0** **BN25J-B5** **BN25J-E0**	32.8 ft (10 m) 65.6 ft (20 m) 164.1 ft (50 m) 328.2 ft (100 m) 820.0 ft (250 m) 1640.0 ft (500 m)	VCS FOSHA-AC/AD fiber optic cable	Connects DHF11 remote terminal concentrator to DHF11 controller, and parallel printers to LP11, DMB32, LPV11, LPV11-SA, DSRVP-AA via LLF01-A
BN25H-03		Unshielded 100-ohm EIA/TIA Category 5 cable. 8-pin MJ to 8-pin MJ (crossover cable)	Connects copper FDDI (TP-PMD) devices directly or an FDDI Network interface card FDDIcontroller/EISA UTP to an office Faceplate
BN25K-0E **BN25K-03** **BN25K-04** **BN25K-07**	1.6 ft (0.5 m) 9.8 ft (3 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP 2-pair office cable for 10BaseT wired pin to pin	10BaseT repeaters that use an internal crossover (DETMR)
BN26L-03 **BN26L-04** **BN26L-07**	9.8 ft (3 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 2-pair cable wired pin to pin	10BaseT repeaters that use an internal crossover (DETMR)
BN26M-0E **BN26M-01** **BN26M-03** **BN26M-04** **BN26M-07**	1.6 ft (0.5 m) 3.3 ft (1.0 m). 9.8 ft (3 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 4-pair cable wired pin to pin	Shielded open DECconnect patch cord or 10BaseT or Token Ring office cable
BN26N-03 **BN26N-04** **BN26N-07**	9.8 ft (3 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 2-pair cable wired with crossover	10BaseT repeaters that do not implement an internal crossover (DETPR)
BN26R-03		Eight 8-pin modular jacks to 50-pin D-sub(10BaseT or RS-423)	Connect either a 10BaseT Repeater or an RS-423 Communications server to the Open DECconnect patching insert H3117-MA
BN26S-03		Shielded 100-ohm EIA/TIA Category 5 cable. 8-pin MJ to 8-pin MJ (crossover cable)	Connects copper FDDI (TP-PMD) devices directly or an FDDI Network interface card FDDIcontroller/EISA UTP to an office Faceplate.
BN26T-03		Shielded 100-ohm adapter cable with built-in Balun(100-ohm to150-ohm). 8-pin MJ to IBM IDC connector	Connects 100-ohm twisted Pair Media Access Unit to the IBM 150-ohm cable system
BNCIA-10 **BNCIA-20** **BNCIA-45**	32.8 ft (10 m) 65.6 ft (20 m) 147.6 ft (45 m)	Connectors: BNC-type connectors	Cable set that connects CPU/storage controllers to the Star Coupler
BNE2A-MA **BNE2A-MB** **BNE2A-MC** **BNE2A-ME**	76.8 ft (23.4 m) 230.3 ft (70.2 m) 383.9 ft (117 m) 1640.4 ft (500 m)	Plenum-rated coaxial cable	Standard 802.3/Ethernet cable(backbone)
BNE2B-MA **BNE2B-MB** **BNE2B-MC** **BNE2B-ME**	76.8 ft (23.4 m) 230.3 ft (70.2 m) 383.9 ft (117 m) 1640.4 ft (500 m)	PVC-insulated coaxial cable	Ethernet

Cables *(continued)*

Order Number	Length	Description	Where Used
BNE3H-05 **BNE3H-10** **BNE3H-20** **BNE3H-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	PVC-insulated transceiver cable with straight connector	IEEE 802.3
BNE3K-05 **BNE3K-10** **BNE3K-20** **BNE3K-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	PVC-insulated transceiver cable with right-angle connector	IEEE 802.3
BNE3L-05 **BNE3L-10** **BNE3L-20** **BNE3L-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	Plenum-rated transceiver cable with straight connector	IEEE 802.3
BNE3M-05 **BNE3M-10** **BNE3M-20** **BNE3M-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	Plenum-rated transceiver cable with right-angle connector	IEEE 802.3
BNE4C-02 **BNE4C-05**	6.6 ft (2 m), 16.4 ft (5 m)	Office transceiver cable with PVC insulation straight connector	IEEE 802.3
BNE4D-02 **BNE4D-05**	6.6 ft (2 m), 16.4 ft (5 m)	Office transceiver cable with PVC insulation, right-angle connector	IEEE 802.3
BNE4G-02 **BNE4G-05**		PVC-insulated IEEE 802.3 Tranceiver cable. Both ends have straight connectors. The PC NIC end has screw locks. The Tranceiver end has Bale locks.	Connects an offic PC NIC to an 802.3 transceiver. Used in nonenviromental airspace
BS06M-21	21.0 ft (6.4 m)	37-position to 40-position (via adapter) cable	Connects DRV1W-Sx to Q-bus VAX or PDP-11 systems
H4010-AA	BA2xx to BA4xx connection kit	For connections between BA2xx series enclosures and BA4xx series enclosures.	
H8240-00		EIA/TIA Category 3 flat 6-conducter terminal cable. 26 AWG stranded 100-ohm(EIA-423/232) 1000' Roll	Raw stranded cable to build office terminal cables. Connects low speed terminals to office Faceplates.
H8240-A		EIA/TIA Category 5 round8-conducter 100-ohm UTP cable 26 AWG stranded 1000' Roll	Raw stranded cable to build office cables.(CATEGORY 5) Connects either lowspeed terminals or High speed Work stationsto office Faceplates.
H8240-B		EIA/TIA Category 5 round 8-conducter 100-ohm Screened UTP cable. 26 AWG stranded 1000' Roll	Raw stranded cable to build office cables (Screened CATEGORY 5).Connects either low speed terminals or high speed Work stations to office Faceplates.
H8243-A	1000.0-ft (300 m)	PVC-insulated ThinWire cable spool	ThinWire 802.3/Ethernet products
H8244-A	1000.0-ft (300 m)	Plenum-rated ThinWire cable spool	ThinWire 802.3/Ethernet products
H8245-A **H8246-A**	1000.0-ft reel PVC 1000.0 ft reel Plenum rated	DECconnect Terminal Interconnect.	Connects faceplate or wallplate to SER
H8245-C		EIA/TIA Category 5 round 8-conducter 100-ohm UTP cable. 24 AWG solid wire 1000' Roll PVC.	This is a behind the wall Building wire. This cable connects an area Faceplate Back to an SER. (PVC)
H8245-D		EIA/TIA Category 5 round 8-conducter 100-ohm Screened UTP cable. 24 AWG solid wire 1000' Roll PVC	This is a behind the wall Building wire. This cable connects an area Faceplate Back to an SER.(PVC). Used where screened wire is a requirement.
H8246-C		EIA/TIA Category 5 round8-conducter 100-ohm UTP cable. 24 AWG solid wire 1000' Roll PVC.	This is a behind the wall Building wire This cable connects an area Faceplate back to an SER. (PLENUM)

Cables *(continued)*

Order Number	Length	Description	Where Used
H8246-D		EIA/TIA Category 5 round 8-conducter 100-ohm UTP cable. 24 AWG solid wire 1000' Roll PVC.	This is a behind the wall Building wire This cable connects an area Faceplate back to an SER. (PLENUM) Used where screened wireis a requirement.
H8584-AC		8-Pin MP to 6-pin MJ adapter	
H8585-AA		8-Pin MJ to DB9 null-modem adapter	
H8585-AB		8-Pin MJ to DB25 modem adapter	
H8585-AC		8-Pin MJ to DB25 modem adapter	
H8853-AA		Male to Female 25-pin adapter with EOS/ESD protection	

MMJ Accessories

Order Number	Description
BC16E-02 **BC16E-10** **BC16E-25** **BC16E-50** **BC16E-A0**	EIA-423 office cable
H0401-A	Crossover switch (four EIA-423 connectors)
H8571-C	25-pin male EIA-423 DECconnect to EIA adapter (with 5 male pins) with mating hex nuts
H8571-D	Full 25-pin male EIA-423 DECconnect to EIA filtered adapter with jack screws
H8571-E	EIA-423 DECconnect 25-pin adapter with jack screws
H8571-J	9-pin MMJ adapter
H8572-00	MMJ cable extender
H8575-A	Female 25-pin EIA-423 DECconnect MMJ to EIA general-purpose adapter with jack screws
H8575-B	Female 9-pin EIA-423 DECconnect to printer adapter with jack screws
H8672-A	PC to printer interconnect kit

Note: The associated connections in the following charts are not a statement of software/firmware support, only of physical connectivity.

Communications

Device from	Device to	Adapter Required	Cable Required
DECNIS 500/600: WANcontroller 614	V.35 device	BC19F-02	BC19L-xx
	V.36/EIA-449/422 device	BC19B-02	BC55D-xx
	V.24/V.28, EIA-232D device	BS23V-02	BC22F-xx
WANcontroller 618	V.35 device	None	BC19L-xx
	V.36/V.11, EIA-422 device	None	BC55D-xx
	V.24/V.28, EIA-232D device	None	BC22F-xx
WANcontroller 622	V.35 device	BC19F-02	BC19L-xx
	V.36/V.11, EIA-422 device	BC19B-02	BC55D-xx
LANcontroller 601 (DNSAE-AA: 1 x 15-pin AUI female)	802.3/Ethernet 15-pin AUI male	None	BNE3*-xx or BNE4*-xx
	802.3/Ethernet ThinWire BNC	DECXM-AA	BC16M-xx
LANcontroller 602 (DNSAE-BA; 2 x 15-pin AUI female)	802.3/Ethernet 15-pin AUI male	None	BNE3*-xx or BNE4*-xx
LANcontroller 602 (DNSAE-BB; 2 x ThinWire BNC)	802.3/Ethernet ThinWire BNC	None	BC16M-xx
LANcontroller 602 (DNSAE-BC; 2 x MJ8 RJ45)	802.3/Ethernet UTP MJ8 RJ45	None	BN26K-xx or BN25G-xx (no crossover) BN24F-xx (crossover)
CXY08 DSRVA DSRVB	DHQ11/DHU11/DMB32/DZ11/LA210/LA120/LA100/LA50 /LG31/LN03/LQP02/VT1xx/VT2xx/VT3xx/VT420		BC22D BC16E
	LA70/LG02/LP27/LP29	H8575-A	
DSRVP	LG01/LG02/LP27/LP37/LP29		BC27A
CXY08	DF100/DF200 asynchronous modems (2400 baud or less)		BC22E or BCC14
DSRVB	DF100 synchronous modems (over 2400 baud)		BC22F

EIA-423 Open DECconnect Communications Interfaces

Device from	Device to	Adapter Required	Cable Required
CXA16 DHB32 DHQ11 DHT11 DHV11 DSRVB-B	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/DHQ11/DHU11/DMB32/DZ11/VT1xx/VT2xx	H8575-A	BC16E
CXA16 DSRVB-B	LA75/LJ25x/VT3xx/VT420/LA70 DEClaser 2000/LA324		BC16E
DSRZC	DM3XX EIA-422 local connect		BC19Y
DFMZA	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/VT1xx/VT2xx/VT3xx/VT420		BC22D
	LA70/LA324/DEClaser 2000 series/LA75/LJ25x/VT3xx/VT420	H8575-A	BC16E
	DF100 synchronous modems		BC22F
	DFMZA (EIA-423)		BC17D

EIA-423 Open DECconnect Communications Interfaces *(continued)*

Device from	Device to	Adapter Required	Cable Required
DELNI DECXM H4000 H4005	DEBET/DEBNA/DECSA/DELQA/DELUA/ DEMPR/DEMSA/DEQNA/DESNA/ DESNC/DESQA/DESVA-B/DSRVA/ DSRVB/DSRVC/DSRVS/DSRZA		BNE3x
DELNI DECXM H4000 H4005	DECNA		BCC06 + BNE3x
H4000 H4005	DEREP		BNE3x
DEMPR DESPR	DEPCA/DECXM/DESVA/VAXmate		BC16M
DMR11	EIA-422/EIA-423 modems		BC55D
DMP11	DMR11/DMP11/DMV11 (integral point)		BC55S or BC55T
	DF100 synchronous modems (over 2400 baud)		BC17C
	V.35 modems		BC17E
	DF100/DF200 modems (2400 baud or slower)		BC22F
CXY08 DHQ11	LA210/LA120/LA100/LA50/LG31/LN03/ LQP02/VT1xx/VT2xx/VT3xx/VT420		BC22D
DHU11 DHV11	LA70/LA324/DEClaser 2000 series/ LA75/LJ25x/VT3xx/VT420	H8575-A	BC16E BC22E or BCC14
DMB32 DMF32 DMZ32 DZ11 DZ32 DZQ11 DZV11	DF03/DF112/DF124/DF126/DF224/DF242 DF126/DF127/DF129		BC22F
DMB32	DF112/DF124/DF126/DF224/DF242 (asynchronous only)		BC22E or BCC14
DMF32	DF126 (synchronous only—2400 baud or slower)		BC22F
	DF127/DF129 (synchronous only—over 2400 baud)		BC17C
	LA210/LA120/LA100/LA50/LG31/LN03/ LQP02/VT1xx/VT2xx/VT3xx/VT420		BC22D
	LG01/LG02/LP25/LP26/LP27/LP29		BC27A
	LP04/LP14		BC27B
DF03 DF112 DF124 DF126 DF224 DF242 DFM04/08/16	CXY08/DH11/DHB32/DHQ11/DHV11/ DHT11/DHU11/DMB32/DMF32/DMZ32/ DV11/DZ11/DZQ11/DZV11/LA210/LA120/ LA100/LN03/VT1xx/VT2xx/VT3xx/VT420		BC22E or BC22F BCC14
DF126 DF127 DF129	DMB32/DMC11/DMF32/DMP11/DMR11/ DMV11/DPV11		BC17C
DFM04/08/16	VT1xx/VT2xx/VT3xx/VT420/		BCC14
	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/DHB32/DHU11/DMB32/DMF32/ DHQ11/DHV11/DZQ11		BC22E or BC22F
	DFM04/08/16 (concentrated link port only)		BC22L
	DF100/DF200 (on channel ports only)		BC22M

Fiber Optics

Device from	Device to	Adapter Required	Cable Required
LP11 DMB32 LPV11 LPV11-SA DSRVP-AA	LG01/LG02/LP27/LP29		BN25J

Storage Devices

Disks

Device from	Device to	Adapter Required	Cable Required
RA60 RA70 RA8x RA9x SA482 SA6xx SA8xx	HSC5X-BA/HSC5X-DA/KDA50/KDB50/RB86/UDA50		BC26V

SCSI Disk Interfacing

Any SCSI device	VAX 4000, DECsystem 5500, R400X, B400X		BC06P

Cluster Interconnect

SC008	CI750/CI780/CIBCA/CIXCD HSC50/HSC70/HSC40		BNCIA

Tapes

TA78 TA79 TA81 TA90	HSC40/HSC50/HSC70		BC26V
TU80 TU81	Controller		BC17N

PC Products

DECstation/DECpc	LA70/LA324/DEClaser 2000 series/LA75P/LJ25x		BC19M
parallel port	LA210	LA10X-EP	BC19M
DECstation/DECpc serial port	LA70/LA324/DEClaser 2000 series/LA75P/LJ25x/ LN03/LN03S/LN03R/LA210	H8575-J	BC16E

Terminals and Printers

Terminals

Device from	Device to	Adapter Required	Cable Required
VT1xx	LA70/LA324/DEClaser 2000 series/LA75/LJ25x	H8575-A	BC16E
	LA50/LA100/LA210/LG31/LN03/LQP02/LQP03		BC22D
VT2xx	LA70/LA324/DEClaser 2000 series/LA75/LJ25x LA50/LA100/LA210/LN03/LQP02/LQP03	H8575-B	BCC05
VT3xx	LA70/LA324/DEClaser 2000 series/LA75/LJ25x		BC16E
VT420	LA50/LA100/LA210/LN03/LQP02/LQP03	H8575-A	BC16E
	LQP45	H8575-A	BC16E or BC22D
VT1xx VT2xx VT3xx VT420	CXY08/DECSA/DLVJ1/DHB32/DHF11/DHQ11/DHT11/DHU11/ DHV11/DMB32/ DMF32/DMZ11/DSRVA-AA/DSRVB/ DSRZA		BC22D
	DF100/DF200 series asynchronous modems		BCC14 BC22E or BC22F
	DF100 series synchronous modems		BC22F or BCC04

Printers

Device from	Device to	Adapter Required	Cable Required
LA50 LA100 LA210	CXY08/DECSA/DLVJ1/DHB32/DHF11/DHQ11/DHU11/DHV11/ DMB32/DMF32/ DMZ32/DSRVA-AA/DSRVB/ VT1xx (EIA-232 devices)		BC22D
LCG01	DF100/DF200 series asynchronous modems		BC22E
LCP01	DF100 series synchronous modems		BC22F
LG01 (serial)	VT3xx/VT420	H8575-A	BC16E
LG02 (serial) LG31 LN03 LQP02 LQP45 LN03R LA75 LJ25x LA70 LA324 DEClaser 2000 series	CXA16/DSRVB-B/VAXmate/VT3xx/CK-DHB32-Lx/ CK-DHQ11-Wx/CK-DHV11-Wx		BC16E
LG01 LG02 LP25 LP26 LP27 LP29 LP37	DMB32/DMF32/LP11/LPV11/DSRVP-AA/LPV11-SA		BC27A BC27L
LP05 LP14	DMB32/DMF32/LP11/LPV11		BC27B
LLD11 LN01K-AA LN01K-LF	LSP25/LSP26/LSP27/Long-line LN01		BN27D
LLF01-A	LP27/LP29/LG01/LG02/LP37		BN25J

Chapter 8
Storage Devices

Digital Storage Solutions

Comparison Charts

StorageWorks Family Modular Storage Expansion

Expansion Boxes (SCSI)

Storage Controllers/Adapters

RAID Storage Subsystems

Storage I/O Servers

Storage Arrays

Storage Array Building Blocks

Disk Devices

Network Storage Servers

Optical Devices

CD-ROM Devices

Tape Devices

Overview

The StorageWorks family of products, a complete storage subsystems family, enables customers to configure the storage they need by choosing from an interchangeable set of elements. These elements include storage devices, array controllers, power, packaging, interconnects, and software. Built on the SCSI-2 standard, Digital's StorageWorks products are designed to move from system to system as required.

Digital's implementation of the ANSI SCSI standard for drives is aimed at Digital's Alpha AXP systems, VAX-and RISC-based workstations, RISC servers, and multi-user PCs and PC LAN servers. StorageWorks solutions bring flexibility, modularity, and availability to Novell LANs and Sun Systems as well.

Moving from a proprietary storage environment to open SCSI-based storage solutions built on industry standards, Digital has retained the benefits of Digital Storage Architecture (DSA)—performance, high availability, and data integrity. Digital's storage strategy creates solutions that grow to meet future needs while protecting existing storage investments.

Digital continues to offer a broad and flexible range of storage solutions, suitable for application environments spanning the desktop, office, and data center. Depending upon performance and capacity requirements, users can choose Digital tape and optical products, large and small disks, and solid state disks. Many of these devices, along with storage arrays, controllers, and I/O servers, are based on DSA, a carefully planned framework of standardized interfaces. DSA governs the interactions of all Digital host systems and storage subsystems. Two interfaces, Standard Interconnect (SI) and Digital Storage System Interconnect (DSSI), implement DSA.

Digital also continues its commitment to systems integration and investment protection by offering a range of connectivity options that permit the use of SCSI storage devices throughout the VAX and Alpha environments, as well as those of Novell and Sun. These include VAXBI, DSSI, and Hierarchical Storage Controller (HSC) cluster versions of SCSI peripherals

Storageworks Architecture and Products

At the core of Digital's modular storage are industry-standard SCSI-2 devices encased in rugged 3.5- or 5.25-inch carriers that snap into shelves or a small desktop enclosure. Carriers have different front openings for devices such as tape or CD-ROM drives that have removable media, and include the following features:

- Radio-frequency shielding
- Shock protection
- Mechanical mounting for individual storage devices
- Circuitry that supports easy removal without powering down
- Universal power supplies and battery back-ups

Storage devices enclosed in this consistent packaging provides the flexibility to mix and match devices in many permutations without retesting for FCC or safety compliance. The devices and supporting electronics come together in two types of shelves and one desktop box. BA350 shelves are 19-inch industry standard rackmount-compatible units that can stand vertically as pedestals or be mounted in cabinets. The desktop box extends the modular family to PCs and workstations, enabling them to use the same storage devices installed on larger systems.

In general, the modular storage devices are single-ended SCSI, with strict limitations on cable lengths. Digital's carrier-mounted DWZZA signal converter enables a shelf's single-ended backplane to use differential SCSI cabling, so that a modular shelf can be located up to 25 meters (82 feet) from the host computer or array controller.

Storageworks Architecture and Products *(continued)*

With the introduction of the StorageWorks HSD05 controller, DSSI systems can connect up to seven SCSI-2 devices to a single DSSI port, so that more than 88 Gbytes can attach to a single DSSI bus. The RAID Array 210 Subsystem provides RAID levels for striping, shadowing, striped shadowing, and striping with parity for the AlphaServer 2100 system and as a standalone system in combination with StorageWorks disk drives and enclosures.

A complete family of HSJ CI storage controllers is available for StorageWorks subsystems. The HSJ products interface directly to the CI/Star Coupler to provide scalability, customer-defined SCSI-2 storage capacity, availability, and high performance. Three models complement the HSJ40 controller: the HSJ30, a low-cost, entry-level CI system; the HSJ42, a high-performance, dual-redundant HSJ40 package; and the HSJ44, a high-performance, high-availability solution.

The HSC family also supports modular products; four StorageWorks shelves can be installed in the top of most HSC cabinets.

Digital Storage Architecture

Besides the StorageWorks family of products, virtually all of Digital's storage subsystems are based on DSA, thus protecting a customer's investment in Digital subsystems. With DSA, new storage products incorporating new technologies do not require additional software drivers or applications software modification.

With DSA storage solutions having subsystem-based intelligence, DSA can offload host-associated functions, thus providing more usable CPU power. Software compatibility and software migration are easily achieved with no loss in performance.

Standard Interconnect Series Family (SDI/STI)

The SI family of Standard Disk Interconnect (SDI) devices and Standard Tape Interconnect (STI) devices provide high-capacity, high-performance, and high-reliability storage for Digital's mid-range and high-end systems. The SI family includes the HSC95 and HSC65 I/O servers as well as RA-series disk drives, storage arrays, TA-series tape drives, KDM70, KDB50, KDA50, and UDA50 board controllers.

SDI drives are also offered in 1-meter (40-inch) cabinets with single-phase power, embedded in VAX 6000 system cabinets, and as single spindles for upgrading existing configurations.

Features

- High data availability through OpenVMS VAX Shadowing
- High performance through VAX Disk Striping and ESE50 solid state disks
- Seek ordering—reorders I/O requests to improve I/O access time
- Overlapped seeks—transfers data from one disk while simultaneously seeking on other disks with outstanding I/O requests
- Rotational optimization—selects the disk nearest the beginning sector when more than one disk is positioned on cylinder
- Express queue—provides immediate servicing of I/O requests if required
- Speed matching buffers—use high-speed RAM to smooth the disk data burst rates to host CPU I/O bus
- Redundant header addresses—records disk block header information four times for more reliable sector location

Standard Interconnect Series Family (SDI/STI) *(continued)*

- Automatic sector relocation—the automatic revectors process removes defective blocks from service and replaces them with others without causing shrinkage in disk capacity
- Error detection code—checks controller memory and data-path errors as well as ECC hardware operation
- Error reporting—reports all significant errors to the host system, enabling detection and preventive action, where needed, before subsystem failure or data loss

Digital Storage System Interconnect (DSSI) Family

The DSSI storage subsystem family is a building block set of storage products that offers highly competitive storage solutions. DSSI is ideal as primary local storage or as part of a DSSI VMScluster system. With the addition of the magazine tape subsystem and storage cabinet, DSSI now offers solutions that meet storage and backup requirements from the office to the data center.

The DSSI family includes RF series disk-integrated storage elements, storage pedestals, storage array cabinets, TF series tape drives and magazine tape subsystems, KFQSA and KFMSA board adapters and embedded adapters.

Features

- Multiple DSSI buses supported on each host
- Up to seven ISEs supported per DSSI bus in a single-host configuration
- Integrated disk storage and tape backup in a single cabinet for VAX 10000, VAX 7000, and VAX 6000 systems
- Full DSA compliance and VAXsimPLUS support offer superior serviceability
- DSSI VMScluster support and host-based volume shadowing provide high availability
- ISEs may be grouped into stripe sets and into shadow sets for higher performance
- Customer-selectable HISPEED mode allows flexible mixed-array high-performance configurations

Small Computer System Interface (SCSI)

As part of Digital's commitment to open systems, Digital provides an extensive offering of SCSI disk, tape, and CD-ROM storage devices. These devices conform to Digital's implementation of the ANSI SCSI standard for disk drives. The advantages to using an industry-standard SCSI bus include low cost, configuration flexibility, and investment protection. Digital SCSI products feature a family of disk drives that vary in form factor, capacity, and performance to match application requirements.

Storage Array Cabinet Capacity and Performance Comparison Chart

Array	SX100/SX106	SA900	SF400	SX300
Disk/tape supported	None	—	10	6
SF36	1	—	10	6
TF857	1	—	10	6
TF867	1	—	10	6
TA857	1	3	—	3
TA867	1	3	—	3
ESE50	—	4	—	4
Interface	DSSI	SDI	DSSI	SDI/DSSI

Note: Transfer rate, seek time, and access time depend upon component devices used. See above chart.

SCSI Disk Drive Comparison Chart

Specifications	RZ25L	RZ26L	RZ28	RZ28B
Capacity				
Formatted	535 MB	1.05 GB	2.10 GB	2.10 GB
Unformatted	635 MB	1.342 GB	2.69 MB	2.57 GB
Buffer size	240 KB	512 KB	1024 KB	256 KB
Transfer rate				
To/from media	2.6–4.4 MB/s	3.3 MB/s	2.4–4.9 MB/s	3.3–5.3 MB/s
Bus/async	5 MB/s	5 MB/s	5 MB/s	5 MB/s
Bus/sync	10 MB/s	10 MB/s	10 MB/s	10 MB/s
Requests per second				
@ 50 ms	53.9	82.9	75.2	N/A
Error Correcting Code (ECC)	48	264	264	
Operating Environment				
Ambient temperature	10°–55°C (50°–131°F)	5°–50°C (41°–122°F)	5°–55°C (41°–131°F)	5°–50° C
Relative humidity	8%–80%	8%–80%	10%–90%	8%–80%
Maximum wet bulb, noncondensing	25.6°C (78.1°F)	28°C (82°F)	26.5°C (79.7°F)	
Altitude, m [ft]	–304.8 to 3048 [–1000 to 10,000]	2500 [8000]	–304.8 to 1828 [–1000 to 6000]	[–1000 to 10,000]
Heat dissipation (typical)	10	8.4	14.9 W	
Temperature gradient	11° C/hr (20° F/hr)	20° C/hr (36° F/hr)	20° C/hr (36° F/hr)	20° C/hr (36° F/hr)
Shock and Vibration	10 Gpk, 10+-3 ms, 5 to 22 Hz, 0.01 in. DA, 22 to 500 Hz, 0.25 Gpk	10 Gpk, 10+-3 ms, 5 to 22 Hz, 0.01 in. DA, 22 to 500 Hz, 0.25 Gpk	10 Gpk, 10+-3 ms, 5 to 22 Hz, 0.01 in. DA, 22 to 500 Hz, 0.25 Gpk	10 Gpk, 10+-3 ms, 5 to 22 Hz, 0.01 in. DA, 22 to 400 Hz, 0.25 Gpk
Acoustic Noise				
Idle (bel)	4.6	–	4.2	4.1
Seeking (bel)	5.0	–	5.0	4.4
Latencies				
Track-to-track seek	2.5 ms	9 ms	1 ms	1 ms
Average seek	10.5 ms	10.5 ms	9.5 ms	9 ms
Average access	16 ms	15.1 ms	15.1 ms	14.5 ms
Average rotational latency	6.8 ms	5.54 ms	5.6 ms	5.5 ms
Rotational speed (rev/min)+-0.5%	5400	5400	5400	5400
Recording density	38,843 b/in.	56,000 b/in.	–	50,000
Track density(tracks/in.)	1760	2150	3215	3000
Areal density (MB/in.^{2})	68.28	–	45.86	
Read/write heads (data)	9	7	16	19
Software support				
OpenVMS (version)	5.5-2	5.5-2 (generic device) 5.5-2 (full support)	5.2-2	5.5-2
DEC OSF/1 AXP (version)	1.5	–	–	1.5
ULTRIX (version)	4.3a	–	2.2D	–
Power				
Maximum seeking	10.3 W	13.7 W	14.9 W	11 W
Maximum startup	34.5 W	–	60.7 W	–
Functional				
Servo	Dedicated	Dedicated	Embedded	Dedicated
Disks	5	4	8	10
Physical				
Height, cm [in.]	4.1 [1.63]	4.14 [1.63]	4.14 [1.63]	4.11 [1.62]
Width, cm [in.]	10.2 [4.0]	10.2 [4.0]	10.1 [4.0]	10.2 [4.0]
Depth, cm [in.]	14.6 [5.75]	14.6 [5.75]	14.6 [5.75]	14.6 [5.75]
Weight, kg [lb]	0.8 [1.8]	0.8 [1.8]	0.85 [1.9]	0.93 [2.1]

Tape Selection Chart

The chart below is a simplified guide to choosing a tape subsystem to meet most customer needs. To use the chart:

1. Determine whether system will be clustered or standalone (column 1).
2. If the system is standalone, determine which CPU(s) will be used (column 1).
3. Determine the amount of disk storage required, allowing for growth (column 2).
4. Use column 3 to determine the most appropriate tape unit for the applications listed.

For atypical needs, such as a requirement for specific media format, refer to the supplementary information on the following page.

Product Recommendations

Column 1	Column 2	Column 3	
System	**Number of Gbytes of Disk[1] on System**	**Disk Backup, Data Collection, Archiving, SW Distribution[2]**	**Highest Speed Backup, Data Collection**
VMSclusters DSSI	Any number Any number	SA100, SA106 TF85/TF857 TF86/TF867	TA92 TF85/TF857 TF86/TF867
Standalone[3]			
VAX 9000 Systems	Any number	One or more TF857/TF867	One or more TF857/TF867
VAX 6000/7000/10000 Systems	1–6 >6	TF85/TF86 One or more TF857/TF867	One or more TF857/TF867
VAX 8xxx Systems	1–4 >4	TLZ06** SZ106/SZ100**	TZ85/TZ86** SZ106/SZ100**
VAX 4000 Systems	1–4 1–6 >6	TLZ06* TF85/TF86, TLZ07 TF857/TF867, TZ87, TZ875, TZ877	TF85/TF86 TF857/TF867
MicroVAX Systems	1–4 >4	TLZ06, TLZ07 TZ85/SZ100, TLZ07 TZ86/SZ106, TZ87, TZ875, TZ877	TZ85/TZ86, TZ87, TZ875, TZ877 TZ85/SZ100 TZ86/SZ106
DECsystems (RISC)	Any number	TLZ06, TKZ15	TZ85/TZ86/TZ87
applicationDEC Systems	Any number	TZK10/TLZ06/TKZ15	TLZ06
VAXstations/DECstations (RISC)	0–4 0–1 >4	TLZ06, TLZ07 TZK10 TZ86/SZ106, TKZ15	TLZ06, TLZ07 TZ86/SZ106 TZ87
DEC 10000 Model 600 DEC 7000 Model 600/700 DEC 4000 Model 600/700	1–4 1–6 >6	TLZ06, TLZ07, TZ85, TZ86, TZ87 TZ85, TZ86, TZ87, TLZ07 TZ857, TZ867, TZ877	TZ85, TZ86, TZ87 TZ857, TZ867, TZ877 TZ87, TZ875, TZ877
DEC 3000 Models 400/500	1–4 >4	TZK10, TLZ06, TLZ07,TZ86, TZ87 TZ85/TZ857[3]	TZ85, TZ86, TZ87 TZ87, TZ875, TZ877
Network Backup			
InfoServer 150	0–4 >4	TLZ06 TZ85/SZ100	TZ85 TZ85/SZ100

Notes:

[1] 1 Gbyte = an 85% full RA90, two 85% full RA82s, one 85% full RF72 or RZ57, etc.

[2] Any of these media are suitable for customers to distribute software to other users. Software load media for AXP systems is CD-ROM only. For receiving Digital's software distribution, the primary supported media are CD-ROM optical disks, TK cartridges, 9-track magtape.

[3] DLT loader in StorageWorks data center cabinets only.

[4] ULTRIX currently does not support loaders; SZ100/SZ106 and Tx8x7 subsystems will require manual intervention if used on ULTRIX-based systems.

* With KZQSA adapter

** With KZBSA adapter

Tape Comparison Chart

Tape Drives	Densities (bits/in.)	Operating Mode	Interface	System Support	Typical time to back up 1-Gbyte disk (minutes)	No. of reels or cartridges to backup 1-Gbyte disk
TA857/SA100	42,500, 48 tracks	Streaming	HSC	OpenVMS Cluster	30	0.4
TA867/SA106	42,500, 112 tracks	Streaming	HSC	OpenVMS Cluster	30	0.17
TF85/TF857	42,500, 48 tracks	Streaming	DSSI	VAXft, VAX 4000/6000/7000/10000, MicroVAX 3000, MicroVAX II	26	0.4
TF86/TF867	42,500, 112 tracks	Streaming	DSSI	Same as TF857 above	26	0.17
TZ85/SZ100	42,500, 48 tracks	Streaming	SCSI-2	InfoServer, MicroVAX 3100, VAXstations, DECstations, VAX 8000	Depends on network or system performance	0.4
TZ86/SZ106	42,500, 112 tracks	Streaming	SCSI-2 VAXBI[2]	Same as TZ85 above except InfoServer	Same as TZ85 above	0.17
TZ87 **TZ877** **SZ107**	62,500, 128 tracks	Streaming	SCSI-2	DEC 3000 AXP DEC 4000/7000/10000 AXP VAXstation MicroVAX 3100 VAX 4000 VAX 6000	3	0.05
TK70	10,000, 48 tracks	Streaming	Q-bus	MicroVAX, VAX 4000	185	4
TK50/TZ30	6666, 22 tracks	Streaming	UNIBUS	VAX, InfoServer	370	11
TKZ09		Streaming	Q-bus[1] SCSI	MicroVAX, VAX RISC, DECstation 5000-240 DEC 3000/4000/7000/10000	40	0.2
TKZ08	43,200	Streaming	SCSI	RISC, ULTRIX, DECstations	80	0.5
TLZ06 **TLZ6L**	DDS and DDS-C Standard format	Streaming	SCSI Q-bus[1] VAXBI[2]	DECstation 5000, VAXstation 4000, DECsystem 5000, DEC 4000, DEC 3000 Model 400/500, MicroVAX 3100, applicationDEC, VAX 4000/6000/8000, DEC 7000/10000	55	0.25
TLZ07	DDS and DDS-C Standard format	Streaming	SCSI	MicroVAX II, MicroVAX 3100 Models 30/40/80/90 MicroVAX 3300, 3400, 3500, 3600, 3800, 3900 VAX 4000 Models 100, 100A, 105A, 200-700A VAXstation 4000 VLC, Models 60, 90A DECpc AXP 150 DEC 2000 Models 300, 500 AXP DEC 3000 Models 300L, 300X, 400, 500, 500X, 600, 700, 800, 900 AXP DEC 4000 Models 6xx, 7xx AXP AlphaServer 2100	33	.125

[1] With KZQSA adapter.

[2] With KZBSA adapter; VAX 6000 requires DWMBB VAXBI/XMI adapter.

Tape Comparison Chart *(continued)*

Tape Drives	Densities (bits/in.)	Operating Mode	Interface	System Support	Typical time to back up 1-Gbytedisk (minutes)	# of reels or cartridges to backup 1-Gbyte disk
TZK10 **PCXAT** **TZK11**	QIC-320 QIC-525 Standard formats	Streaming	SCSI	DECstation 5000, VAXstation 4000, DECsystem 5000, DEC 3000 Model 600/800, MicroVAX 3100, applicationDEC, MS-DOS, PCs, InfoServer	90	2–3
TKZ60	38,000	Streaming	SCSI-2 Q-bus[1] VAXBI[2]	Alpha AXP MicroVAX, VAX 4000/6000/8000 VAXstations, DECstations, Infoserver	20 uncompressed 10 compressed	5 uncompressed 3 compressed
TSZ07	1600/6250	Streaming	SCSI-2 Q-bus[1] VAXBI[2]	Alpha AXP DECstations DECsystems VAXstations MicroVAX, VAX 4000/6000/8000 InfoServer	80	7

[1] With KZQSA adapter.
[2] With KZBSA adapter; VAX 6000 requires DWMBB VAXBI/XMI adapter.

Flexible/Optical Media Specifications

Option Number	Media Type	Capacity (MB)[1]	Tape Length[2]	Form Factor[3]	Shelf Life[4]	Coercivity (OE)[5]	Durability (Passes)[6]	Type Material[7]	Environmental Conditions Storage[8]	Archival[9]	Operating[10]
RX02K-10	DDDS	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
RX31K-10	DDDS	0.360	N/A	5.25	20*	300	3,500.000	GFO	10-51/8-80		10-51/8-80
RX24K-10	DDDS	0.720	N/A	3.5	20*	650	4,000,000	CGFO	4-53/8-90		10-60/8-80
RX23K-10	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
RV02K-01	WORM	2000	N/A	12	5/30	N/A	50,000	TA	-10-50/0-95		10-45/0-90
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
RWX1K-02	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
TUN06-SL	REEL	35	600	7	20*	350	40,000	GFO	5-48/20-80	5-32/20-80	16-32/20-80
TUN12-SL	REEL	70	1200	8.5	20*	350	40,000	GFO	5-48/20-80	5-32/20-80	16-32/20-80
TUN24-SL	REEL	145	2400	10.5	20*	350	40,000	GFO	5-48/20-80	5-32/20-80	16-32/20-80
TUN24-AL	REEL	145	2400	10.5	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
PC4XT-DA	DC2060	60	307.5	3.5	10*	550	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
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
TLZ04-CB	DAT-60M	1300	196.9	2.9	10	1540	2,000	MP	5-32/20-60	16-29/40-60	5-45/20-80
TLZ06-CB	DAT-90M	2000	295.3	2.9	10	1540	2,000	MP	5-32/20-60	16-29/40-60	5-45/20-80
TKZ8X-CB	8MM	5000	367.5	3.7	30*	1540	1,500	MP	5-32/40-60		5-45/20-80
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	10000	1167	4.2	20	1540	500,000*	MP	10-40/20-80*	18-28/40-60	10-40/20-80

* Information obtained from sources other than Digital Equipment Corporation, American National Standards Institute, or manufacturer specifications.

[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. **Note:** parameter is variously defined within the industry and may not be comparable between product types. Some general definitions are as follows:

- For diskettes: wear resistance in number of revolutions as defined in product-specific documentation.
- For optical devices: load/unload, spin/up down cycles.
- 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.

[8] Maximum temperature/humidity range in C/%RH, non-condensing.

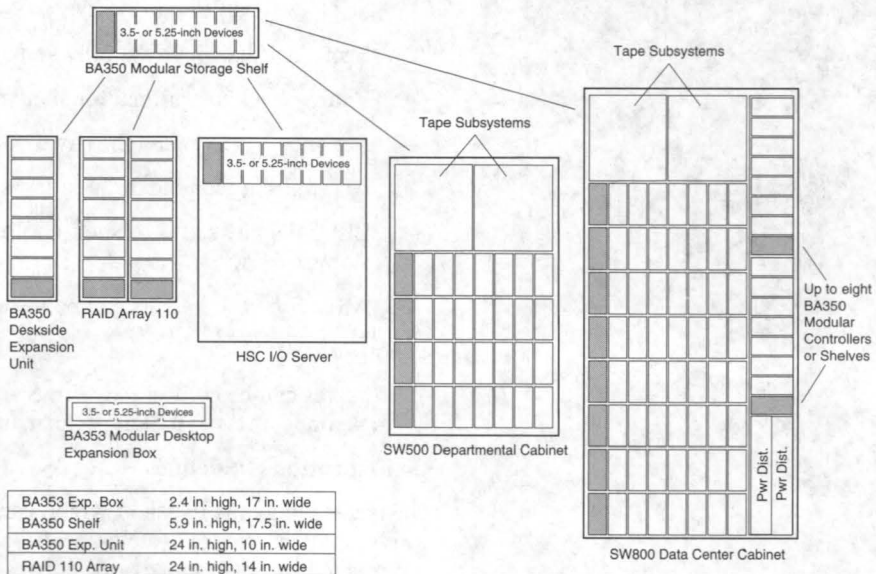
[9] Maximum temperature/humidity range in C/%RH, non-condensing. If field is blank, refer to "storage" figures.

[10] Maximum temperature/humidity range in C/%RH, non-condensing.

StorageWorks

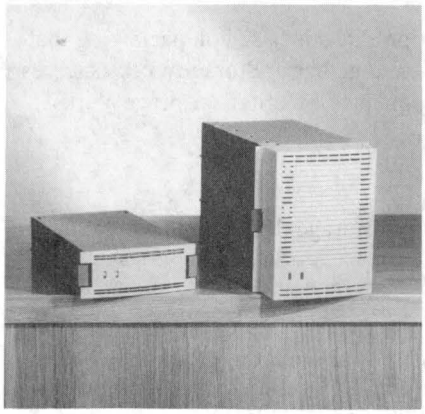
Digital's StorageWorks family of modular products is based on packaging that The devices and supporting electronics come together in StorageWorks shelves mounted in different enclosures. The components of Digital's StorageWorks modular family include:

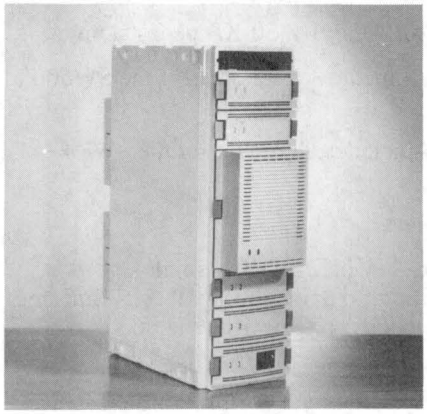
- **Storageworks Building Block**—including storage devices and electronics in 3.5- and 5.25-inch format, mounted in a carrier for StorageWorks shelves. These building blocks house CD-ROM, disk, tape drives, controllers, and servers.
- **Storageworks Building Block Shelf**—used for mounting StorageWorks Building Blocks. Can be inserted into StorageWorks data center cabinet, departmental cabinet, HSCs, or DEC 7000, and DEC 10000 AXP systems.
- **Storageworks Deskside Expansion Unit**—the BA350-KB pedestal unit.
- **Storageworks Departmental Cabinet**—includes all models of the SW500 cabinets.
- **Storageworks Data Center Cabinet**—includes all models of the SW800 cabinets.
- **Storageworks HSD05 Array Controllers**
- **Storageworks SCSI Signal Converter**—enables a shelf's single-ended backplane to use differential SCSI cabling, so that a StorageWorks Building Block shelf can be located up to 20 meters (65.6 feet) from the SCSI host controller.
- **Storageworks HSJ40 Controller Subsystems**—All HSC controllers except the HSC50 support modular products; two shelves can be installed in the top of HSC60/65/90/95 cabinets. Today's HSC servers make an ideal bridge into SCSI-based storage. See the HSC section for more detail on SCSI-connectivity with StorageWorks Building Block Shelves in the HSCs.
- **Storageworks Desktop Expansion Unit**—houses up to three StorageWorks Building Blocks in the BA353 models for workstations and PC use

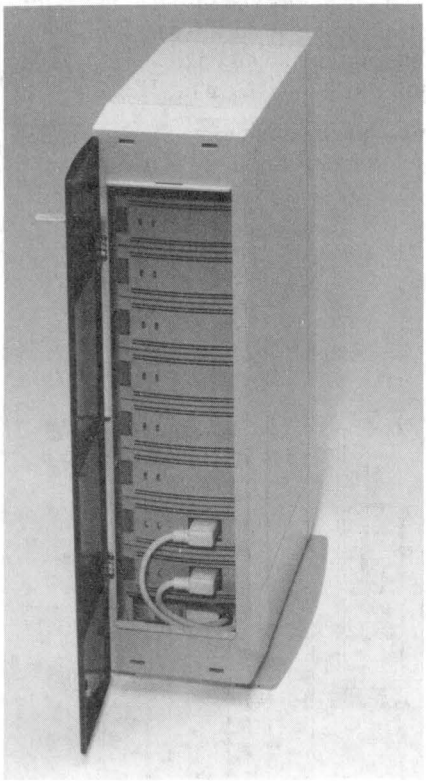


BA353 Exp. Box	2.4 in. high, 17 in. wide
BA350 Shelf	5.9 in. high, 17.5 in. wide
BA350 Exp. Unit	24 in. high, 10 in. wide
RAID 110 Array	24 in. high, 14 in. wide
SW800	6.7 in. high, 31 in. wide
HSC	41.7 in. high, 21.3 in. wide

StorageWorks Building Blocks Shelf/Deskside Expansion







All StorageWorks supported devices are mounted in green rugged carriers, creating a StorageWorks Building Block (SBB). Empty white carriers are available for non-supported, industry-standard SCSI-2 devices. Digital provides carrier specifications to allow customers and device vendors to determine physical, functional, and electrical integration as well as compliance with regulatory requirements. No additional pre-sales support is provided by Digital. A 90-day return-to-Digital warranty is provided.

Generic Carrier Kit

Carrier kit includes: shield, device ID select and alert logic, instructions and tools

SWXBA-BA	Generic Carrier Kit. Empty white carrier for 3.5-inch fixed media devices for StorageWorks enclosures
SWXBA-BB	Generic Carrier Kit. Empty white carrier for 3.5-inch removable media devices for StorageWorks enclosures
SWXBB-BB	Generic Carrier Kit. Empty white carrier for 5.25-inch removable and fixed media devices for StorageWorks enclosures

StorageWorks Building Block Shelves

Custom storage expansion is created by inserting StorageWorks building blocks into a desktop expansion unit, building block shelves or pedestal units. A pedestal unit is created by mounting shelves inside a pedestal enclosure. The shelf can be configured with a dual power supply for redundancy.

Features

- Flexibility
  - Shelves accommodate standard SCSI devices mounted in StorageWorks carriers
  - Shelves can be horizontally or vertically mounted in cabinets and/or system enclosures
  - Shelves support up to seven 3.5-inch devices or two 5.25-inch devices
  - Shelves support 3.5- and 5.25-inch devices in same shelf
- Availability
  - "Hot swappable" capability
  - Each shelf has power supply and redundant cooling
  - Battery backup optional for shelves
  - Redundant power supplies available for each shelf
  - All LEDs are visible through translucent pedestal door
  - LEDs display status of shelf cooling, power supplies, and other activity of storage devices
  - All major components can be installed or replaced by customer
- Performance
  - Shelves can be configured with two SCSI data channel cards for high data rateapplications and high performance devices.

Configuration Guidelines

The basic element is the shelf which can be installed in several different storage arrays using cabinet-or system-specific mounting brackets. Power for each shelf is furnished by either an ac or dc subsystem power supply. There are provisions for optional redundant power supplies as well as optional battery backup units. Cooling for each shelf is provided by two field-replaceable blowers mounted on the back of the shelf.

StorageWorks Building Blocks Shelf/Deskside Expansion *(continued)*

Configuration Guidelines ***(continued)***

A single modular shelf may house as many as seven different 3.5-inch devices, plus a power supply. 3.5-and 5.25-inch devices may be combined in a shelf.

All supported devices, (disk, tapes, power supplies, adapters) are mounted in carriers. Empty carriers are available to house 3.5- and 5.25-inch devices. Customers are referred to device vendors for configuration, installation, support, and maintenance of non-supported devices.

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. The SCSI buses are also user configurable.

Ordering Information

Shelf

BA350-SB	Single-height shelf, configured for seven 3.5-inch devices, or four 3.5-inch devices and one 5.25-inch full-height device, or one 3.5-inch device and two 5.25-inch full-height devices Installation of redundant power supply reduces number of 3.5-inch devices by one. Two 5.25-inch half-height devices (RRD42/43, TZK10/11) can be mounted in one 5.25-inch full-height carrier. Suitable for home, office, and industrial use. FCC class B certified.
BA350-KB	Deskside unit with BA350-SB shelf, BA35X-VA pedestal kit, BA35X-HA universal power, BN27S-03 U.S./Japan power cords. Suitable for home, office, and industrial use. FCC class B certified.
BA35X-VA	Pedestal mounting kit to enclose the BA350-SB shelf for deskside use. Includes locking translucent front door, BN27S-03 U.S./Japan power cord, and daisychained power switch.
BA350-JA	Shelf for mounting in SW500 Departmental Cabinet and SW800 Data Center Cabinet—includes power supply and mounting bracket.
BA655-AA	Double shelf specifically designed for use with DEC 7000 and 10000 AXP systems. Includes power supplies (BA35X-HB), special mounting brackets, system-supplied cooling.
BA35X-RB	Rackmounting kit for using the BA350-SB shelf in NEMA (RETMA) 19-inch cabinets. The resulting assembly requires 7 inches of vertical space.
BA35X-RD	Rackmounting kit for using the BA350-SB shelf in metric width cabinets. The resulting assembly requires 150 mm of vertical space.
BA35X-MA	Blower assembly for BA350. Replacement unti for self-maintenance.

Note: A power supply mounted in the shelf provides an automatic power connection at insertion to these supported devices. Power cords for devices mounted in pedestals **are not required**.

Shelf Specifications

Physical Dimensions	
BA350-KB Deskside Expansion Units	
Height	61 cm (24 in.)
Width	25.4 cm (10 in.)
Depth	36.8 cm (14.5 in.)
BA350-SB Modular Storage Shelves	
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-inch 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 Building Blocks Shelf/Deskside Expansion *(continued)*

Ordering Information *(continued)*

Supported Devices

EZ51R-VA	107-Mbyte solid state disk in 5.25-inch carrier
EZ54R-VA	428-Mbyte solid state disk in 5.25-inch carrier
EZ58R-VA	856-Mbyte solid state disk in 5.25-inch carrier
RRD42-VB	CD-ROM device in 5.25-inch carrier (BA35X-CD
RRD42-VU	CD-ROM device, can be added to RRD42-VB
RRD43-VA	Dual-speed CD-ROM drive in 5.25-inch carrier. One additional half-height device can be added.
RRD43-VC	Three dual-speed CD-ROM drives in 5.25-inch carrier. **Note:** Order this part number only for **three** RRD43 CD-ROM drives in 5.25-inch carrier.
RRD43-VU	Dual-speed CD-ROM upgrade, must be added to RRD43-VA, RRD42-VB, TKZ10-VA, TKZ11-VA
RRD44-VA	Dual-speed high-performance CD-ROM drive in 5.25-inch carrier with space for addtional half-height device.
RRD44-VU	Dual-speed high-performance CD-ROM upgrade, must be added to RRD44-VA, RRD43-VA, RRD42-VB, TZK10-VA, TZK11-VA
RWZ52-VA	1.2-Gbyte multifunction optical drive in 5.25-inch carrier
RX26-VA	2.8-Mbyte diskette drive in 3.5-inch carrier
RZ25-VA	426-Mbyte disk drive in 3.5-inch carrier
RZ25L-VA	535-Mbyte disk drive in 3.5-inch carrier
RZ26-VA	1.05-Gbyte disk drive in 3.5-inch carrier
RZ26L-VA	1.05-Gbyte disk drive in 3.5-inch carrier
RZ28-VA	2.1-Gbyte disk drive in 3.5-inch carrier
RZ28B-VA	2.1-Gbyte disk drive in 3.5-inch carrier
SWXTE-AA	5.0-Gbyte 8-mm helical scan tape drive in 5.25-inch carrier
SWXTE-AB	5.0-Gbyte 8-mm helical scan tape drive, can be added to SWXTE-AA
TKZ09-VA	5.0-Gbyte 8-mm tape drive in 5.25-inch carrier
TLZ06-VA	4.0-Gbyte 4-mm digital audio tape (DAT) in 3.5-inch carrier
TLZ07-VA	8.0-Gbyte 4-mm digital audio tape (DAT) in 3.5-inch carrier
TLZ6L-VA	4.0-Gbyte 4-mm digital audio tape (DAT) in 5.25-inch carrier
TZ86-VA	6.0-Gbyte tape in 5.25-inch carrier
TZ87-VA	20.0-Gbyte tape in 5.25-inch carrier
TZ87N-VA	20-Gbyte tape in 5.25-inch carrier, reads TK50
TZK10-VA	525-Mbyte QIC tape in 5.25-inch carrier
TZK10-VU	525-Mbyte QIC tape, add-on to TZK10-VA for two TZK10 tapes in one 5.25-inch carrier
TZK11-VA	2.0-Gbyte QIC tape in 5.25-inch carrier
TZK11-VU	2.0-Gbyte QIC tape, add-on to TZK11-VA for two TZK10 tapes in one 5.25-inch carrier
TKZ15VA	5-Gbyte, 5.25-inch SCSI tape drive

Power Supply

Note: Power supply choice is determined by the power supply design of system.

BA35X-HA	131-Watt universal ac input power supply. Maximum two per BA350 shelf. Occupies single 3.5-inch carrier.
BA35X-HB	131-Watt 48-Vdc input power supply. Maximum two per BA350 shelf. For use on DEC 7000/10000 AXP systems. Occupies single 3.5-inch carrier. (**Note:** One power supply included in each of the two shelves in BA655. Order this option for redundant power or spares.)
BA35X-HC	Optional battery backup for BA350 power supply. Supplies power for 16, 32, or 64 seconds as defined by user. Occupies single 3.5-inch carrier.

StorageWorks Building Blocks Shelf/Deskside Expansion *(continued)*

Power Supply Specifications

Power Requirements	
BA35X-HA Universal ac Input Power Supply	
Input	90–264 Vac, 47–63 Hz, auto-ranging
Output	131 W +12 Vdc, +5 Vdc
Power Cable Connector	IEC C14, Shrouded
BA35X-HB Universal dc Input Power Supply	
Input	32–72 Vdc, 47–63 Hz, auto-ranging
Output	131 W +12 Vdc, +5 Vdc
BA35X-VA Pedestal Mounting Kit	
Power Connector	IEC C14, Shrouded

StorageWorks Deskside Cabinet

Overview

The SW300 is an integrated unit comprised of devices and controllers in a single system. The SW300 is optimized for high availability. With the enhanced backplane, the need for the device SCSI (BC21x) cables has been eliminated. The SW300 features an Environmental monitor, AC power entry box configurable to N+1 power redundancy with only five power supplies, and N+1 redundant dual-speed blowers.

Features

- Flexibility
  - Provides packaging for 24 3.5-inch SBBs or eight 5.25-inch SBBs
  - Provide packaging for two HSJ40 family/HSZ40 family/HSD40/HSD30 and two cache modules
  - Device SCSI cables eliminated
  - Security locking door
  - Transportability
  - Provides internal single-ended six SCSI buses eliminating need for external device cables
- Availability
  - Utilizes redundant controllers (HSJ40 family/HSZ40 family/HSD40/HSD30)
  - Redundant Environmental Monitor unit with access to all available status signals
  - N+1 redundant power
  - Optional N+N Full redundant power and ac input
  - LEDs display status and activity of storage devices and all FRUs.
  - All major components can be installed or replaced by customer.
  - Cooling provided by 7+1 redundant dual-speed blowers
  - Audible alarm on faults

Configuration Guidelines

All supported devices, (disk, tapes, power supplies, adapters) are mounted in carriers. Empty carriers are available to support 3.5- and 5.25-inch devices.

The SW300 will utilize and integrate the RZ26L-VA, RZ28-VA, RZ28B-VA disk drives, TLZ06/TLZ07 tape, HSx30/40 controllers at announcement. SBBs are compatible with all StorageWorks enclosures.

StorageWorks Deskside Cabinet *(continued)*

Ordering Information

SW300-AA	SW300 Integrated Expansion Pedestal. Provides packaging for 24 3.5-inch SBBs, two controllers (not HSD05), two cache, or eight 5.25-inch SBBs, or mixed combinations. Includes integrated backplane, eight dual-speed blowers, six single-ended SCSI buses, ac power entry unit, environmental monitor, five BAHX-HD power supplies (will not use BA35X-HA), user documentation
BA35X-HD	3.5-inch universal power supply in SBB, 145 Watts for use with SW300-AA, maximum eight per SW300
BA35X-HE	AC power entry unit for redundancy, maximum of two per SW300
BA35X-EA	Environmental monitor for redundancy, maximum of two per SW300
BA35X-MD	Dual-speed blower replacement

Supported Devices

RZ26L-VA	3.5-inch disk drive, 1.05-Gbyte (formatted) capacity in carrier
RZ28-VA	3.5-inch disk drive, 2.0-Gbyte (formatted) capacity in carrier
RZ28B-VA	3.5-inch disk drive, 2.0-Gbyte (formatted) capacity in carrier
TLZ06-VA	3.5-inch tape drive, 4-mm DAT, 4-Gbyte capacity in carrier
TLZ07-VA	3.5-inch tape drive, 4-mm DAT, 8-Gbyte capacity in carrier

Controllers

Controller	Interface	Storage Device Buses
HSD30	Digital standard system interconnect (DSSI)	Six 8-bit single-ended SCSI-maximum of two
HSJ30	Computer Interconnect (CI) bus	Six 8-bit single-ended SCSI-maximum of two
HSJ40	CI bus	Six 8-bit single-ended SCSI-maximum of two
HSZ10	Fast, wide, differential SCSI	Five 8-bit single-ended SCSI-maximum of two
HSZ15	Fast, wide, differential SCSI	Five 8-bit single-ended SCSI-maximum of two
HSZ40	Fast, wide, differential SCSI	Six 8-bit single-ended SCSI-maximum of two

Country Kits

Order country-specific 13-20 amp input power cords, as listed.

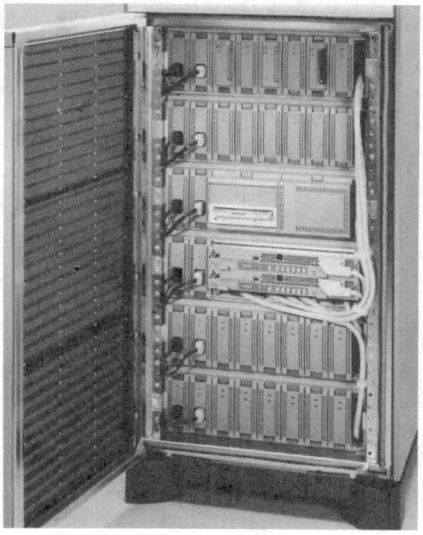
Order Number	Country/Voltage	Amps	Plug	Meters (Feet)
BN27S-03	U.S./Japan, 250 V	15	NEMA 5-15	3.0 (9.8)
BN19H-2E	Australia/New Zealand, 250 V	10	AS 3112-1981	2.5 (8.2)
BN19W-2E	Central Europe, 250 V	10	CEE 7/7(Schuko)	2.5 (8.2)
BN19A-2E	U.K./Ireland, 250 V	10	BS 1363	2.5 (8.2)
BN19E-2E	Switzerland, 250 V	10	SEV 1011	2.5 (8.2)
BN19K-2E	Denmark, 250 V	10	Afsnit 107	2.5 (8.2)
BN19M-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 Deskside Cabinet *(continued)*

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 Vac, 47–63 Hz, auto-ranging
Output	145 W +12 Vdc, +5 Vdc
Power Cable Connector	IEC C14, Shrouded
Power Requirements of SW300	
Voltage	100-120/220-240 Vac, 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 Departmental Cabinet



The StorageWorks Departmental Cabinet SW5xx provides high-capacity storage expansion to CI-based OpenVMS Clusters and supports a wide variety of SCSI devices. Slots in the cabinet can be used to support StorageWorks shelves (up to 10) and one or two TZ8xx backup tapes and magazine tape subsystems.

It provides SCSI expansion for many AXP systems*. Up to eight single-ended SCSI buses (two per KZMSA) are supported on DEC 7000/10000 AXP systems running OpenVMS AXP. Sixteen SCSI buses are supported under DEC OSF/1 AXP. DWZZA SCSI signal converters are required to extend each single-ended SCSI bus from the host adapter into the cabinet. A DWZZA signal converter kit provides everything needed to connect SCSI drives in the SW500 cabinet to the KZMSA host adapter.

The SW500 may also be used to configure custom HSJ40-based subsystems.

Maximum SW500 configurations are:

- Ten device shelves (BA350-JA)
- Nine device shelves and one controller shelf (BA350-MB)
- Eight device shelves and two controller shelves
- Five device shelves, one controller shelf, and two Tz8xx tape shelves†

* System device support can be found in *StorageWorks Configuration Guide* (EK-BA350-CG)
† Maximum number of controller shelves is limited to one when tape shelf is installed in cabinet.

Features

- 43 inches (1100 mm) high and 1-phase power
- Support for wide variety of devices: disks, tapes, tape subsystems, and CD-ROMs
- Electronic temperature sensing automatically matches air flow to cooling requirements
- Optional second power supply allows isolated disk arrays in single cabinet

Configuration Guidelines

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. Physically, the cabinet can hold up to 70 3.5-inch devices, or 42 3.5-inch devices and up to two TZ8xx magazine subsystems.

Ordering Information

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.

SW5XP-AC/AD Second Power Distribution Unit—supports up to 24 addtional shelf power supplies and ac power cords with each shelf.

Note: All SW5xx StorageWorks arrays require separately ordered HSJ40 controllers.

Order Number	Devices	Controller	Shelves	Power Supply	Cables	ACC/UPG
SW510-AC/AD	6 RZ26-VA		3 BA350-SB 1 BA350-MA	4 BA35X-HA	6 BN21H-01	4 BA35X-RD
SW510-BC/BD	6 RZ26L-VA	1 HSJ40-AD	3 BA350-SA/JA* 1 BA350-MB*	4 BA35X-HA	5 BN21H-01	
SW510-CC/CD	6 RZ26L-VA 1 TZ867-AE/AF	1 HSJ40-AD	3 BA350-SA/JA* 1 BA350-MB*	4 BA35X-HA	1 BN21H-02 5 BN21H-01	1 CK-SF400-TE
SW512-AD/AD	6 RZ26-VA		3 BA350-SB 1 BA350-MA	4 BA35X-HA	6 BN21H-01	4 BA35X-RD
SW512-BC/BD	6 RZ28B-VA	1 HSJ40-AD	3 BA350-SA/JA* 1 BA350-MB*	4 BA35X-HA	5 BN21H-01	
SW512-CC/CD	6 RZ28B-VA 1 TZ867-AD/AF	1 HSJ40-AD	3 BA350-SA/JA* 1 BA350-MB*	4 BA35X-HA	1 BN21H-02 5 BN21H-01	1 CK-SF400-TE

StorageWorks Departmental Cabinet *(continued)*

Ordering Information *(continued)*

Pedestal Packaged Configurations

Order Number	Devices	Controller	Shelves	Power Supply	Cables	ACC/UPG
BA350-KC	3 RZ26L-VA	1 HSD05-AA	1 BA350-KB*	1 BA35X-HA		
BA350-KE	3 RZ28B-VA	1 HSD05-AA	1 BA350-KB*			

* BA350-JA/MB/KB shelves come with one power supply. To calculate total number of power supplies, add shelf number to power supply number.

Tape Mounting Kit

The SW500 supports two tape loaders in the top four slots (two BA350 slots in front and two BA350 slots in back) of cabinet. One tape bezel mounting kit supports one or two tape drives.

CK-SF400-TE Tape mounting bezel kit (supports two tapes)

Specifications

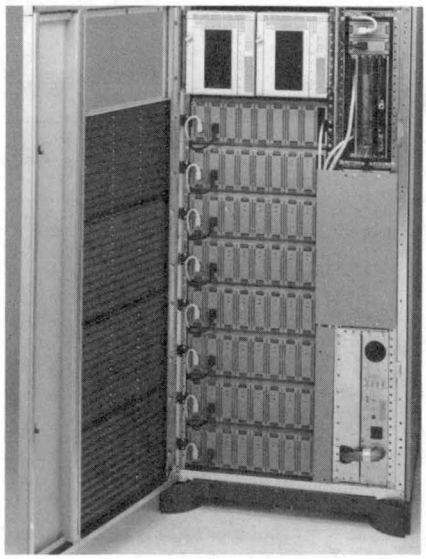
StorageWorks Departmental Cabinet

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 Vac, 240 Vac
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 HSJ40 Controller Subsystems

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State				Thermal Dissipation	
			L1	L2	L3	Neutral	Watts	Btu/kJ/h
SW510-AC	120	60	3.2				229	210
SW510-AD	240	50	1.7				229	[720]
SW511-AC	120	60	5.9				432	518
SW511-AD	240	50	3.8				432	[1776]
SW512-AC	120	60	3.2				220	210
SW512-AD	240	50	1.8				220	[720]
HSJ-series	+ 5	DC	4.5				31	
		DC	0.7					

StorageWorks Data Center Cabinet



The StorageWorks Data Center Cabinet SW8xx provides high-capacity storage expansion for SCSI devices attached to HSCs within CI-based OpenVMS Clusters and supports a wide variety of SCSI devices. Slots in the cabinet can be used to support StorageWorks shelves (up to 24) and up to four TZ8xx backup tapes and magazine tape subsystems.

The StorageWorks Data Center Cabinet SW8xx provides SCSI expansion space for HSCs with SCSI drives. DWZZA signal converters are required for each SCSI bus connected to the SCSI channel card in the HSC. A second DWZZA signal converter kit contains everything needed to connect external SCSI storage to the HSC cabinet.

The StorageWorks Data Center Cabinet also provides SCSI expansion for the DEC 7000/10000 AXP systems. Up to eight single-ended SCSI buses (two per KZMSA) are supported on DEC 7000/10000 AXP systems running OpenVMS AXP. Sixteen SCSI buses are supported under DEC OSF/1 AXP. DWZZA SCSI signal converters are required to extend each single-ended SCSI bus from the host adapter into the cabinet. A DWZZA signal converter kit provides everything needed to connect SCSI drives in the SZ400 cabinet to the KZMSA host adapter.

Features

- Support for wide variety of devices: disks, tapes, tape subsystems, and CD-ROMs
- Electronic temperature sensing automatically matches air flow to cooling requirements
- Optional second power distribution unit allows isolated disk arrays in a single cabinet

Configuration Guidelines

Number of devices supported in cabinet is function of the number of hosts or controllers accessing the cabinet, and number of SCSI channels supported by each host/controller. Physically, the cabinet can hold up to 168 3.5-inch devices, or 140 3.5-inch devices and four TZ8xx magazine subsystems.

Ordering Information

SW800-AA/AB Basic StorageWorks Data Center Cabinet. Includes power distribution unit for supporting up to 24 StorageWorks shelves and ac power cords with each shelf. Requires 3-phase power.

SW8XP-AA/AB Second Power Distribution Unit—supports up to 24 additional shelf power supplies and ac power cords with each shelf.

Note: All SW8xx StorageWorks arrays require separately ordered HSJ40 controllers.

Order Number	Devices	Controller	Shelves	Power Supply	Cables	ACC/UPG
SW810-AA/AB	6 RZ26-VA		3 BA350-SB 1 BA350-MA	4 BA35X-HA	6 BN21H-01	4 BA35X-RD
SW810-BA/BB	18 RZ26L-VA	1 HSJ42-AD	6 BA350-JA 1 BA350-MB 1 SW8XP-AA/AB	7 BA35X-HA	6 BN21H-01	
SW810-CA/CB	18 RZ26L-VA 1 TZ867-AE/AF	1 HSJ42-AD	5 BA350-JA 1 BA350-MB 1 SW8XP-AA/AB	6 BA35X-HA	1 BN21H-02 5 BN21H-01	1 CK-SF400-TE
SW812-AA/AB	6 RZ28-VA		3 BA350-SB 1 BA350-MA	4 BA35X-HA	6 BN21H-01	4 BA35X-RD
SW812-BA/BB	18 RZ28B-VA	1 HSJ42-AD	6 BA350-SA/JA 1 BA350-MB 1 SW8XP-AA/AB	7 BA35X-HA	6 BN21H-01	
SW812-CA/CB	18 RZ28B-VA 1 TZ867-AE/AF	1 HSJ42-AD	5 BA350-SA/JA 1 BA350-MB 1 SW8XP-AA/AB	6 BA35X-HA	1 BN21H-02 5 BN21H-01	1 CK-SF400-TE

StorageWorks Data Center Cabinet *(continued)*

Ordering Information *(continued)*

Pedestal Packaged Configurations

Order Number	Devices	Controller	Shelves	Power Supply	Cables	ACC/UPG
BA350-KC	3 RZ26L-VA	1 HSD05-AA	1 BA350-KB*	1 BA35X-HA		
BA350-KE	3 RZ28B-VA	1 HSD05-AA	1 BA350-KB*			

Tape Mounting Kit

The SW800 supports four tape loaders in the top four slots (four BA350 slots in front and four BA350 slots in back) of cabinet. One tape bezel mounting kit supports one or two tapes; select one additional tape bezel mounting kit for third and four tape, if required.

CK-SF400-TE Tape mounting bezel kit (supports two tapes)

Specifications

StorageWorks Data Center Cabinet

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 Vac, 240/416 Vac
AC plug type	NEMA L21-30, IEC 309-516P6W
Number of phases	3
AC-plug type	
Rated current	24 Amps/phase

Operating Environment

Class A

Storageworks HSJ-Series Controller Subsystems

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State				Thermal Dissipation	
			L1	L2	L3	Neutral	Watts	Btu/kJ/h
SW810-AA	120220/41	60	0.7	0.7	0.7	1.2	149	510
SW810-AB	6/208	50	0.3	0.3	0.3	0.6	149	[536]
SW811-AA	120/208	60	2.6	2.6	2.6	4.5	532	1819
SW811-AB	220/416	50	1.3	1.3	1.3	2.3	532	[1915]
SW812-AA	120/208	60	0.7	0.7	0.7	1.2	149	510
SW812-AB	220/416	50	0.3	0.3	0.3	0.6	149	[536]
HSJ-Series	+ 5	DC	4.5				31	
		DC	0.7					

StorageWorks HSD05 Array Controller

The StorageWorks HSD05 array controller brings DSSI support to the StorageWorks family of products. The HSD05 connects to a single port on the DSSI Bus, providing connectivity for up to seven SCSI devices. The HSD05 allows customers to expand the amount of DSSI connected storage devices.

The HSD05 is a 3.5-inch StorageWorks array controller that mounts in a BA350-SA shelf along with up to six SCSI devices. The StorageWorks shelves may be mounted in the SW500 or SW800 cabinets. Up to seven HSD05 array controllers mounted in BA350-SA shelves may be daisy-chained together using the tri-link to fully utilize the DSSI bus. Maximum DSSI bus length supported is 60 feet.

StorageWorks HSD05 Array Controller *(continued)*

HSD05-AA includes the tri-link and a bus terminator. HSD05 does not provide cache or raid functionality.

Features

- Direct connection to DSSI bus
- Connection for up to seven SCSI devices, six SCSI devices per StorageWorks shelf
- DSSI to SCSI support for VAX 4000, DEC 4000 AXP, VAX 6000, VAX 7000, and VAX 10000 systems
- Supports Host-Based Raid 0 (striping) and Raid 1 (unassisted Host-Based Volume Shadowing)
- Multihost operation, up to three hosts on the DSSI bus

SCSI Devices Supported

- 1.05-Gbyte RZ26L hard disk
- 2.1-Gbyte RZ28 hard disk
- 107-Mbyte EZ51R SCSI solid state disk
- 428-Mbyte EZ54R SCSI solid state disk
- 4.0-Gbyte TLZ06 4-mm DAT tape
- TLZ6L 4-mm DAT tapes
- 6.0-Gbyte TZ86 tape
- TZ87 and TZ87N tape

Adapters Supported

- EDA670
- D4000
- KFDDA
- KFDDB
- KFMSA
- KFQSA

StorageWorks Environments/Cabinets Supported

BA350-SA	StorageWorks shelf assembly, 1/2 SCSI
BA350-JA	StorageWorks BA350-SA shelf kit
BA350-KA	StorageWorks deskside expansion unit
BA350-LA	StorageWorks shelf assembly, for S-PIU
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet

Operating System Support

OpenVMS VAX V5.5-2, V6.0 and OpenVMS AXP V1.5 supports HSD05 with limitations. Devices are identified as generic or unknown device types. Model type identifiers are not present in the operating system software

Device/Option Capabilities

Supported:

- Up to seven disk storage devices on same SCSI bus from HSD05
- Up to two tape storage devices on same SCSI bus from HSD05
- Two solid state storage devices on a SCSI bus from HSD05
- Up to two tapes and two disks or one tape and five disk devices on a SCSI bus from HSD05

Not Supported:

- Combined use of HSD05 and DWZZA adapters

Recommendation

For optimal performance the HSD05 should be operated at a maximum of 80 percent utilization. This allows for optimal performance with workload peaks. If an HSD05 is more than 80 percent utilized, order an additional controller.

Ordering Information

HSD05-AA	StorageWorks HSD05 DSSI Array Controller, seven SCSI-2 disk tape and SSD device support

StorageWorks HSD30 Array Controller

Product Description

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 (BA350-MA) 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. 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 HSD05 devices. The tri-link and a 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.

Features

- Direct connection to the DSSI Bus
- Connection for up to 21 SCSI Devices, 7 SCSI devices per StorageWorks shelf
- DSSI to SCSI Support for VAX 4000, DEC 4000 AXP, VAX 6000, VAX 7000, and VAX 10000 systems
- Provides controller based striping (Raid 0) and supports host-based Raid 1 (Phase II Volume Shadowing)
- 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 0nodes

SCSI Devices Supported

- RZ26, 1.05-Gbyte disk
- RZ26L, 1.05-Gbyte disk
- RZ28, 2.1-Gbyte disk
- RZ28B, 2.1-Gbyte disk
- EZ51/54/58R SCSI solid state disk devices
- RRD42/43/44 optical devices
- TLZ06/TLZ6L 4mm tape devices
- TZ86/87/87N tape devices
- TZ867/77 tape devices with loader

Adapters Supported

- EDA670
- Embedded DEC 4000 AXP DSSI adapter
- KFMSA
- KFDDA/B

StorageWorks HSD30 Array Controller *(continued)*

StorageWorks Environments Supported

BA350-SA/SB	Storage shelf assembly, 1/2 SCSI
BA350-MA/MB	Storage controller shelf
BA350-JA	Storage BA350-SA shelf kit
BA350-LA	Storage shelf assembly, for S-PIU
SW500-AC/AD	StorageWorks departmental cabinet
SW800-AA/AB	StorageWorks data center cabinet

Operating System Support

OpenVMS VAX Version 5.5-2, V6.0, and OpenVMS AXP 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 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 AXP 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-AA	StorageWorks Array Controller 130d; 18 SCSI-2 disk, tape, SSD, optical device support; RAID 0, base firmware and license
HSD30-AD	StorageWorks Array Controller 130d; 18 SCSI-2 disk, tape, SSD, optical device support; RAID 0, 16-Mbyte cache, base firmware and license
HSD30-AF	StorageWorks Array Controller 130d; 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 cache

StorageWorks HSD30 Array Controller *(continued)*

StorageWorks Cables for the HSD30

BC29S-xx	DSSI cable to VAX or DEC 7000, 10000 AXP systems to HSD
BC29R-xx	DSSI cable to VAX or DEC 4000 AXP 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 SCSI Signal Converter



The StorageWorks Signal Converter adapts differential SCSI systems to single-ended SCSI signals to provide long (up to 25 meters [82 feet]) 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 worksystems fails. Customers can be freed of the 6-meter (19.6-foot) SCSI limit and locate SCSI devices over 61 meters (200 feet) apart using synchronous transfers. No changes are required to existing devices or software.

The DWZZA signal converter is bidirectional 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.

Ordering Information

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 both the DWZZA-MA and a power supply encased in small standalone unit; used for DEC 7000 and DEC 10000 AXP systems, and for HSCs that require connectivity to the StorageWorks family.

StorageWorks SCSI Signal Converter *(continued)*

Specifications

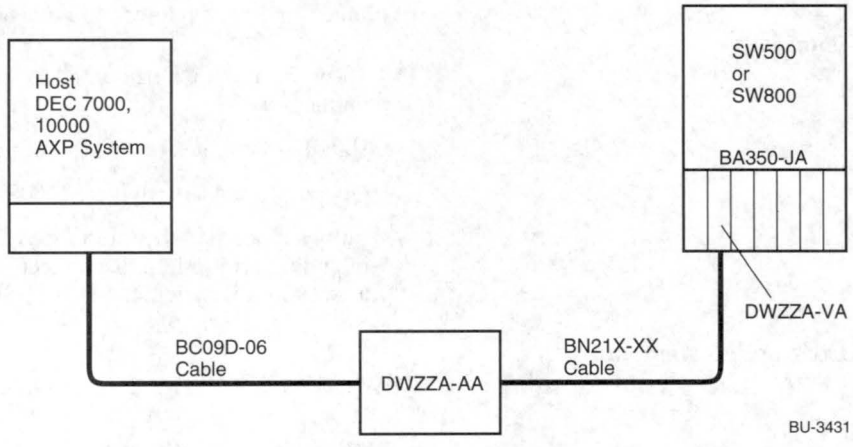
DWZZA-MA	3.25-inch x 6.5-inch module
DWZZA-VA	Standard 3.5-inch StorageWorks Building Block
DWZZA-AA	4.5-inch wide, 3-inch high, 8-inch long tabletop unit
Connectors	
Single-ended	50-pin low-density shielded SCSI device (A cable connector).
Differential	68-pin panel-mounted SCSI ``P'' connector
Power Required	
Input voltage	5 Vdc
Input current	Electronics 1.5 Amps; Terminators 0--3 Amps
Total power consumption	7.5–22.5 Watts

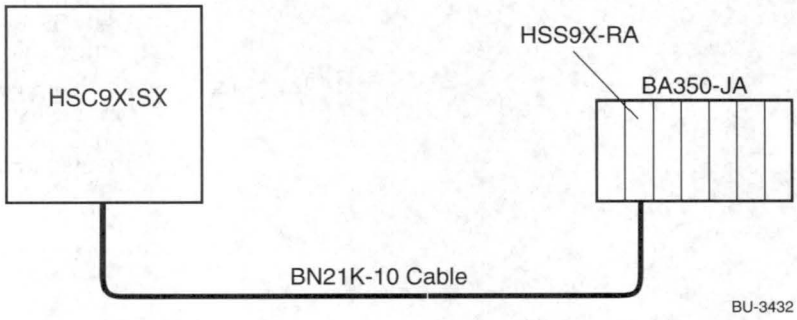
SCSI Signal Converter Kits

SWX01-AA Shelf and signal converter kit for attaching external SCSI storage (single-ended SCSI bus to the DEC 7000/10000 AXP systems. Extends single-ended SCSI bus from DEC 7000/10000 AXP systems into SW800 cabinet. Includes DWZZA-AA stand-alone single-ended to fast-wide signal converter to attach to host BC09D-06 (6-feet) single-ended SCSI cable to host 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.

Note: SWX01-AA and HSS9X-RA are preconfigured packages. The components in the preconfigured packages can be ordered for use in customized configurations. These packages are examples of possible configurations:





StorageWorks HSJ-Series Array Subsystems

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 RZ26 or RZ28 disk drives (or other 3.5-inch storage devices) or 20 RZ74 drives (or other 5.25-inch devices) can be supported by one or two dual-redundant HSJ40s within the data center cabinets.

For subsystem configuration assistance see *StorageWorks Subsystem Configuration Guidebook, Second Edition* (EC-N0581-45).

Features

- Direct connection to CI—channel card functionality included
- High-performance and connectivity storage controllers, with up to 32-Mbyte read cache and RAID 0 (Striping) built in
- Coexistence with all HSC models
- Optional controller redundancy with automatic failover and redundant power option
- StorageWorks packaging for maximum configuration flexibility

HSJ-Series Array Controllers

The expanded family of HSJ-Series Array subsystems provide new, scalable 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. 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.

- EZ51R 107-Mbyte, 5.25-inch solid state disk
- EZ54R 428-Mbyte, 5.25-inch solid state disk
- EZ58R 856-Mbyte, 5.25-inch solid state disk
- RRD42 CD-ROM
- RRD43 CD-ROM
- RZ26L 1.05-Gbyte, 3.5-inch disk
- RZ28 2.01-Gbyte, 3.5-inch disk
- RZ28B 2.01-Gbyte, 3.5-inch disk
- TLZ06 4.0-Gbyte 4-mm DAT tape
- TLZ06L 4.0-Gbyte 4-mm DAT tape with loader
- TZ86 6.0-Gbyte DLT tape
- TZ867 6.0-Gbyte tape with loader
- TZ87 and TZ87N 2.0-Gbyte DLT tape
- TZ877 140-Gbyte DLT tape subsystem
- TSZ07 40/140 reel-to-reel tape
- TSZ07 1600/6250 reel-to-reel tape

StorageWorks HSJ-Series Array Subsystems *(continued)*

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.

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).

HSJ42

Packaged as a dual-redundant HSJ40 configuration, the HSJ42 provides support for a miximum 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.

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.

Operating System Support

HSJ-series controller subsystems supported by OpenVMS VAX V5.5-2 and above; and OpenVMS AXP V1.5.

Ordering Information

StorageWorks HSJ-Series Array Controller Subsystems Family

HSJ30-AA	StorageWorks Array Controller 130c; 18 SCSI-2 device support, RAID 0, Base Firmware and License
HSJ30-AD	StorageWorks Array Controller 130c; 18 SCSI-2 device support, RAID 0, Base Firmware and License, 16-Mbyte Read Cache
HSJ30-AF	StorageWorks Array Controller 130c; 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
HSJ40-AD	StorageWorks Array Controller 140c; 36 SCSI-2 device support; 16-Mbyte Read Cache, RAID 0, Base Firmware and License
HSJ40-AF	StorageWorks array HSJ40 controller 140c; 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-AD	Two HSJ40-AD StorageWorks Array Controller 140c; 36/72 SCSI-2 device support, 32-Mbyte total Read Cache, RAID 0, Base Firmware and License
HSJ42-AF	Two HSJ40-AD StorageWorks Array Controller 140c; 36/72 SCSI-2 device support, 64-Mbyte total Read Cache, RAID 0, Base Firmware and License
HSJ42-AD	Four HSJ40-AD StorageWorks Array Controller 140c; 72/144 SCSI-2 device support, 64-Mbyte total Read Cache, RAID 0, Base Firmware and License
HSJ42-AF	Four HSJ40-AD StorageWorks Array Controller 140c; 72/144 SCSI-2 device support, 128-Mbyte total Read Cache, RAID 0, Base Firmware and License

StorageWorks HSJ-Series Array Subsystems *(continued)*

Subsystem Configuration

The flexibility of the StorageWorks HSJ-series controller array subsystems require familiarity with the configuration guidelines and associated restrictions described in *StorageWorks Subsystem Configuration Guidebook, Second Edition*, "Configuring Modular SCSI Storage for CI-Based Systems," (EC-N0581-45). To ensure that factory configurations match customer requirements, **all orders must be submitted in an indented format via configure-to-order methodology**. Should ambiguities in ordered configurations exist, manufacturing will configure subsystems to distribute storage devices and associated SCSI cabling to balance controller bus loading.

StorageWorks HSZ40 Array Subsystems

The StorageWorks HSZ40 Array Controller provides connectivity and performance extensions for locally-attached SCSI devices on DEC 3000 and DEC 7000/10000 AXP systems. Up to 42 SCSI-2 Disk and Solid State Disk devices may be attached to each HSZ40, with up to 88 Gbytes of disk storage when deploying the RZ28. RAID 0 (striping) is standard, with 16-Mbyte or 32-Mbyte Read Cache optionally 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 1400 I/O/s request rate and up to 10 MB/s bandwidth. SCSI devices are attached to the 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 in the Dual Target mode to appear as two SCSI targets, thus doubling the Logical Unit addressing to sixteen.

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
- DEC 3000 AXP support via the KZTSA Host Adapter and DEC 7000/10000 AXP support with the KZMSA
- Supported on DEC OSF/1 for AXP V2.0

SCSI Devices Supported

- RZ26
- RZ26L
- RZ28
- RZ28B
- EZ51R
- EZ54R
- EZ58R

Note: A maximum of two, EZ5xx devices per HSZ40 device bus is recommended.

StorageWorks HSZ40 Array Subsystems *(continued)*

Host Adapter Support

Processor	Adapter	Configuration Guidelines
DEC 3000 AXP	KZTSA	Up to 3 HSZ40 Array Controllers supported per KZTSA; dual target feature supported
DEC 7000/10000 AXP	KZMSA	Maximum of 1 HSZ40 per KZMSA bus or 2 HSZ40s per KZMSA; dual target feature not supported

StorageWorks Enclosures Support

SW500-AC/AD	StorageWorks Departmental Cabinet
SW800-AA/AB	StorageWorks Data Center Cabinet
BN21K-xx	FWD-SCSI Host Interconnect Cabling

Note: For more information, see the *StorageWorks Subsystem Configuration Guidebook*, EC-N0581-45.

Operating System Support

DEC OSF/1 for AXP V2.0.

Ordering Information

HSZ40-AA	StorageWorks 140s Array Controller; 42 SCSI-2 Disk/SSD Support; RAID 0, Base Firmware and License
HSZ40-AD	StorageWorks 140s Array Controller; 42 SCSI-2 Disk/SSD Support; 16-Mbyte Read Cache, RAID 0, Base Firmware and License
HSZ40-AF	StorageWorks 140s Array Controller; 42 SCSI-2 Disk/SSD Support; 32-Mbyte Read Cache, RAID 0, Base Firmware and License
HSZ40-XD	16-Mbyte Read Cache Option for HSZ40-AA, 16-Mbyte total
HSZ40-XE	16-Mbyte Read Cache Option for HSZ40-AD, 32-Mbyte total; Mandatory return of installed cache
HSZ40-XF	32-Mbyte Read Cache Option for HSZ40-AA, 32-Mbyte Total

InfoServer 1000 for StorageWorks

InfoServer systems are network resources designed to work in conjunction with SCSI storage devices to provide information to local area network users. They support a variety of SCSI devices, including CD-ROM, hard drives, magneto-optical, tape devices, and CD-recordable drives. Using a sophisticated software kernel, a disk caching scheme, and specialized network protocols, the InfoServer delivers information from these devices to multiple concurrent connections with performance comparable to a locally attached device.

InfoServer systems serve information from devices simultaneously to different client platforms in the native file format of that particular client. Client platforms supported by the InfoServer system include MS-DOS, Novell, NetWare, PATHWORKS for DOS, Macintosh, ULTRIX, and OpenVMS. In addition, X terminals can be clients of InfoServer systems for enhanced X terminal characteristics.

InfoServer systems serve multiple clients simultaneously, regardless of format, using LASTport/Disk. This sophisticated protocol allows the InfoServer to transfer information efficiently at the block level. The server relies on the client to interpret the information according to its own file format. Clients run software that enables them to communicate with the server. In some cases, the client software resides within the operating system, i.e., PATHWORKS for DOS and OpenVMS. In other cases it must be ordered separately. This software is simply a media and documentation kit. Since the rights to use the client software are supplied with the server, there are no additional ``per-client'' software charges.

The repackaged InfoServer 1000 in a StorageWorks building block can be integrated into StorageWorks packaging along with storage devices.

Advantages of InfoServer 1000 in a StorageWorks building block:

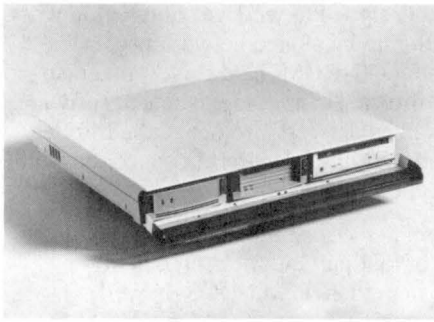
- Ability to serve storage devices to a local area network without being attached to a file server (integrating the server into the StorageWorks subsystem)
- Ability to serve information from storage devices to multiple clients and client platforms simultaneously
- Fast data access for mostly read applications, appears as local drive
- A platform that can integrate into Novell, Macintosh, UNIX, ULTRIX, and OpenVMS VAX easily and inexpensively

Ordering Information

SWDCI-AA	InfoServer 1000 StorageWorks System Building Block for Digital systems
SWXCI-AA	InfoServer 1000 StorageWorks System Building Block for generic systems

See Infoserver 1000 in *Network Storage Servers*, later in this chapter, for specifications to add Ethernet Communications.

Desktop Expansion Unit—BA353 Family



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.

The Desktop Expansion Unit has its own power and cooling systems; a SCSI-2 host interface that connects it to a personal computer, workstation, or server; a power switch; and a power outlet that can feed a second device. When configuring the subsystem, snap any StorageWorks building block 3.5-inch SCSI device into the enclosure. The subsystem has a low noise level and contains an anti-theft feature that helps secure the plug-in drives.

It accommodates three devices and supports combinations of: one 5.25-inch half-height device (TZK11, RRD43, RRD44, or TZ30) and two 3.5-inch half-height devices or three 3.5-inch half-height devices (TLZ06-VA, RZ2x-VA).

The Desktop Expansion Unit is available with embedded TZ30, TZK11, RRD43, or RRD44 at time of order; two additional 3.5-inch disk drives are supported. TZ30, TZK11, RRD43, and RRD44 devices are not field installable. The Desktop Expansion Unit is a low-cost, easy-to-configure storage solution.

Features

- Supports up to three disk, tape, floppy, or CD-ROM devices in a space-saving desktop package
- Allows mix and match devices, form factors, and multivendor products
- Uses industry-standard SCSI-2 interfaces and drives

Ordering Information

BA353-AA	Desktop expansion unit, universal power supply, 120-V power cord, and user documentation. Requires SCSI cable.
BA353-AF	Desktop expansion unit with one RRD42, universal power supply, 120-V power cord, and user documentation. Requires SCSI cable.
BA353-AH	Desktop expansion unit with one TZ30, universal power supply, 120-V power cord, and user documentation. Requires SCSI cable.

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 system	Front to rear 6 CFM/slot
Number of blowers	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-inch devices	User-selectable
for 5.25-inch devices	User-selectable

Desktop Expansion Unit—BA353 Family *(continued)*

SCSI Cables

Three types of SCSI cables are used with StorageWorks products.

- A cables
- P cables
- Transition cables

SCSI Cable Characteristics

Number of pins:	50 or 68
Pin density:	Low or high
Connector form:	Male or female
Connector orientation:	Straight or right angle
Securing mechanism:	Bail locks, thumb latches or jackscrews
Length:	From 0.15 m (0.49 ft) to 20 m (65.6 ft) Note SCSI bus length restrictions.)

SCSI A Cable

SCSI-1 and SCSI-2 implementations use a 50-pin cable—an "A" cable—to carry the bus information.

This A cable is used for 8-bit, single-ended communications; 8-bit refers to the 8-bit-wide data bus; single-ended refers to a single-wire-driven signal on the cable as opposed to a differential wire-pair-driven signal.

Cable	Host Connector	StorageWorks Connector
BN21H	50-pin, high-density, male, straight thumb latches	50-pin, high-density, male, straight thumb latches
BN21J	50-pin, high-density, male, right-angle, 2-56 jackscrews	50-pin, high-density, male, straight thumb latches
BC10U	50-pin, high-density, male, straight thumb latches	50-pin, high-density, male straight thumb latches

SCSI P Cable

Typically, the HSx-series controllers use a SCSI-3 ``P'' cable for communicating with a host that uses a 16-bit-wide differential bus.

Cable	Host Connector	StorageWorks Connector
BN21K	68-pin, high-density, male, straight, 2-56 jackscrews	68-pin, high-density, male, right-angle, 2-56 jackscrews
BN21L	68-pin, high-density, male, right-angle, 2-56 jackscrews	68-pin, high-density, male, right-angle, 2-56 jackscrews

SCSI Transition Cables

SCSI transition cables have different connector types on each end. They are used to transition the SCSI bus signals from one connector type to another; for example, from a 50-pin to a 68-pin connector, or from a 50-pin, low-density connector to a 50-pin, high-density connector.

Cable	Host Connector	StorageWorks Connector
BN21M	68-pin[1], high-density, male, right-angle, 2-56 jackscrews	50-pin, low-density, male, straight bail locks
BN21N	68-pin[1], high-density, male, right-angle, 2-56 jackscrews	50-pin, high-density, male, straight thumb latches
BN21P	68-pin[2], high-density, female, straight thumb latches	50-pin, high-density, male, straight thumb latches
BC09D(3)	50-pin, low-density, male, straight bail locks	50-pin, high-density, male, straight thumb latches

[1] Only 50 pins are used.
[2] Only 38 pins are used.
[3] Used on SCSI adapters with 50-pin, low-density connectors.

Desktop Expansion Unit—BA353 Family *(continued)*

SCSI Cable Order Numbers

SCSI Cable Lengths and Order Numbers

Length	SCSI A			SCSI P			SCSI Transition		
M (FT)	BN21H	BN21J	BC10U	BN21K	BN21L	BN21M	BN21N	BN21P	BC09D
0.15 (0.49)	–	–	–	–	-0B	–	–	–	–
0.3 (0.98)	-0C	–	-01	–	–	–	–	–	–
0.5 (1.6)	-0E	-0E	–	–	–	–	–	–	–
0.91 (3.0)	–	–	–	–	–	–	–	–	-03
1 (3.3)	-01	-01	–	–	–	–	–	–	–
1.83 (6.0)	–	–	-06	–	–	–	–	–	-06
2 (6.6)[1]	-02	-02	–	-02	-02	-02	-02	-02	–
3 (9.8)	-03	-03	-09	-03	-03	-03	-03	–	–
3.7 (12.0)	–	–	-12	–	–	–	–	–	-12
5 (16.4)[2]	-05	-05	–	-05	-05	-05	-05	–	–
10 (32.8)	–	–	–	-10	-10	-10	-10	–	–
15 (49.2)	–	–	–	-15	-15	-15	-15	–	–
20 (65.6)[3]	–	–	–	-20	-20	-20	-20	–	–

[1] Use cables of 2 meters (6.6 ft) or less for fast, single-ended, SCSI buses.
[2] Use cables of 5 meters (16.4 ft) or less for slow, single-ended, SCSI buses.
[3] Use cables of 20 meters (65.6 ft) or less for differential SCSI buses.

DSSI Cables

BC29R-30	DSSI cable—VAX 4000, DEC 4000 AXP to HSD (30 ft)
BC29R-45	Same as above (45 ft)
BC29R-60	Same as above (60 ft)
BC29S-30	DSSI cable—VAX 6000, DEC 7000, 10000 AXP to HSD (30 ft)
BC29S-45	Same as above (45 ft)
BC29S-60	Same as above (60 ft)
BC29T-03	DSSI cable—horizontal shelf to vertical shelf link to connect shelves on same side of cabinet to HSD (3 ft)
BC29U-02	DSSI cable—horizontal shelf to horizontal shelf link to connect shelves on same side of cabinet to HSD (2 ft)
BC29T-09	DSSI cable—horizontal shelf to vertical shelf link to connect one shelf in front and one shelf in back of cabinet to HSD(9 ft)

Country Kits

The power cords listed below are 2.5 meters (U.S. cord is 118 inches). Power cords are needed for each shelf using BA35X-HA power supply. These power cords are required. Both the BA35X-VA and BA35X-HA have an IEC C14 standard power plug.

For countries not listed below, consult International Power Cables and Connectors (A-SP-EL00002-TB-0000).

BN27S-03	U.S./Japan, 120 Vac <le33>BN19H-2E\\Australia/New Zealand, 220 Vac
BN19W-2E	Central Europe, 220 Vac
BN19A-2E	U.K./Ireland, 240 Vac
BN19E-2E	Switzerland, 220 Vac
BN19K-2E	Denmark, 220 Vac
BN19M-2E	Italy, 220 Vac
BN19S-2E	India, 220 Vac
BN18L-2E	Israel, 220 Vac

SZ12 Expansion Boxes

The SZ12 expansion box is a dual-drive enclosure used to house SCSI storage drives. SZ12 expansion box configurations and upgrade kits are supported on the following systems: DEC 3000 AXP, DECstation 5000, DECsystem 5000, VAXstation 4000, and MicroVAX 3100 Models 30, 40, 80, and 90 only.

Configuration Rules

- The SZ12 expansion box supports a maximum of two 5.25-inch full-height disk drives, or one 5.25-inch full-height disk drive and one removable media device (diskette, tape, or compact disks).
- Supported combinations are:
  - Two 5.25-inch full-height disk drives
  - Two 3.5-inch half-height disk drives
  - One 5.25-inch removable media device and one 5.25-inch or 3.5-inch disk drive.
- Maximum of three SZ12 expansion boxes (six storage drives) supported on one SCSI controller, with maximum of one internal drive.
- 120 V expansion boxes include power cord; order power cord for 240 V variants.
- SZ12 expansion box is customer installable.

Ordering Information

SZ12 Dual-Drive Expansion Boxes

SZ12N-XA/XB	1.05-Gbyte RZ26 half-height disk drive
SZ12N-NA/NB	Two 1.05-Gbyte RZ26 half-height disk drives
SZ12Q-XA*	2.0-Gbyte RZ73 full-height drive
SZ12Q-QA*	Two 2.0-Gbyte RZ73 full-height drives
SZ12X-LA/LB	1.44-Mbyte RX23 half-height diskette drive
SZ12X-MA/MB	1.2-Mbyte RX33 half-height diskette drive
SZ12X-HA/HB	95-Mbyte TZ30 half-height tape drive
SZ12X-EA/EB	525-Mbyte TZK10 half-height QIC tape drive

*RZ73 not supported on MicroVAX 3100.

Note: If the required storage combinations are not offered above, order the single-drive SZ12 configuration plus an upgrade kit; see

SZ12 Upgrade Kits

- One free storage cavity must be available to house the upgrade kit.
- Upgrade kits are customer installable.

RZ25-UK	426-Mbyte half-height disk drive
RZ26-UK	1.05-Gbyte half-height disk drive
RZ73-UK*	2.0-Gbyte full-height disk drive
RX23-UK	1.44-Mbyte half-height diskette drive
RX33-UK	1.2-Mbyte half-height diskette drive
TZ30-UK	95-Mbyte half-height tape drive
TZK10-UK	525-Mbyte half-height QIC tape drive
RRD42-UK	600-Mbyte half-height compact disc drive

*RZ73 not supported on MicroVAX 3100.

SZ12 Expansion Boxes *(continued)*

Power Cords for SZ12 Expansion Boxes

120 V expansion boxes include power cord. Expansion boxes for 240 V systems require a country-specific cord.

BN19K-2E	Denmark
BN19C-2E	Austria, Belgium, Finland, France, German, Holland, Norway, Portugal, Spain, Sweden
BN19P-1K	U.S./Canada/Mexico
BN19U-2E	Israel
BN19Z-2E	Italy
BN19E-2E	Switzerland
BN19A-2E	U.K./Ireland
BN19H-2E	Australia/New Zealand

KDM70 XMI Disk/Tape Controller (SDI/STI)

The KDM70 single-host disk and tape controller is an XMI-based eight-port controller that offers full support for SDI-STI devices. The KDM70 supports up to eight RA-series disk drives, up to two TA-series tape formatters, including the high-performance SA-series storage arrays, the IBM-compatible TA91 tape drive, and up to two ESE solid state disks.

The KDM70 provides high-performance I/O throughput by using a CVAX microprocessor to offload the host system. This is the first DSA controller that features Dynamic Channel Allocation (DCA) with the two data channels dynamically allocated among eight ports to achieve optimal performance.

Features

- Data buffering—provides buffering of up to 180 Kbytes of data
- Direct controller-to-host memory transfers
- Self-contained diagnostics—host-independent diagnostic capability
- Fully overlapped seeks, seek reordering, request fragmentation
- Self-contained diagnostics—provides host-independent diagnostics
- High availability—disk drives can be statically dual-ported to two separate KDM70s
- Data rate: 3.4 Mbytes/second sustained
- Request rate: 1200 I/O requests/second
- VAXsimPLUS support

Ordering Information

KDM70-AA	KDM70 controller with KDM70 software; comprises two XMI modules which occupy adjacent XMI backplane slots.
CK-KDM00-LF	Cabinet kit, 0.9-m (3-ft) internal SDI/STI controller-to-bulkhead cables and I/O distribution panels for use with VAX 6000/7000/10000 systems.
QA-YG5AA-H5/HM	KDM70 software H-kits (TK50/magtape); should only be ordered for self-maintenance customers requiring KDM70 software update; all other customers receive the kit via automatic distribution.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units
		5 V	12 V	–12 V	–5.2 V	–2 V	
KDM70-AA	2 XMI slots	17.40	0.00	0.00	0.00	0.00	4

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 adapter can support up to 14 RF72, RF73, or RF31/31-F* disk storage elements or combination of RF disk drives and TF8x/TF8xx series magazine tape subsystems. The KFMSA supports up to four TF ISEs (two per DSSI bus).

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 multiplexing 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.

* RF31/31-F drives require microcode release 256 or later to be supported.

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.
CK-KFMSA-LK	Cable kit, two 1.2-meter (4-foot) internal cabinet DSSI cables. Connects XMI backplane (adapter) to VAX 9000 host computer I/O bulkhead. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators. For use with external DSSI ISEs.

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.

KFMSA XMI Disk/Tape Adapter (DSSI) *(continued)*

Configuring Information

KFMSA-BA options required for SF200/SF210/SF400 configurations.

Number of RF72/73 Disk Drives		Options Required		
Single-and Two-System Host	Three-and Four-System Host	KFMSA-BA	CK-KFMSA-LN	Cabinet-to-Cabinet Interconnect
2–6	2–4	1	1	1
7–12	5–8	1	1	2
13–18	9–12	2	2	3
19–24	13–16	2	2	4
25–30	17–20	3	3	5
31–36	21–24	3	3	6
37–42	25–28	4	4	7
43–48	29–32	4	4	8
49–54	33–36	5	5	9
55–60	37–40	5	5	10
61–66	41–44	6	6	11
67–72	45–48	6	6	12
73–78	49–52	7	7	13
79–84	53–56	7	7	14
85–90	57–60	8	8	15
91–96	61–64	8	8	16
97–102	65–68	9	9	17
103–108	69–72	9	9	18
109–114	73–76	10	10	19
115–120	77–80	10	10	20
121–126	81–84	11	11	21
127–132	85–88	11	11	22
133–138	89–92	12	12	23
139–144	93–96	12	12	24

Notes:

1. Use CK-SF200-xx for KFMSA-BA to SF2xx cabinet-to-cabinet interconnect.
2. Use BC21Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect forVAX 6000/7000/9000/10000 systems.
3. Use BC22Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 4000and Q-bus MicroVAX systems.
4. Use CK-SF100-xx for KFMSA-BA to KFMSA-BA cabinet-to-cabinet interconnect.
5. VAX 6000 system supports up to 72 RF72/73s in SF series cabinet.
6. VAX 7000/10000 systems support up to 144 RF72/73s.
7. To calculate maximum supported RF72/73s if TF8xs or TF8xxs are required in atwo-system DSSI OpenVMS Cluster configuration, subtract two RF72/73s for every oneTF8x or TF8xx required; for all other configurations, subtract one RF72/RF73 forevery TF8x or TF8xx required.
8. All option requirements increase by 50 percent in two-system DSSI OpenVMS Clusterconfigurations when both systems are end nodes.

KFMSA XMI Disk/Tape Adapter (DSSI) *(continued)*

Configuring Information *(continued)*

KFMSA-BA options required for SF220/SF35 configurations.

Number of RF35 Disk Drives				Options required		
Single-System	Two-System	Three-System	Four-System	KFMSA-BA	CK-KFMSA-LN	Cabinet-to-Cabinet Interconnect
1–7	1–6	1–5	1–4	1	1	1
8–14	7–12	6–10	5–8	1	1	2
15–21	13–18	11–15	9–12	2	2	3
22–28	19–24	16–20	13–16	2	2	4
29–35	25–30	21–25	17–20	3	3	5
36–42	31–36	26–30	21–24	3	3	6
43–49	37–42	31–35	25–28	4	4	7
50–56	43–48	36–40	29–32	4	4	8
57–63	49–54	41–45	33–36	5	5	9
64–70	55–60	46–50	37–40	5	5	10
71–77	61–66	51–55	41–44	6	6	11
78–84	67–72	56–60	45–48	6	6	12
85–91	73–78	61–65	49–52	7	7	13
92–98	79–84	66–70	53–56	7	7	14
99–105	85–90	71–75	57–60	8	8	15
106–112	91–96	76–80	61–64	8	8	16
113–119	97–102	81–85	65–68	9	9	17
120–126	103–108	86–90	69–72	9	9	18
127–133	109–114	91–95	73–76	10	10	19
134–140	115–120	96–100	77–80	10	10	20
141–147	121–126	101–105	81–84	11	11	21
148–154	127–132	106–110	85–88	11	11	22
155–161	133–138	111–115	89–92	12	12	23
162–168	139–144	116–120	93–96	12	12	24

Notes:

1. Use CK-SF200-LM for KFMSA-BA to SF2xx cabinet-to-cabinet interconnect.
2. Use BC21Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect forVAX 6000/7000/9000/10000 systems.
3. Use BC22Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 4000and Q-bus MicroVAX systems.
4. Use CK-SF100-LM for KFMSA-BA to KFMSA-BA cabinet-to-cabinet interconnect.
5. Use CK-SF100-LP for KFMSA-BA to VAX 4000 cabinet-to-cabinet interconnect.
6. VAX 6000 system supports up to 84 RF35s.
7. VAX 7000/10000 systems support up to 168 RF35s.
8. To calculate maximum supported RF35s if TF8xs or TF8xxs are required, subtractone RF35 for every TF8x or TF8xx that is required.

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units
		5 V	12 V	–12 V	–5.2 V	–2 V	
KFMSA	1 XMI slot	6.0	0.00	0.00	0.00	0.00	2

KFMSB XMI to DSSI Disk/Tape Adapter

The KFMSB disk and tape adapter is an intelligent XMI-based dual-channel adapter between the XMI backplane bus and two DSSI cable buses.

The KFMSB adapter can support up to 14 RF72, RF73, RF74 RF35, or RF36 disk or EF51, EF52, EF53 solid state disk storage elements or combination of RF disk drives and TF8x/TF8xx series magazine tape subsystems. The KFMSB supports up to four TF ISEs (two per DSSI bus). It is available for DEC 7000 AXP systems, and is the follow-on to its VAX counterpart the KFMSA-BA.

The KFMSB-AA and KFMSB-UA require OpenVMS AXP V6.1 and use of the CK-KFMSB-LC cable kit.

KFMSB XMI to DSSI Disk/Tape Adapter *(continued)*

Features

- Supports RF35, 36, 72, 73, 74,TF 85, 86 TF857, TF867, EF51, 52, 53
- Supports up to a tri-host cluster
- "Clusterable" on the DEC 7000 Model 600, VAX 7000 Model 600, VAX 6000 Models 200/300/400/500/600
- Support for up to 6 KFMSB per system
- Support for 6 KFMSB per XMI
- Data Rate = 6.4 Mbytes/second peak; 4.0 Mbytes/second sustained aggregate of both buses*
- Request rate: capable of over 700–900 I/O requests per second*

* Dependent on size of packets, direction, and DSSI loading

Ordering Information

KFMSB-AA	XMI to DSSI Adapter. XMI to two DSSI buses, for up to 14 storage elements. Includes installation and user documentation.
CK-KFMSB-LC	Cable kit for KFMSB-AA. Includes two 8-foot internal DSSI cables, I/O adapter/I/O connection, two DSSI terminators
KFMSB-UA	KFMSA-BA to KFMSB-AA upgrade. Includes KFMSB-AA XMI module, installation guide, and cabinet kit. **Note:** Mandatory return of KFMSA-BA module.

KZMSA XMI Storage Adapter (SCSI)

The KZMSA disk, tape, and CD-ROM adapter is an XMI-based adapter that offers a system interconnect path to Digital's SCSI devices. It is available on the DEC 7000 AXP systems. The KZMSA adapter can support up to 14 RZ26 or RZ73 disk storage elements or combination of RZ disk drives and TLZ06 tape subsystem.

The KZMSA incorporates a CVAX processor, two 2-MIP SCSI NCR53C710 I/O processors, and a custom gate array to create a very powerful storage adapter. It provides two high-speed, independent paths to storage elements with parity detection and retry. The KZMSA adapter's bandwidth and extremely low latency permit unconstrained performance of all attached storage elements.

Features

- Two SCSI buses supported
- Supports up to 14 SCSI devices
- Latency less than 500 ms on each SCSI bus
- Data rate: up to 10.0 Mbytes/second peak, 4.4 Mbytes/second sustained per bus, aggregate adapter up to 20.0 Mbytes/second peak, 7.2 Mbytes/second sustained
- Request rate: capable of over 1300 I/O requests per second
- Built-in automatic self-diagnosis
- Fast SCSI can be enabled on either or both channels

Operating System Support

	OpenVMS AXP	DEC OSF/1 AXP
Adapters per bus	4 per XMI	8 per XMI
Adapters per system	6 per system	8 per system

KZMSA XMI Storage Adapter (SCSI) *(continued)*

Ordering Information

KZMSA-AB	XMI-to-SCSI adapter for DEC 7000 AXP OpenVMS Cluster and storage sharing applications. Includes installation and user documentation. Requires one XMI slot.
CK-KZMSA-LA	Cable kit, two 0.76-m (30-in.) internal cabinet SCSI cables. Connects XMI backplane (adapter) to DEC 7000 AXP host computer I/O bulkhead. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two SCSI bus terminators.

KFQSA Q-bus Storage Adapter (DSSI)

The KFQSA storage adapter is a single, quad-height module that provides a space-saving, low-power link between the Q-bus and DSSI. It is capable of supporting up to seven nodes, including any combination of DSSI-based storage devices or connection to another CPU. The KFQSA transfers commands and data between the host and ISEs using direct memory access (DMA) hardware, maximizing the number of CPU cycles available for additional applications development. The sustained data transfer rate is 1.5 Mbytes per second with a throughput limit of 190 I/Os per second.

The KFQSA uses the same Storage System Port (SSP) used by the RQDX3 and KDA50 controllers, and is supported by existing device drivers across all 32-bit operating systems. To ensure high data integrity, the adapter runs power-up, self-test diagnostics, provides online and offline diagnostics, and provides fault detection and isolation. Byte parity and packet error detecting code (EDC), combined with automatic retry, serve to ensure the highest level of data integrity.

Features

- Occupies a single slot in the Q-bus backplane and requires low power
- Links Q-bus VAX, MicroVAX, and DECsystem computer systems to DSSI for expanded system performance and high storage capacity
- Offers support for high-availability, dual-host configurations with OpenVMS V5.1-1 and higher
- Makes more CPU cycles available for application use with Direct Memory Access (DMA) hardware moving data between adapter and main memory
- 190 I/Os per second throughput
- 1.5 Mbytes per second sustained data rate

Ordering Information

KFQSA- AA	Q-bus-to-DSSI adapter, field installed into BA23 or H9642 system enclosure.
KFQSA-BA	Q-bus-to-DSSI adapter, field installed into BA123 system enclosure.
KFQSA-SA	Q-bus-to-DSSI adapter, factory installed for BA213 system enclosure and rtVAX 3800 system only.
KFQSA-SE/SG	Additional DSSI adapter. For DECsystem 5400 and DECsystem 5500 systems, BA4xx, BA2xx, and H9644 enclosures; factory/ field installed.

Note: Requires BC21M-09 cable; order separately.

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
KFQSA	1	5.5	0.00	27.50	4.4	0.5

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). DECsystem 5500 systems can use the KZQSA to connect the above devices as well as RZ25, RX23, RX33, RZ56, RZ57, TZ30, and TZK10. (KZQSA cannot be used to connect TKZ08 to DECsystem 5500.)

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.
- DECsystem 5500 systems support two KZQSA adapters per configuration; each KZQSA supports up to seven devices. Each adapter requires one Q-bus slot. Devices connected to DECsystem 5500 systems by KZQSA cannot be used as boot devices.

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
KZQSA	1	5.4	0.0	27.0	4.4	0.5

KZPAA PCI-to-SCSI Host Bus Adapter

The KZPAA is a PCI-to-SCSI fast, narrow, single-ended host bus adapter 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. Installing KZPAAadapters in each of three available PCI slots would enable customers to configure up to 21 RZ28 disk drives for an additional 44 Gbytes of storage.

No RAID capabilities are supported in the KZPAA. For RAID performance and/or availability, choose the SWXCR EISA-to-SCSI RAID controller.

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 AXP(V6.1), DEC OSF/1 AXP(3.0) and Windows NTAS (V3.5) support

KZPAA PCI-to-SCSI Host Bus Adapter *(continued)*

Features *(continued)*

- Supports most StorageWorks industry-standard devices including:
  - **Disks:** RZ25, RZ26, RZ28, RZ28B, RZ29, RZ73, RZ74, RZ26B, RZ26L, RZ28L, RZ58,EZ51R,EZ54R
  - **Tapes:** TLZ06, TLZ6L, TZK11, TKZ15,TZ85, TZ857, TZ86, TZ867, TZ87, TZ877, TZ875, TLZ04, TKZ08, TKZ09, TZK10,TSZ07
  - **Other:** RRD42, DWZZA, RRD43
- Three-year warranty provides low cost of ownership

Ordering Information

KZPAA-AA	PCI-to-SCSI adapter

Configuration Rules

- Supported on AlphaServer 2100 systems.
- External cables must be ordered separately. Use BN21H-02 SCSI cable.
- KZPAA-AA adapters ordered separately for use in systems with embedded storage require one 17-03948-01 internal cable.
- When ordered with a system, cables to connect adapter to internal drives are included.
- Maximum number of KZPAA adapters supported on each AlphaServer 2100 systems is equivalent to the number of PCI slots available.

KZTSA TURBOchannel to SCSI-2 Adapter

The KZTSA is a high-performance, intelligent TURBOchannel to SCSI-2 fast, wide, differential adapter designed for demanding server and workstation I/O requirements. The KZTSA provides increased total system performance by providing high sustained I/O rates while freeing the CPU from I/O operations (i.e. SCSI bus arbitration, DMA processing).

The KZTSA can be connected to StorageWorks products with an optional DWZZA.

Features

- Supported on DEC 3000 systems running DEC OSF/1 AXP (V 2.0)
- Single slot 4.6- x 5.6-inch TURBOchannel module
- Differential SCSI bus can be configured in lengths of up to 25m
- 16-bit wide SCSI bus supports both 8- and 16-bit devices
- Over 1350 I/Os per second throughput
- Up to 20 Mbytes/second bandwidth, with 11 Mbytes/second sustained
- Use with HSZ10 and HSZ40 supported
- Supports up to seven SCSI devices
- Customer installable

Ordering Information

KZTSA-AA	TURBOchannel to FWD SCSI-2 adapter

VELOCITOR Storage Subsystems

Digital offers a family of storage subsystems based on IPI (Intelligent Peripheral Interface) technology, a high-speed interconnect between storage controllers and storage devices. VELOCITOR storage subsystems are high-performing storage subsystems available for Alpha AXP and DECstation systems.

VELOCITOR is a premium-performance storage solution offered at a moderate price. The IPI technology allows for performance improvements in the drives. Applications such as animation, seismic data, simulation, and high-speed graphics require high sustained data rates. VELOCITOR uses IPI and PTD (parallel transfer disk) technology to provide high transfer rates.

All VELOCITOR subsystems include a high-performance disk controller, Elite-3 5.25-inch disk drives, device driver software, and either a desktop enclosure or a standard RETMA rackmount assembly.

Features

- TURBOchannel and Futurebus support (DEC 3000, DEC 4000, and DEC 7000 AXP systems as well as DECstation 5000 systems)
- 24-Mbyte/second peak IPI transfer rate (utilizing striping and multi-drives)
- Up to eight disks per IPI channel, 2.9 (formatted) Gbytes per disk
- Supported under DEC OSF/1 AXP, OpenVMS AXP, and ULTRIX
- Controller-based striping and shadowing

Ordering Information

2L-RIT01-AA*	3-Gbyte tabletop enclosure, 1.5- and 10-foot cables, documentation
2L-RIT02-AA*	6-Gbyte tabletop enclosure, 1.5- and 10-foot cables, documentation
2L-RIPR1-BA*	3-Gbyte rackmount enclosure, 15-foot cable, documentation
2L-RIPR2-BA*	6-Gbyte rackmount enclosure, 15-foot cable, documentation
2L-RIPR3-BA*	9-Gbyte rackmount enclosure, 15-foot cable, documentation
2L-RIPR4-BA*	12-Gbyte rackmount enclosure, 15-foot cable, documentation
2L-RITCL-BA	TURBOchannel to IPIcontroller, DEC OSF/1 AXP device driver
2L-RITCL-BB	TURBOchannel to IPIcontroller, OpenVMS AXP device driver
2L-RITCL-BC	TURBOchannel to IPIcontroller, ULTRIX driver
2L-RIACL-BA	Futurebus to IPIcontroller, DEC OSF/1 AXP device driver
2L-RIACL-BB	Futurebus to IPIcontroller, OpenVMS AXP device driver
2L-RIPCB-xx	IPI cable (xx = 1.5, 5, 10, 15 feet)

* Purchase of TURBOchannel or Futurebus controller required.

Note: Rackmount customers requiring dual porting should order a second 2L-RIPCB-xx cable for each rackmount enclosure.

Configuration Notes

- Each rackmount assembly can house up to four IPI drives.
- Four rackmount units per cabinet are supported (the HA900 cab is highly recommended for multiple rack configurations).

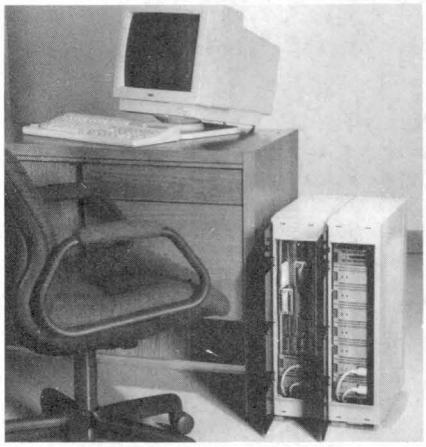
VELOCITOR Storage Subsystems *(continued)*

Specifications

Desktop VELOCITOR	
Enclosure Dimensions	
Height (operational)	10.9 cm (4.3 in.)
Width	48.3 cm (19.0 in.)
Depth	38.35 cm (15.0 in.)
Clearance, rear	20.3 cm (8.0 in.)
Clearance, sides	12.7 cm (5.0 in.)
Weight (approximate)	10.7 kg (23.5 lb) (one drive) 14.8 kg (32.5 lb) (two drives)

Rackmount VELOCITOR Enclosure (One Shelf)	
Enclosure Dimensions	
Height (operational)	21.4 cm (8.43 in.)
Width	42.9 cm (16.88 in.)
Depth	68.6 cm (27.0 in.)
Weight (approximate)	No drives: 25.4 kg (56 lb) 1 drive: 29.5 kg (65 lb) 2 drives: 33.6 kg (74 lb) 3 drives: 37.6 kg (83 lb) 4 drives: 41.7 kg (92 lb)

StorageWorks RAID Array 110



The StorageWorks RAID Array 110 is a complete RAID solution that consists of a RAID controller and five disk drives in a dual-pedestal stand. Digital's hardware Redundant Array of Independent Disks (RAID) subsystem is designed for customers needing high data availability, increased I/O performance, and SCSI storage capacity. With its own internal RAID controller (HSZ10), the StorageWorks RAID Array 110 is a complete controller-based solution.

In the workstation, server, and timesharing markets, the HSZ10 hardware RAID controller off-loads the host processor from performing the complex algorithms that spread user data across multiple drives. This enables the RAID Array 110 to deliver high-availability solutions as an inexpensive subsystem, without impeding processor performance.

The deskside unit houses an HSZ10 RAID controller and two power supplies on the left side, while the right side houses a third (optional) power supply and five drives. The subsystem is expandable to 30 disk drives by adding dual-pedestal enclosures. RAID levels 0, 1, 0 plus 1, and 5 are supported by the HSZ10 controller and selected by users via the software utilities ordered with the RAID Array 110. Levels 0 and 1 are striping and shadowing, respectively. Level 5 can be called "throughput-optimized."

The host array interface is differential 8/16-bit, 10/20-Mbyte/second, SCSI-2, while the array channel interface is single-ended 8-bit, 5-Mbyte/second SCSI-2.

The power supply slots of the RAID Array 110's dual BA350-EA are connected in parallel. Two power supplies run the basic subsystem with its five disks. Another optional power supply can provide redundancy for the whole system.

RAID Array 110 software notifies the system operator in the event of a disk drive failure. A carrier-mounted spare drive can be ordered so that if a drive fails, the problem unit can be snapped out, and a replacement snapped in to begin automatically rebuilding data.

Features

- Up to 30 disk drives; supports 426-Mbyte RZ25-VA, 1.05-Gbyte RZ26L-VA, 2.1-Gbyte RZ28-VA disks
- Utilizes SCSI id on system bus, freeing system resources
- Drive "hot swapping" capability
- Power supply "hot swapping"
- Optional redundant power supply
- Redundant and "hot swap" fans
- Deskside footprint only 61 cm high x 50.8 cm wide x 36.8 cm deep (24 in. high x 20 in. wide x 14.5 in. deep)
- Battery backup unit for orderly disk shutdown (up to two minutes)
- Automatic rebuild upon drive replacement

Supported Systems

The RAID Array 110 subsystem supports MicroVAX 3100 Models 30/40/80/90, VAXstation 4000 Models 60 and 90, and VAX 4000 Model 100 systems as well as EISA-based systems and servers running MS-DOS, SCO UNIX, and Novell Netware.

Supported Operating Systems

The RAID Array 110 subsystem supports OpenVMS VAX V5.5-2H4. It will not support OpenVMS VAX V6.0. Support for OpenVMS VAX V6.1 is planned.

Intel 386/486 platforms are supported under SCO UNIX 3.2.4, Novell Netware 3.11, and MS-DOS 3.3 or 5.0.

StorageWorks RAID Array 110 *(continued)*

Ordering Information

Note: List RAID subsystem before disk drive five-packs, platform kits, and options.

Subsystems

SWDRA-01	StorageWorks Drive-Ready RAID Array 110 Subsystem for VAX systems with single-ended SCSI controllers. Includes dual-pedestal enclosure with two power distribution units and power supplies, HSZ10 RAID controller, DWZZA-VA single-ended to differential SCSI converter, BC09D and BN21L cables, U.S./Japan 120-V power cord, and documentation.
SWXRA-01	StorageWorks Drive-Ready RAID Array 110 Subsystem for EISA-based Intel systems. Includes dual-pedestal enclosure with two power distribution units and power supplies, HSZ10 RAID controller, U.S./Japan 120-V power cord, and documentation.

Expansion

SWDSE-01	StorageWorks Drive-Ready dual-pedestal enclosure for RAID Array 110 storage expansion. Each pedestal enclosure includes power distribution unit, power supply, four SCSI cables (BN21H-03), U.S./Japan 120-V power cord, and documentation.

Platform Kits

QL-0FFA9-AA	OpenVMS Platform kit for VAX systems. DEC RAID OpenVMS VAX Utility license
QA-0FFAA-H5/H8	OpenVMS Platform kit for VAX systems. DEC RAID OpenVMS VAX Utility license binaries (TK50 or CD-ROM)(OpenVMS VAX V5.5-2H4)
SWIKN- AA	Novell Netware Platform kit for Intel systems. Includes RAID Utility Software license, documentation; binaries for Novell Netware (3.5-inch floppy media); EISA to SCSI host adapter (KZESA) with device drivers, license, and binaries; BN21P-OB Y-cable; and BN21K 68-pin to 68-pin cable
SWIKS-AA	SCO UNIX Platform kit for Intel systems. Includes RAID Utility Software license and documentation; binaries for SCO UNIX (3.5-inch floppy media); EISA to SCSI host adapter (KZESA) with device drivers, license and binaries; BN21P-OB Y-cable; and BN21K 68-pin to 68-pin cable
SWIKM-AA	MS-DOS Platform kit for Intel systems. Includes RAID Utility Software license and documentation; binaries for MS-DOS (3.5-inch floppy media); EISA to SCSI host adapter (KZESA) with device drivers, license, and binaries; BN21P-OB Y-cable; and BN21K 68-pin to 68-pin cable

Options

SWDDB-5A	StorageWorks Disk Drive five-pack; five RZ26-VA, 1.05-Gbyte disk drives
SWDDB-5B	StorageWorks Disk Drive five-pack; five RZ28-VA, 2.1-Gbyte disk drives
BA35X-HC	Battery backup unit
HZS10-AA	RAID Array controller
BA35X-HA	131-watt AC power supply
DWZZA-VA	Single-ended to differential SCSI converter
KZESA-AA	EISA to SCSI adapter, no cache
KZESA-DA	EISA to SCSI adapter, 4-Mbyte cache
KZESA-FA	EISA to SCSI adapter, 16-Mbyte cache
RZ25-VA	Spare RZ25, 426-Mbyte disk drive in SBB

StorageWorks RAID Array 110 *(continued)*

Power Cords

BN27S-03	US/Japan, 120 V
BN19H-2E	Australia/New Zealand, 220 V
BN19W-2E	Central Europe, 220 V
BN19A-2E	UK/Ireland, 240 V
BN19E-2E	Switzerland, 220 V
BN19K-2E	Denmark, 220 V
BN19M-2E	Italy, 220 V
BN19S-2E	India/South Africa, 220 V
BN18L-2E	Israel, 220 V

Upgrades

Note: Jumpers and terminators must be configured at installation. Upgrades are incremental. Do not mix drive types in RAID set

5-to 10-Drive Upgrade

SWDSE-01	Dual expansion pedestal
SWDDB-5x	Disk drive five-pack
BNxxx-xx	Power cord (order two)

10-to 15-Drive Upgrade

SWDDB-5x	Disk drive five-pack

15-to 20-Drive Upgrade

SWDSE-01	Dual expansion pedestal
SWDDB-5x	Disk drive five-pack
BNxxx-xx	Power cord (order two)

20-to 25-Drive Upgrade

SWDDB-5x	Disk drive five-pack

25-to 30-Drive Upgrade

SWDDB-5x	Disk drive five-pack

Specifications

Drive hot swap	Standard
Fault monitoring	Standard
Redundant power	Optional
Power supply hot swap	Standard
Battery backup	Optional
Expansion	Up to 30 disk drives
Host interface	SCSI-2
Host transfer rate	20 Mbytes/second
Drive interface	Single-ended SCSI (5 Mbytes/second)
# of drive interfaces	5
Max. drives/controller	30
Supported RAID levels	0, 1, 0+1, 5
Serviceability	Hot-pluggable
Microprocessor	68020

Physical Characteristics (two-shelf configuration)	
Height	610 mm (24.0 in.)
Width	356 mm (14.0 in.)
Depth	381 mm (15.0 in.)
Maximum weight	28 kg (62 lb)

Disk Drives	
Interface	SCSI-2
Form factor	3.5 inches
Formatted capacity/ drive	426 Mbytes, 1.05 Gbytes, or 2.1 Gbytes
Serviceability	Hot-pluggable

StorageWorks RAID Array 110 *(continued)*

Specifications *(continued)*

Power Requirements	
Voltage	120/240 Vac
Frequency	50-60 Hz
Power supply rating	131 watts
Base unit	Two power supplies
Redundant power	Three power supplies
Serviceability	Hot-pluggable
Environmental	
Operating temperature	10° to 40° C (50° to 104° F)
Non-operating	–40° to 66° C (–40° to 150° F)
Relative humidity	10% to 80%
Regulatory	
Approvals	FCC-B, UL, CSA, VDE, TUEV

StorageWorks RAID Array 210 Subsystem

Product Description

The StorageWorks RAID Array 210 subsystem is a hardware-based RAID subsystem for Alpha AXP 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 Storage* (EC-G2412-45).

The StorageWorks RAID Array 210 subsystem is comprised of: 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.

StorageWorks Raid Array 210 Subsystem *(continued)*

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 (VMS), System Console (OSF), Event Viewer (Windows NT); written to a log file (OSF and VMS); 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 AXP systems and Intel servers that use the industry-standard EISA bus.

Supported Operating Systems

The StorageWorks RAID Array 210 subsystem is supported on OpenVMS AXP, DEC OSF/1 AXP, SCO UNIX, Novell Netware, and Windows NT.

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 *(continued)*

Ordering Information *(continued)*

KZESC-AA **Single Channel EISA backplane RAID controller for Alpha AXP 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 AXP, DEC OSF/1 AXP**, and **Windows NT AXP.** 4-Mbyte cache. Requires SCSI cable.

KZESC-BA **Three Channel EISA backplane RAID controller for Alpha AXP 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 AXP, DEC OSF/1 AXP**, and **Windows NT AXP.** 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).

Specifications

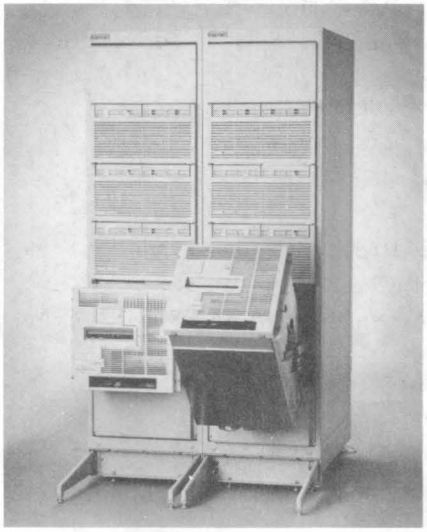
RAID Level	Physical Drives per logical drive	Useable Storage	Data Redundancy	Max. # of Drives KZESC-AA	Max. # of Drives KZESC-BA
0	2-8	All	No	7	21
1	2	50%	Yes	6	16
0+1	3-8	50%	Yes	7	21
5	3-8	66%-87%	Yes	7	21
JBOD	1	All	No	7	8

StorageWorks Raid Array 210 Subsystem *(continued)*

Specifications *(continued)*

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
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
Number of drive groups (logical drives) suppported	Up to 8 per controller
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	RZ25L-VA, 0.5 Gbytes RZ26L-VA, 1.05 Gbytes RZ28-VA, 2.1 Gbytes
Automatic reconstruct	Yes
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	2
Cache support	Yes (4 Mbytes standard)

DECraid+ Rackmount Storage Subsystems



DECraid+ systems are high-performance rackmount storage subsystems designed to provide the highest availability RAID solutions for VAX systems. The DECraid+ NOVA storage subsystem is the highest capacity solution in a 12-square-foot space and offers the highest performance RAID storage subsystem in DECraid+ cabinetry. The DECraid+ footprint allows more controllers, CPUs, high volume drives, or rackmountable equipment than any other Digital cabinet.

DECraid+ NOVA incorporates StorageWorks modular shelves, a choice of high capacity SCSI drives, and the powerful HSJ40 controller. These cabinets integrate European Millimeter Standard equipment and RETMA standard equipment.

DECraid+ Rackmount Storage Subsystems *(continued)*

The DECraid+ NOVA subsystem expands the storage capacity to 432 Gbytes of storage (216 shadowed storage). Each StorageWorks shelf supports six disks and a redundant power supply. This package consists of two DECraid+ cabinets joined together; each cabinet holds three HSJ40 controllers and 108 RZ28 SCSI disks.

For higher performance, DECraid+ NOVA can be configured with three drives per channel to best match the throughput of the controller. Half the maximum number of drives (36-drive maximum) will be used for the DECraid+ NOVA performance solution. The package consists of two DECraid+ cabinets joined together; each cabinet will hold six HSJ40 controllers, and 102 RZ28 SCSI disks. Additional custom cabinets can be joined in order to create a higher capacity solutions. DECraid+ NOVA storage subsystems are custom quotable.

DECraid+ SDI and SCSI includes two HSC95 I/O controllers, a bank of Storage Array Building Blocks or StorageWorks, and the OpenVMS VAX layered RAID software licenses needed for RAID 0 and Raid 1 for two CPUs.

DECraid+ is packaged in three different configurations to handle the SDI and SCSI buses. Customers can choose between 100% SDI, 100% SCSI, or 50% of SDI and SCSI. Each configuration holds the internal cabling.

DECraid+ controllers and drives are fully redundant: two HSC95s can be dual-ported to the 48 SDI, 40 SCSI, or 24 SDI/20 SCSI drives to provide protection to critical applications data. All disk drives are fully DSA compliant.

DECraid+ is supported on the VAX 7000 and 10000 systems, and is well suited for transaction processing or production environments which access large databases frequently. Typical applications that benefit from DECraid+ include airline reservation systems, catalog sales, banking operations, large retail stores, health services, process and discrete manufacturing, and utility account services. Lower capacity systems can be custom quoted.

Features

- Configurations using HSJ40 controller
- RAID software licenses for RAID 0 (VAX Disk Striping)and RAID 1 (VMS Volume Shadowing)
- Small footprint—Up to 432 Gbytes; in less than 12 square feet of floorspace
- Incorporation of StorageWorks Modular Shelves
- Availability—100% redundancy of all hardware and data in subsystem; with all disk drives fully shadowed

Ordering Information

SCSI high-end system includes the following:

HSC95-ZA	Two Rackmount HSC95s—100% SCSI
HSC9X-SX	16 SCSI disk/tape channel cards
BA350-SA	24 StorageWorks shelves*
BA35X-HA	24 ac StorageWorks power supply
RZ74-VA	40 5.25-inch 3-Gbyte (formatted) SCSI disk drives* 16 power cords
H9702-MT	Two empty H9702 cabinets
881-A	Two power controllers 2 power distribution panels
H885-AA	24 Tri-Link adapters*
BN21H-03	16 3M SCSI cables
BN21H-02	16 2M SCSI cables 24 BA350 rackmount kits/bezels
BNCIA-20	Four 6-meter (20-foot) CI cables

* Storage capacity required determines mix of BA350-SA, BA35X-HA, RZ74-VA, and H885-AA included in the system.

DECraid+ Rackmount Storage Subsystems *(continued)*

Ordering Information *(continued)*

SDI high-end system includes the following:

H9702-AA/AB	Two 2-meter (81-inch) cabinets, including 120/240 V power controllers
H9702-JK	Joiner kit for two H9702 cabinets
2T-HSC95-BA/BB	Two rackmount 48-port HSC95 controllers
HSC5X-DA	Eight 4-port disk/tape data channel cards
HSC9X-FA	Eight 8-port disk data channel cards
2T-SAxx-JK	12 SAxx Storage Array Building Blocks*
2T-BC26V-15	24 bundles of four shielded 4.6-meter (15-ft) SDI cables
BNCIA-10	Two CI bus cables, 10 meters (32.8 ft)
QL-AB2A5-AA	Two VMS Volume Shadowing licenses
QL-YELA9-JV	VAX Disk Striping Driver (cluster-wide license)
QA-YELAA-Hx	VAX Disk Striping software, H5 = TK50 media; HM = 9-track tape media
QA-YELAA-GZ	VAX Disk Striping software documentation

* Storage capacity required (33, 48, 96 Gbytes)determines the SABB variant included in the system.

SCSI high-end 140-Gbyte DECraid+

2T-HSZ95-BA/BB	40 5.25-inch disk drives in 24 StorageWorks shelves
2T-HSZ95-BE/BF	40 5.25-inch disk drives in 24 StorageWorks shelves; with VAX Disk Striping software

SDI high-end 96-Gbyte DECraid+

2T-HSR95-MC/MD	12 SA73-JK 8.0-Gbyte SABBs
2T-HSR95-ME/MF	12 SA73-JK 8.0-Gbyte SABBs with VAX Disk Striping software

SDI mid-range 48-Gbyte DECraid+

2T-HSR95-KC/KD	12 SA72-JK 4.0-Gbyte SABBs
2T-HRS95-KE/KF	12 SA72-JK 4.0-Gbyte SABBs with VAX Disk Striping software

SDI entry-level 33-Gbyte DECraid+

2T-HSR95-JC/JD	12 SA71-JK 2.8-Gbyte SABBs
2T-HSR95-JE/JF	12 SA71-JK 2.8-Gbyte SABBs with VAX Disk Striping software

Notes: To achieve full redundancy, specify twice the raw capacity needed. For example, if 48 Gbytes of RAID storage are required, select the 96-Gbyte DECraid+ solution to allow VMS Volume Shadowing software to fully shadow 48 Gbytes of storage.

All DECraid+ configurations require a custom quotation that can be obtained through a Digital Services Sales Support Specialist. For more information, call Digital Services Sales Support at 800-832-6277 or 603-884-8990.

Options	
H9702-KB	Floor bolt-down kit for one H9702 cabinet (two kits are needed to completely secure DECraid+ system to the floor)
2T-SC008-AC	Rackmount Star Coupler. Requires 26.7-cm (10.5-inch) vertical rack space (available in any of the standard SDI DECraid+ configurations)

DECraid+ Rackmount Storage Subsystems *(continued)*

Specifications

DECraid+ Cabinet (shipped as two separate cabinets, easily joined together on site.)

	Single Cabinet	Operational Configuration (Two Cabinets)
Height (operational)	2057 mm (81 in.)	2057 mm (81 in.)
Height (shipping)	2311 mm (91 in.)	2311 mm (91 in.)
Width	559 mm (22 in.)	1118 mm (44 in.)
Depth	965 mm (38 in.)	965 mm (38 in.)
Weight (approximate)	493 kg (1086 lb)	985 kg (2172 lb)

Operating environment

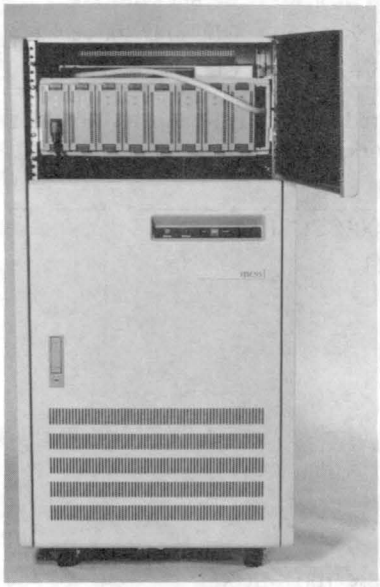
Temperature	
Operating	10° to 40° C (50° to 104° F)
Nonoperating	–40° to 66° C (–40° to 151° F)
Relative humidity	
Operating	10% to 90%
Nonoperating	5% to 95%
Maximum wet bulb temperature	
Operating	28° C (82° F)
Nonoperating	32° C (90° F)

	SDI	SCSI	SDI	SCSI
Electrical (four power controllers/system)	(4) 877-DB	(2) 70-30100-01 (2) 881-A	(4) 877-E	(2) 70-30100-01 (2) 881-B
Power requirements (ac input)	120 V	208 V	240 V	415 V
Voltage range (Vrms)	90–132	180–220	180–264	360–443
Power source phasing	Single	3-phase	Single	3-phase
Frequency range (Hz)	47–63	59–61	50–60	49–51
System rated current (Amps) nominal*	22.43*	–	13.30*	–
Power consumption (Watts) per cabinet	1470	–	1470	–
USA power cord plug+ (2-pole, 3-wire)	NEMA L5-30P	NEMA L21-30P	NEMA L6-30P	IEC 309 516P6W

* Divided between two power controllers per cabinet. Each cabinet requires 22.43 Amps (@120 V) or 13.30 Amps (@240 V).

HSC Intelligent I/O Servers





HSC controllers offer the performance, connectivity, and functionality required by Digital's high-end VMScluster customers. These intelligent storage servers include an embedded 64-Mbyte cache, HSC High-performance Software and Cache analysis tools, and they support a combination of SDI and SCSI disk drives and TA/TZ series tape drives.

Connection to SCSI drives is provided via SCSI data channel card, which can be installed into any HSC40, 60, 65, 70, 90, or 95. Each of these HSCs can be upgraded to accommodate up to four StorageWorks shelves containing SCSI drives inside the controller cabinet. A rackmount HSC95, connecting up to 56 SCSI drives, is also available mounted in the StorageWorks data center cabinet.

The embedded cache allows the HSC to support a greater number of users with an acceptable response time. Embedded HSC cache is enabled for 32 Mbytes, providing for up to a 60 percent cache hit rate. The HSC cache is a write-through cache, which guarantees the highest data integrity.

HSC cache is accessible to any or all SDI or SCSI disks. Two tools, both included on the new HSC65/HSC95 software media, help determine the most optimal use of cache:

- Cache NEEDS ANALYSIS Tool—Tests to see if HSC cache will benefit the I/O profile on a non-cached HSC. This tool can be used on the HSC40, HSC60, HSC65, HSC70, HSC90, or HSC95 products.
- Cache Performance ANALYSIS Tool—Allows the system manager to determine the cache benefit on a disk-by-disk basis. This means HSC performance can be optimized by excluding disks with I/O profiles that do not benefit from cache or by adjusting cache parameters on a disk-by-disk basis.
- Embedded cache
- Cache tools
- Provide up to 1800 I/O requests per second, a 40 percent increase in throughput over the HSC60/HSC90s
- Support sustained transfer rate of 4.0 MB/second
- HSC high-performance software V8.3, including the following significant enhancements:
  - Support for added SCSI disks and tapes
  - 32-Mbyte cache support
- SCSI data channel card performance improvement

HSC Comparison Chart

	HSC40	HSC50	HSC60	HSC65	HSC70	HSC90	HSC95	RM HSC95
I/O per second throughput	1150	550	1300	1800	1150	1300	1800	1800
Maximum sustained transfer (Mbytes/s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Number of channels	3	6	3	3	8	8	8	8
Number of SDI/SCSI ports	12/21	24	20/21	20/21	32/52	48/52	48/52	20/56
Maximum capacity (Gbytes)*	63	48†	63	63	116	124	124	168
Accepts tape drives	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accepts solid state disk	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cache embedded/option	No	No	Yes	Yes	No	Yes	Yes	Yes
Full CI cluster support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgradable for faster performance/connectivity	Yes	No	Yes	Yes	Yes	Yes	No	No
DSA compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Assumes RZ74 drives.
† Assumes RA73 drives.

HSC Intelligent I/O Servers *(continued)*

Prerequisite Software

OpenVMS V5.5-2

Ordering Information

Preconfigured HSC Packages

A number of preconfigured HSC packages have been created for ease of ordering.

HSC95 Storageworks Rackmount Starter Packages

The following packages contain the HSC95 configured in the StorageWorks data center cabinet, with necessary cabling and mounting hardware to allow connection to SCSI and/or SDI/STI drives. Each HSC included in these packages has been configured for either 100% SCSI, or for 50% SCSI and 50% SDI/STI channel cards. **Note:** xA = 120 V; xB = 240 V

HSR95-SA/SB (50% SCSI)		**HSR95-ZA/ZB (100% SCSI)**	
HSC95-SA/SB	Rackmount server	HSC95-ZA/ZB	Rackmount server
HSR9X-SA/SB	DECarray 400 cabinet	HSR9X-SA/SB	DECarray 400 cabinet
BNCIA-20	CI cable set	BNCIA-20	CI cable set

HSR95-QA/QB and HSR95-RA/RB are fully redundant, dual-path, 100% SCSI HSC95 configurations packaged in StorageWorks data center cabinet with 16 SCSI data channel cards and 40 disk drives.

HSC95-ZA/ZB)	Rackmount servers (2), 100% SCSI
HSC9X-SX	SCSI data channel cards (16)
RZ2x-VA	40 disk drives
BA350-SA	Serial shelf (8)
BA35X-HA	Shelf power supply (16)
BN21T-09	Power cord—gray (8)
BN21U-09	Power cord—black (8)
SF400-UA/UD	Add-on power controller
BN21H-02	2-meter SCSI cable (16)
BA35X-RA	Rackmount kit (8)
BNCIA-20	CI cable sets (2)
HSR95-QA/QB	Forty RZ28 2.1-Gbyte disks, 100% SCSI
HSR95-RA/RB	Forty RZ26L, 1.05-Gbyte disks, 100% SCSI

HSR95-FA/FB and HSR95-HA/HB packages include: 100% SCSI HSC95 in StorageWorks data center cabinet with two SCSI data channel cards, two BA350 shelves and 12 disk drives. The HSC can accept up to six additional SCSI data channel cards and cabinet supports up to six more BA350 shelves. Includes HSR95-AZ/AZ, HSC9X-SZ, BN21J-02.

HSR95-FA/FB	Twelve RZ28 2.1-Gbyte disks, 100% SCSI
HSR95-HA/HB	Twelve RZ26L, 1.05-Gbyte disks, 100% SCSI

HSR95-DA/DB starter kit includes: 100% SCSI rackmount HSC95 in StorageWorks data center cabinet with one SCSI data channel card, six RZ74 disk drives, one HSC9X-SX, one DWZZA signal converter, mounting hardware, SCSI cables, power supplies, and cables.

HSR95-DA/DB	Six RZ74 3.57-Gbyte disks, 100% SCSI

HSC Intelligent I/O Servers *(continued)*

HSC95 Storageworks Rackmount Starter Packages (continued)

HSR95-GA/GB and HSR95-JA/JB packages include: 50% SCSI HSC95 in StorageWorks data center cabinet with two SCSI data channel cards, two BA350 shelves containing 12 disk drives. The HSC can accept up to two additional SCSI data channel cards and cabinet supports up to six more BA350 shelves. Up to four SDI/STI channel cards can also be installed in the HSC; however all RA/TA devices must be installed external to the cabinet (e.g., SA900).

HSR95-GA/GB	Twelve RZ28 2.1-Gbyte disks, 50% SCSI
HSR95-JA/JB	Twelve RZ26L, 1.05-Gbyte disks, 50% SCSI

HSR95-EA/EB starter kit includes: 50% SCSI-50% SDI rackmount HSC95 in StorageWorks data center cabinet with one SCSI data channel card, two BA350 shelves, six RZ74 disk drives, one HSC9X-SX, one DWZZA signal converter, mounting hardware, SCSI cables, power supplies, and cables.

HSR95-EA/EB	Six RZ74 3.57-Gbyte disks, 50% SCSI-50% SDI

HSR95-ZA/ZB package includes: 100% SCSI HSC95 in StorageWorks data center cabinet, ready to accept up to eight SCSI data channel cards, and up to eight BA350 shelves.

HSR95-ZA/ZB	100% SCSI HSC95 in data center cabinet

HSR95-SA/SB package includes: 50% SCSI HSC95 in StorageWorks data center cabinet, ready to accept up to four SCSI data channel cards and four SDI/STI disk/tape channel cards. A total of eight BA350 shelves can be configured in the cabinet. All RA/TZ devices must be installed externally, e.g., SA900).

HSR95-SA/SB	50% SCSI HSC95 in data center cabinet

Standalone/Add-On HSC Configurations

The following are traditional standalone HSC65/95 controllers.

HSC65-BA/BB	HSC65 with 20-port SDI/STI capability and embedded cache, 120 V/240 V.
HSC95-BA/BB.	HSC95 with 48-port STI/STI capability and embedded cache, 120 V/240 V

The following are add-on rackmount HSC95 controllers to be mounted in the StorageWorks data center cabinet (e.g., as a redundant controller).

HSC95-SA/SB	Rackmount 50% SCSI HSC95 with 28-port SCSI capability and 20-port SDI capability, embedded cache, 120 V/240 V
HSC95-ZA/ZB	Rackmount 100% SCSI HSC95 with 56-port SCSI capability, embedded cache, 120 V/240 V

Add-On Components

The following components are to be used to configure an order.

HSC Channel Cards

HSC5X-DA	4-port SDI/STI disk and tape data channel card
HSC9X-FA	8-port SDI disk data channel card
HSC9X-SX	7-port SCSI data channel card
HSC9X-SZ	SCSI mount and interface kit. Includes 7-port SCSI data channel card, BA350 shelf, power supply and power cord

HSC Intelligent I/O Servers *(continued)*

Add-On Components (continued)

HSC Add-On Options

HSC5X-EA	Auxiliary power supply
BA35X-HA	BA350 shelf ac power supply (for redundancy)
DWZZA-VA	Differential to single-ended adapter
HSR9X-SA/SB	StorageWorks data center cabinet; can be configured with up to two rackmount HSC95s and up to eight BA350 shelves.
HSR9X-LA	6-Gbyte BA350 shelf package for installation into HSC or StorageWorks cabinet; includes six RZ26L drives, power supply and all cables.
HSR9X-CA	Standalone HSC SCSI capacity add-on kit with four RZ74 disks. Package includes one SCSI data channel card, two BA350 shelves, four RZ74 drives, mounting hardware, SCSI cables, power supplies, and cables. Designed for configuring 14 Gbytes of RZ74 storage inside standalone HSC cabinet.
HSR9X-FA	Rackmount HSC SCSI capacity add-on kit with four RZ74 disks. Package includes all hardware to install 14 Gbytes of RZ74 storage in a StorageWorks cabinet, for connection to a Rackmount HSC95: one SCSI data channel card, two BA350 shelves, four RZ74 drives, one DWZZA signal converter, mounting hardware, SCSI cables, power supplies, and cables.
HSR9X-HA	HSC HSC40/60/70/90 RZ74 SCSI kit. Package includes all hardware to upgrade an existing HSC for SCSI and install 14 Gbytes of RZ74 storage into the HSC cabinet: cabinet upgrade hardware, one SCSI data channel card, two BA350 shelves, four RZ74 drives, mounting hardware, SCSI cables, power supplies, and cables.
QA-QWDAA-H7	StorageWorks HSC media kit (RX33)
QL-0WDA9-AA	StorageWorks HSC software license

StorageWorks devices supported are: RZ26-VA, RZ26L-VA, RZ28-VA, RZ74-VA, TZ86-VA, TZ867-VA, TKZ09-VA, TLZ06-VA, TLZ6L-VA, EZ51R-VA.

Upgrade Packages

A wide range of field-installable upgrade paths for the HSC40/60/65/70/90/95 are available.

HSC Processor Upgrade Packages

Upgrade kits to the HSC65 and HSC95 include changes to the program memory design, which improves processing speed, and a 64-Mbyte cache module. Several upgrade packages have been created which both enhance processor performance and provide the upgrade to SCSI. Two HSC50 migration packages are also available, which require mandatory return of the HSC50.

HSC6X-EA/EB	HSC40 to HSC65 upgrade, 120/240 V
HSC6X-FA/FB	HSC60 to HSC65 upgrade, 120/240 V
HSC6X-GA/GB	HSC60 to HSC65 upgrade, 120/240 V*
HSC9X-LA/LB	HSC40 to HSC95 upgrade, 120/240 V
HSC9X-MA/MB	HSC60 to HSC95 upgrade, 120/240 V
HSC9X-NA/NB	HSC60 to HSC95 upgrade, 120/240 V*
HSC9X-HA	HSC65 to HSC95 upgrade, 120/240 V
HSC9X-PA	HSC70 to HSC95 upgrade, 120/240 V
HSC9X-QA	HSC90 to HSC95 upgrade, 120/240 V
HSC9X-RA	HSC90 to HSC95 upgrade, 120/240 V*

*Requires mandatory return of the old cache modules.

HSC Intelligent I/O Servers *(continued)*

Upgrade Packages (continued)

HSC Processor Upgrade Packages *(continued)*

HSS9X-MA/MB	HSC50 to HSC95 migration package, includes one HSC9X-FA SDI channel card, 120/240 V
HSS9X-NA/NB	HSC50 to HSC95 SCSI migration package, includes one SCSI data channel card, BA350 shelf, power supply, and power cord
HSS9X-PA	HSC70 to HSC95 SCSI migration package, includes processor upgrade plus SCSI data channel card, BA350 shelf, power supply and power cord
HSS9X-QA	HSC40 to HSC95 SCSI migration package, includes processor upgrade plus SCSI data channel card, BA350 shelf, power supply and power cord
HSR9X-NA	HSC70 to HSC95 SCSI upgrade, includes BA350 shelf, six RZ26L disks, power supply, and all cables
HSR9X-GA	HSC70 to HSC95 SCSI starter package, includes six RZ28 disk drives

SCSI Upgrades for the New and Existing HSCS

HSR9X-MA	6-Gbyte SCSI upgrade package for HSC40/60/70/90, includes SCSI data channel card, BA350 shelf and six RZ26L disks, power supply and all cables
HSR9X-KA	Standalone HSC RZ28 SCSI starter kit
HSC9X-SA	HSC SCSI-ready adapter kit for HSC40/60/70/90, for installing SCSI data channel cards, includes new I/O bulkhead and rear door
HSC9X-SE	HSC extension cabinet for HSC40/60/65/70/90/95; supports I/O bulkhead connections of up to eight SCSI data channel cards. NOTE: Maximum three channel cards for HSC40/60/65 and eight for HSC70/90/95.
HSC9X-SS	SCSI array starter kit for HSC40/60/65/70/90/95 for installing BA350 shelves into HSC cabinet, includes upper front door panel and power distribution kit
HSC9X-SF	Standalone HSC upgrade kit supports four StorageWorks BA350 shelves on top of the HSC.
HSC9X-SC	Rackmount HSC95 100% SCSI I/O bulkhead kit
HSC9X-SD	Rackmount HSC95 50% SCSI/50% SDI I/O bulkhead kit

The HSC65/HSC95 can utilize a combination of HSC5X-BA, HSC5X-CA, HSC5X-DA, HSC9X-FA, HSC9X-SX, and HSC9X-SZ. The HSC65/95 will not support the HSC6X-BA or HSC9X-BA, since the cache module is already included.

Cables

BN21H-XX	SCSI cable for connecting drives in internally mounted BA350 shelf to the SCSI data channel card
BN21K-XX	SCSI cable for connecting drives in externally mounted BA350 shelf to the SCSI data channel card
BN21T-09	Redundant power cord
BNCIA-20	20-meter CI cable pair

HSC Software

QL-NBKA9-AA	HSC high-performance software license
QA-NBKAA-GZ	HSC high-performance documentation kit
QA-NBKAA-H7	HSC high-performance media and documentation kit (RX33)
QL-NBKA9-RA	HSC high-performance software update license

HSC Intelligent I/O Servers *(continued)*

Specifications

Physical Characteristics	Standalone	Rackmount
Height	105.9 cm (41.7 in.)	44.5 cm (17.5 in.)
Width	54.0 cm (21.3 in.)	48.3 cm (19. in.)
Depth	91.4 cm (35.0 in.)	67.3 cm (26.5 in.)
Weight	240 kg (450 lb)	65.9 kg (145 lb)

Note: Weight represents maximum configuration.

Power Requirements	Standalone	Rackmount HSC in Cabinet
NEMA receptacle type	L5-30R	—
IEC receptacle type	(See Note)	—
PCS+/PDS+ cable type	BC24S	—
Number of phases	1	3

Model	Voltage Nominal V	Frequency Nominal Hz	Current in amps Steady state				Thermal dissipation	
			L1	L2	L3	N	Watts	Btu/kJ/h
HSC65/95-BA/SA/ZA	120	60	12.3	N/A	N/A	12.3	785	3480 Btu/h
HSC65/95-BB/SB/ZB	240	50	7.0	N/A	N/A	7.0	785	3670 kJ/h

Note: HSC65/95-BB incorporates removable line cord (17-00199-10). Power consumption and heat dissipation specifications for these items do not include a channel (HSC5X-BA/DA, HSC9X-FA) device.

HSC Rack-Mountable Subsystems

HSC rack-mountable subsystems are Hierarchical Storage Controller subsystems in a 48.3-cm (19-inch) wide, rack-mountable chassis. They provide the same functionality and technology as standard HSC subsystems, but mount in any EIA-standard 48.3-cm (19-inch) wide rack or enclosure, utilizing 62.2 cm (24.5 inches) of vertical rack space.

Based on the standard, cabinet version HSCs, rack-mountable HSCs use the same multiple high-speed microprocessors to locate, organize, and access data. They support the same combinations of SA or RA Standard Disk Interfaces (SDI/SCSI) and SCSI or Standard Tape Interfaces (STI) and provide the same superior I/O throughput to optimize physical disk and tape operations.

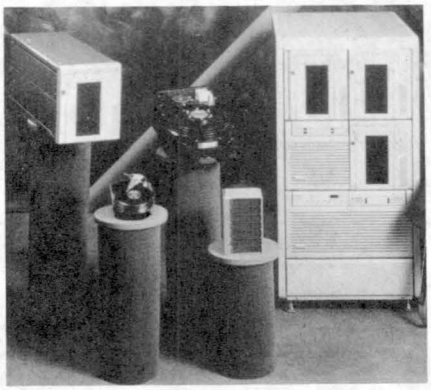
The rack-mountable HSC chassis extends the capabilities of the HSC to applications where footprint or environmental constraints prohibit use of the standard subsystems. It can be mounted in the DECarray 400 with other equipment in one cabinet, mounted in air-conditioned enclosures for use in non-conditioned, non-computer room environments, or mounted in contaminant-protected (NEMA) cabinets for use in dusty, dirty areas such as warehouses or manufacturing facilities. Rack-mountable HSCs are configured according to application needs or can be ordered as chassis alone for mounting by the user.

The rack-mountable HSC is available in a number of models that support a wide range of SDI/SCSI devices or a combination of SDI and SCSI disk and tape drives.

Ordering Information

Rack-mountable HSC subsystem configurations other than those in the DECarray 400 cabinet require a custom quotation which can be obtained through a Digital Services Sales Support Specialist. For more information, call Digital Services Sales Support at 800-832-6277 or 603-884-8990.

DECarray 300 Family (SDI/DSSI)



The DECarray 300 storage subsystem supports multiple bus configurations in one 1.1-meter (42-inch) high, single-phase cabinet. This space and power-efficient package combines SDI and DSSI disks as well as backup tape drives, making a wide variety of initial storage configurations available for high-end, mid-range, and low-end systems.

Investment is protected because SA71, SA72, SA73, SF73, SF74, SF35, SF36, TF857, TF867, TA857, TA867 can be added to these initial configurations at any time. The DECarray 300 family offers the flexibility needed to meet the variety of storage demands generated by new applications, additional users, and network expansion. The SA70 can migrate a maximum of two boxes into the DECarray 300 cabinet.

- Occupies only 5.5 ft^2 (0.5^2 m) of floorspace
- Variable drive capacity—systems can be configured for maximum capacity or maximum I/O throughput
- Accepts installation up to six separately powered and cooled Storage Array Building Blocks (SABBs) and up to six TF857/TF867 or three TA857/TA867 tape subsystems
- Maximum unattended tape storage backup capacity is 252 Gbytes (six TF867 tape drives). The TF867 tape subsystem consists of DSSI-based streaming tape device and automatic cartridge loader
- ESE50 solid state device—add up to four (see ESE50 for more information)

Ordering Information

Note: DECarray storage enclosures are 1.1-meter (42-inch), 3-high cabinets. GBf refers to Gbytes formatted. Custom configurations are available from the factory with SDI SABBs.

SF300 DECarrays (DSSI) configured for single systems; require appropriate CK-SF200-Lx cable kits, 60 Hz/50 Hz.

SF300-TE/TD	18.2 Gbytes	1 x TF857

SABBs for SF300 3-High DECarrays, 60 Hz/50 Hz

SF36-BE	3.2 Gbytes	1 x SF36	2 x RF36
SF36-HE	9.6 Gbytes	1 x SF36	6 x RF36
SF36-JE	19.2 Gbytes	1 x SF36	12 x RF36
TF857-AA/AB	18.2 Gbytes	1 x TF857	
TF867-AA/AB	42 Gbytes	1 x TF867	

To upgrade SF300 DECarrays to multi-host systems, order one of the following

CK-SF200-LM	2.7-m (9-ft) DSSI cable kit for VAX 6000/7000/9000/10000
CK-SF200-LP	2.7-m (9-ft) DSSI cable kit for VAX 4000 and MicroVAX
CK-SF200-L3	7.6-m (25-ft) version of -LM
CK-SF200-L7	15.2-m (50-ft) version for VAX 6000/7000/9000/10000
CK-SF200-L8	15.2-m (50-ft) version for VAX 4000 and MicroVAX systems

The following DECarrays (SDI) require external BC26V-12/25/50/80cables—one per drive; duplicate set required for dual porting—60/50 Hz.

SA300-XA/XD	Empty DECarray cabinet	
TA857-AA/AB	18.2 Gbytes	1 x TA857
TA867-AA/AB	42 Gbytes	1 x TA867

DECarray 300 Family (SDI/DSSI) *(continued)*

Mounting Kits

CK-SA300-T1	Mounting kit for TA857/TA867 in DECarray 300
CK-SA300-L1	Mounting kit for SA71/SA72/SA73 in DECarray 300 (not required for -AK or -BK variants)
CK-SA300-L2	Mounting kit for RA9x in DECarray 300

Specifications

Physical Characteristics		
Height	106.9 cm (42 in.)	
Width	54.7 cm (21.5 in.)	
Depth	91.5 cm (36 in.)	
Weight: Empty cabinet	148 kg (327 lb)	
RA9x	34 kg (74 lb)	
Sx7x	40 kg (89 lb)	
TF857	25 kg (56 lb)	
Power Requirements	**120 V**	**240 V**
Number of phases	Single	Single
AC-plug type	NEMA L5-30P	P/N 12-14379-03
Rated current	24 amps	12 amps
RA9x	3.6	1.8
Sx7x	2.22	1.5
Tx857	1.73	0.9

Operating Environment— Class A Operating Environment

Agency compliance	FCC, UL, IEC, CSA, TUEV, and FTZ
Maximum altitude	2438 m (8000 ft)
Relative humidity	40% to 60% noncondensing
Temperature	18° to 24° C (64.4° to 75.2° F)
Disks Supported	RA71, RA72, RA73, RF72, RF73, RF35
Tapes Supported	TF857, TF867, TA857, TA867

SA900 DECarray (SDI)

The SA900 DECarray 170-cm (67-in.) high cabinet offers the flexibility of configuring ESE50 solid state devices and TA857/TA867 tape subsystems.

Features

- Three-phase power
- Maximum of 126 Gbytes of tape unattended backup within one footprint
- New small, round less-expensive cables

Ordering Information

Order Number	Gbyte Capacity	Number of Components	Space Available for SA7x/RA92/ESE/tape	Prerequisites: Number Open Ports	BC26X Cables	OpenVMS Version	HSCxx Software*	HSC50 Software
SA900-TE/TF	18.2	1 x TA857	8	1	1	5.4-2	6.0	4.1
SA900-TG/TH	36.4	2 x TA857	6	2	2	5.4-2	6.0	4.1
SA900-TJ/TK	54.6	3 x TA857	4	3	3	5.4-2	6.0	4.1
SA900-XA/XD	0	–	10	N/A	(For migration program)			
H9A00-BA/BB	0	–	10	N/A	(Empty cabinet)			

* HSC40/60/70/90 software version

Cable	Length	Where used
BC26V-12	12 ft (3.7 m)	One cable connects one RA7x or one RA9x to an existing SDI I/O server or controller.
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	
Non-Plenum (Not Fire Code Safety Rated)		
BC26G-12	12 ft (3.7 m)	Round white small cable that connects one RA71 or RA72 to an existing SDI I/O server or controller.
BC26G-25	25 ft (7.6 m)	
BC26G-50	50 ft (15.2 m)	
BC26G-80	80 ft (24.4 m)	
Plenum (Fire Code Safety Rated)		
BC26J-12	12 ft (3.7 m)	Round white small cable that connects one RA71 or RA72 to an existing SDI I/O server or controller.
BC26J-25	25 ft (7.6 m)	
BC26J-50	50 ft (15.2 m)	
BC26J-80	80 ft (24.4 m)	

Note: In the SA900, BC26V-12 (12 ft/3.7 m) cables are suitable for drives located in the bottom rack only. It is recommended that 25-ft (7.6-m) cables or longer be used in all slots of the SA900 storage array.

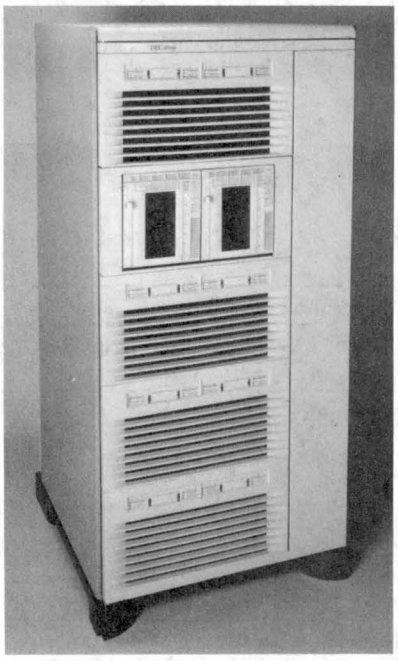
Specifications

Physical Characteristics	
Height	170.0 cm (66.94 in.)
Width	61.0 cm (24.0 in.)
Depth	108.0 cm (42.5 in.)
Weight	532.0 kg (1172.0 lb)

Note: Weight represents maximum configuration.

Power Requirements	
NEMA receptacle type	L21-30R
IEC receptacle type	309
Number of phases	3

SF400 DECarray (DSSI)



The SF400 DECarray is Digital's highest capacity DSSI storage array. It supports almost any combination of DSSI storage array building blocks, including the SF36 and the TF857, TF867 tape subsystem within 10 half-rack slots. For maximum flexibility, these storage products can be installed as many different combinations.

The DECarray 400's dual power distribution option greatly reduces the possibility of the storage subsystem becoming a single point of failure and allows for greatly enhanced shadow set availability when the individual members of shadow sets are also configured on separate DSSI buses and adapters.

The size of the DECarray 400 cabinet matches the dimensions and physical appearance of the VAX 7000/10000 platform. This newest member of the Storage Array families provides a variety of packaging options for DSSI storage products. In addition, the DECarray 400 has been designed to the mounting specifications defined for Digital's future storage products.

- Over 100 Gbytes of disk capacity
- Dual power distribution option allows isolated shadow sets in one cabinet
- Up to 10 TF857 or TF867 tape subsystems installable within a single cabinet
- 2.7-to 15.2-meter (9-to 50-foot) DSSI host interconnect cables available

All SF400s are preconfigured for single-host operation; i.e., they are preconfigured to operate as an end-node on the DSSI bus.

Ordering Information

Custom SF400 DECarray (DSSI 5-High Cabinet, 60/50 Hz)

SF400-XA/XD	0 Gbyte, 10 open slots

Preconfigured SF400/TF857 DECarrays (DSSI 5-High Cabinet, 60/50 Hz)

SF400-TE/TF	18.2 Gbytes	1 x TF857

Add-ons for SF400 5-High DECarrays, 60/50 Hz

TF857-AE/AF	18.2 Gbytes	1 x TF857
TF867-AE/AF	42 Gbytes	1 x TF867

SF400 Accessories/Upgrades

SF400-UA/UD	Upgrade to dual power distribution unit, 60/50 Hz
CK-SF400-TE	Upgrade tape loader door bezel

SF400 DECarray (DSSI) *(continued)*

Specifications

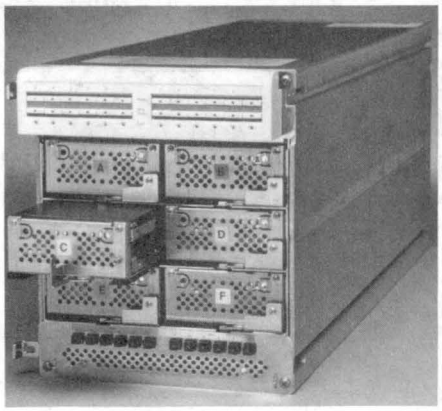
Physical Characteristics	
Height	170 cm (67 inches)
Width	80 cm (31 inches)
Depth	87.5 cm (34.5 inches)
Weight	508 kg (1121 lb) maximum
Operating Environment	
Class A operating environment	
Agency compliance	U.L., CSA, TUEV, FCC, VDE
Relative humidity	10% to 85%
Temperature	10° to 40° C (50° to 104° F)
Heat dissipation min/max	4000 watts (13.6 KBtu/Hr), maximum
Non-operating altitude	4900 m (16000 ft) maximum
Operating altitude	2400 m (8000 ft) maximum
Systems supported	VAX 10000, VAX 9000, VAX 7000, VAX 6000, VAX 4000, Q-bus MicroVAX, and MicroVAX II
Disks/tapes supported	SF36, SF35, SF74, SF73, SF72, TF857, TF867
Power Requirements	
Voltage (ac)	120/208 Vac and 240/416 Vac
Number of phases	3
AC-plug type	NEMA L21-30P and IEC-309-516P6W
Rated current	24 Amps/phase and 16 Amps/phase

Model	Voltage Nominal V	Frequency Nominal HZ	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
SF400-XA	120/208	60	0.5	0.5	N/A	N/A	0.5	50	171 Btu/h
SF400-XD	240/416	50	0.3	0.3	N/A	N/A	0.3	50	180 kJ/h
SF400-UA	120/208	60	1.0	1.0	N/A	N/A	1.0	100	341 Btu/h
SF400-UD	240/416	50	0.5	0.5	N/A	N/A	0.5	100	360 kJ/h
SF400-TE	120/208	60	2.1	1.8	0.0	0.0	1.8	160	546 Btu/h
SF400-TF	240/416	50	1.2	0.9	0.0	0.0	0.9	160	576 kJ/h

Notes:

- Currents are for nominal voltages of 120-Vac phase-to-neutral corresponding to 208-Vac phase-to-phase or for 240-Vac phase-to-neutral corresponding to 416-Vac phase to phase.
  - 101 and 220 nominal voltages will have proportionately higher phase currents by the ratio of 120/101 or 240/220 to the currents specified in this table.
- SF7X, SF3X, and TF8XX products are not line frequency dependent.
- Startup currents are calculated for the worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.

SF36 Storage Array Building Blocks (DSSI)



The SF36 storage arrays are half-rack building blocks (SABBs) that can house from 2 to 12 of Digital's highest performing DSSI Integrated Storage Elements (ISEs). Each RF36 ISE includes an intelligent controller and Storage Control Protocol (MSCP) server, enabling the SF36 to achieve industry-leading performance that scales linearly as devices are added. Compatible with previous generations of SABBs, the SF36 contains independent power and cooling elements.

Custom configurations of SF36 can be ordered directly for the SF400.

- Striping kit for SF36 SABBs in VAX 6000 systems
- Available in DECarray SF400 cabinet
- Single drive upgrades available
- Highest I/O throughput (73 I/O requests per second for RF35)
- Warm swap
- Easy removability
- Compact packaging with 3.5-inch form factor

Software Support

Requires OpenVMS V5.5 or later.

Ordering Information

SF36-BE	3.2-Gbyte SABB for embedding in SF400, includes integrated disk controllers, half-rack enclosure, two RF36 1.6-Gbyte disks, internal cabinet cable, mountinghardware, and user documentation
SF36-HE	9.6-Gbyte SABB for embedding in SF400 arrays, includes integrated disk controllers, half-rack enclosure, six RF36 1.6-Gbyte disks, internal cabinet cable, mounting hardware, and user documentation
SF36-JE	19.2-Gbyte SABB for embedding in SF400 arrays, includes integrated disk controllers, half-rack enclosure, 12 RF36 1.6-Gbyte disks, internal cabinet cable, mounting hardware, and user documentation
SF36-UE	1.6-Gbyte RF36 3.5-inch disk upgrade kit for SF3x-B* and SF3x-H*SABB; includes mounting hardware and user documentation

Rackmount DSSI Storage

Rackmount DSSI storage can be provided in a 19-inch-wide enclosures. Rackmount SF36 storage array building blocks use DSSI ISE technology to provide high capacity and performance in a half-rack. Rackmount DSSI storage is suitable for primary local storage or shared storage in a DSSI OpenVMS Cluster. It is used with other rackmounted equipment and is ideal when floor space is limited. By using a complete rackmount configuration, customers can save up to 75% of the floor space used by non-rackmount configurations.

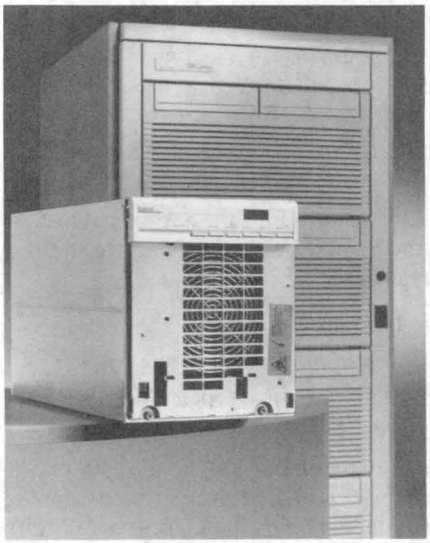
Rackmount storage arrays are suitable for any METRIC or RETMA/EIA standard 19-inch cabinets. For SF36 storage arrays, customers can choose from one to 12 drives in each SABB (Storage Array Building Block). Each SABB has an integral controller and a multi-track read-ahead cache, providing high throughput. HISPEED mode, selectable on each ISE, substantially reduces access times.

Physical Characteristics	
Height	31.1 cm (12.25 in.)
Width	22.2 cm (8.75 in.)
Depth	71.1 cm (28.0 in.)
Weight	41.4 kg (91.0 lb)

Note: Weight represents maximum configuration.

For more product information, technical support, and a custom quotation, contact the Digital Services Sales Support Team at 800-832-6277 or 603-884-8990.

ESE50 Solid State Disk



The ESE50 is Digital's fastest Standard Disk Interconnect (SDI) storage system. Using semiconductor technology, the ESE50 eliminates I/O bottlenecks and enables users to achieve maximum system utilization by matching the accelerated power of today's CPUs and VMSclusters with fast access to their systems' most time-critical data.

The ESE50 is the same form factor as an RA92 and can be configured in SA900/SA800/SA600/SA300 storage array cabinets along with magnetic disk and tape storage products. It is available in three different capacities: 120 Mbytes, 600 Mbytes and 1 Gbyte. An integrated data retention system (hard disk, batteries, control logic), which ensures permanent data protection in the event of an ac power loss, is provided with all models. In addition, the ESE50 600-Mbyte and 1-Gbyte models incorporate a redundant power supply which provides industry-leading data availability. A 120-to 600-Mbyte upgrade package is available when the need to increment capacity arises.

Superior I/O performance can make a major difference in optimizing the performance of applications in a broad range of industries. From financial trading and telecommunications to retail, pharmaceutical, manufacturing, and scientific environments, the ability to achieve consistently fast access to growing volumes of data is a competitive necessity. Designed to meet this need, the fast access time and I/O per second throughput capabilities of the ESE50 meet the challenge of timely access to the data.

The ESE50 can improve system response time, reduce prolonged batch job runtimes, and allow users to be added without impacting user-level system perfor- mance. The ESE50 can reduce system management workload and help expand computing capabilities without adding resources. Its performance boost can also extend the life of inefficiently-coded applications, alleviating the need for expensive application software development.

Features

- Performance–Device access timef 0.25 ms provides the fastest and most consistent access tresponse-time critical data
- Capacity–Up to 1 Gbyte with integrated data retention in a single RA92-sized rack-mountable unit
- Packaging–Packaging in SA900/SA800/SA600/SA300 storage array cabinets, like RA9x/SA7x magnetic drives, allows forptimized floor space, power, and HSC controller ports
- Affordability–Attractive pricingn entry level models and even greater savingsn higher capacityptions
- Availability–Usef industry-leading N+1 power supply component redundancy ensures extremely high data availability

Ordering Information

ESE50-AA/AB	120-Mbyte solid state disk with integrated data retention, 120 V, 60 Hz/240 V, 50 Hz
ESE50-BA/BB	600-Mbyte solid state disk with integrated data retention and redundant power supply, 120 V, 60 Hz/240 V, 50 Hz
ESE50-CA	120-to 600-Mbyte upgrade kit consisting of eight 64-Mbyte memory array cards and one power supply module
ESE50-DA/DB	1.0-Gbyte solid state disk with integrated data retention and redundant power supply, 120 V, 60 Hz/240 V, 50 Hz

Note: Each ESE50 requires one BC26V cable. If dual porting is required, a duplicate set of cables must be purchased; 25-ft. (7.6-m) length cables or greater are recommended.

ESE50 Solid State Disk *(continued)*

Option	Length	Where Used
BC26V-12	12 ft (3.7 m)	One cable connects one ESE50 to an existing SDI I/O controller
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Configuration Notes

Packaging—No installation kits are required for SA600/SA800 storage array cabinets. The CK-SA900-L2 installation kit is required for the SA900 cabinet and the CK-SA300-L2 installation kit for the SA300. A maximum of four ESE50 units are supported in a single storage array cabinet.

Field Installation—All ESE50 options are field installable only.

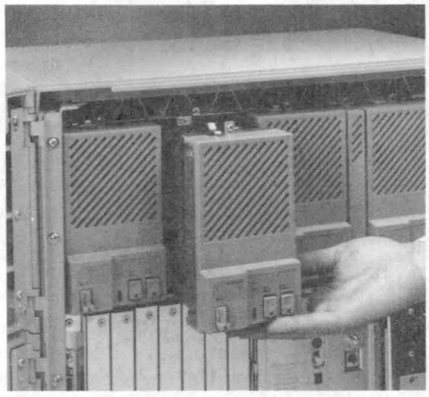
OpenVMS Support—The ESE50 has been tested under V5.4, V5.5, V5.5-1. The ESE50 is fully supported under OpenVMS V5.5-2 and OpenVMS AXP V1.5 (and all subsequent releases).

Controller Support—ESE50 units are supported on HSC40/60/65/70/90/95 controllers with version V6.0 or later microcode and KDM70 controllers running V2.4 or later microcode. ESE50 is not supported on KDA50, KDB50 or UDA50 controllers.

Specifications

Physical Characteristics		
Height	26.5 cm (10.4 in.)	
Width	22.2 cm (8.7 in.)	
Depth	47 cm (18.5 in.)	
Shipping weight	22.7 kg (50 lb)	
Installed weight	20.5 kg (45 lb)	
Power Requirements		
Standards	UL listed; CSA certified; FCC Class A verified	
Voltage	120/208 Vac at 60 Hz; single-phase WYE 220/240 Vac at 50 Hz	
Maximum heat dissipation	300 W	
Operating Environment		
Temperature range	15° –32° C (59° –90° F)	
Relative humidity	20% to 80%	
Maximum wet bulb	25° C (77° F)	
Minimum dew point	2° C (36° F)	
Maximum altitude	8,000 ft above sea level	
Maximum acoustic noise	45 dBA	
Performance		
Maximum throughput	1800 I/O requests per second	
Seek time	Not applicable	
Average latency	Not applicable	
Access time	0.25 ms	
Peak transfer rate	2.5 Mbytes/s	
Spiral transfer rate	2.0 Mbytes/s	
DSA Features		
SDI Ports	2	
Data Organization		
Formatted Capacity	Sectors (Blocks)	Decimal MB
ESE50-AA/AB	238,080	121.9
ESE50-BA/BB	1,196,544	612.6
ESE50-DA/DB	1,915,392	980.6

EF5x Solid State Disk



The EF5x series of solid state disks (SSD) satisfy the I/O requirement of today's CPUs. Millions of CPU cycles can be idled while waiting for the completion of a single I/O to magnetic disk. "Near zero" access time to data is now required to realize optimum performance and the fullest return on system investments. The Alpha-ready EF5x provides fast access to data necessary to enhance system performance.

Solid state disk, based on semiconductor technology, provides up to a 10x improvement in transaction throughput. Applications that are critical, directly produce revenues, or are customer service oriented, significantly benefit from the sub-millisecond access time provided by the EF5x. And, because they are DSA-compliant devices, SSDs implement as easily as magnetic disk.

The EF5x is based on a standard 5.25-inch full-height form factor and supports VAX 4000, VAX 6000, VAX 7000, VAX 10000, MicroVAX 3300/3400/3500/3600/3800/3900, MicroVAX II, and DSSI-based OpenVMS Clusters. Capacities of 107 Mbytes, 205 Mbytes, and 267 Mbytes are available.

The EF51R and EF52R models incorporate an integrated data retention system (voltage sensing logic, batteries, and hard disk) with continuous backup to provide the data permanence of magnetic disk. In the event of a power failure, the data retention system offloads data from the storage arrays onto the integrated hard disk for safe, secure storage until power is returned. The continuous backup feature constantly updates the contents of the internal hard drive. This conserves battery power, reduces backup time, and affords virtually an unlimited number of off-load/restore cycles when protecting data from a power loss.

Features

- Fast I/O speeds up system performance: access to data up to 100 times faster than magnetic disk
- "Plugs and plays" like magnetic disk: fits into standard systems and storage arrays, requires no software rewrites, and benefits are realized immediately
- Ideal price/performance for business-critical applications on smaller systems, distributed applications, and server applications
- Provides a competitive advantage: applications implement faster, user productivity increases, time to market speeds-up, and business growth is supported

Ordering In formation

EF51R-AF	107-Mbyte DSSI solid state disk with integrated data retention for VAX 4000-BA4xx; R400X, B400X and SF2x0/SF300/SF400 DECarray cabinets; includes user documentation, mounting hardware; field installed.
EF52R-AF	205-Mbyte DSSI solid state disk with integrated data retention for VAX 4000-BA4xx; R400X, B400X and SF2x0/SF300/SF400 DECarray cabinets; includes user documentation, mounting hardware; field installed.
EF53-AF	267-Mbyte DSSI solid state disk (without data retention)for VAX 4000-BA4xx; R400X, B400X and SF2x0/SF300/SF400 DECarray cabinets; includes user documentation, mounting hardware; field installed.

EF5x Solid State Disk (continued)

Configuration Notes

Systems Supported—All DSSI-based VAX 4000, VAX 6000, VAX 7000, VAX 10000, MicroVAX 3300/3400/3500/3600/3800/3900, and MicroVAX II systems are supported by the EF5x.

Operating System Support

OpenVMS Version	Restrictions
Before OpenVMS 5.4-3	• Not tested, not supported
OpenVMS 5.4-3	• Tested and supported • Generic device: no OpenVMS name recognition • OpenVMS "SHOW DEVICE" indicates generic DSSI disk: "device type (type not yet identified)" • Cannot be used as a boot device; cannot load • OpenVMS on the device and run as a system disk
OpenVMS 5.5-0, 5.5-1	• Not tested, not supported
OpenVMS 5.5-2	• Tested and supported • OpenVMS qualified • Cannot be used as a boot device; cannot load • OpenVMS on the device and run as a system disk

Installation Kits—The EF5x devices are pre-packaged with mounting hardware to accommodate installation in all supported cabinets.

Mounting Prerequisites—The EF5x fits into standard 5.25-inch cavities in system and storage array cabinets. The number of EF5x units per cabinet is limited to seven devices per bus which is standard with other DSSI devices. No special rules regarding device placement within cabinets apply.

System Cabinets—EF5x cannot be mounted in the VAX 4000 Model 200 BA215 cabinet.

VAX 4000 Expansion Cabinet—R400X and B400X: for VAX 4000 systems, MicroVAX 3300/3400/3500/3600/3800/3900 and MicroVAX II systems.

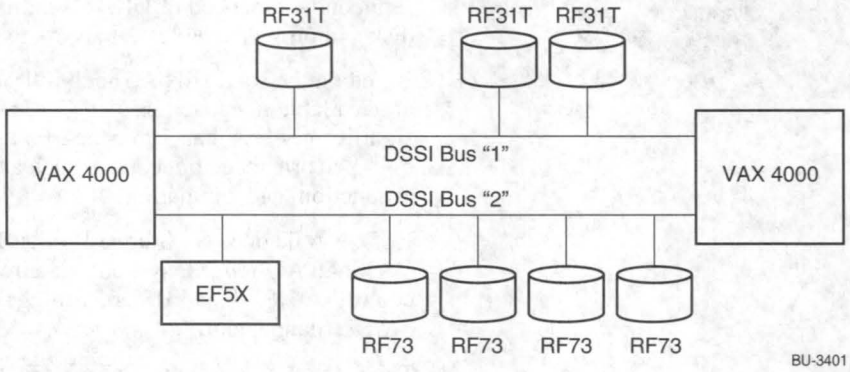
Storage Array Cabinets

- SF2x0, SF300, and SF400 DECarray cabinets.
- The SF7x Storage Array Building Block (SABB) is required to install the EF5x in DECarray cabinets. The EF5x can be installed in the SF7x SABBs either as a single device, in pairs, or in any combination up to four devices. EF5x and RF magnetic disk can be mixed and matched.
- SF72-EK SABB (with four open slots) available for mounting into SF DECarray cabinets with space for additional SABB.

EF5x Solid State Disk *(continued)*

Cabling—No cables are required.

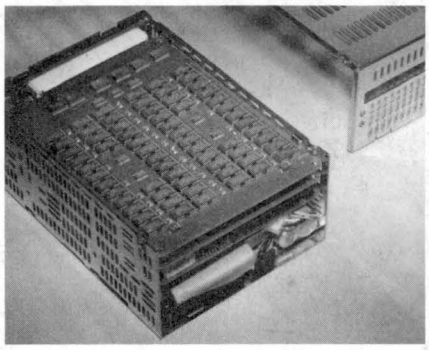
I/O Balancing—CPU type, application, and load determine I/O activity. Solid State Disks should contain the "hot" data that receives the majority of I/O requests. Place this "hot" data with "cold" data (infrequently accessed) on the same DSSI bus. Place "warm" data on another DSSI bus, spreading the I/O load to achieve balanced performance. The following DSSI dual-host VAX 4000 configuration exemplifies this balance:



Specifications

Performance		
Access time	<1 ms	
Throughput potential	800+ I/O requests per second (DSSI adapter and workload dependent)	
Formatted Capacity	**Sectors (Blocks)**	**Decimal Mbyte**
EF51R	208,800	106.9
EF52R	399,400	204.5
EF53	522,000	267.3
Operating Environment		
Temperature range	10–40° C (50°–104° F)	
Relative humidity	8% to 80% noncondensing	
Maximum wet bulb	25.6° C (78° F)	
Maximum altitude	4572 m (15,000 ft)	
Acoustic noise	4.2 bels, operating (ISO7779)	
Power Requirements		
Standards	UL, CSA, FCC Class A	
Voltage	12 V ±5%; 5 V ±5%	
Heat Dissipation		
	Maximum	**Typical**
EF51R-AF	28 W	13 W
EF52R-AF	27 W	8 W
EF53-AF	11 W	6 W
Physical Dimensions		
Height	8.26 cm (3.25 in.)	
Depth	20.32 cm (8.0 in.)	
Width	14.60 cm (5.75 in.)	
Weight	2.55 kg (5.6 lb)	

EZ5x Solid State Disk



The EZ5x provides the speed and benefit of solid state disks on Fast SCSI-2 systems from Digital and other vendors.

From single user systems to clusters implementing SCSI-2, the EZ5x series provides fast access to response-time critical data necessary to maintain system performance.

Solid state disks (SSDs) use DRAMs as the storage media to replace the rotating platters and electromechanical head assemblies of magnetic disks. The semiconductor speed of DRAMs eliminates the latency associated with magnetic disk and provides the fastest access to storage subsystem data.

Based on the standard 5.25-inch full-height form factor, EZ5x solid state disks are available in capacities of 107, 428, and 856 Mbytes. With an access time significantly less than 1 ms, the EF5x solid state disks support a wide range of high-performance applications such as time-critical OLTP, batch, development, production, and simulation.

EZ5x-VA devices are StorageWorks Building Blocks and connect to Digital VAX and Alpha AXP systems via direct connect, KZMSA (XMI to SCSI) controller, HSJ40 and HSD05 StorageWorks Array Controllers, and the HSC9X-SX/SZ channel card.

The EZ5x-VA, configured as a StorageWorks subsystem, supports select systems from other vendors. Additionally, the EZ5x-AA variant is available for integration into 5.25-inch full-height storage slots of non-Digital SCSI-based systems.

All EZ5x models incorporate a complete data retention system to provide data permanence if power is lost. When a power loss is sensed, the data retention system (comprised of 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 EZ5x 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.

The EZ5x solid state disks support Digital's primary storage interconnects and compliment the SDI ESE50 and DSSI EF5x solid state disks. Like these products, the EZ5x is software compatible and implements as easily as magnetic disks.

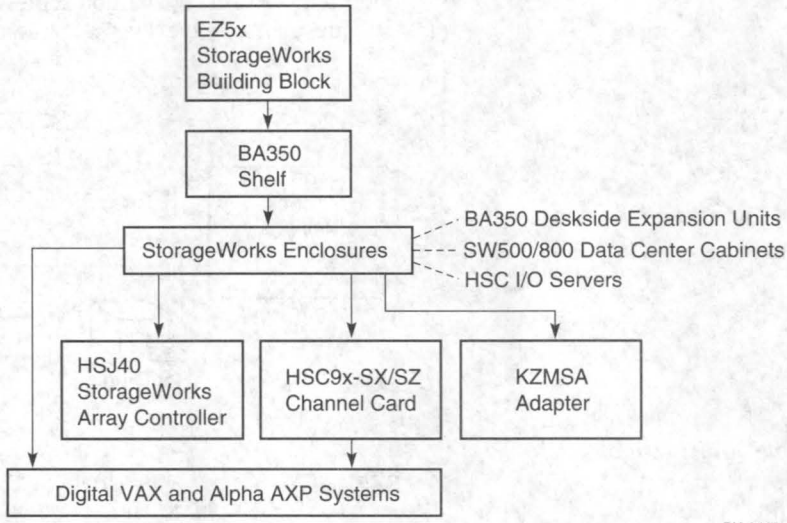
Features

- Time-critical data is accessed up to 100 times faster than magnetic disks
- Supports a breadth of systems and applications
- Sophisticated continuous backup and ECC provides industry-leading availability
- Industry standard and open, executes the SCSI-2 Common Command Set

EZ5x Solid State Disk *(continued)*

Configuration Notes

Systems Supported—All SCSI-capable VAX and Alpha AXP systems are supported via StorageWorks. The EZ5x-VA StorageWorks Building Block connects to these systems directly through the KZMSA controller, the HSJ40 StorageWorks Array Controller, or HSC I/O servers implementing the HSC9X-SX/SZ channel card. Systems offering specific device-level support: DEC 4000 AXP, DEC 7000 AXP, DEC 10000 AXP, VAX 7000, and VAX 10000. The EZ5x also supports DSSI-based systems through the HSD05 StorageWorks Array Controller.



Operating System Support

- OpenVMS V5-5.2 and later
- OpenVMS AXP V1.5 and later
- VMSclusters (OpenVMS V5-5.2 and OpenVMS AXP V1.5)
- DEC OSF/1 AXP V1.3-4 and later
- Sun OS 4.1.3 (SparcStation 10, 330)
- Solaris (Sun Sparc II)
- HPUX 8.05 (HP 9000 720)
- HPUX 9.01 (HP 9000 730)
- System 7.0.1, System 7.1, A/UX (Macintosh)

Installation Kits and Cables

- EZ5x-VA drives are packaged as StorageWorks Building Blocks. No additional mounting hardware or cabling is required.
- EZ5x-AA drives are supplied as a "brick only" for integration into other enclosures or non-Digital systems which are able to accept standard 5.25-inch full-height storage devices. No mounting hardware or cabling is included.

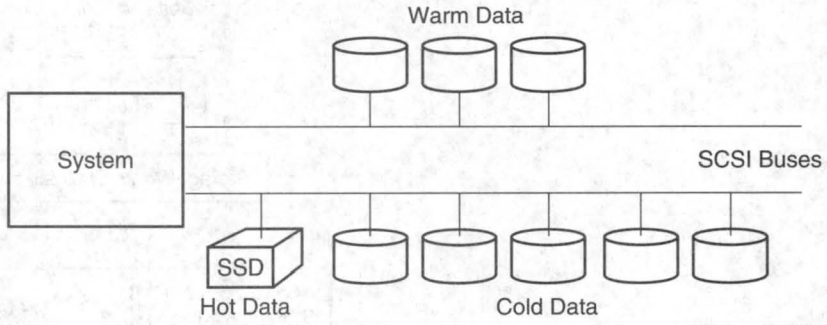
EZ5x Solid State Disk *(continued)*

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 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 shown 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:



Ordering Information

EZ51R-VA	107-Mbyte SCSI solid state disk with integrated data retention system. StorageWorks Building Block, includes user documentation; field installed.
EZ54R-VA	428-Mbyte SCSI solid state disk with integrated data retention system. StorageWorks Building Block, includes user documentation; field installed.
EZ58R-VA	856-Mbyte SCSI solid state disk with integrated data retention system. StorageWorks Building Block, includes user documentation; field installed.
EZ51R-AA*	107-Mbyte SCSI solid state disk with integrated data retention system, includes user documentation; field installed.
EZ54R-AA*	428-Mbyte SCSI solid state disk with integrated data retention system, includes user documentation; field installed.
EZ58R-AA*	856-Mbyte SCSI solid state disk with integrated data retention system, includes user documentation; field installed.

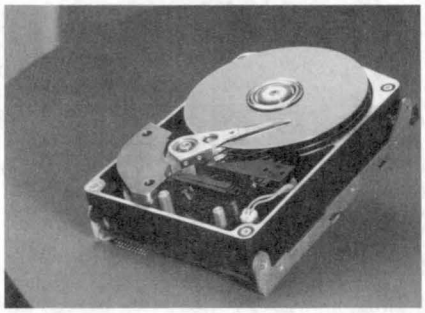
*See the "Installation Kits and Cables" section in the Configuration Notes.

EZ5x Solid State Disk *(continued)*

Specifications

Interface		
Fast SCSI-2 single-ended		
Performance		
Access time	<1 ms	
Maximum throughput potential	800+ I/O requests per second (adapter and workload dependent)	
Formatted Capacity	**Sectors (Blocks)**	**Decimal Byte**
EZ51R	208,800	106.9
EZ54R	835,300	427.7
EZ58R	1,670,700	855.4
Operating Environment		
Temperature range	10°–40° C (50°–104° F)	
Relative humidity	10%–90% noncondensing	
Maximum wet bulb	28° C (82° F)	
Maximum altitude	2500 m (8000 ft)	
Acoustic noise	4.2 bels, operating (ISO7779)	
Power Requirements		
Standards	UL, CSA, FCC Class A, TUV	
Voltage	12 V ± 5%, 5 V ± 5%	
Heat Dissipation	**Peak**	**Nominal**
EZ51R	28 W	13 W
EZ54R	28 W	17 W
EZ58R	28 W	17 W
Physical Dimensions		
Height	8.26 cm (3.25 in.)	
Depth	20.32 cm (8.0 in.)	
Width	14.60 cm (5.75 in.)	
Weight	2.55 kg (5 lb., 10 oz)	

RF36 Integrated Storage Element (DSSI)



The 1.6-Gbyte RF36 integrated storage element (ISE) provides increased I/O bandwidth performance for VAX 4000 and Q-bus MicroVAX systems. The RF36 ISE is a leading-edge, full-height, 3.5-inch disk storage device. With its integral, dedicated controller, the RF36 ISE adds state-of-the-art single drive performance to the linear increase in system performance achieved when additional ISEs are added to DSSI. The RF36 ISE, combined with the DSSI bus, offers industry-leading 264-bit error correction, higher reliability, system and data availability, and provides maximum bandwidth for I/O intensive applications. The RF36 ISE with DSSI is a full implementation of Digital Storage Architecture (DSA).

With three-system enclosure storage cavities, the system can contain over nine Gbytes of disk storage, an I/O bandwidth of 438 I/Os per second, with room available for a tape drive. For applications requiring storage expansion, the RF36 is supported in the R400X expander box. The R400X expansion pedestal can contain up to 13 RF36 ISEs for a total of 20.9 Gbytes of formatted disk drive storage spread across 13 ISEs, thereby providing highest linear scalability.

The RF36 offers DSSI integrity and availability Features, higher capacity, higher performance, and greater I/O bandwidth, in less physical space, at a lower operating cost. All of these Features make the RF36 ISE the storage solution for performance-oriented on line transaction processing (OLTP), shop floor control, and other mission-critical applications.

RF36 Integrated Storage Element (DSSI) *(continued)*

Features

- Capacity: 1.6 Gbytes (formatted); 2.05 Gbytes (unformatted)
- Areal density: 150 Mbits/in.
- Peak transfer rate: 3.1–6.25 Mbytes/second
- Peak transfer rate to DSSI bus: 4.0 Mbytes/second
- Read-ahead cache: 512 Kbytes
- Rotational latency: 5.6 ms
- Average seek time: 9.5 ms; HISPEED mode, 7.5 ms
- Average access time: 15.1 ms; HISPEED mode, 13.1 ms
- Throughput: 83 I/Os per second (@50 ms)*
- Spiral transfer: 2.3 to 4.66
- Data integrity: ECC/EDC/parity
- VAXsimPLUS: Future support
- Control panel: Optional remote

*See Disk Comparison Chart.

Ordering Information

Note: RF36s are 1.6-Gbyte, 3.5-inch full-height, fixed disk ISEs.

RF36E-AA/AF	RF36 with DSSI interface for BA4xx based systems and R400X/B400X expanders; factory/field installed.
RF362-AA/AF	Two RF36s with DSSI interface for BA4xx systems and R400X/B400X expanders. Fits in one 5.25-inch storage cavity; factory/field installed.
RF36E-SA/SF	RF36 with DSSI interface for BA2xx based systems and expanders; factory/field installed.
RF36U-AF	RF36 upgrade kit for capacity expansion of RF36E-AA/AF in the field for BA4xx based systems and expanders; cables included.
RF36-EK/EN	RF36 for VAX 4000 Model 100 or SF12 expansion box; field/factory installed.
DL-RF36A-A6/AB	Factory-installed RF36s in BA4xx, qty 6/qty 12.
SF12-CA	RF36 in SF12 expansion box.

Specifications

Voltage	+5, +12
Weight	0.9 kg (1.9 lb)

Option			dc Amps @ 5 V	dc Amps @ 12 V	Watts Drawn
RF36 (Single Drive)	Typical	(Peak @spinup)	0.78	2.65	N/A*
	Maximum	(Peak @spinup)	0.86	2.89	N/A*
	Typical	(Seeking)	0.78	0.91	14.9
	Maximum	(Seeking)	0.85	0.96	16.6

* The first set of +12 V figures are transient currents during the first seconds of spinup; power refers more to continuous consumption and does not therefore apply.

RZ-Series Disk Drives (SCSI)



The RZ family of SCSI Winchester disk drives consists of 3.5-and 5.25-inch form factors. Capacities range from 245 Mbytes to 2.0 Gbytes. In addition, the family offers a variety of performance characteristics that can be matched to the system or application environment.

The 3.5-inch drives are typically mounted in the system enclosure of the desktop systems and are also available in external storage expansion enclosures.

With the exception of the DECsystem 5500 and DECsystem 5900 which use only 5.25-inch disks, the 3.5-and 5.25-inch drives may be mixed on systems to provide the required capacity and/or performance.

The following drives are available:

- RZ24L—245 Mbytes, an ideal drive for single-user VAXstations
- RZ25L—535 Mbytes, ideal for single-user DECstations and entry-level servers
- RZ26L—1.05 Gbytes, low-cost replacement for RZ26; for Alpha AXP systems, MicroVAX 3100, VAX 4000 systems, and StorageWorks
- RZ28—2.0 Gbytes for Alpha AXP systems and servers

RZ25L SCSI Disk Drive
The RZ25L 535-Mbyte, 3.5-inch form factor, 1-inch-high SCSI-2 hard disk drive offers a low-cost, high-performance replacement to the RZ25 and RZ56. The RZ25L provides four times the cache of the RZ25, faster average access time, and superior bandwidth for workstation applications.

RZ26L SCSI Disk Drive
The RZ26L 1.05-Gbyte, 3.5-inch form factor, 1-inch-high, SCSI-2 disk drive is available on Alpha AXP systems, MicroVAX 3100 Models 30/40/80/90, VAX 4000 systems, and in the StorageWorks Family of Modular Storage products. The RZ26L is the replacement product for the RZ26, offering superior price/ performance benefits.

RZ28 SCSI DISK DRIVE
The RZ28 2.0-Gbyte, 3.5-inch SCSI-2 disk drive is maximum capacity in a 3.5-inchform factor for Alpha AXP systems, MicroVAX 3100 Models 30/40/80/90, and in theStorageWorks Family of Modular Storage Products.

Features

The RZ series of 3.5-and 5.25-inch Winchester disk drives offer numerous Features that are unique in SCSI disk products.

- Reliability
  - Elevated shock, vibration, and temperature Specifications to meet the requirements of an office environment
  - Thorough testing to Digital's SCSI standards for both signal integrity and command conformance
- Data Integrity
  - 48-bit error correction code (ECC): RZ25L
  - 264-bit error correction code (ECC): RZ26L, RZ28
  - On power failure, writes-in-progress are completed, thus preventing data loss or corruption
  - 90 percent on-board diagnostic coverage on power-up, for improved fault isolation
  - Write as well as read diagnostics on power-up
  - All errors, hard and soft, are reported to the system to aid in monitoring drive condition

RZ-Series Disk Drives (SCSI) *(continued)*

- Performance
  - Drive buffer management optimized to Digital operating systems
  - Drives support overlapped seeking for near-linear incremental performance
- Compatibility
  - All Digital SCSI disk drives undergo exhaustive system and software regression testing
- Quality Assurance
  - Ongoing testing to assure consistent quality throughout the manufacturing life of the product

Digital's SCSI implementation is documented *in Small Computer System Interface*, An Overview (EK-SCSIS-OV) and Small Computer System Interface, A Developer's Guide (EK-SCSIS-SP).

Prerequisite Software

See SCSI Disk Drive Comparison Chart.

Ordering Information

The following table lists the systems that support RZ series disk drives. Drives can be factory installed (see respective system menus for maximum quantity allowed) or installed as an add-on at the customer site.

System	Factory Installed	Add-On	Installation
VAXstation 4000 VLC	**RZ24L-ES**	**RZ24L-ER**	Customer installable
	RZ25L-ES	**RZ25L-ER**	Customer installable
VAXstation 4000 Model 60/90	**RZ25L-EM**	**RZ25L-EL**	Customer installable
	RZ28-EM	**RZ26B-EL**	Customer installable
		RZ28-EL	Customer installable
MicroVAX 3100 Models 30/40/80/90	**RZ24L-EJ**	**RZ24L-EH**	Field installed
	RZ25L-EN	**RZ25L-EK**	Field installed
	RZ26L-EN	**RZ26L-EK**	Field installed
	RZ28-EN	**RZ28-EK**	Field installed
DECstation 5000 Model 20/25/33/50/133	**RZ25L-FM**	**RZ25L-FN**	Customer installable
DECsystem 5000 Model 25/50/150	**RZ26-FM**	**RZ26-FN**	Customer installable
DECpc AXP 150	**RZ25-VA**	**PB2RA-BA**	Factory installed
DEC 2000 Model 300	**RZ26L-VA**	**PB2RA-DA**	Factory installed
	RZ28-VA	**PB2RA-EA**	Factory installed
DEC 3000 Models 300/300L	**RZ25L-EP**	**RZ25L-EP**	Field installed
	RZ26L-EP	**RZ26L-EP**	Field installed
	RZ28-EP	**RZ28-EP**	Field installed
DEC 3000 Model 600/800 and Model 600S/800S	**RZ25L-EJ**	**RZ25L-EJ**	Field installed
	RZ26L-EJ	**RZ26L-EJ**	Field installed
	RZ28-EJ	**RZ28-EJ**	Field installed
DEC 4000	**RZ26L-MY**	**RZ26L-MY**	
	RZ73-MX		Field installed
	RZ74-MX		
	RZ74-VA		
	RZ28-MY		
DEC 7000	**RZ26L-VA**		
	RZ73-VA		
	RZ74-VA		
	RZ28-VA		
DEC 10000	**RZ26L-VA**	**RZ26L-VA**	
	RZ73-VA		
	RZ74-VA		
	RZ28-VA		

RZ-Series Disk Drives (SCSI) *(continued)*

Power Cords

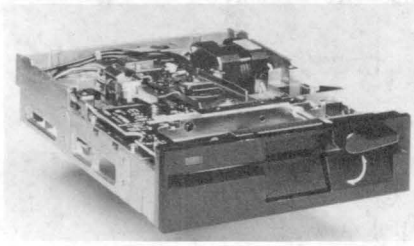
A power cord is required for each 220/230/240 V RZ device ordered.

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

See the SCSI comparison chart.

RX33 Flexible Diskette Drive (SCSI)



The RX33 is a half-height, 5.25-inch 1.2-Mbyte diskette drive. In high-density mode, the drive provides industry-standard compatibility utilizing double- sided high-density diskettes. This allows customers access to a vast software base of industry media. In BA23 configurations, the RX33 can go into standard mode allowing users to read and write RX50-type standard-density diskettes on a single side. This dual-mode capability allows Digital customers to access a vast software base without sacrificing RX50 software compatibility. The RX33 is offered in the SZ12 expansion box for use with Digital's desktop systems. In this SCSI configuration, support of the RX50 mode is not available—access to the industry- standard software base is fully supported.

Features

- Formatted capacity per diskette: 1.2 Mbytes
- Peak transfer rate: 500 Kbytes/second
- Average seek time: 92 ms
- Average rotational latency: 83 ms
- Bytes per sector: 512
- Sectors per track: 15
- Tracks per diskette: 160
- Brushless direct drive dc motor
- Dynamic media clamping
- Diskette ejection mechanism
- "Diskette changed" detection device

Ordering Information

Note: RX33s are 1.2-Mbyte diskette drives.

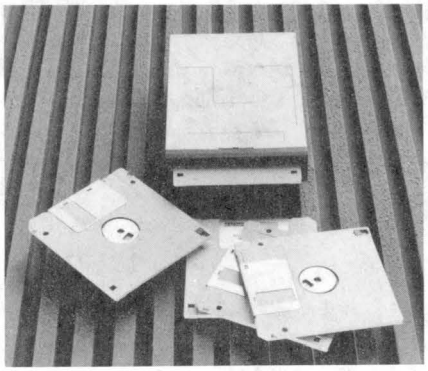
RX33A-AA	RX33 with cables, for use in BA23 enclosure (drive 1)
RX33A-BA	RX33 with cables, for use in BA123 enclosure (drive 1)
RX33-AS	RX33 for use in applicationDEC 433
RX33-UK	RX33 upgrade kit for SZ12/RZ5X expansion box
RX33K-10	Pack of ten RX33s

Note: See SZ12 description in this chapter for RX33 included in SZ12 dual-drive expansion box.

Configuring Information

Option	dc Amps Drawn at		Watts Drawn
	5 V	12 V	
RX33	0.35	0.22	4.40

RX26 Flexible Diskette Drive (SCSI)



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 third level to the existing industry diskette structure of 0.7 Mbyte and 1.4 Mbytes, formatted (1 Mbyte and 2 Mbytes unformatted, respectively).

It is fully backward compatible on both read and write capabilities with the RX23 3.5-inch media at both 0.7-Mbyte and 1.4-Mbyte capacities. This important feature provides users with access to the complete range of industry-standard software published on 3.5-inch microfloppies. The RX26 may be operated in these modes as well. The RX26 employs the industry-standard FDD interface.

The RX26 is offered in the VAXstation 4000 Model 60/90 workstations, the SZ03 expansion box, and MicroVAX 3100 Models 30/40/80/90.

Features

- Formatted capacity per diskette: 2.8 Mbytes (2 Mbytes unformatted)
- Peak transfer rate: 1-Mbyte/second (in 2.8/4-Mbyte mode)
- Average seek time: 95 ms
- Average rotational latency: 100 ms
- Sectors per track: 36
- Tracks per diskette: 160

Ordering Information

	VAXstation 4000 Models 60/90	VAX 4000 Model 100 MicroVAX 3100 Models 30/40/80/90	DECstation 5000 Models 20/25/33	DECsystem 5900
Factory	RX26-ES	RX26-EN	RX26-FP	RX26-LF
Field	RX26-UL	RX26-EL	RX26-FN	RX26-LG

RX26K-10 Pack of ten 2.8-Mbyte 3.5-inch flexible diskettes

RX23 Flexible Diskette Drive (SCSI)

The RX23 flexible diskette drive provides a convenient removable storage for desktop systems. It Features exceptional storage capacity and functionality in a highly compact, 3.5-inch form factor.

The RX23 drive utilizes industry-standard 3.5-inch microfloppy diskettes. Industry diskettes are currently offered in two standard capacities: 2.0-Mbyte, high-density floppies (1.4-Mbyte formatted), and 1.0-Mbyte, standard-density floppies (700-Kbyte formatted). The RX23 drive will read and write to the high-density media while providing read-only compatibility with the standard-density media. This dual mode capability provides users with access to the complete range of industry-standard software published on 3.5-inch microfloppies.

The RX23 is offered in most Digital desktop systems as well as in the SZ12 dual-drive expansion box.

Features

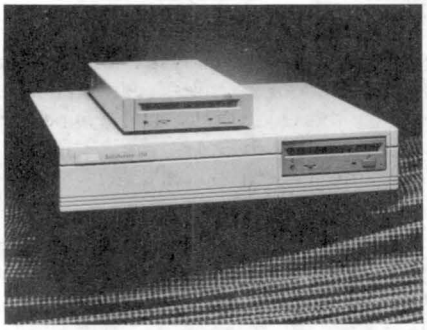
- Formatted capacity per diskette: 1.4 Mbytes
- Peak transfer rate: 500 Kbytes/second
- Average seek time: 94 ms
- Rotational latency (average): 100 ms
- Sectors per track: 18
- Tracks per diskette: 160
- Operating current consumption: 0.22 A @ 5.00 Vdc (typical)

Ordering Information

RX23K-10 Pack of ten 1.44-Mbyte 3.5-inch flexible diskettes.

Note: See SZ12 description in this chapter for RX23 included in SZ12 dual-drive expansion box.

InfoServer 1000 Network Storage Servers



InfoServer systems are network resources designed to work in conjunction with SCSI storage devices to provide information to local area network users. They support a variety of SCSI device types, including CD-ROM, hard drives, magneto-optical, tape devices, and CD-recordable drives. Using a sophisticated software kernel, a disk caching scheme, and specialized network protocols, the InfoServer delivers information from these devices to multiple concurrent connections with performance comparable to locally attached device.

InfoServer systems serve information from devices simultaneously to different client platforms in the native file format of that particular client. Client platforms supported by the InfoServer system include MS-DOS, Novell NetWare, PATHWORKS for DOS, Macintosh, ULTRIX, and OpenVMS. In addition, X terminals can be clients of InfoServer systems for enhanced X terminal characteristics.

InfoServer systems serve multiple clients simultaneously, regardless of format, using LASTport/Disk. This sophisticated protocol allows the InfoServer to transfer information efficiently at the block level. The server relies on the client to interpret the information according to its own file format. Clients run a small piece of software that enables them to communicate with the server. In some cases, the client software resides within the operating system, i.e., PATHWORKS for DOS and OpenVMS. In other cases, it must be ordered separately. This software is simply a media and documentation kit. Since the rights to use the client software are supplied with the server, there are no additional "per-client" software charges.

File formats supported by operating systems are:

	OpenVMS	ULTRIX	MS-DOS	Macintosh
Native	ODS_2	UFS	High Sierra ISO 9660	HFS
Other	ISO 9660 High Sierra	ISO 9660 High Sierra		ISO 9660 High Sierra

Features

- Users of DOS PCs, RISC workstations, VAX systems, and Macintosh systems can access information simultaneously from one central resource.
- Packaged system comes with preconfigured hardware and factory-loaded software for easy installation and use.
- Highly scalable system can accommodate up to 100 concurrent connections.
- Server provides load-balancing and failover capabilities for most clients, enhancing system reliability.
- Separate function access software, such as tape function access, provide "upgrade" capabilities to incorporate more functionality on the server.

The InfoServer 1000 features a unique server form factor—industry-standard 5.25-inch half-height—which enables it to reside with storage devices.

The InfoServer 1000 controller module features one SCSI connection, enabling it to serve up to seven SCSI devices. It comes with the rights to use 50 concurrent connections, and can be upgraded to 100 connections. The InfoServer kernel software runs in FLASH memory and can be upgraded over the network.

InfoServer 1000 Network Storage Servers (continued)

The InfoTower

The InfoTower is a CD-ROM expansion cabinet for InfoServer systems. It supports up to seven CD-ROM drives. A windowed door lets users see which drives are active. It can be locked to prevent unauthorized access. This 17-inch-high (43.2-cm-high) cabinet can be placed horizontally or vertically on or beside an InfoServer 100, 150, or 1000 system. Some InfoServer 1000 packaged systems come embedded in an InfoTower cabinet; e.g., the InfoServer Librarian.

The InfoTower is offered in four-and seven-drive configurations. The four-drive variant is designed for environments where the SCSI bus is partially populated—for instance in a two-drive InfoServer 100 system. The seven-drive InfoTower accommodates all cabling to fully populate one SCSI bus.

Additional CD-ROM drives can be added to four-drive configurations as needs change. A mounting bracket kit adapts RRD43 readers to fit, plugging into the backplane which provides the SCSI connection. InfoTower drives are powered from a single, switch-selectable power supply in the cabinet, which allows the unit to be placed in 120-V or 240-V environments.

InfoServer SW1000 StorageWorks System Building Block

See StorageWorks, page 9.25 for ordering information.

Ordering Information

InfoServer 1000 Solution Focused Packaged Systems

Select system. -*A systems include 120-V power cord; -*E 240-V systems require country kit. 240-V systems also require country-specific power cords for each desktop storage device. InfoServer 1000 packaged systems can be ordered with ThinWire or AUI connections; "*" with "B" for ThinWire, or "C" for AUI.

Systems include:

- 60-ns CPU
- 4 Mbytes of memory; 3 for cache
- NVRAM to store configuration data
- Factory-installed software (FIS) kernel
- Network upgradable kernel
- ThinWire or AUI connector
- One external SCSI port
- One console port
- Power supply
- Function access software appropriate to the packaged system
- English-language user documentation

InfoServer 1000 Network Storage Servers *(continued)*

Order Number	Packaged System	Storage Device	Function Access Software
SEAD*-AA/AE	InfoServer 1000 controller module (base system building block)	None	Disk
SEAD*-BA/BE	InfoServer Local Area CD	1 x 600 MB RRD43	Disk
SEAD*-RA/RE	InfoServer Librarian four-drive variant(comes packaged in InfoTower cabinet)	4 x 600 MB RRD43	Disk
SEAD*-SA/SE	InfoServer Librarian seven-drive variant(comes packaged in InfoTower cabinet)	7 x 600 MB RRD43	Disk
SEAV*-DA/DE	InfoServer 1000 VXT	1 x 245 MB RZ24L in SZ03 1 x 600 MB RRD43	VXT and disk
SEAV*-AA/AE	InfoServer 1000 VXT	1 x 245 MB RZ24L in SZ03	VXT and disk
SEAT*-AA/AE	InfoServer Scribe	None	Disk and tape

InfoTower CD-ROM Expansion Cabinet

Options require international power cord.

SZ18A-CA	InfoTower with four RRD43 CD-ROM drives
SZ18A-DA	InfoTower with seven RRD43 CD-ROM drives
H056-AA	Mounting kit with two 5.25-inch brackets to mount external RRD43s internal to InfoTower
RRD42-JL	600-Mbyte RRD43 CD-ROM drive to integrate into four-drive InfoTower

Additional External Storage Devices

- The following devices are supported in InfoServer 1000 systems. For more information on these devices, refer to their descriptions elsewhere in this chapter.
- Most external devices include SCSI interconnect cables. For devices that do not include a SCSI cable, order the appropriate cable. The InfoServer 1000 comes with a BC09D-03 cable.
- InfoServer 1000 supports one tape drive.
- Order international power cord for each device.

RRD43/44	600-Mbyte removable read-only CD-ROM drives
RZ24L	245-Mbyte 3.5-inch fixed-disk drive
RZ26/RZ26L	1.05-Gbyte 3.5-inch fixed-disk drive
TK50Z-GA	TK50 w/SCSI interface
TZK10	525-Mbyte QIC tape drive
TZK11	2.0-Gbyte QIC tape drive
TZ86	6.0-Gbyte tape drive
TZ867	42-Gbyte tape loader
TZ30	95-Mbyte tape drive

Third-party devices supported: Toshiba 3104B, ALPHATRONIX INSPIRE, Sony CDW900E and EW/DW, Philips CDD521, and JVC XR-1001

InfoServer 1000 Network Storage Servers *(continued)*

Client Software

Includes media and documentation only. The right-to-use client software resides with the server licensing. No need to order client software for PATHWORKS for DOS or OpenVMS clients when running the latest version of those operating systems.

QA-YSHAB-HX	InfoServer Client for ULTRIX/RISC
QA-YSHAC-HX	InfoServer Client for ULTRIX/VAX
QA-YSHAD-HW	InfoServer Client for DOS (for use by Novell or generic DOS clients)
QA-YSHAE-HB	InfoServer Client for Macintosh (coexists in PATHWORKS for Macintosh environment)

Note: x denotes media type, 5 = TK50, M = magtape

Function Access Software

Select to add function access capability to system if required.

InfoServer 1000 Systems

QA-0UVAA-H8	Tape function access for InfoServer 1000 media
QL-0UVA9-AA	License to use tape function software
QA-0USAA-H8	Media kit to upgrade from 51 to 100 connections
QL-0USA9-AA	License to use upgrade software

Kernel Software Updates

Order only if not subscribing to OpenVMS Consolidated Distribution Software Service.

QA-YSHAA-H8	InfoServer kernel media and documentation kit
QL-YSH99-RA	License to use kernel software update

International Country Kit for -*E InfoServer 1000 Systems

SEAKB-AA	U.S.
SEAKB-AC	Canada
SEAKB-AD	Denmark
SEAKB-AE	U.K./Ireland
SEAKB-AP	Austria, Belgium, France, Germany, Finland, Holland Norway, Sweden, Portugal, and Spain
SEAKB-AG	Germany/Austria
SEAKB-AI	Italy
SEAKB-AJ	Japan
SEAKB-AK	Switzerland
SEAKB-AT	Israel
SEAKB-AZ	Australia
SEAKB-BJ	India

InfoServer 1000 Network Storage Servers *(continued)*

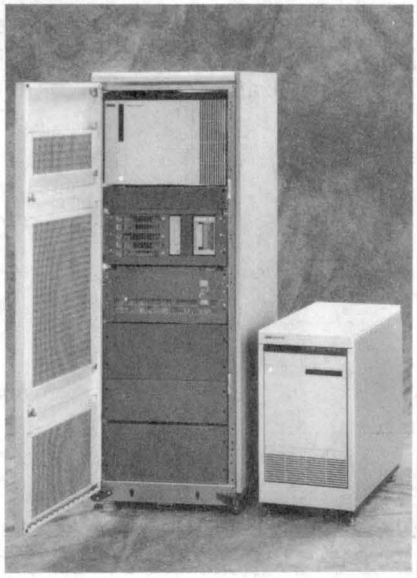
International Power Cords for InfoTower and Desktop Storage Devices

BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland Norway, Sweden, Portugal, and Spain
BN19K-2E	Denmark
BN19C-2E	Germany
BN19M-2E	Italy
BN18L-2E	Israel
BN19E-2E	Switzerland
BN19A-2E	U.K.
BN19H-2E	Australia
BN19S-2E	India

Specifications

System	InfoServer 1000	InfoTower (and Librarian Configuration)
Enclosure	Mini-tabletop	InfoTower
Maximum drives	Seven	Seven
Ethernet communications	One SCSI port One console port One ThinWire or AUI	One SCSI port One console port One ThinWire or AUI
Physical Characteristics		
Height	3.9 cm (1.53 in.)	17.78 cm (7.0 in.)
Width	14.5 cm (5.7 in.)	43.18 cm (17.0 in.)
Depth	21.1 cm (8.3 in.)	43.18 cm (17.0 in.)
Weight	1.25 kg (2.75 lb)	25.45 kg (56.0 lb)
Power Requirements		
Nominal voltage	120/240 V auto ranging	120/240 V switch selectable
Power source phasing	Single	Single
Nominal frequency	50–60 Hz	50–60 Hz
Voltage range	90–135 Vac	90–135 Vac
	180–265 Vac	180–265 Vac
Line frequency tolerance	47–63 Hz	47–63 Hz
Maximum running current	0.7 A @ 110 Vac	8 A @ 115 Vac including auxiliary
	0.42 A @220 Vac	6A @ 230 Vac including auxiliary
Maximum power consumption	35 W	307 W
Operating Environment		
Temperature (sea level)	10° to 40° C (50° to 104° F)	10° to 35° C (50° to 95° F)
Relative humidity	10% to 80%	10% to 85%
Maximum operating altitude	2400 m (8000 ft)	2400 m (8000 ft)

StorageServer 100 Optical Storage System



The StorageServer 100 is an ULTRIX-based hierarchical storage system that directly manages 19 to 342 Gbytes of compact, low-cost storage. Files are accessible to applications that run directly on the DECsystem 5900 or DECsystem 5000 Model 240 as well as clients served over the network.

The total cost of storage is lowered because the StorageServer software migrates files to the most cost-effective media. In addition, storage management is simplified because all file tracking and cataloging is maintained automatically, reducing the expense of traditional tape libraries.

The StorageServer 100 can meet the requirements of storage intensive applications such as imaging, multimedia, publishing, office automation, libraries of engineering diagrams and documents, and extended databases. When used in a network environment, clients may include UNIX systems, IBM PCs and compatibles, Macintosh, and VMS systems using popular communications protocols including TCP/IP, NFS, DECnet/OSI, and PATHWORKS.

The StorageServer 100 utilizes both rewritable optical and magnetic disk technologies. StorageServer software automatically migrates files between magnetic disk and optical platters based on usage patterns in an application transparent manner. Magnetic storage is dynamically allocated to active files, inactive files reside on optical platters. File system responsiveness remains extremely high. The number of system bus connections is greatly reduced while the amount of online storage is dramatically increased.

Features

- 19 to 342 Gbytes of high capacity, compact storage
- Incremental expansion available in units of 19 Gbytes and 85 Gbytes---optical libraries may be mixed and matched
- Significantly reduces cost of ownership for storage and system management by automating storage, cataloging/tracking, and retrieving files
- Optical platters are managed in volume sets as limitless disks simplifying system management
- Reduces user delay/latency to data over conventional secondary storage
- Uses industry standard 5.25-inch rewritable optical platters with 595-Mbyte capacity (formatted) per platter
- File access is transparent to users and applications
- User's files may be up 2 Gbytes in size, independent of capacity of media
- Significantly lower maintenance costs than magnetic storage

Prerequisites

Hardware/SCSI Bus Connections

- DECsystem 5900, DECsystem 5000 Model 240, or DECsystem 5000 Model 200
- Each 19-Gbyte deskside/rackmount optical library requires three SCSI bus connections, one for each of the two optical drives and one for the mechanical selector
- Each 85-Gbyte full-height optical library requires five SCSI bus connections, one for each of the four optical drives and one for the mechanical selector

Note: The maximum number of optical libraries that can be physically configured onto a single DECsystem server is either six 19-Gbyte deskside/ rackmount units or four 85-Gbyte full-height units, or some combination thereof. The maximum is limited by the number of SCSI buses and connections available after consideration for specialized adapters/controllers, tapes, and magnetic disks for both standard storage and StorageServer file migration. SCSI bus length limitations applicable to only the DECsystem 5900 may limit the number of 85-Gbyte optical libraries to three. Refer to system ordering menus for additional information.

StorageServer 100 Optical Storage System *(continued)*

Prerequisites *(continued)*

Software: ULTRIX V4.2C or later

Configuration Guidelines

Optimal performance assumes the proper ratio of magnetic to optical storage according to the percentage of active files, the size of those files, and the read/write ratio. Variations are to be expected according to workloads.

Typically, the percentage of magnetic to optical storage will be 5 to 20 percent.

Ordering Information

The StorageServer 100 software and hardware may be ordered separately or as a complete package.

Software

QL-MRCAS-AA	StorageServer U/R base license
QL-MRCAC-3B	StorageServer U/R incremental license*
QL-MRCAS-RA	StorageServer update license
QA-MRCAA-H5	StorageServer media (TK50) and documentation
QA-MRCAA-H8	StorageServer media (CD-ROM) and documentation
QA-MRCAA-GZ	StorageServer documentation only

* The incremental license allows up to 20 Gbytes of online storage. This license must be ordered from Digital if customers acquire the optical library system (jukebox) from non-Digital sources (i.e., HP).

Optical Libraries/Jukeboxes

The following optical library systems (jukeboxes) from Digital include appropriate incremental licenses and five blank optical platters.

RW100-CA	19-Gbyte optical library system
RW100-GA	85-Gbyte optical library system

The following non-Digital optical libraries models from HP are currently supported.

C1710M	20-Gbyte deskside optical library
C1715C	93.6-Gbyte optical library
C1715M	93.6-Gbyte optical library

Packaged Hardware and Software

Each of the following includes five blank optical platters and the appropriate StorageServer base and incremental license.

RW100-AA/AB	19-Gbyte base option, TK50 media, 120/240 V
RW100-BA/BB	19-Gbyte base option, CD-ROM media, 120/240 V
RW100-CA/CB	19-Gbyte add-on option, 120/240 V
RW100-DA/DB	Same as RW100-AA/AB except rackmountable version for DECsystem 5900 enclosure, 120 V/240 V
RW100-EA/EB	85-Gbyte base option, TK50 media, 120/240 V
RW100-FA/FB	85-Gbyte base option, CD-ROM media, 120/240 V
RW100-GA/GB	85-Gbyte add-on option, 120/240 V

Specifications

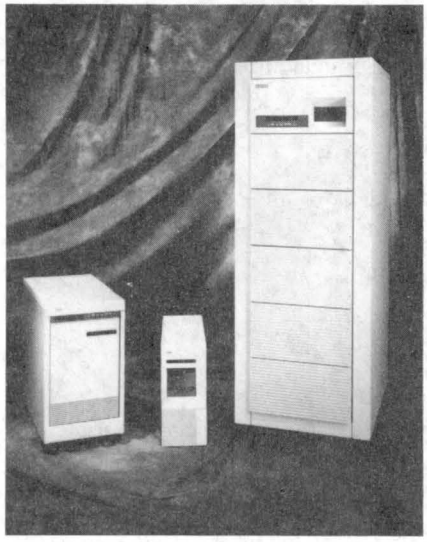
Deskside/rackmount unit	19.04-Gbyte maximum with 32 platters 595 Mbytes per platter, with 512 bytes/sector, conforming to MbytesISO/IEC 10089A and ANSI X3B11 standards
Full-height cabinet model	85.68-Gbyte maximum with 144 platters
Multifunction optical drives	Two per deskside/rackmount (19-Gbyte)unit Four per full height (85-Gbyte) cabinet
Maximum transfer rates	Read: 680 Kbytes/second; Write: 340 Kbytes/second

StorageServer 100 Optical Storage System *(continued)*

Specifications *(continued)*

Physical Characteristics				
	Height	**Width**	**Depth**	**Weight**
Deskside 19-Gbyte cabinet	72.0 cm (28.3 in.)	37.5 cm (14.8 in.)	80.0 cm (31.5 in.)	79 kg (174 lb)
Rackmount 19-Gbyte option	40.0 cm (15.7 in.)	48.3 cm (19.0 in.)	75.9 cm (30.0 in.)	58 kg (127 lb)
Full-Height 85-Gbyte cabinet	184.7 cm (72.7 in.)	65.1 cm (25.6 in.)	97.1 cm (38.2 in.)	360 kg (792 lb)
Power Requirements				
Deskside cabinet or rackmount (19 Gbytes)	Line Voltage: 100–127 Vac, 200–240 Vac, 50–60 Hz Power Consumption: 250 W maximum, 110 W typical			
Full-height cabinet (85 Gbytes)	Line Voltage: 100–127 Vac, 200–240 Vac, 50–60 Hz Power Consumption: 475 W maximum, 200 W typical			

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 online or operator-attended offline 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, healthcare, technical publishing, and scientific data collection. Digital's RW500 Optical Library family includes four models with formatted capacities ranging from 19 to 170 Gbytes. Multifunction drives support a mix of both rewritable and write-once (WORM)operations to maximize application design flexibility.

With Digital's Optical Storage Management Software (DEC OSMS), the RW500 family can form a complete OpenVMS VAX solution. DEC 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 application, and mounts platters as those volumes are requested by the application. When a drive detects the presence of WORM or rewritable media, DEC OSMS automatically invokes the appropriate file system (either Files-11 for Rewritable or the DEC OSMS-supplied write-once file system). The software also manages the jukebox robot, while keeping track of cartridges, their status, and location.

As drive capacities expand, the jukebox can be upgraded by replacing the drives. The hardware platform and system integration "middleware" remains the same. For example, owners' first-generation RW500 systems can economically upgrade their optical libraries to the new double-capacity drives while retaining the existing jukeboxes, media, and application software.

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
- Fully compatible with the StorageServer 100 product (RW100-xx)
- Easy-to-use development platform
- Widespread applications support
- Investment protection via drive upgrades, forward and backward media compatibility, and uniform software interface.

StorageWorks RW500 Optical Library Family *(continued)*

Features *(continued)*

- Commitment to media standards
- Industry leadership reliability for library mechanism (robot), electronic, and the optical drive

Configuration Guidelines

- All jukeboxes have universal power supplies.
- Each jukebox consumes one SCSI ID for the robot, plus one for each drive.
- For an OpenVMS VAX solution, order the appropriate member of the RW500 family, media, and corresponding software. The software license order must correspond to the jukebox ordered.
- To attach an RW500 jukebox to a Storage Server 100, customers should order the appropriate RW500 family member (hardware only), along with the Storage Server software and supported system hardware. Refer to Storage Server information for more details.

Prerequisites

OpenVMS VAX Systems

Hardware:

- KZQSA Adapter required for Q-bus MicroVAX and 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 an BC56H-xx cable.

Software:

- OpenVMS 5.4-3 to OpenVMS 6.1

Storage Server 100 Support

- The DECsystems used with the Storage Server 100 require a BC09D cable.
- Refer to Storage Server 100 for Storage Server 100 hardware and operating system software prerequisites.

Ordering Information

RW500 Optical Library

RW524-ZA	19-Gbyte (formatted) single-drive optical library
RW530-ZC	38-Gbyte (formatted) dual-drive optical library
RW534-ZF	104-Gbyte (formatted) four-drive optical library
RW536-ZF	170-Gbyte (formatted) four-drive optical library

Software

QL-0UMA9-AA	OSMS V1.1 for RW524-ZA
QL-0UBA9-AA	OSMS V1.1 for RW530-ZC
QL-0UCA9-AA	OSMS V1.1 for RW534-ZF
QL-0UEA9-AA	OSMS V1.1 for RW536-ZF
QA-0UBAA-H*	OSMS media and documentation kit (TK50 or magtape)
QA-0UBAA-GZ	OSMS documentation kit

Optical Media

RWX5K-01	1.2-Gbyte, 5.25-inch rewritable media
RWX5K-02	1.2-Gbyte, 5.25-inch CCW WORM media

Drive Characteristics

Interface	Single-ended SCSI-2; one cable supports robot and drives
Media technology	Magneto-optical (130 mm/5.25 in.)
Archival life	30 years

StorageWorks RW500 Optical Library Family *(continued)*

Specifications

Capacity	High-Capacity Mode	Low-Capacity Mode
512-byte sectors	1.2 Gbytes (600 Mbytes/side)	594 Mbytes (297 Mbytes/side)
1024-byte sectors	1.3 Gbytes (650 Mbytes/side)	650 Mbytes (325 Mbytes/side)
Rewritable standards (CCS format)	ECMA 184 ISO/IEC DIS 13549 (draft)	ISO/IEC 10089A ANSI X3.212-1992
Write-once standards (CCW format)	ECMA 184 ISO/IEC DIS 13549 (draft)	ISO/IEC 11560 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 Mbytes/s	1.0 Mbytes/s
Writes (maximum sustained) With verification	0.53 Mbytes/s	0.33 Mbytes/s

Jukebox Characteristics	RW524	RW530	RW534 AND RW536
Average disk exchange time	8 seconds	7 seconds	8 seconds
Height (mm/in.)	494/19.4	720/28.3	1847/72.7
Width (mm/in.)	220/8.7	375/14.8	651/25.6
Depth (mm/in.)	694/27.3	800/31.5	971/38.2
Weight (kg/lb)	35/78	86/189	347/764 and 360/792
Environmental			
Operating temperature	5° to 50° C	10° to 40° C	10° to 40° C
Non-operating	–40° to 70° C	–30° 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	110–240 Vac	110–240 Vac
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Power consumption Typical/maximum	70/100 W	110/250 W	200/457 W

CD-ROM Devices

Digital offers two dual-speed, SCSI-based CD-ROM drives, the RRD43 and RRD44. Both CD-ROM drives provide an excellent vehicle for software, documentation, and subscription-based information/database distribution. In addition, both the RRD43 and RRD44 provide the necessary performance capabilities demanded by today's emerging multimedia applications. The RRD43 and RRD44 support 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.

The RRD43, a general-purpose, dual-speed CD-ROM drive, meets the requirements of a wide variety of applications. It supports a 2X (300 Kbytes/second) transfer rate for non-audio data, while retaining 1X (150 Kbytes/second) transfer rate for audio applications. The RRD43 utilizes an innovative caddy-less system for CD loading and unloading that supports both horizontal and vertical mounting.

The RRD44 is a high-performance drive, and is intended to meet the needs of the most demanding applications where fast access time (<200ms) and extra performance (2.2X transfer rate) can yield substantial performance improvements. Graphics-intensive and pre-publishing systems are among those applications which will benefit from the utilization of the RRD44. The RRD44 utilizes a caddy-load mechanism.

Features	RRD43	RRD44
• Capacity	600 Mbytes	600 Mbytes
• Average access time	320 ms	200 ms
• Transfer rates(KB/sec)	150 (1X) 300 (2X)	150 (1X) 300 (2X) 330 (2.2X)
• Form factor	5.25 inches, 1-inch high	5.25 inches, half-height
• Loading	Tray	Caddy

Ordering Information

RRD43-AC	RRD43 for AlphaServer 2100; field installed. Infoserver 1000 required H056-AA mounting kit for field installed
RRD43-EN/EK	RRD43 for VAX 4000 Model 100/100A systems; factory/field installed
RRD43-FB	RRD43 Tabletop for VAX 4000 (except 100/100A) and DEC 4000 AXP systems; includes connecting cables and 120 V power cord
RRD43-DG	RRD43 Tabletop for VAX 4000 Model 100A, includes connecting cables; requires country-specific power cord
RRD43-DH	RRD43 Tabletop for VAX 4000 (except 100/100A) and DEC 4000 AXP, includes connecting cables; requires country-specific power cord
RRD43-HM	RRD43 for DEC 3000 Models 400/500/600/600S/800/800S AXP systems; factory installed
RRD43-FA	RRD43 Tabletop for DEC 3000 Models 300/400/500/600/ 600S/800/800S AXP, and VAX 4000 Model 100A systems; includes connecting cables and 120-V power cord
RRD43-MX	First or third RRD43 for DEC 4000 AXP systems; factory/field installed
RRD43-MY	Second or fourth RRD43 for DEC 4000 AXP systems; factory/field installed
RRD43-BA	RRD43 for DEC 7000 systems; factory installed
RRD43-VA	RRD43 in StorageWorks 5.25-inch carrier
RRD43-VU	RRD43 upgrade for TZK11-VA, RRD42-VB, RRD43-VA, RRD44-VA

CD-ROM Devices *(continued)*

Ordering Information *(continued)*

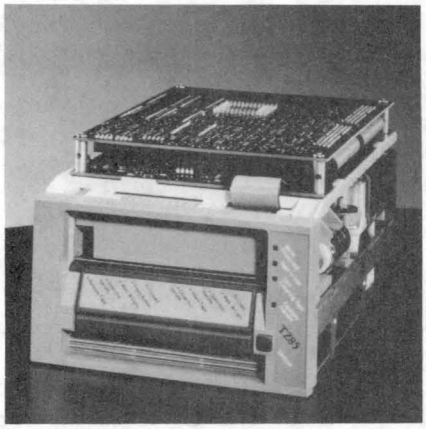
RRD43-VC	Three RRD43 drives in a single StorageWorks 5.25-inch carrier
RRD44-AC	RRD44 for AlphaServer 2100; field installed. Infoserver 1000 required H056-AA mounting kit for field installed
RRD44-VA	RRD44 in StorageWorks 5.25-inch carrier
RRD44-VU	RRD44 upgrade for TZK11-VA, RRD42-VB, RRD43-VA, RRD44-VA
RRD4X-CA	Five protective plastic caddies for the RRD44

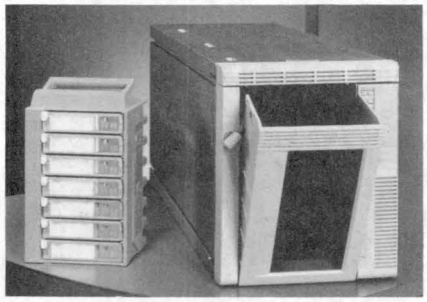
Power Cords

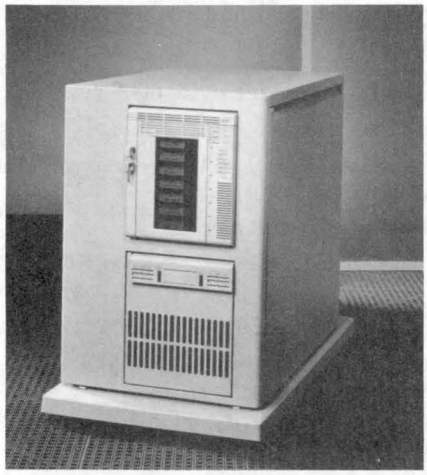
For 240 V options select appropriate power cord.

BN19A-2E	U.K./Ireland
BN19W-2E	Germany, Austria, Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19Z-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Digital Linear Tape (Tx800 Family)







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 20 Gbytes of formatted capacity (2 to 1 compression), the TZ87 tape drives can complete full backups in under an hour. The TX85 (2.6 Gbytes) and TX86 (6 Gbytes) have an 800 Kbyte-per-second transfer rate.

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) overlapped with parity from the DSSI bus, 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 offline 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 DLT cartridge tape drive subsystems use 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. While the CompacTape III cartridge resembles earlier cartridges, it is not interchangeable in earlier tape drives. However, the Tx85 tape drive subsystem accepts and reads cartridges from TZ30, TK50, TK70, and TF70 tape drives. Users currently employing these tape subsystems for backups, archiving, and software interchange can thus protect their earlier investment. Tx86 drives offer Tx85 read and write compatibility, and TZ30/TK50/TK70 read compatibility. TZ87 tape drives offer TZ85/TZ86 read and write compatibility, and TZ30/TK50/TK70 read compatibility. TZ87N tape drives offer TZ87 and TZ86 read and write compatibility only.

- DSSI interface (TF devices) for Tx85/Tx86
- SCSI interface (TZ devices)
- Extensive embedded diagnostic/self-test software
- Four LEDs and audio indicators of subsystem status on front panel

Tx85 Features

- Up to 2.6-Gbyte formatted capacity per cartridge
- TZ30/TK50/TK70 read compatibility
- Available as system embedded and in an attractive tabletop enclosure

Tx86 Features

- Up to 6-Gbyte capacity per cartridge
- Tabletop enclosure, system embedded, or 5.25-inch StorageWorks enclosure
- Read/write compatibility with Tx85 drives
- TZ30/TK50/TK70 read compatibility

Digital Linear Tape (Tx800 Family) *(continued)*

TZ87 Features

- Up to 20 Gbytes capacity per cartridge
- 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
- Tabletop enclosure or 5.25-inch StorageWorks carrier
- Read/write compatible with TZ85/TZ86 only

Software Support

Most common tape functionality, such as COPY, MOUNT, INIT, BACKUP, TAR, and DUMP will function normally on OpenVMS V5.3 or later or ULTRIX V4.2 or later for SCSI-based drives. DSSI tape subsystems are supported by OpenVMS V5.4-2 but not on ULTRIX. For some of these earlier versions of the operating systems, there are some operational limitations in such areas as device name recognition, error reporting facility, and standalone backup. These restrictions depend on the type of drive, system, and version of operating system used. Contact a Digital Sales Office for a list of support limitations.

The TZ86/867 and 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.

TF85/TZ85 Ordering Information

Note: Tx85s are 2.6-Gbyte (formatted), 800-Kbyte 5.25-inch cartridge tape subsystems; each incudes tape cartridge, head cleaning cartridge, mounting chassis, U.S. power cords, and documentation.

TF85B-AA	TF85 factory-installed-only version for VAX 6000 systems
TF85C-AA	TF85 for VAXft 610/612 systems
TF85E-JA/JF	TF85 for BA4xx enclosure and R400X/B400X expansion pedestals; factory/field installed.
TF85E-27	Same as TF85E-JF—quantity 27 (full palette)
TF85-TA	TF85 in tabletop enclosure for DSSI-based systems. Requires external DSSI cable.
TF85T-18	Same as above—quantity 18 (full palette)
TF85D-AA	TF85 cartridge tape drive for VAX 7000, VAX 10000 systems; includes mounting, chassis, and cables
TZ85-LF/LG	TF85 cartridge tape drive for DECsystem 5900 embedded; factory/field installed
TZ85E-MX	TZ85 cartridge tape drive, factory/field installable for DEC 4000 systems (BA640), includes mounting hardware
TZ85-TA	TZ85 cartridge tape subsystem in tabletop enclosure for SCSI-based systems. Requires external SCSI cable.
TZ85-RA	Includes one TZ85-TA, KZBSA VAXBI adapter, 40-inch internal cable with I/O bulk head connector. Order external SCSI cable (BC19J-xx) separately. NOTE: Supported on OpenVMS VAX systems only. Some VAX 8250/8350 systems require an 8-foot controller-to-bulkhead cable. Order 2R-CKKZB-S8 internal single-ended SCSI cable.
TFM85-AA	TF85 tape drive for DSSI-based systems, includes KFMSA-BA XMI-DSSI controller and CK-KFMSA-LJ cable kit. Factory installed only.
TFM85-DA	Same as TFM85-AA except for VAX 7000 and VAX 10000 systems.
TFM85-TA	Same as TFM85-AA except in tabletop enclosure. Requires external DSSI cable.

Digital Linear Tape (Tx800 Family) *(continued)*

Configuration Notes

- When connected to a KFQSA installed in a MicroVAX II or MicroVAX 3xxx (except MicroVAX 3100) system, the TF85 and TF857 tape subsystems do not support booting of MicroVAX Diagnostics Monitor (MDM) or VMS.
- OpenVMS V5.4-2 is required for boot support on VAX 4000 series systems and MicroVAX 33/34xx series systems (only bootable on embedded DSSI adapter), although a TZ85 can be booted on a MicroVAX 3100. VMS V5.4-3 is required for VAX 6000 and VAX 9000 series systems.
- For optimum TF85/TF857 back up performance, Digital recommends the TF85/TF857 be connected to a high-performance adapter such as the KFMSA adapter module on the VAX 6000 and VAX 9000 or the embedded DSSI adapter such as those found on VAX 4000 systems.
- For VAX 4000 systems, the DSSI controller module is physically attached to the tape drive, and therefore the subsystem can only be mounted in the removable-media slot in BA4xx enclosures and R40xx/B40xx expansion pedestals, which were designed to house this tape drive/controller combination.

TF86/TZ86 Ordering Information

Tx86s are 6-Gbyte (formatted) cartridge tape drive subsystems with 800-Kbyte/sec transfer rate. Each includes tape cartridge, U.S. power cord, and documentation.

TF86-TA	TF86 in tabletop enclosure for DSSI-based system requires external DSSI cable.
TFM86-TA	TF86-TA with KFMSA-BA DSSI controller and CK-KFMSA-LN cable kit. Requires external DSSI cable.
TF86E-JA/JF	TF86 cartridge tape drive for VAX 4000* BA4xx enclosure and R400X/B400X expansion pedestals; factory/field installed.
TZ86-TA	TZ86 cartridge tape drive in tabletop enclosure for SCSI-2-based systems. Requires external SCSI cable.
TZ86-RA	Includes TZ86-TA KZBSA VAXBI adapter, 40-inch internal cable with I/O bulkhead connector. Requires external SCSI cable (BC19J-xx). Note: Supported on OpenVMS VAX systems only. Some VAX 8250/8350 systems require an 8-foot controller-to-bulkhead cable. Order 2R-CKKZB-S8 internal single-ended SCSI cable.
TZ86E-MX	TF86 cartridge tape drive for DEC 4000 systems (BA640), includes mounting hardware; factory/field installed.
TZ86-JA/JF	TZ86 cartridge tape drive for VAX 4000* BA4xx enclosure and R400X/B400X expansion pedestals; factory/field installed
TZ86-VA	TZ86 cartridge tape drive in 5.25-inch StorageWorks carrier

* See restriction on VAX 4000 order menu.

TZ87 Ordering Information

TZ87-JA/JF	TZ87 cartridge tape drive for VAX 4000* BA4xx enclosure and R400X/B400X expansion pedestals;factory/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	TZ8N cartridge tape drive in tabletop enclosure for SCSI-based systems. TZ85/86 read/write compatible only. Requires external SCSI cable.
TZ87N-VA	TZ8N cartridge tape drive in StorageWorks carrier. TZ85/86 read/write compatible only

Cables, media, and power cords for the Tx800 family are described in the next section..

DLT Family of Magazine Tape Subsystems

DLT magazine tape subsystems—Tx857/Tx867 or TZ877—combine the DLT cartridge tape drive and an automatic cartridge loader to provide highly reliable unattended backup for SCSI, DSSI, and CI systems. Up to 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. When fully loaded, the Tx857 subsystems can back up as much as 18 Gbytes in a single shift (8 hours)without operator intervention. The Tx867 subsystems can back up as much as 42 Gbytes in two shifts (16 hours) without operator intervention. 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.

Tx857/Tx867/TZ875/TZ877 Features

- Incorporate the 2.6-Gbyte Tx85, 6-Gbyte Tx86, or 20-Gbyte TZ87/TZ87N cartridge tape drives
- Maximum capacity: up to seven cartridges for up to 42-Gbyte unattended backup
- TZ30/TK50/TK70 read compatibility (except for TZ87N)
- Tx85 read/write compatibility (Tx857)
- Tx86 read/write compatibility (Tx857 and Tx867)
- TZ87 read/write compatibility (TZ857, TZ867, TZ875, TZ877)
- Available in pedestal enclosure (SZ100/106/107, SA100/106, SF100/106)
- Available in tabletop enclosure (TZ875-TA or TZ875-NT)
- Available for inclusion in storage arrays (TF8x7, TA8x7, TZ867, TZ877)

Software Support

OpenVMS V5.4 or higher is required for the HSC-based TA8x7/SA10x. Same limitation as described for the Tx85/Tx86 devices. The TZ87/875 and TZ877 are supported on OpenVMS V5.5-2, ULTRIX 4.2A, DEC OSF/1 V2, and OpenVMS AXP V1.5. In addition, the TZ86 and TZ87 are supported in Microsoft Windows NT V3.5.

Tx857 Ordering Information

TF857-AA/AB	18.2-Gbyte (formatted) half-rack magazine tape subsystem for SF200/210/220 DECarray storage subsystems and SF300 systems. Includes tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120 V/240 V.
TF857-AE/AF	TF857 magazine tape subsystem for SF400 DECarray.
TF857-CA/CB	Same as above except for VAXft Model 610/612 systems.
SF100-PA/PB	18.2-Gbyte (formatted) magazine tape subsystem for DSSI-based systems in pedestal enclosure; includes tape subsystem, seven tape magazines, head cleaning magazine, tape magazine, pedestal enclosure, documentation; 120 V/240 V. Requires external DSSI cable. Accommodates one SF72, SF73, or SF35 SABB. Field installable only.
SF101-AA/AB	Same as above except includes KFMSA-BA DSSI controller and CK-KFMSA-LJ cable kit, 120 V/240 V. Requires external DSSI cable. Accommodates one SF72, SF73, or SF35 SABB. Field installable only.
SF200-TE/TF **SF300-TD/TE** **SF400-TE/TF**	Half-rack magazine tape subsystem for DSSI-based systems, 18.2-Gbyte (formatted), includes appropriate DECarray storage cabinet, tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120 V/240 V. See Storage Array section.

DLT Family of Magazine Tape Subsystems *(continued)*

Tx857 Ordering Information *(continued)*

TA857-AA/AB	Full-rack magazine tape subsystem for SA300 or SA900 storage arrays. 18.2-Gbyte (formatted), includes tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120/240 V. For SA300 DECarray, use CK-SA300-T1 mounting kit.
SZ100-AA/AB	18-Gbyte magazine tape subsystem in pedestal enclosure for SCSI, includes seven TK85K data cartridges, cleaning kit, tape magazine, documentation. 120/240 V. Requires external SCSI cable.
SZ100-RA/RB	18-Gbyte VAXBI magazine tape subsystem. Includes an SZ100 magazine tape subsystem and a KZBSA VAXBI-SCSI controller. Requires external SCSI (BC19J-xx) cable. Note: Supported on OpenVMS VAX systems only. Some VAX 8250/8350 systems require an 8-foot controller-to-bulkhead cable. Order 2R-CKKZB-S8 internal single-ended SCSI cable.
SA100-AA/AB	Magazine tape subsystem for HSC-based systems, 18.2 Gbytes (formatted) in a pedestal cabinet enclosure. Includes seven TK85K media cartridges, one TK85-M tape cartridge magazine, one TK85-HC head cleaning cartridge, HSC interface, cabinet, BC26V-25 cables, and documentation; 120/240 V.

Upgrades

An upgrade package is available for customers who have a Tx857 or Tx867 variant and want to take advantage of the Tx867 or TZ877 higher capacity. The Tx867-UG or 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 lable.

Tx867 Ordering Information

TF867-UG	TF857-to-TF867 and SF100-to-SF106 upgrade.
TF867-AA/AB	DSSI 42-Gbyte (formatted) cartridge loader tape subsystem for SF2xx and SF300 DECarrays, 120 V/240 V.
TF867-AE/AF	TF867 magazine tape subsystem for the SF400 DECarray, 120/240 V.
TZ867-UG	SZ100 to SZ106 upgrade.
TZ867-AE/AF	SCSI 42-Gbyte (formatted) cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mounting brackets and cables, 120/240 V.
TA867-AA/AB	CI 42-Gbyte (formatted) cartridge loader tape subsystem, full rack, for SA300/SA900, includes BC26V-25 cable, 120 V/240 V. CK-SA300-T1 mounting kit required for SA300.
TA867-UG	TA857-to-TA867 and SA100-to-SA106 upgrade.
SZ106-AA/AB	SCSI 42-Gbyte (formatted) cartridge loader tape subsystem in pedestal enclosure, 120 V/240 V. Requires external SCSI cable.
SZ106-RA/RB	SCSI 42-Gbyte (formatted) VAXBI magazine tape subsystem in pedestal enclosure. Includes SZ106 and KZBSA VAXBI SCSI controller, 120 V/240 V. Requires external SCSI cable. Note: Supported on OpenVMS VAX systems only. Some VAX 8250/8350 systems require an 8-foot controller-to-bulkhead cable. Order 2R-CKKZB-S8 internal single-ended SCSI cable.

DLT Family of Magazine Tape Subsystems *(continued)*

Tx867 Ordering Information *(continued)*

SF106-AA/AB	DSSI 42-Gbyte (formatted) cartridge loader tape subsystem with pedestal enclosure, 120 V/240 V. Requires external DSSI cable. Accommodates one SF72, SF73, or SF35 SABB. Field installable only.
SF106-AC/AD	SF106-AA with KFMSA-BA DSSI controller and CK-KFMSA-LJ, 120 V/240 V. Requires external DSSI cable. Accommodates one SF72, SF73, or SF35 SABB. Field installable only.
SA106-AA/AB	TA867-AA with pedestal enclosure, 120 V/240 V

Note: All SA10x CI tape options include a BC26V-25 7.6-m (25-ft) STI cable.

TZ877 Ordering Information

TZ877-AE/AF	SCSI 140-Gbyte (formatted) cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mounting brackets and cables, 120/240 V
TZ877-NE/NF	SCSI 140-Gbyte (formatted) cartridge loader tape subsystem for mounting in SW500/SW800 cabinets; includes mouting brackets and cable, 120/240 V. Tz85 and TZ86 read/write compatible only.
SZ107-AA/AB	SCSI 140-Gbyte (formatted) cartridge loader tape subsystem in pedestal enclosure, 120/240 V

TZ875 Ordering Information

TZ875-TA	SCSI 100-Gbyte (formatted) table top 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-Gbyte (formatted) table top 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.

Cables

Note: Refer to Storage Array section for additional cables and/or cabinet kits that may be required

DSSI Cables	
CK-SF200-LM	2.7-m (9-ft) for VAX 6000/7000/9000/10000
CK-SF200-LP	2.7-m (9-ft) for MicroVAX 3xxx/BA2xx-and BA4xx-based VAX 4000
CK-SF400-TE	Tape bezel for SF400.

For SF100/SF106 pedestal subsystems and tabletop drives, use the following CK-SF100 cable kits:

CK-SF100-LM	2.7-m (9-ft) for VAX 6000/7000/9000/10000
CK-SF100-LP	2.7-m (9-ft) for MicroVAX 3xxx/BA2xx-and BA4xx-based VAX 4000
CK-SF100-L3	7.6-m (25-ft) for VAX 6000/7000/9000/10000
CK-SF100-L4	7.6-m (25-ft) for MicroVAX 3xxx/BA2xx-and BA4xx-based VAX 4000
CK-SF100-L5	4.8-m (16-ft) for VAX 6000/7000/9000/10000
CK-SF100-L6	4.8-m (16-ft) for MicroVAX 3xxx/BA2xx-and BA4xx-based VAX 4000

BC21Q-3F	1.06-m (3.5-ft) daisychain cable
BC21Q-50	15.2-m (50-ft) for VAX 6000/7000/9000/10000
BC22Q-50	15.2-m (50-ft) for MicroVAX 3xxx/BA2xx-and BA4xx-based VAX 4000

DLT Family of Magazine Tape Subsystems *(continued)*

SCSI Cables

Select one of the following SCSI cables for:

InfoServer

BC56H-03	0.9-m (3-ft) 68-pin to 50-pin pos SCSI adapter cable assembly
BC56H-06	1.8-m (6-ft) 68-pin to 50-pin pos SCSI adapter cable assembly
BC56H-12	3.6-m (12-ft) 68-pin to 50-pin pos SCSI adapter cable assembly

DECsystem 5900/DECsystem 5000 Cables

BC09D-12	3.6-m (12-ft) SCSI cable, Champ/SCSI-2

MicroVAX 3100 Models 10E, 20E, 30, 40, and 80 Cables

BC06P-2F	76.2-cm (2.5-ft) SCSI cable, TLZ04/RRD40/TZ85
BC06P-06	1.8-m (6-ft) SCSI cable, TLZ04/RRD40/TZ85
BC06P-09	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

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 tabletop TF86 and TF867 are supported with restrictions on any system configuration that supports the TF85 and TF857. OpenVMS V5.4-2 is the earliest version that provides full support for the TF85. The TF86/TF867 are supported with restrictions in OpenVMS V5.3 and higher. The TZ86/TZ867/TZ87/TZ877/TZ875 are supported in OpenVMS AXP V1.5 and DEC OSF/1 V2. The TZ87/TZ875/TZ877 are supported with restrictions in OpenVMS V5.4-2 and ULTRIX V4.2.

DLT Family of Magazine Tape Subsystems *(continued)*

Specifications

Performance	Tx85/Tx86	TZ87
Data transfer rate (formatted)	0.8 Mbyte/second	2.5 Mbyte/second
Read/write speed	100 in./s, streaming	150 in./s
Transfer rate, raw	1.1 Mbytes/s	N/A
Sustained transfer rate, user data		
On DSSI bus	0.706 Kbyte/second	N/A
On SCSI-2 bus	0.600 Kbyte/second	N/A
On SCSI-2 bus with Infoserver	0.200 Kbyte/second	N/A
On HSC	0.550 Kbyte/second	N/A
Peak transfer rate		
On DSSI bus	4.0 Mbytes/s (synchronous mode)	N/A
On SCSI-2 bus	3.0 Mbytes/second (average)	N/A
On HSC	1.2 Mbytes/second	N/A
Repositioning time	1.3 seconds typical	N/A
Access time (with tape mark)	3 minutes maximum 1.5 minutes average	N/A
Cartridge load/unload cycle time with loader	38 seconds typical	N/A
Data Organization		
Recording format	48-track serial serpentine fixed block	
Recording density	42,500 bits/inch	
Recording method	MFM, bit serial data	
Track density	96 tracks per inch	
Read-write head	Two-channel ferrite, servo-controlled	
Record size	Variable up to (64 Kbyte–1 byte), 4-Kbyte blocking factor	
Tx85 maximum capacity	2.6 Gbytes (formatted)	
Tx857 maximum capacity	18.2 Gbytes (formatted)	
Supported Interfaces		
DSSI	TF85, TF857, SF100, TF86, TF867, SF106	
SCSI-2	TZ85, TZ857, SZ100, TZ86, TZ867, SZ106, TZ87, TZ877, SZ107	
HSC	TA857, SA100, TA867, SA106	

Tx85/Tx86/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 (with controller mounted)	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	3.2 kg (7 lb)	3.2 kg (7 lb)	
Power Requirements			
Voltage	+5 V, +12 V, dc only		
Power consumption	56.37 watts maximum, 29.74 watts typical, 35 watts average		
Dissipation (maximum watts x 3.41)	192 Btu's		
Line type	Molex 5129-4A		

DLT Family of Magazine Tape Subsystems *(continued)*

Specifications *(continued)*

Tx85/Tx86/TZ87 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	56.37 watts maximum, 29.74 watts typical, 35 watts average
Dissipation (maximum watts x 3.41)	192 Btus
Line type	Single-phase AC, NEMA#515, IEC#320

Tx857/Tx867/TZ877

Physical Characteristics	
Height	2.65 cm (10.42 in.)
Width	22.2 cm (8.74 in.)
Length	64.7 cm (25.50 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

Sx100/Sx106/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	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

Cartridge

Physical Characteristics	
Width	10.5 cm (4.15 in.)
Height	2.54 cm (1.0 in.)
Length	11.3 cm (4.165 in.)
Weight	0.23 kg (0.5 lb)
Tape	0.53-mil thick, 0.5-inch metal powder
Length	361.5 m (1186 ft) of usable tape
Cartridge	Digital-designed CompacTape III
Durability, magazine	10,000 insertions
Durability, cartridge	20,000 passes
Compatibility	TK50-K (TZ30, TK50), TK52-K (TK70)and TK85K

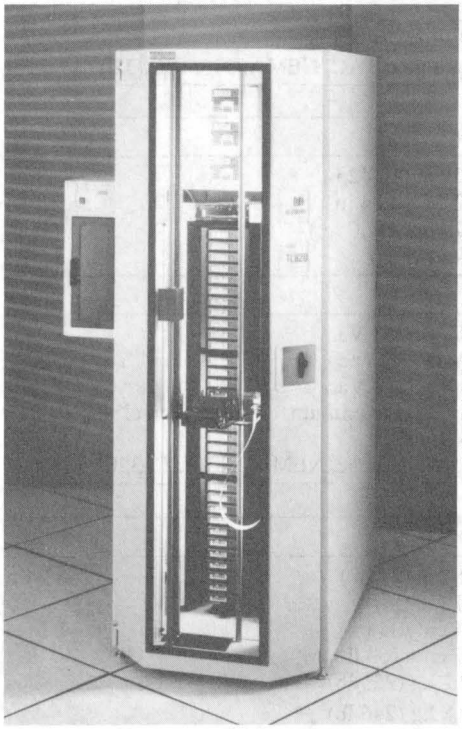
DLT Family of Magazine Tape Subsystems *(continued)*

Specifications *(continued)*

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)
	(fully loaded)	2.04 cm (4.5 lb)

TL820 DLT Automated Tape Library



The TL820 Digital Linear Tape (DLT) library is the newest member of Digital's family of near on-line automated storage products, providing up to 5.2 Terabytes of storage for unattended backup operations, archiving, 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, at significantly lower cost, the TL820 will provide users with the ability to automate large-scale backup and archiving 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 scalable solution for application and system growth.

The performance and capacity of the TL820 subsystem are ideally suited to the implementation of large-scale archival 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 (200cm) cabinet, each 28-inch (72 cm) tower contains up to 264 DLT tape cartridges and three differential SCSI-2 DLT drives. A single TL820 will provide 2.6 Terabytes of storage capacity, or 5.2 Terabytes utilizing the TZ87 hardware data compression. Up to five TL820 towers can be connected together; their robots are 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 for DEC OSF/1 AXP, OpenVMS AXP, and OpenVMS VAX systems
- Up to five towers can be connected together for up to 26 Terabytes of enterprise-wide data storage

TL820 DLT Automated Tape Library *(continued)*

Prerequisites

Hardware

- Each library cabinet requires 2 SCSI-2 buses
- HSC/HSJ

Software

Use of the TL820 requires robotics and media management software. Users have a growing number of Digital and third party options for the integration of the TL820:

- Users who purchase the 2T-TL820-BA receive DECLS software and service. DECLS provides software connectivity for OpenVMS VAX to SLS, Tapesys™ from Software Partners, and UIS Archive from Raxco. DECLS also provides support for the TL820 under OpenVMS AXP
- Users running DEC OSF/1 AXP can utilize Polycenter NetWorker Save and Restore V2.2B software
- Branches™ from Acorn Software also supports the TL820 for OpenVMS VAX and OpenVMS AXP
- OpenVMS AXP V1.5 for DEC 3000, 4000, 7000, and 10000 AXP systems
- OpenVMS V5.5-2 or later for DECLS on VAX 6000, 7000, 9000, 11/750, and 11/780 sytsems. OpenVMS V6.1 will be required for Polycenter (MLM/MRM) software

Ordering Information

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.

2T-TL820-BA	DLT tape library with three TZ87 drives; Inport/Outport Device (IOD); DECLS software and service
TL820-BA	DLT tape library with three TZ87 drives; Inport/Outport Device (IOD)
TL820-AC	DLT library expansion cabinet with three TZ87 drives and attachment kit
TL82X-BA	Cartridge bin pack for TL820, holds 11 cartridges
TL82X-MT	Media kit: TK85K cartridge (273 cartridges)

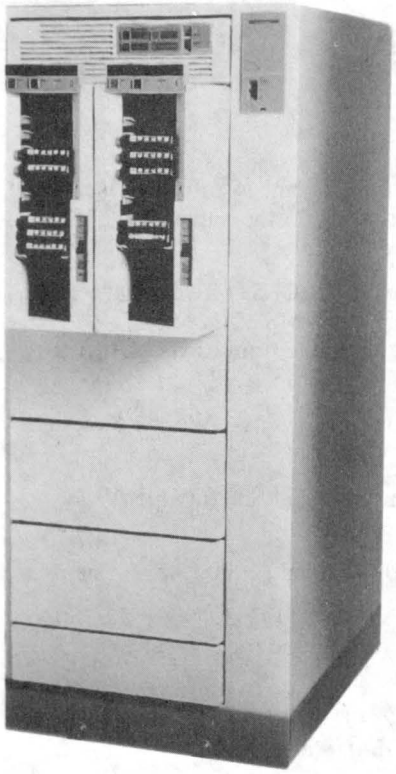
Specifications

TL820 Tape Library Specifications	
Height	78.7 in/200cm
Width	36 in/ 72cm
Depth	47 in/120cm
Weight	784 lbs (356 kg) with drives, unloaded
Power	90–132 and 176–264V autoranging, 47 to 63 Hz
MSBF	500,000 cartridge exchange cycles

TZ87 Drive Specifications	
Transfer rate	Up to 1.25 MB/s native; up to 2.5 MB/s, compressed
Maximum capacity	20 Gbytes
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

TA92 Cartridge Tape Subsystem



The TA92 is a high-performance, IBM 3480/3490-compatible tape storage subsystem for large computer systems and is offered to support customers who are committed to 3480/3490 technology for tape backup.

The TA92 supports 36 tracks and enhanced tape (long tape), which increase the capacity to 800 Mbytes per cartridge. Improved Data Recording Capability (IDRC) is standard and can provide an additional two times capacity depending upon the application, for a total of 1.6 Gbytes or more per cartridge.

Packaged with a single controller and two drives, each with a six-cartridge stacker, the TA92 provides up to 19.2 Gbytes of unattended backup capacity with IDRC. This capacity not only improves the cost per Mbyte, but significantly increases the amount of data that can be backed up without operator involvement, improving backup efficiency.

The TA92 is backwards read-compatible with the TA90, TA90E, and TA91 drives. It is available in two variants: Packaged with an interface that connects to an HSC for CI-based cluster support, or directly to the XMI backplane for support on VAX 6000/7000/9000/10000 systems, as well as the DEC 7000 and DEC 10000 AXP systems (OpenVMS only).

- Supports 36 track and long tape for 800-Mbyte-per-cartridge capacity
- Capacity increases of 1.6 Gbytes per cartridge or more are possible with IDRC, depending upon data type and application
- Backwards read-compatibility with IBM 3480/3490 devices such as TA90, TA90E, and TA91
- Maximum data transfer rate: 2.6 Mbytes/second
- Rewind time: 48 seconds per cartridge or less

Ordering Information

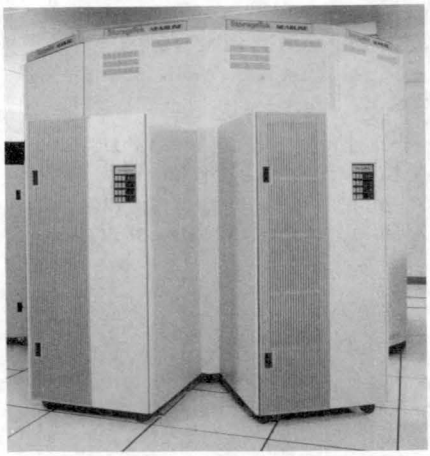
2R-TA92-KA	Two 36-track tape drives with loaders for VAX 6000/9000 systems; XMI adapter, 20-foot FIPS cable
2R-TA92-KC	Two 36-track tape drives with loaders for VAX 7000/10000 systems, DEC 7000/10000 AXP systems; XMI adapter, 20-foot FIPS cable
2R-TA92-TA	Two 36-track tape drives with loaders for HSC40/60/65/70/90/95, HSC adapter, 20-foot FIPS cable
2R-TA92-XA	Two 36-track tape add-on drives; 20-foot FIPS cable

Prerequisite Hardware

Two adjacent XMI backplane slots required.

Note: For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990.

StorageTek 4400 ACS Automated Tape Library



The OpenVMS VAX to StorageTek connectivity products provide the ability to connect OpenVMS VAX users to the Storage Technology 4400 Automated Cartridge System (ACS), a high-availability automated tape library for IBM 3480 compatible cartridges.

The ACS is a collection of up to 16 interconnected Library Storage Modules, each of which contains up to 6,000 cartridges at 200-Mbyte storage capacity per cartridge, providing access to up to 19,200 Gbytes (19.2 Terabytes) of near on-line storage. The 4400 ACS uses robotics and an optical scanning system to quickly and accurately locate and mount tape cartridges.

There are two ways to connect the StorageTek 4400 ACS to a VAX environment:

- The TC44 offers a connection through an HSC40, HSC60, HSC70, or HSC90. This option will be preferred by customers who are accustomed to the features of an OpenVMS Cluster environment. HSC-connected resources are shared equally across all CPUs in an OpenVMS Cluster.
- The KCM44 provides a direct connection to a VAX via the XMI bus. It offers maximum performance at 4.5 Mbytes per second burst rate, and supports dynamic sharing of tape drives within the ACS with other Digital and non-Digital hosts.

In both cases, DCSC software communicates over Ethernet via TCP/IP to the 4400 ACS Library Server to manage the allocation of tape cartridges and drives.

A specially priced Junior Library Package is also available for customers who do not require the capacity or cannot justify the cost of a full library. Packaged with a KCM44 or TC44 and with DCSC software, the Junior Library is the same physical size as a full StorageTek Library. However, only 2,000 to 3,000 of the cartridge slots are enabled.

Features

- Provides fast, automated access to 6,000 tapes for unattended backup
- Provides 19.2 Terabytes OR MORE of near on-line storage capacity
- Junior Library package offers special pricing, and access to 2,000 or 3,000 cartridges
- Uses industry-standard IBM 3480/3490 tape cartridges
- Supported in a mixed CPU vendor environment

Prerequisites

Hardware

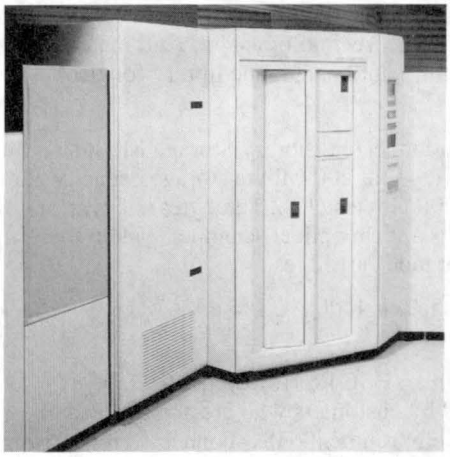
- For TC44 connection: HSC40, HSC70, HSC60, or HSC90 and two HSC5X-DA cards
- For KCM44 connection: two adjacent slots in an XMI backplane (restrictions apply)

Software

- OpenVMS V5.4-2 or higher. If tape units under control of a KCM44 are to be served to the cluster, then OpenVMS V5.5 or higher is required.
- VMS ULTRIX Connection (for TCP/IP) V1.3 required for DCSC Control Path
- DCSC Software Version 1.1
- For TC44 connection: HSC software V5.0F or higher

Note: These products are available by custom quote only. For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990.

Wolfcreek Automated 3480/3490 Tape Library from StorageTek™



Wolfcreek, a high availability automated tape library for IBM 3480 and 3490 compatible cartridges is the newest addition to Digital's family of 3480 Automated Tape libraries. Smaller than the STK 4400 ACS, Wolfcreek is ideally suited for many OpenVMS environments.

Wolfcreek can be configured with four or eight drives, and up to 1,000 cartridges at 400 Mbytes (18-track) or 1.6 Gbytes (36-track) of data per cartridge. It uses robotics and an optical scanning system to quickly and accurately locate and mount tape cartridges for up to 1.6 Terabytes of near on-line storage.

There are two ways to connect WolfCreek to a VAX environment:

The TC44 offers a connection through an HSC40, HSC60, HSC70, or HSC90. This option is preferred by customers who are accustomed to the features of a OpenVMS Cluster environment. HSC-connected resources are shared equally across all CPUs in a OpenVMS Cluster.

The KCM44 provides direct connection to a VAX via the XMI bus. It offers maximum performance at 4.5 Mbytes/second burst rate, and supports dynamic sharing of tape drives within the library with other Digital and non-Digital hosts.

In both cases, DCSC software communicates over Ethernet via TCP/IP to the Library Server to manage the allocation of tape cartridges and drives.

Features

- Supports a wide range of capacity and performance requirements
- Provides fast, automated access to large numbers of tapes for unattended backup
- Uses industry standard IBM 3480/3490 tape cartridges
- Supported in a mixed CPU vendor environment

Prerequisites

Hardware

For TC44 connection: HSC40, HSC70, HSC60, or HSC90 and two SC5X-DA cards.

For KCM44 connection: two adjacent slots in an XMI backplane (restrictions apply)

Software

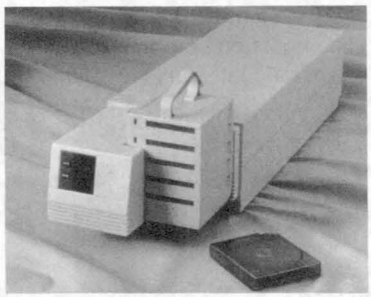
Open VMS V5.4-2 or higher. If tape units under control of KCM44 are to be served to the cluster, OpenVMS V5.5 or higher is required. TCP/IP required for DCSC Control Path

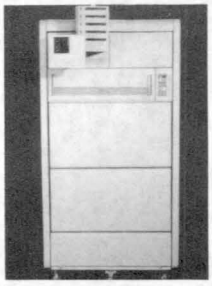
DCSC Software Version 1.1

For TC44 connection: HSC software V5.0F or higher

Note: These products are available by custom quote only. For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990.

Digital's Automated Storage Library





The Automated Storage Library is Digital's latest offering of cost-effective, efficient and expandable automated tape libraries for entry-level data storage. The library provides automation of functions such as backup and restore and archive. It also offers cost-effective expandability.

The Library includes the Odetics ACL5480 robotic tape library single Library Module Unit (LMU) total storage capacity of 58 Gbytes of data, two 3480/90-compatible cartridge drives, and automation management software. Data compression is available and allows for up to two times the capacity at a lower storage cost per megabyte. Available application options include packages such as Digital's SLS and RAXCO UIS-Archive software.

Each LMU is expandable, supporting up to five interconnected LMUs per single library. A fully expanded library holds a total of 1,824 cartridges (365 Gbytes uncompressed) in a dual-drive configuration, and up to 1,632 cartridges (326 Gbytes uncompressed) with six cartridge drives. Pass-through mechanisms link the modules into a system that provides seamless data access.

Cartridges can be entered into the library one at a time using the autoloader, or in groups of 12 using a cartridge magazine. The magazines provide a convenient container for easily accessed, offline storage of pools or classes of information and are utilized as cartridge storage magazines inside the library.

Features

- High storage capacity at an entry-level cost and at a fraction of the footprint of currently offered library-based storage systems.
- Expandable from one to five library units (LMUs) for a storage capacity range of 58 Gbytes up to 365 Gbytes.
- Library unit dimensions (H x W x D): 199 x 71 x 114 cm (78.3 x 28 x 45 in)
- Supported with Digital's SLS or UIS archive for complete automated backup and restore solution.
- Compatible with OpenVMS VAX systems.

Note: For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990

TKZ60 Cartridge Tape Drive

Photos goes here The TKZ60 is a third-party vendor labeled product that provides data inter- change capability for VAXstations, DECsystems/DECstations, and Alpha workstations via a SCSI interface and for VAX Q-bus systems via an optional KZQSA. The TKZ60 is available on all VAX 6000 (with a DWMBB VAXBI/XMI adapter) and VAX 8000 systems. It is available on DEC 7000 and DEC 10000 AXP systems via an optional KZMSA XMI/SCSI adapter and on HSC SCSI-ready systems. The TKZ60 is also supported on the HSD05 and HSJxx storage controllers.

This product is designed to meet the needs of customers who are currently using TA90 and IBM 3480 compatible media on other platforms within their business environment and have a requirement to exchange data between these platforms and their Digital systems.

This cartridge tape drive uses the same 200-Mbyte tape cartridges as the TA90 and IBM 3480 drives. It is also compatible with STK 4480, Fujitsu M2480, and other 3480 format drives. It can be purchased with or without a sequential loader, providing an unattended capacity of 1 Gbyte with a 5-cartridge magazine, or 2 Gbytes with a 10-cartridge magazine. The TKZ60 sequential loader is supported on OpenVMS systems. With RISC ULTRIX systems, the TKZ60 supports standard tape utilities (TAR, DUMP, DD, CPIO); however, the TKZ60 sequential loader supports multivolume DUMP only. DEC OSF/1 AXP systems do not support the sequential loader.

TKZ60 Cartridge Tape Drive *(continued)*

The drive provides full 18-track, parallel recording with a thin-film head. TKZ60 models are available with the IBM IDRC compaction/compression algorithm, which is used to increase capacity. An upgrade kit is also available to provide IDRC capability to existing TKZ60 drives.

Features

- Compact size—13.3 cm (5.25 in.) high x 21.7 cm (8.55 in.) wide x 54 cm (21.25 in.) deep
- Tabletop and rackmountable versions
- Available with or without sequential cartridge loader
- 5-slot and 10-slot cartridge magazines available
- Auto-ranging power supply
- Single-ended or differential variants
- Upgrade kit available for existing TKZ60 drives

Prerequisites

Hardware

- KZQSA adapter for Q-bus MicroVAX and VAX 4000 systems
- KZMSA adapter for DEC 7000 or DEC 10000 AXP systems
- SCSI interconnect cable must be ordered separately

Software

Requires minimum of OpenVMS V5.4-1, OpenVMS AXP V1.0, RISC ULTRIX V4.2A with CAM, or DEC OSF/1 AXP V1.2

Ordering Information

Order the following for direct SCSI, Q-bus (via KZQSA) or XMI (via KZMSA) connection:

TKZ60-EA	Rackmountable 3480-compatible tape drive, single-ended SCSI, with IDRC compression. Prerequisite: TK60R-AA rackmount kit.
TKZ60-EC	Rackmountable 3480-compatible tape drive with loader, single-ended SCSI, with IDRC compression. Prerequisite:TK60R-AA rackmount kit and TK60K-AB or TK60K-BB (5-or 10-slot cartridge magazine).
TKZ60-FA	Tabletop 3480-compatible tape drive, single-ended SCSI, with IDRC compression
TKZ60-FC	Tabletop 3480-compatible tape drive with loader, single-ended SCSI, with IDRC compression. Prerequisite: TK60K-AB or TK60K-BB (5-or 10-slot cartridge magazine).
TKZ60-GA	Rackmountable 3480/3490 compatible tape drive, differential SCSI, with IDRC compression. Prerequisite: TK60R-AA rackmount kit.
TKZ60-GC	Rackmountable 3480/3490 compatible tape drive with loader, differential SCSI, with IDRC compression. Prerequisite: TK60R-AA rackmount kit and TK60K-AB or TK60K-BB (5-slot or 10-slot cartridge magazine).
TKZ60-HA	Tabletop 3480/3490 compatible tape drive, differential SCSI, with IDRC compression
TKZ60-HC	Tabletop 3480/3490 compatible tape drive with loader, differential SCSI, with IDRC compression. Prerequisite: TK60K-AB or TK60K-BB (5-slot or 10-slot cartridge magazine).

IDRC Field Upgrade Kit

Existing TKZ60 units which do not include the IDRC compression algorithm for increased capacity can be upgraded. **Note:** Only TKZ60-AA/BA/AC/BC built after May 1993 may be upgraded. Manufacturing date can be found on TKZ60 serial number label.

TK60U-AB	IDRC compaction/compression field upgrade kit

TKZ60 Cartridge Tape Drive *(continued)*

Power Cords

The TKZ60 has an auto ranging power supply. For 240 V use, a country-specific power cord is required.

BN19A-2E	U.K./Ireland
BN19D-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19N-2E	Italy
BN19U-2E	Israel

SCSI Cables

BC19J-XX	50-pin straight bale lock to 50-pin straight bale lock connector for MicroVAX 3100, DECsystem 5100, DECsystem 5500 (via SCSI port only) and VAXstation 4000
BC06P-XX	50-pin right-angle bale lock to 50-pin right-angle bale lock connector for Q-bus MicroVAX and VAX 4000 systems (via KZQSA)
BC56H-XX	68-pin straight microconnector to 50-pin straight bale lock connector for VAXstation 3100, DECstation 2100/3100
BC09D-XX	50-pin straight bale lock to 50-pin straight microconnector for DECstation 5000 Models 200/240

Accessories

TK60R-AA	TKZ60 rackmount kit
TK60K-AB	5-slot cartridge magazine
TK60K-BB	10-slot cartridge magazine
TK60E-AA	Rackmount to tabletop conversion kit
TA90K-30	3480 tape cartridges, quantity 30

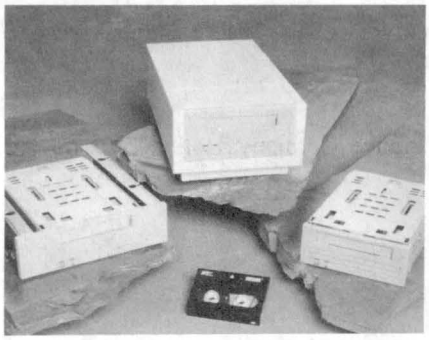
Specifications

Physical Characteristics

	Without Loader	With Loader
Height	11.74 cm (4.62 in.)	11.74 cm (4.62 in.)
Width	21.72 cm (8.55 in.)	21.72 cm (8.55 in.)
Depth	59.98 cm (21.25 in.)	79.54 cm (28.95 in.)
Weight	11.34 kg (25 lb)	18.59 kg (41 lb)

Note: For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990.

TLZ06 4-mm DAT Tape Drive (SCSI)



The TLZ06 tape drive is a 4-mm Digital Audio Tape (DAT) drive with a capacity of 4.0 Gbytes (with data compression) per cartridge and a SCSI-2 interface. At a lower price, this new drive is smaller, faster, and has a higher capacity than its predecessor, the TLZ04 tape drive. It is included as internal storage in several of the new Alpha AXP systems.

The TLZ06 tape drive has a sustained transfer rate of 366 Kbytes/s in data compression mode for a typical backup of 1 Gbyte/hour. To provide for flexible configurations it is offered as an embedded device, in a slim 3.5-inch form factor or a 5.25-inch, half-height form factor. It is also offered in a standalone tabletop enclosure and in the SZ16 expansion box.

This second-generation DAT drive uses four direct-drive motors and a helical-scan, read-after-write recording technique to provide reliable data recording, with or without data compression (DC), on 60-or 90-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 high 4.0-Gbyte capacity of the TLZ06 tape drive is achieved by a combination of a 90-meter cassette and typical 2x data compression. These features, combined with the Digital Data Storage recording formats (DDS-DC), ensure that interchangability is retained as capacity increases. DDS-labeled media is required to ensure the highest data integrity during read/write operations.

Data compression is software selectable on the TLZ06 tape drive and can be turned off to read and write to 60-meter DAT tapes for interchange with the TLZ04 tape drive. However, it is important to remember that data compressed and recorded on 60-meter DAT cassettes by the TLZ06 drive cannot be read by the TLZ04 drive. The TLZ04 will NOThandle 90-meter DAT cartridges.

Features

- 366-Kbyte/s peak transfer rate (with data compression) for an unattended backup rate of 1-Gbyte/hour
- Q-bus compatible with KZQSA adapter
- VAXBI compatible with KZBSA adapter (OpenVMS VAX only)
- Supported on VMS V5.5-1, ULTRIX V4.2C, and SCO UNIX V3.2.4
- Read and write compatible with TLZ04
- Industry-standard DDS and DDS-DC formats for industry-wide data interchange

TLZ06 4-mm DAT Tape Drive (SCSI) *(continued)*

Ordering Information

System	Factory Installed (embedded)	Field Installed (embedded)	Tabletop
MicroVAX 3100 Model 10e	N/A	N/A	**TLZ06-FA**
MicroVAX 3100 Models 30/40/80/90	**TLZ06-HF**	**TLZ06-HG**	**TLZ06-FA**
VAX 4000 Model 100/100A	**TLZ06-HF**	**TLZ06-HG**	**TLZ06-GA**
All other VAX 4000 systems	N/A	N/A	**TLZ06-GA**
MicroVAX II and 3xxx[1]	N/A	N/A	**TLZ06-GA**
VAXstation 4000 VLC	N/A	N/A	**TLZ06-FA**
VAXstation 4000 Model 60/90	**TLZ06-GF**	**TLZ06-GG**	**TLZ06-FA**
DECsystem 5100	**TLZ06-FF**	**TLZ06-FG**	**TLZ06-FA**
DECsystem 5500	N/A	N/A	**TLZ06-GA**
DECsystem 5900	**TLZ06-LF**	**TLZ06-LG**	**TLZ06-FA**
DECstation 5000 Models 20/25/33/50	N/A	N/A	**TLZ06-FA**
DECstation 5000 Models 120/125/133	**TLZ06-FM**	**TLZ06-FL**	**TLZ06-FA**
DECstation 5000 Models 200/240/260	N/A	N/A	**TLZ06-FA**
VAX 6000/VAX 8xxx	N/A	N/A	**TLZ06-RA**[2]
DEC 3000 Models 400/500/600/800	**TLZ06-MF**		
DEC 4000 Model 600/700	**TLZ06-MX/MY**		
DEC 7000 Model 600	**TLZ06-VA**		
DEC 10000 Model 600	**TLZ06-VA**		

1 Requires KZQSA adapter.

2 Includes KZBSA adapter. **Note:** For VAX 8700/8800, OpenVMS VAX V5.4-3 required; for all other VAXBI systems, OpenVMS VAX V5.4-1. Some VAX 8250/8350 systems require an 8-foot controller- to-bulkhead cable. Order 2R-CKKZB-S8 internal single-ended SCSI cable.

Notes: One media and cleaning cartridge included with all models. See SZ16 expansion box in this chapter for TLZ06 expansion box configurations and ordering information.

Accessories and Supplies

TLZ04-HA	Cleaning cartridge for TLZ04 and TLZ06
TLZ06-CB	Five-pack of 90-m data cartridges for TLZ06 only.
TLZ04-CB	Five-pack of 60-m data cartridges

KZQSA Adapter

KZQSA-AA	TLZ06 adapter for BA23 MicroVAX II systems
KZQSA-BA	TLZ06 adapter for BA123 MicroVAX II systems
KZQSA-CA	TLZ06 adapter for DECsystem 5500 system (optional)
KZQSA-SA/SF	TLZ06 adapter for BA200/BA400 MicroVAX 3000 and VAX 4000 systems; factory/field installed

TLZ06 4-mm DAT Tape Drive (SCSI) *(continued)*

Power Cords

240 V devices require a country-specific power cord.

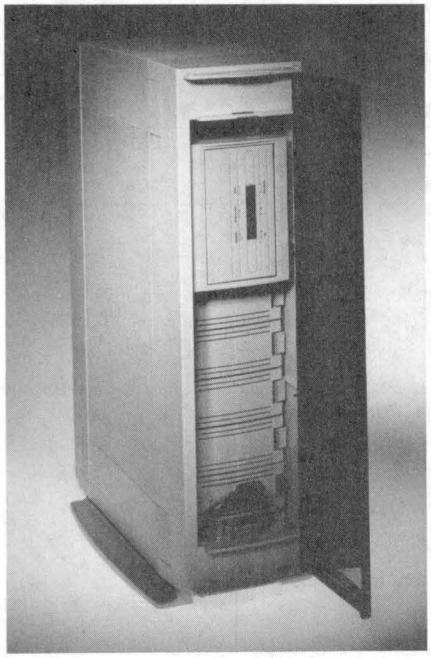
BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18U-2E	Israel

Specifications

Physical Characteristics

	3.5-Inch Embedded	5.25-Inch Embedded	Tabletop
Height	4.1 cm (1.6 in.)	4.1 cm (1.6 in.)	8.6 cm (3.4 in.)
Width	10.1 cm (4.0 in.)	14.6 cm (5.7 in.)	13.5 cm (5.3 in.)
Depth	15.2 cm (6.0 in.)	18.0 cm (7.1 in.)	23.6 cm (9.3 in.)
Weight	0.9 kg (2.0 lb)	1.1 kg (2.4 lb)	2.4 kg (5.2 lb)

TLZ6L 4-mm DAT Tape Autoloader



The TLZ6L is a well-integrated tape autoloader subsystem that combines the TLZ06 DAT drive with a magazine autoloading mechanism. The TLZ6L provides high storage capacity in a compact form-factor, using industry-standard Digital Data Storage (DDS) DAT technology.

The loader supports up to four cartridges in an internal magazine, or eight or 12 cartridge magazines. With data compression, up to 48 Gbytes of unattended backup capability is available. The loader operates in sequential or random access mode, depending upon software support. The cartridge capacity and performance are identical to those of the TLZ06 tape drive, providing a typical backup performance of 1 Gbyte per hour.

The TLZ6L is available in a standalone table top enclosure as well as in a StorageWorks SBB.

Features

- 16 Gbytes of capacity with standard four cartridge magazine
- Up to to 48 Gbytes of capacity with optional magazines
- Transfer rate: 366 Kbytes per second
- DDS-DC data compression
- Table top or StorageWorks enclosures
- Eight-character alphanumeric status display
- SCSI-2 interface
- Supported in OpenVMS VAX 5.5-2 and OpenVMS AXP 1.5

Note: When using the optional eight-cartridge and 12-cartridge magazines with the tabletop model in a horizontal position, a minimum of 4 in. (100 mm) of operating clearance is required below the bottom of the loader.

Ordering Information

TLZ6L-DA	For MicroVAX 3100 Models 30/40/80/90, VAX 4000 Models 100/100A systems; includes four cartridge magazine, five data cartridges, cleaning cartridge and 3-ft SCSI cable
TLZ6L-GA	For DEC 4000 Models 600/700 AXP systems; includes four cartridge magazine, five data cartridges, cleaning cartridge and 6-ft SCSI cable
TLZ6L-VA	For StorageWorks BA350 modular storage shelf

TLZ6L 4-mm DAT Tape Autoloader *(continued)*

Accessories and Supplies

TLZ04-HA	Cleaning cartridge for TLZ04/06/6L
TLZ06-CB	Five-pack of 90-m data cartridges
TLZ6L-04	Four-cartridge magazine with plastic storage box
TLZ6L-08	Eight-cartridge magazine with plastic storage box
TLZ6L-12	Twelve-cartridge magazine with plastic storage box

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

TLZ07 4-mm DAT Tape Drive (SCSI)

The TLZ07 is available from Digital for backup, archiving, and data interchange applications. Based on the DDS-2 standard, the TLZ07 provides up to 8 Gbytes of unattended backup capability, with a sustained transfer rate of up to 810 Kbytes/per second for a typical backup time of 1.5 GB/hour. To provide for flexible configurations it is offered as an embedded device, in a 3.5-inch form factor or a 5.25-inch, half-height form factor.

This third-generation DAT drive uses four direct-drive motors and a helical-scan, read-after-write recording technique to provide reliable data recording, with or without data compression (DC), 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 capacity of the TLZ07 tape drive 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 that interchangability is retained as capacity increases. DDS-2 labeled media is required to ensure the highest data integrity during read/write operations.

The TLZ07 implements the new DDS-2 media recognition system, consisting of sensors to recognize a striped tape leader used only on data-grade tapes. The system is intended to eliminate performance and service issues related to customer use of audio-grade media cartridges.

Data compression is software selectable on the TLZ07 tape drive and 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 by the TLZ07 drive 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.

TLZ07 4-mm DAT Tape Drive (SCSI) *(continued)*

Features

- 810-Kbyte/s peak transfer rate (with data compression) for an unattended backup rate of 1.5-Gbyte/hour
- Q-bus compatible with KZQSA adapter
- Read and write compatible with TLZ04 and TLZ06.
- Industry-standard DDS and DDS-DC 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 small servers.
- First Generation Read/Write Compatibility: The TLZ07 can read and write both DDS-2 and DDS-1 media ensuring investment protection as well as data interchange with DDS-1 drives
- Multiple Packaging Options: The TLZ07 is available in system-installed, tabletop, and StorageWorks versions enabling wide-spread customer adoption and convenience.
- Media Quality Checking: The TLZ07 implements the new DDS-2 media recognition system, eliminating performance and service issues related to customer use of audio-grade media cartridges.

Ordering Information

TLZ07-DA	8-Gbyte 4mm DAT Tabletop Tape Drive, with 3-foot (BC19J-03) SCSI cable. Supports AlphaServer 2100 and DEC 3000 300/300L/300X/300LX with BC09D-03
TLZ07-GA	8-Gbyte 4mm DAT VAX4000/DEC4000 Tabletop Tape Drive, with 6-foot (BC06P-06) cable. Supports AlphaServer 2100 with BC09D-06
TLZ07-GF	8-Gbyte 4mm DAT Tape. Factory installed for VAXstation 4000-60
TLZ07-GG	8-Gbyte 4mm DAT Tape. Field installed for VAXstation 4000-60
TLZ07-HF	8-Gbyte 4mm DAT Tape. Factory installed for MicroVAX 3100/VAX4000-100,100A,105A
TLZ07-HG	8-Gbyte 4mm DAT Tape. Field installed for MicroVAX 3100/VAX4000-100,100A,105A
TLZ07-JA	8-Gbyte 4mm DAT Tape. Factory installed for VAX 4000 Models 200-700A
TLZ07-JF	8-Gbyte 4mm DAT Tape. Field installed for VAX 4000 Models 200-700A
DL-TLZ07-JA	8-Gbyte 4mm DAT Tape, RRD43-AA CD-ROM. Factory installed for VAX 4000 Models 200-700A
DL-TLZ07-JF	8-Gbyte 4mm DAT Tape, RRD43-AA CD-ROM. Field installed for VAX 4000 Models 200-700A
TLZ07-LG	8-Gbyte 4mm DAT Tape, 5.25-inch half height internal mount, for AlphaServer 2100, DECpcAXP150, DEC 2000-300/500.
TLZ07-MF	8-Gbyte 4mm DAT Tape for PE400—PE800 cabinet mounting on DEC 3000 Models 400, 500, 500X, 600, 700, 800, 900
TLZ07-MX	1st 8-Gbyte 4mm DAT Tape for DEC 4000 Model 6x0 and 7x0

TLZ07 4-mm DAT Tape Drive (SCSI) *(continued)*

TLZ07-MY	2nd 8-Gbyte 4mm DAT Tape for DEC 4000 Model 6x0 and 7x0
TLZ07-VA	8-Gbyte 4mm DAT Tape with snap-in carrier for StorageWorks BA350 shelves
FR-PCXAT-AF	8-Gbyte 4mm DAT Tape, 5.25-inch half height internal for DECpcXL Server

Note: One media and cleaning cartridge included with all models.

TLZ07 Support Matrix

System	TLZ07 variants supported			Packaging choices	
	DEC OSF/1 V2.0	OpenVMS V6.1	POLYCENTER	Internal	Tabletop
MicroVAX II[1]	N/A	-GA/-DA	-GA/-DA		X
MicroVAX 3100 Models 30, 40, 80, 90	N/A	-HF/-HG -DA	-HF/-HG DA	X	 X
MicroVAX 3300, 3400,[1] **3500, 3600, 3800, 3900**	N/A	-DA	-DA		X
VAX 4000 Models					
100, 100A, and 105A	N/A	-HF/-HG	-HF/-HG	X	
100, 100A, and 105A	N/A	-GA	-GA		X
200–700A[1]	N/A	-GA	-GA		X
200–700A	N/A	-JA/-JF	-JA/-JF	X	
VAXStation 4000 VLC, Models 60, 90	N/A N/A	-GA -GF/-GG	-GA -GF/-GG	 X	X
DEC 2000 Models 300, 500	-LG/-GA	-LG/-GA	-LG/-GA	X	X
DEC 3000 Models 300L[2]**, 300X, 400, 500, 500X, 600, 700, 800, 900**	-DA	-DA	-DA		X
DEC 4000 AXP Models 6xx, 7xx	-MX/-MY -VA/-GA	-MX/-MY -VA/-GA	-MX/-MY -VA/-GA	X	 X
AlphaServer 2100[3,4]	-LG/-DA	-LG/-DA	-LG/-DA	X	X
DECpc AXP 150	-LG	-LG	-LG	X	

[1] Requires KZQSA adapter.
[2] DEC 3000 Models 300L/300X use TLZ07-DA with BC09D-03 only.
[3] Requires BC09D-03 cable.
[4] Supported under DEC OSF/1 V3.0

System Support

Supported on DEC OSF/1 AXP V2.0, Windows NT Daytona 703, and POLYCENTER products (SLS V2.4, HSM V1.0, and DECnsr V3.0). Also supported on OpenVMS AXP V6.1 with an additional OpenVMS update kit which is necessary to support data compression (kit is included in each drive).

Accessories and Supplies

TLZ04-HA	Cleaning cartridge for TLZ04 and TLZ07
TLZ04-CB	Five-pack of 60-m data cartridges for TLZ04, TLZ06, TLZ07.
TLZ06-CB	Five-pack of 90-m data cartridges for TLZ06 or TLZ07 only.
TLZ07-CA	Single 120-m data cartridge for TLZ07 only.
TLZ07-CB	Five-pack of 120-m data cartridges for TLZ07 only

TLZ07 4-mm DAT Tape Drive (SCSI) *(continued)*

KZQSA Adapter

KZQSA-AA	TLZ07 adapter for BA23 MicroVAX II systems
KZQSA-BA	TLZ07 adapter for BA123 MicroVAX II systems
KZQSA-CA	TLZ07 adapter for DECsystem 5500 system (optional)
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

Drive Specification

Capacity (formatted)	8 Gbytes* (120m tape)
Buffer Size:	1 Mbyte
Transfer Rate:	810 KBs sustained
Format and Compatibility:	
Reording Format	DDS-2 (120m tape)
Write/Read	DDS-1 (90/60m tape)

Physical Characteristics

	3.5-inch Embedded	5.25-inch Embedded	Tabletop
Height	4.1 cm (1.6 in.)	4.1 cm (1.6 in.)	8.6 cm (3.4 in.)
Width	10.1 cm (4.0 in.)	14.6 cm (5.7 in.)	13.5 cm (5.3 in.)
Depth	15.2 cm (6.0 in.)	18.0 cm (7.1 in.)	23.6 cm (9.3 in.)
Weight	0.9 kg (2.0 lb)	1.1 kg (2.4 lb)	2.4 kg (5.2 lb)

TKZ15 and TKZ09 8-mm Helical Scan Tape Drives (SCSI)



The TKZ15 and TKZ09 are industry-compatible 8-mm helical scan tape drives with SCSI interface for unattended backup, storage, and data interchange.

TKZ15—Based on the EXB-8505, the TKZ15 provides the ability to record up to 10 Gbytes of formatted data per cartridge (assuming a two to one compression ratio). In most operating systems environments, the TKZ15 is read/write compatible with the TKZ08/TKZ09 and EXB-8500 based drives.

The TKZ15 is offered in a tabletop enclosure as well as in a 5.25-inch StorageWorks carrier. The TKZ15 can be connected directly to SCSI systems and servers as a stand alone tabletop unit or installed in a BA350 type storage building block.

TKZ09—Based on the EXB-8500, the TKZ09 provides the ability to record up to 5 Gbytes of formatted data per cartridge. It is read-write compatible with EXB-8200 based drives such as the TKZ08 and EXB-8500-based drives.

The TKZ09 is offered in a tabletop enclosure supporting a wide variety of RISC ULTRIX, direct SCSI OpenVMS VAX Q-bus (via KZQSA), OpenVMS AXP, and DEC OSF/1 AXP systems. The TKZ09 can also be mounted in a 5.25-inch slot in the Mass Storage Drawer (MASA) of the DECsystem 5900. For Q-bus systems, a KZQSA adapter is required. The TKZ09 carries the third-party logo of Transitional Technology, Inc.

Features

	TKZ15*	TKZ09
Storage capacity	10 Gbytes	5 Gbytes
Recording format	8 mm	8 mm
Interface	SCSI	SCSI
Other supported connectivity	Q-bus	Q-bus
Head-to-tape speed	152 in. per second	152 in. per second
Sustained data rate	1000 Kbytes per second	500 Kbytes per second
Configurations	Tabletop, -VA for BA350	Single tabletop; embedded for DECstation 5900
Multi-volume backup	Yes, except for ULTRIX	Yes

* Assume 2 to 1 compression

Systems Supported

Device	TKZ15/TKZ09	Cable Required
RISC ULTRIX/Direct SCSI		
DECsystem/DECstation 2100/3100	X	BC56H-03,06
DECsystem 5100	X	BC19J-03,06
DECsystem 5500	X	BC06P-02,06,09
DECsystem 5900	X	BC09D-12
DECsystem/DECstation 5000-20/25	X	BC09D-03,06,12
DECsystem/DECstation 5000-120/125/133	X	BC09D-03,06,12
DECsystem/DECstation 5000-200	X	BC09D-03,06,12
DECsystem/DECstation 5000-240	X	BC09D-03,06,12
VAX OpenVMS/Direct SCSI		
VAXstation 3100-30/38/40/48/76	X	BC56H-03,06
VAXstation 4000-60/VLC	X	BC19J-03,06
MicroVAX 3100-10e/20e	X	BC19J-03,06
MicroVAX 3100-30/40/80/90	X	BC19J-03,06
VAX OpenVMS/Q-bus with KZQSA		
MicroVAX 3000 series 3300/3400/3500/3600/3800/3900	X	BC06P-02,06,09
VAX 4000 series 100/200/300/400/500/600	X	BC06P-02,06,09

TKZ15 and TKZ09 8-mm Helical Scan Tape Drives (SCSI) *(continued)*

Systems Supported

OpenVMS AXP/Direct SCSI		
DEC 3000-300/400/500/600	X	BC06P-02,06,09 or BC19J-03,06
DEC 4000	X	BC06P-02,06,09
DEC 7000/10000	X	BC06P-02,06,09
DEC OSF/1 AXP/Direct SCSI		
DEC 3000-300/4500/500/600	X	BC06P-02,06,09 or BC19J-03,06
DEC 7000/10000	X	BC06P-02,06,09

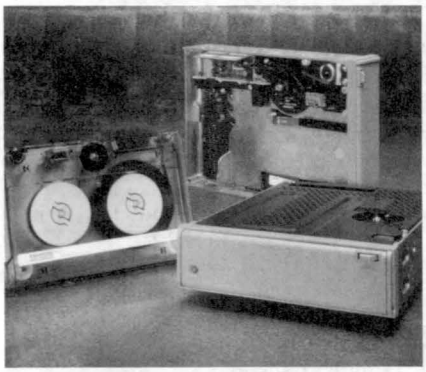
Prerequisites	TKZ15	TKZ09
Software	RISC ULTRIX V4.3A OpenVMS VAX V5.5-2 OpenVMS AXP V1.5 DEC OSF/1 V2	RISC ULTRIX V4.3 OpenVMS VAX V5.5 OpenVMS AXP V1.5 DEC OSF/1 AXP V1.2
Hardware	SCSI interconnect cable; For Q-bus, a KZQSA adapter, For DEC 7000/10000, a KZMSA adapter	SCSI interconnect cable; For Q-bus, a KZQSA adapter, For DEC 7000/10000, a KZMSA adapter

Ordering Information

TKZ15-TA	5/10-Gbtye 8-mm tape drive in tabletop enclosure. Includes data cartridge, cleaning cartridge, and documentation.
TKZ15-VA	5/10-Gbyte 8-mm tape drive in 5.25-inch StorageWorks carrier. Includes data cartridge, cleaning cartridge, and documentation
TKZ09-AA/AF	5-Gbyte 8-mm single embedded tape drive factory/field installed in a DECsystem 5900. Includes two data cartridges, one cleaning cartridge, and documentation.
TKZ09-BA	5-Gbyte 8-mm single tabletop tape drive. Includes two data cartridges, one cleaning cartridge, documentation, and U.S. power cord.

Note: For additional information contact the Sales Support Team at 800-832-6277 or (603) 884-8990.

TZK10 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI)



The TZK10 tape drive is an industry-standard quarter-inch cartridge (QIC) streaming tape device, with a capacity of up to 525 Mbytes. It uses a 5.25-inch, half-height form factor. Used for backup and data interchange, the TZK10 can read and write according to the following tables. The TZK10 tape drive is used for backup and data interchange.

Cartridge	System	Capacity	Format	Read	Write
DC6525	ULTRIX, VMS	Up to 525 Mbytes	QIC 525	X	X
DC6320	ULTRIX, VMS	Up to 320 Mbytes	QIC 320	X	X
DC6150 or DC600XTD	ULTRIX	Up to 150 Mbytes	QIC 150	X	X
DC6150 or DC600XTD	ULTRIX	Up to 120 Mbytes	QIC 120	X	X
DC600A	ULTRIX	Up to60 Mbytes	QIC 24	X	

Features

- Both 320-Mbyte and 525-Mbyte (formatted) tape capacities
- 200-Kbyte/second transfer rate
- 5.25-inch half-height form factor
- Embedded and tabletop models
- Read/write speed: 120 inches/second streaming
- Supported interface: SCSI
- Supported in ULTRIX V4.1, OpenVMS V5.4-2, and SCO UNIX

Ordering Information

Note: TZK10s are 525-Mbyte QIC-tape-embedded drives.

TZK10-FF/FG	TZK10 for DECsystem 5100 system and MicroVAX/VAXserver 3100 Models 10e/20e; factory/field installed. Note: MicroVAX 3100 Models 10e/20e ordered without factory-installed TZK10 cannot have TZK10 installed at a later date.
TZK10-FM/FL	TZK10 for DECstation 5000 Models 125/133; factory/field installed.
TZK10-LF/LG	TZK10 for DECsystem 5900; factory/field installed
TZK10-GF/GG	TZK10 for VAXstation 4000 Model 60/90; factory/field installed.
TZK10-VA	TZK10 for StorageWorks BA350 modular storage shelf
PCXAT-AA	TZK10 for DECpc 400MT/MTE, DECpc 400LV/LP/LX, and DECpc 400ST running under SCO UNIX. Includes documentation.
PCXAT-AB	TZK10 for DECpc 400MT/MTE, DECpc 400LV/LP/LX, DECpc 400ST and 500ST running under DOS. Includes DOS driver and documentation.
PCXAT-AC	TZK10 for DECpc 400MT/MTE, DECpc 400LV/LP/LX, DECpc 400ST and 500ST running under OS/2. Includes OS/2 driver and documentation.

Notes: One media and one cleaning cartridge included in all models; also available in SZ12/SZ16 dual-drive expansion boxes.

Accessories and Supplies

TZK1X-HA	TZK10 cleaning cartridge.
TZK1X-CB	5-pack, 320-Mbyte QIC media cartridges (DC6320)
TZK1X-CD	5-pack, 525-Mbyte QIC media cartridges (DC6525)

Specifications

Physical Characteristics (Embedded)			
Height	4.40 cm (1.75 in.)	Depth	21.80 cm (8.6 in.)
Width	15.00 cm (5.9 in.)	Weight	1.1 kg (2.4 lb)

TZK11 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI)

The TZK11 tape drive utilizes the QIC-2GB 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
DC9000 (Magnus 2.0)	OSF, OpenVMS	Up to 2.0 Gbytes	QIC-2GB	X	X
DC9000 (Magnus 1.2)	OSF, OpenVMS	Up to 1.2 Gbytes	QIC-1GB	X	X
DC9000 (Magnus 1.0)	OSF, OpenVMS	Up to 1.0 Gbytes	QIC-1GB	X	X
DC6525	OSF, OpenVMS	Up to 525 Mbytes	QIC 525	X	X
DC6320	OSF, OpenVMS	Up to 320 Mbytes	QIC 320	X	X
DC6150 or DC600XTD	OSF	Up to 150 Mbytes	QIC 150	X	X
DC6150 or DC600XTD	OSF	Up to 120 Mbytes	QIC 120	X	X
DC600A	OSF	Up to 60 Mbytes	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 DEC OSF/1 AXP, OpenVMS V5.5-2, OpenVMS AXP 1.5, and SCO UNIX

Ordering Information

TZK11-DA	ZK11 tabletop, including 3-ft SCSI cable and terminator
TZK11-HF/HG	ZK11 for MicroVAX 3100 Model 30/40/80/90 systems; factory/field installed
TZK11-MF	ZK11 for DEC 3000 Model 400/500/600/800 AXP systems
TZK11-VA	ZK11 for StorageWorks BA350 modular storage shelf
TZK11-VU	ZK11 for StorageWorks BA350 modular storage shelf

Note: One data cartridge and one cleaning cartridge included in all models; also available in the ba353 desktop expansion box.

Accessories and Supplies

TZK1X-CE	Single 2.0 Gbyte QIC media cartridge (DC9000)
TZK1X-CF	5-pack, 2.0 Gbyte QIC media cartridges (DC9000)
TZK1X-CD	5-pack, 525-Mbyte QIC media cartridges (DC6525)
TZK1X-CB	5-pack, 320-Mbyte QIC media cartridges (DC6320)
TZK1X-HA	ZK10/TZK11 cleaning cartridge

Specifications

Physical Characteristics (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)

TSZ07 Magnetic Tape Drive (SCSI)



The TSZ07 is a dual-density 1600/6250-bit/inch magnetic tape drive that can be connected to SCSI workstations using the built-in SCSI 2 interface, and to Q-bus MicroVAX systems via the KZQSA adapter, to provide industry-standard 9-track data interchange (one TSZ07 per KZQSA prior to OpenVMS VAX V5.5-2). The TSZ07 can be connected to DECsystem 5500 systems using the embedded SCSI adapter or to Q-bus systems using the KZQSA adapter. It can also be connected to DEC 7000 and DEC 10000 AXP systems using the KZMSA adapter. The TSZ07 is also available on all VAX 6000 systems with a VAXBI/XMI adapter (DWMBB or any VAX 8xxx system running OpenVMS). The TSZ07 is available in a standard 48.3-cm (19-inch) rackmount form, in a tabletop version, or top mounted in a 1-meter (40-inch) cabinet which includes an 874-type power controller and provides 53.3 cm (21 inches) of cabinet expansion space.

- Recording density: 6250 bits/inch (GCR), 1600 bits/inch (phase encoded)
- Formatted capacity @ 6250 bits/inch: 140 Mbytes (2400-foot reel), @ 1600 bits/inch: 40 Mbytes (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 Kbytes/second
- Maximum SCSI transfer rate: 4 Mbytes/second (synchronous)
- Automatic loading and threading
- 8-character alphanumeric front panel display
- 1 Mbyte of cache memory
- Front loading with low-profile 22.2-cm (8.75-inch) height
- Auto-ranging power supply
- Low acoustic noise level

Prerequisites

Hardware

- KZQSA adapter for Q-bus MicroVAX and VAX 4000 systems
- KZMSA adapter for DEC 7000 or DEC 10000 AXP systems
- DWMBB VAXBI/XMI adapter for VAX 6000 systems

Software

TSZ07-xx	Requires minimum of OpenVMS V5.4-1, OpenVMS AXP V1.0, RISC ULTRIX V4.1 or DEC OSF/1 AXP V1.2
TSB07-xx	Requires minimum OpenVMS V5.3 except VAX 87xx/88xx which requires OpenVMS V5.4-3

TSZ07 Magnetic Tape Drive (SCSI) *(continued)*

Ordering Information

Order the following for direct SCSI, Q-bus (KZQSA required for Q-bus), or XMI bus (KZMSA required for DEC 7000 or DEC 10000 systems) connection:

TSZ07-AA*	1600/6250-bit/in. single-ended SCSI rackmountable 9-track magtape
TSZ07-BA	1600/6250-bit/in. single-ended SCSI 9-track magtape mounted in H9642 cabinet, includes 9-ft (2.7-m) external cable (BC06P-09), and 120-V power cord
TSZ07-BB†	Same as above except 240 V
TSZ07-CA*	1600/6250-bit/in. single-ended SCSI tabletop 9 track magtape

Order the following for VAXBI connection:

TSB07-AA*	Differential SCSI rackmountable magtape; includes VAXBI adapter, 40-in. (1-m) internal cable, I/O bulkhead with connector, and 25-ft (7.6-m) external cable (BC13N-25)
TSB07-BA	Differential SCSI magtape rackmounted in 40-in. (1-m) cabinet; includes VAXBI adapter, 40-in. (1-m) internal cable, I/O bulkhead with connector, 25-ft (7.6-m) external cable (BC13N-25), and 120 V power cord
TSB07-BB†	Same as above except 240 V
TSB07-CA*	Differential SCSI tabletop magtape; includes VAXBI adapter, 40 in. (1-m) internal cable, I/O bulkhead with connector, and 25-ft (7.6-m) external cable (BC13N-25)

Note: Some VAX 8250/8350 systems require an 8-foot internal controller-to- bulkhead cable. Order 2R-CKKZB-D8 internal differential SCSI cable.

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
TSZ07-EA	Differential SCSI 9-track magtape in H9642 cabinet, includes 9-ft (2.7-m) external cable (BC06P-09), and 120-V power cord
TSZ07-EB†	Same as above except 240 V
TSZ07-FA*	Differential SCSI tabletop 9-track magtape

*Order country kit separately
† Order power cord separately

Country Kits

TSZ07-AA/CA/DA/FA and TSB07-AA/CA require one of the following country kits which include an ac power cord, two 1.8-m (6-ft) SCSI cables (BC06P-06 and BC56H-06), hardware documentation, tape head cleaning kit, and 731.5-m (2400-ft) 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-BJ	India

TSZ07 Magnetic Tape Drive (SCSI) *(continued)*

Power Cords

The TSZ07-BA/BB/EA/EB and TSB07-BA/BB include a SCSI cable, documentation, cleaning kit, and blank magnetic tape reel. 240 V options (-xB) require a power cord from the following list:

BN18B-4E	U.K./Ireland
BN18D-4E	Australia/New Zealand
BN18E-4E	Italy
BN18F-4E	Israel
BN18H-4E	India
BN18T-4E	Canada/U.S./Japan (100/120 V)
BN20B-2E	Canada/U.S./Japan (240 V)
BN18P-4E	Denmark
BN18C-4E	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, and Sweden

Specifications

Physical Characteristics

	TSx07-AA/DA	TSX07-Bx/Ex	TSx07-CA/FA
Height	22.8 cm (9.0 in.)	111.1 cm (43.75 in.)	26.9 cm (10.6 in.)
Width	43.2 cm (17.0 in.)	59.7 cm (23.5 in.)	50.8 cm (20.0 in.)
Depth	63.5 cm (25.0 in.)	83.8 cm (33.0 in.)	68.6 cm (27.0 in.)
Weight	30.9 kg (68.0 lb)	115.9 kg (255 lb)	43.2 kg (95 lb)

Note: For additional information, contact the Sales Support Team at 800-832-6277 or 603-884-8990.

Chapter 9
Terminals, Scanners, Printers

Comparison Charts

X Terminals and Video Terminals

Scanners

Printers

Printer Software

For telephone ordering and pre-purchase technical assistance in the U.S., call 800-DIGITAL.

Video Terminals Comparison Chart

Features	VT510 (North American Model)	VT510 (International Model)	VT510 (International Low Emissions)	VT420 (North American Model)	VT420 (International Model)	VT420 (International Low Emissions)	VT420 with PCTerm	VT340+
General Attributes								
Two-piece, convection-cooled design	X	X	X	X	X	X	X	X
Pedestal base with tilt and swivel	X	X	X	X	X	X	X	X
14-inch flat monochrome CRT screen	X	X	X	X	X	X	X	
13-inch color CRT screen								X
National replacement character set	X	X	X	X	X	X	X	X
Sessions (single or dual wire)	1	1	1	2	2	2	2	2
Vertical split screen								X
Horizontal split screen				X	X	X	X	X
Multiple pages of memory	X	X	X	X	X	X	X	X
Window management features				X	X	X	X	X
Intuitive windows-like setup	X	X	X					
Clock, character tables, calculator	X	X	X					
Downline-loadable macros	X	X	X	X	X	X	X	
Block-mode operation								X
120 V capability only	X			X				X
120 or 240 V versions								X
120 V–240 V self-adjusting capability		X	X		X	X	X	
Display Attributes								
Paper-white, amber, or green display	X	X		X	X			
Paper-white phosphor only			X			X	X	
25th status line	X	X	X	X	X	X	X	X
Keyboard status line	X	X	X	X	X	X	X	X
Dynamic focus—vertical and horizontal	X	X	X					
Cell size	10 x 16	10 x 16	10 x 16	10 x 16	10 x 16	10 x 16	10 x 16	10 x 20
Cell size with overscan	10 x 13	10 x 13	10 x 13	10 x 16	10 x 16	10 x 16	10 x 16	10 x 20
Emulation								
ASCII/ANSI/PCTerm	X	X	X					
WYSE 50+, 150, 60, 160 emulations	X	X	X					
WYSE PCTerm emulations	X	X	X					
ADDS A2 emulations	X	X	X					
Televideo 910+/925/950 emulations	X	X	X					
SCO console mode	X	X	X					
VT420 compatibility	X	X	X	X	X	X	X	X
VT220/320 compatibility	X	X	X	X	X	X	X	X

Video Terminals Comparison Chart *(continued)*

Features	VT510 (North American Model)	VT510 (International Model)	VT510 (International Low Emissions)	VT420 (North American Model)	VT420 (International Model)	VT420 (International Low Emissions)	VT420 with PCTerm	VT340+
Keyboard and Languages								
Digital VT108/WPS108 keyboard	X	X	X	X	X	X	X	
Enhanced PC keyboard	X	X	X				X	
Program function keys	108	108	108	30	30	30	48	15
Save in Non-Volatile RAM	X	X	X					X
Languages supported	25	25	25	25	25	25	16	14
Keyboards	70	70	70	44	44	44	19	18
Key Editor	X	X	X					X
Graphics attributes								
VT330 compatibility (text and graphics)								X
VT340 compatibility (color text and graphics)								X
Graphics memory, two screens								X
Tablet interface								X
16 colors, 16 shades of gray, 13-inch screen								X
Communications								
Modem support	X	X	X	X	X	X	X	X
DEC-423 interface port (EIA)	X	X	X	X	X	X	X	X
Second DEC-423 interface port for dual sessions or printer port				X	X	X	X	X
EIA-232 port	X	X	X		X	X	X	X
Full EIA-232 modem control	X	X	X		X	X	X	X
10-foot cable (BC16E) and 25-pin EIA-232 adapter(H8571-F)				X				
XON/XOFF	X	X	X	X	X	X	X	X
XPC	X	X	X				X	
DTR/DSR, None	X	X	X				X	
Communications Rate to:	115,200	115,200	115,200	38,400	38,400	38,400	38,400	38,400
Printer Support								
Bidirectional printer port	X	X	X	X	X	X	X	X
Serial	X	X	X	X	X	X	X	X
Parallel	X	X	X					
Printer protocol: ANSI	X	X	X	X	X	X	X	X
Printer protocol: Proprinter	X	X	X					
Certifications								
FCC Class A certification	X			X				X
FCC Class B certification		X	X		X	X	X	
VDE Class B, GS certification		X	X		X	X	X	
Swedish Radioprotection Institute (SSI)conformance on low-frequency magnetic fields and low electrostatic fields; white phosphor only			X			X	X	

Nonimpact Printers Comparison Chart

	Printserver 32/ Printgate 32 (LPS32)	PrintServer 17/600 (LPS17)	KODAK 1392	XEROX Production Print Systems†	DEClaser 1800 (LN11)	DEClaser 3500
Technology	Laser	Laser	Electrophotographic	Electrophotographic	Laser	Laser
Speed (max. 8.5 x 11-in. pages/min)	32—Simplex and duplex 32—Duplex (PrintGate)	17—Simplex 15 sides—Duplex	Up to 92 impressions/minute	Up to 135 ppm	8	12
Recommended Impressions/mo. (max)	Up to 150,000	Up to 70,000	1,000,000	Up to 2,500,000	Up to 16,000	Up to 20,000
Number of Colors	1	1	1	1-2	1	1
Paper Type	Cutsheet, labels (special stock required), transparencies, recycled paper	Cutsheet, labels (special stock required), transparencies, envelopes	Cutsheet	Cutsheet	Cutsheet, labels, transparencies, envelopes	Cutsheet, recycled paper, transparencies, labels, envelopes
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	16–41 lb	24 lb
Multipart Forms	No	No	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, 29.7 x 42.0 cm, 21.0 x 29.7 cm, 25.7 x 36.4 cm, 18.2 x 25.7 cm, 14.8 x 21.0 cm	7.5 x 10.5 in, 8.5 x 11 in 8.5 x 14 in, 21.0 x 29.7 cm, 25.7 x 36.4 cm	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	Letter, legal, executive, A4, B5	7.5 x 10.5 in, 8 x 10 in, 8.5 x 11 in, 8.5 x 14 in,
Resident Fonts	29 PostScript	43 PostScript			26 bitmapped, 8 scalable	35 Adobe Postscript Type 1, 13 Intellifonts, 5 Bitmapped
Optional Fonts	Downloadable	Downloadable	Downloadable	Downloadable	None	Downloadable
Characters/inch	*	*	*	4 - 30 cpm horizontal	*	*
Lines/inch	*	*	*	3 - 18	*	*
Graphics Protocols	PostScript, HP PCL, DDIF, ANSI/Sixel, ReGIS, TEKTRONIX 4010/4014, ASCII text, IBM Proprinter, CCITT Groups 3 and 4	PostScript Level 2, HP PCL, DDIF, ANSI/Sixel, ReGIS, TEKTRONIX 4010/4014, ASCII text, IBM Proprinter, CCITT Groups 3 and 4		Xerox	HP LaserJet III (PCL 5), Epson FX-850, IBM Proprinter XL24E	Postscript Level 2, HP-PCL5, Adobe IntelliSelect Automatic Switching
Resolution (Dots per inch)	300 x 300	600 x 600	300 x 300	600 x 600 or 300 x 300	300 x 300	600 x 600
Bar codes	Yes, through ANSI translator and application software	Yes, through ANSI translator and application software		Yes and OCR	No	Yes, via programmable font module
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	RS-232 C Serial, Centronics Parallel	Bi-directional Parallel, LocalTalk, Serial, Network Interface Card supporting: TCP/IP, IPX/SPX, Ethertalk, LAT, FAX
IBM PC- Compatible	Yes, with optional software	Yes, with optional software			Yes	
RAM (standard)	12 MB	16 MB standard; 32 MB maximum			1 MB, 5 MB maximum	3 MB (upgradable to 19 MB)
Noise Level	<55 dBA	<50 dBA	81 dBA (operating) 65 dBA (standby)		45 dBA (operating) 35 dBA (idle)	< 50 dBA (operating) 37 dBA (idle)
Dimensions W x D x H	37 x 27 x 50 in. 93.5 x 69 x 126 cm	17.9 x 22.4 x 19 in 45.4 x 57 x 48.3 cm	31 x 58 x 41 in. 78.7 x 147.3 x 104.1 cm		14.1 x 17.9 x 8.9 in	10.5 x 14.4 x 16 in
Weight	341 lb (155 kg)	98 lb (44.5 kg)	1,100 lb (499.0 kg)		19 lb (8.6 kg)	28.8 lbs

* Varies depending on fonts used.

† See ordering information for specifics on each model.

Nonimpact Printers Comparison Chart *(continued)*

	DEClaser 5100 (LN09)	DECcolorwriter 1000 (LF02)	DECmultiJET 1500 (LJ18P) ††	DECwriter 110i	DECwriter 500i (LJ500)
Technology	Laser	Color thermal wax	Bubble ink-jet, refillable cartridge	Bubble ink-jet, refillable cartridge	Bubble ink-jet, refillable cartridge
Speed (max. 8.5 x 11-in. pages/minute)	8	4 (monochrome) 2 (color)	180 cps 120 cps	180 cps (2.5 ppm)	400 cps (5 ppm)
Recommended Impressions/month (max)	Up to 20,000	Up to 3,000	400	400	600
Number of Colors	1	16.7 million	1	4 (optional)	4 (optional)
Paper Type	Cutsheet, transparencies, envelopes, recycled paper	Plain paper, thermal wax paper, transparencies	Cutsheet, transparencies, envelopes	Cutsheet, transparencies, envelopes	Cutsheet, transparencies, envelopes
Paper Thickness (max)	17–24 lb	17–21 lb	19–24 lb up to 36 lb manual	20 lb (90 g/m^2) 18 - 24 lb	20 lb (90 g/m^2) 19 - 24 lb
Multipart Forms	No	No	N/A	N/A	N/A
Paper Sizes	8.5 x 11 in, 8.3 x11.7 in 7.25 x 10.5 in, 8.5 x 14 in	8.5 x 11 in, 8.5 x 12.3 in, 8.5 x 14 in, 21.0 x 29.7 cm with perforation	8.5 x 11 in, 8.5 x 14 in, 21.0 x 29.7 cm	8.5 x 11 in, 8.5 x 14 in, 21.0 x 29.7 cm	8.5 x 11 in, 8.5 x 14 in, 21.0 x 29.7 cm
Resident Fonts	73 PostScript Level2, 47 HP PCL 5E	17	5	5	5
Optional Fonts	Downloadable or font cartridges	22	7	Yes, via font cartrridge	Yes, via font cartrridge
Characters/inch	*	*	10, 12, 16.67	10, 12, 16.67	10, 12, 16.67
Lines/inch	*	*	*	*	*
Graphics Protocols	PostScript Level 2, HP PCL 5E, DEC ANSI, ASCII	PostScript Level 2, HP PCL5, HP-GL	HP DeskJet Plus (standard), IBM Proprinter X24 and Epson LQ850 (optional)	HP PCL IIIE (standard), IBM Proprinter 4207 and Epson LQ850 (optional)	HP DeskJet (standard), IBM Proprinter 4207 and Epson LQ850 (optional)
Resolution (Dots per inch)	600 x 600	600 x 300	300 x 300	300 x 300	300 x 300
Bar codes	No	Yes, through ON-TAP software in ANSI mode		Yes, with optional ON-TAP software	Yes, with optional ON-TAP software
Interfaces	Serial, parallel, AppleTalk, optional Ethernet network card for TCP/IP, EtherTalk, Novell and LAT	Centronics parallel, serial EIA-232, EIA-422, AppleTalk	Centronics parallel	Centronics parallel	Centronics parallel
IBM PC- Compatible	Yes	Yes	Yes	Yes	Yes
RAM (standard)	6 MB (expandable to 66 MB)	8 MB	8 KB	8 KB	50 KB (standard) 256 KB (maximum optional)
Noise Level	<49 dBa; <33 dBa standby	<53 dBA	45 dBA	45 dBA	45 dBA
Dimensions W x D x H	16.4 x 15.9 x 11.7 in 41.6 x 40.3 x 29.7 cm	13.4 x 17.5 x 11 in 34 x 44 x 28 cm	13.5 x 5.8 x 4.5 in 34.2 x 14.7 x 11.5 cm	14.2 x 14.2 z 11.1 in 36.1 x 36.1 x 28.1 cm	15.2 x 14.4 x 6.9 in 38.5 x 36.5 x 17.5 cm
Weight	37.4 lb (17 kg)	40 lb (18.1 kg)	6.4 lb (2.9 kg)	8.8 lb (4 kg)	17.6 lb (8 kg)

* Varies depending on fonts used.
†† Available in Europe only.

Impact Printers Comparison Chart

	LA70 Personal Printer	LA75 Plus Companion Printer	DECwriter 65	DECwriter 95 (LA95)	DECwriter 195 (LA195)
Technology	Dot-matrix, 9-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire
Speed	200 ch/s (draft) 100 ch/s (memo) 40 ch/s (NLQ)	250 ch/s (draft) 83 ch/s (LQ)	167 ch/s (draft) 53 ch/s (LQ)	215 ch/s (draft) 66 ch/s (LQ)	300 ch/s (draft) 100 ch/s (LQ)
Recommended impressions/month (max)	1,000	2,000	400	1,000	1,000
Number of Colors	1	7	7	7	7
Paper type	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes, transparencies	Cutsheet; fanfold; labels; envelopes, transparencies
Paper thickness (Maximum)	0.012 in. (0.031 cm)	0.012 in. (0.031 cm)	0.016 in (0.042 cm)	0.009 in. (.022 cm)	0.009 in (.022 cm)
Multipart forms	1–3	1–4	Yes—with optional tractor	1–4	1–4
Width of output	4.5–10 in. (11.4–15.5 cm)	4.5–10 in. (11.4–15.5 cm)	8.5 in	4.5–10 in. (11.4–15.5 cm)	7.2–16.1 in (18.3–40.9 cm)
Resident fonts	1	1	8	2 data processing; 9 letter-quality; 2 scalable	10
OCR-A/B	N/A	OCR-A/B	N/A	N/A	N/A
Characters Per inch	5, 6, 6.6, 8.25, 8.55, 9, 10, 12, 13.2, 16.5, 17.1, 18	10, 12, 16.5, 17.5	10, 12, 15, 17.1, 20	10 - 20	10 - 20
Lines per inch	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12
Graphics Protocols	ANSI/(PPL2), IBM Proprinter	ANSI/Sixel, IBM Proprinter	IBM Proprinter X24E, Epson LQ570	Epson Esc P/2 and LQ series, IBM Proprinter X24E	Epson Esc P/2 and LQ series, IBM Proprinter XL24E
Resolution (Dots per inch)	180 H x 180 V	360 H x 180 V	360 H x 360 V	360 H x 360 V	360 H x 360 V
Bar codes	Yes, through optional ON-TAP software, POSTNET support	Built-in 3 of 9 and optional ON-TAP software, POSTNET support	Yes, via ON-TAP softwrare	Yes, through optional ON-TAP software, POSTNET support	Yes, through optional ON-TAP software, POSTNET support
Interfaces	EIA-423[1], Parallel[2]	EIA-423 (MMJ) Centronics Parallel	Centronics Parallel	8-bit Parallel (standard) EIA-232C Serial (optional)	8-bit Parallel and EIA-232C Serial (standard)
IBM PC- Compatible	Yes (IBM Proprinter XL24 emulation)	Yes (IBM Proprinter emulation)	Yes	Yes	Yes
Baud rate	200–9,600	110–9,600	110–19,200	110–19,200	110–19,200
Buffer size	2 KB	8 KB	8 KB (standard)	8 KB data input (standard); 136 KB data input/download (optional)	8 KB standard (expandable to 136 KB)
Noise level	52 dBA (quiet mode)	55 dBA (quiet mode)	48 dBA	43 dBA (quiet mode) 46.5 dBA (normal mode)	49.5 kBA
Dimensions **W x D x H**	15.5 x 11.4 x 4.7 in. 39.3 x 29 x 12 cm	16.8 x 14.5 x 5.3 in 42.7 x 34.5 x 12.1 cm	15.1 x 9.7 x 6.6 in 38.5 x 24.7 x 16.6 cm	17 x 12.6 x 5.4 in. 42.6 x 31.5 x 11 cm	23.8 x 13.3 x 5.6 in 60.4 x 33.8 x 14.3 cm
Weight	16 lb (7.5 kg)	23 lb (10.5 kg)	8.8 lb (4 kg)	11.4 lb (5.17 kg)	18.1 lb (8.2 kg)
Ribbon/ink Technology	Nylon cartridge	Nylon cartridge, optional color	Nylon cartridge, optional colore	Nylon cartridge, optional color	Nylon cartridge, optional color

[1] EIA-232D compatible with optional adapter
[2] PC Centronics type

Impact Printers Comparison Chart *(continued)*

	LA310 Multiprinter	LA424 Multiprinter	LA600 Multiprinter	LG06	LG12
Technology	Dot-matrix, 9-wire	Dot-matrix, 24-wire	Dot-matrix, 24-wire	Line-matrix	Line-matrix
Speed	300 ch/s (high-speed draft) 240 ch/s (draft) 55 ch/s (NLQ)	400 ch/s (draft) 133 ch/s (LQ)	600 ch/s (draft) 300 ch/s (NLQ) 150 ch/s (LQ)	800 lines/min (high speed) 320 (correspondence)	1,200 lines/min (high speed) 475 (correspondence)
Recommended Impressions/month (max)	3,500	6,000	20,000	75,000	150,000
Number of colors	1	7	7 (optional color)	1	1
Paper type	Cutsheet; fanfold, labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Fanfold, labels cardstock, multipart forms (1–6)	Fanfold, labels cardstock, multipart forms (1–6)
Paper thickness (Maximum)	0.013 in.	0.020 in. (0.052 cm)		0.025 in. (0.06 cm)	0.025 in. (0.06 cm)
Multipart forms	1–5	1–6	1–6	1–6	1–6
Width of output	3.46 - 16.5 in.	4–17 in. (10.2 –40.6 cm)	4–15.8 in.	4–16 in. (10.1 – 40.6 cm)	3–16 in. (7.6 – 40.6 cm)
Resident fonts	1	1	11	5	5
OCR-A/B	N/A	OCR-A/B	OCR-A/B	OCR-A/B	OCR-A/B
Characters Per inch	5 - 20	5, 6, 6.7, 8.55, 9, 10, 12, 13.33, 17.14, 18	10, 12, 15, 17, 18	5, 10, 12, 13.3, 15, 16.7	5, 10, 12, 13.3, 15, 16.7
Lines per inch	2 - 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8,	6, 8, 10	6, 8, 10
Graphics Protocols	ANSI/Sixel, IBM Proprinter III, Epson FX-1050	ANSI/sixel, IBM Proprinter	ANSI/sixel, IBM Proprinter X24, Epson LQ 2550	ANSI/sixel, IBM Proprinter emulation	ANSI/sixel IBM Proprinter emulation
Resolution	180 H x 144 V	360 H x 180 V (ANSI mode); 180 H x 180 V (IBM Proprinter mode)	360 H x 360 V	100 H x 100 V	180 H x 96 V
Bar codes	Yes, through optional ON-TAP software; includes POSTNET support	Yes, 3 of 9 and ON-TAP software, POSTNET support	12 resident bar codes including POSTNET	Interleaved 2 of 5 Code 39, EAN 8 EAN, Code 11 Codebar a/n, b/n, c/,* d/e, UPC-A, E, POSTNET, optional ON-TAP software	Interleaved 2 of 5 Code 39, EAN 8 EAN, Code 11 Codebar a/n, b/n, c/,* d/e, UPC-A, E, POSTNET, optional ON-TAP software
Interfaces	DEC-423 Serial, Centronics Parallel	EIA-423 Serial[1], Parallel[2] 20 mA Current Loop	Centronics Parallel, Serial RS-232	EIA-232 parallel (Centronics Data Products)	EIA-232 parallel (Centronics Data Products)
IBM PC- Compatible	Yes	Yes (IBM Proprinter XL24 emulation)	Yes	Yes, through IBM Proprinter emulation	Yes, through IBM Proprinter emulation
Baud rate	150–9,600	200–19,200	600–19,200	300–19,200	300–19,200
Buffer size	16 KB (expandable to 32 KB)	8 KB	47 KB	1 K	1 K
Noise level	51 dBA (quiet mode) <55 dBA	<53 dBA (quiet mode) <55 dBA	53 dBA	52 dBA	52 dBA
Dimensions W x D x H	23.8 x 15 x 4.33 in. 60.5 x 37.8 x 11 cm	24.2 x 12.2 x 6.7 in. 61.5 x 31 x 17 cm	25 x 16.3 x 10.7 in. 62.5 x 40.7 x 26.7 cm	27 x 28.7 x 40.6 in. 69 x 73 x 103 cm	34 x 29 x 42.5 in 86.4 x 73.7 x 108 cm
Weight	22 lb (10 kg)	31.5 lb (14.3 kg)	50 lb (22.7 kg)	225 lb (102 kg)	345 lb (156 kg)
Ribbon/ink Technology	Nylon cartridge	Black and color cartridges	Nylon cartridge (optional color)	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

Line Printer Interconnect Cabling

System Printer Interface	LG06	LG12
LP11	BC27A	BC27A
LPV11	BC27A	BC27A
LPV11-SA	BC27L	BC27L
DMF32	BC27A	BC27A
DMB32	BC27A	BC27A
EIA-232	BC22D	BC22D

X Terminals and Video Terminals

Overview

Digital's high-performance, high-quality terminals improve user productivity, enhance system performance, and enable flexible and reliable communications and network performance.

The VXT 2000 family of X terminals combines superior graphics capability with easy access to applications anywhere on the network. They can boot from and connect to UNIX, OpenVMS, DEC OSF/1 AXP, and ULTRIX systems. A full range of monochrome, color, and grayscale models is supported in 15-, 17-, 19-, and 21-inch monitor sizes. VXT software supports the latest X11 release as well as many value-added features, including Motif Window Manager, 3270 Terminal Emulator as a local client, and centralized management capabilities.

The VT510 terminal is a low-cost, single-session text terminal designed for a multivendor environment. It supports over 30 operating systems and emulates 17 popular terminals. The VT420 dual-session text terminal offers text windowing, six pages of memory, and up to 50 display lines.

The VT420 with PCTerm is a full-featured alphanumeric terminal that supports the PC character set and scan codes for multiuser DOS and DOS applications running under UNIX.

The VT340+ is a color graphics dual-session terminal. The VT340+ is for users who require high-performance, full-color business and preview graphics, as well as high-quality text display capabilities.

VXT 2000/2000+ X Terminals



The VXT 2000 family of X terminals are high-performance networked, desktop devices that provide easy access to applications and databases anywhere on the network. Users can create multiple X sessions to UNIX, DEC OSF/1 AXP, ULTRIX, and OpenVMS hosts, via DECnet, TCP/IP, or LAT protocols. Multiple terminal sessions can be created, without using the X protocol so that the VXT 2000 can also be used as a multiwindowing terminal.

The VXT 2000+ X terminals are higher-performance color and grayscale terminals. The VXT 2000 X terminals are monochrome models that can be upgraded to VXT 2000+ grayscale models. A choice of 15-, 17-, 19- and 21-inch monitors are available. The 15-and 17-inch monochrome models are single-box units.

VXT software supports X11 Release 5 including the latest X11 standard features. VXT software also includes value-added features which provide flexibility and end-user cost savings.

The optional InfoServer 1000 VXT comes preinstalled with VXT and InfoServer software. With this configuration, the VXT 2000/2000+ X terminals can boot from and access fonts stored on the InfoServer. The InfoServer's disk acts as a shared memory resource to the VXT 2000/2000+ X terminals. VXT 2000/2000+ X terminals, used in conjunction with the InfoServer, require only 4 Mbytes of memory.

VXT 2000/2000+ X Terminals *(continued)*

Features

Software Features

- Window System: X11 R5 with support for backing store, save under, shape extension, X Image Extension, Font Server extension
- Network Protocols: TCP/IP, NFS, DECnet, LAT
- Local Clients: OSF/Motif Window Manager, Application Launcher, VT320 series emulation, Terminal Manager, Configuration/Font Manager, IBM 3270 terminal emulation, online documentation, password security
- Font Access: NFS, X Font Server, TFTP, LAT, Lastport
- Font Formats: SNF, BDF, PCF
- Centralized Configuration: Host-based, InfoServer-based, VXT 2000/2000+ X terminal based
- Network Management: SNMP-MIB II, terminal statistics
- Memory Management: Selectable software features, virtual memory, using InfoServer option
- Local language support: English, French, German, Spanish, Dutch and Italian
- Networked printing via TCP/IP or LAT to printers attached to VXT 2000/2000+ X terminal

Hardware Features

- DECimage option for accelerated bitonal image processing available for all two-box models; supports X Image Extensions available in VXT software
- 4-Mbyte standard terminal memory; expandable to 18 Mbytes
- Three-button mouse (200 pulses per linear inch) and mouse pad
- Choice of keyboards—Standard, WPS, and no keyboard
- 17-inch and 19-inch color touchscreen options
- Refresh rate of 72 Hz provides flicker-free display
- Choice of thick wire, ThinWire, or twisted pair (10BaseT) Ethernet connections
- 100 dots per inch resolution

Prerequisites

Processors Supported

- OpenVMS VAX systems (V5.3–V5.5)
- OpenVMS AXP systems (V1.0)
- DEC OSF/1 AXP systems (V1.2)
- ULTRIX systems (V4.2)
- SUN systems (SunOS V4.1.1, V4.1.2—requires local BOOTP daemon)
- HP-UX systems (V8.05)
- IBM AIX systems (V3.1, V3.2)
- X86 systems running SCO UNIX Release V3.2 Version 4, SCO ODT V2.0, SCO ODT V2.0 Development System
- InfoServer 1000 VXT and InfoServer 150VXT
- InfoServer 100 or InfoServer 150 upgraded with VXT 2000 software

VXT 2000/2000+ X Terminals *(continued)*

Step 1—Select Terminal

- All systems offer standard, WPS, or no-keyboard options. All country kits are shipped without keyboards.
- Thick/thin = 802.3/Ethernet thick wire/ThinWire Thick/twisted = 802.3/Ethernet thick wire/twisted-pair (10BaseT)
- U.S./U.K./Canada are 120 V devices

VXT 2000/2000+ with 15-inch Monitor

	15-inch Monochrome Integrated Monitor		VR326 Color Monitor	
Country/Language	**Thick/Thin (single box)**	**Thick/Twisted (single box)**	**Thick/Thin (two box)**	**Thick/Twisted (two box)**
U.S., U.K./English	VX225-AA/BA/UA	VX225-JA/KA/XA	VX255-DA/EA/VA	VX255-MA/NA/YA
Canada/French	VX225-AC/BC/UC	VX225-JC/KC/XC	VX255-DC/EC/VC	VX255-MC/NC/YC
Belgium/Flemish	VX225-UB	VX225-XB	VX255-VB	VX255-YB
Denmark/Danish	VX225-UD	VX225-XD	VX255-VD	VX255-YD
U.K./English	VX225-UE	VX225-XE	VX255-VE	VX255-YE
Finland/Finnish	VX225-UF	VX225-XF	VX255-VF	VX255-YF
Germany/German	VX225-UG	VX225-XG	VX255-VG	VX255-YG
Holland/Dutch	VX225-UH	VX225-XH	VX255-VH	VX255-YH
Italy/Italian	VX225-UI	VX225-XI	VX255-VI	VX255-YI
Switzerland/French	VX225-UK	VX225-XK	VX255-VK	VX255-YK
Switzerland/German	VX225-UL	VX225-XL	VX255-VL	VX255-YL
Sweden/Swedish	VX225-UM	VX225-XM	VX255-VM	VX255-YM
Norway/Norwegian	VX225-UN	VX225-XN	VX255-VN	VX255-YN
France/French	VX225-UP	VX225-XP	VX255-VP	VX255-YP
Spain/Spanish	VX225-US	VX225-XS	VX255-VS	VX255-YS
Portugal/Portuguese	VX225-UV	VX225-XV	VX255-VV	VX255-YV
Australia, New Zealand/English	VX225-AZ/BZ/UZ	VX225-JZ/KZ/XZ	VX255-DZ/EZ/VZ	VX255-MZ/NZ/YZ

VXT 2000/2000+ with 17-inch Monitor

	17-inch Monochrome Integrated Monitor		VR417 Color Monitor	
Country/Language	**Thin**	**Thick/Twisted**	**Thick/Thin**	**Thick/Twisted**
U.S.,U.K./English	VX227-AA/BA/UA	VX227-JA/KA/XA	VX297-DA/EA/VA	VX297-MA/NA/YA
Canada/French	VX227-AC/BC/UC	VX227-JC/KC/XC	VX297-DC/EC/VC	VX297-MC/NC/YC
Belgium/Flemish	VX227-UB	VX227-XB	VX297-VB	VX297-YB
Denmark/Danish	VX227-UD	VX227-XD	VX297-VD	VX297-YD
U.K./English	VX227-UE	VX227-XE	VX297-VE	VX297-YE
Finland/Finnish	VX227-UF	VX227-XF	VX297-VF	VX297-YF
Germany/German	VX227-UG	VX227-XG	VX297-VG	VX297-YG
Holland/Dutch	VX227-UH	VX227-XH	VX297-VH	VX297-YH
Italy/Italian	VX227-UI	VX227-XI	VX297-VI	VX297-YI
Switzerland/French	VX227-UK	VX227-XK	VX297-VK	VX297-YK
Switzerland/German	VX227-UL	VX227-XL	VX297-VL	VX297-YL
Sweden/Swedish	VX227-UM	VX227-XM	VX297-VM	VX297-YM
Norway/Norwegian	VX227-UN	VX227-XN	VX297-VN	VX297-YN
France/French	VX227-UP	VX227-XP	VX297-VP	VX297-YP
Spain/Spanish	VX227-US	VX227-XS	VX297-VS	VX297-YS
Portugal/ Portuguese	VX227-UV	VX227-XV	VX297-VV	VX297-YV
Australia, New Zealand/English	VX227-AZ/BZ/UZ	VX227-JZ/KZ/XZ	VX297-DZ/EZ/VZ	VX297-MZ/NZ/YZ

VXT 2000/2000+ X Terminals *(continued)*

Step 1—Select Terminal *(continued)*

VXT 2000/2000+ with 19/20-inch Monitor

	VR319 Monochrome Monitor		VR320/VRC20 Color Monitor		VR319 Grayscale Monitor	
Country/Language	**Thick/Thin**	**Thick/Twisted**	**Thick/Thin**	**Thick/Twisted**	**Thick/Thin**	**Thick/Twisted**
U.S., U.K./English	VX219-AA/BA/UA	VX219-JA/KA/XA	VX259-DA/EA/VA	VX259-MA/NA/YA	VX259-GA/HA/WA	VX259-RA/SA/ZA
Canada/French	VX219-AC/BC/UC	VX219-JC/KC/XC	VX259-DC/EC/VC	VX259-MC/NC/YC	VX259-GC/HC/WC	VX259-RC/SC/ZC
Belgium/Flemish	VX219-UB	VX219-XB	VX299-VB	VX299-YB	VX259-WB	VX259-ZB
Denmark/Danish	VX219-UD	VX219-XD	VX299-VD	VX299-YD	VX259-WD	VX259-ZD
U.K./English	VX219-UE	VX219-XE	VX299-VE	VX299-YE	VX259-WE	VX259-ZE
Finland/Finnish	VX219-UF	VX219-XF	VX299-VF	VX299-YF	VX259-WF	VX259-ZF
Germany/German	VX219-UG	VX219-XG	VX299-VG	VX299-YG	VX259-WG	VX259-ZG
Holland/Dutch	VX219-UH	VX219-XH	VX299-VH	VX299-YH	VX259-WH	VX259-ZH
Italy/Italian	VX219-UI	VX219-XI	VX299-VI	VX299-YI	VX259-WI	VX259-ZI
Switzerland/ French	VX219-UK	VX219-XK	VX299-VK	VX299-YK	VX259-WK	VX259-ZK
Switzerland/ German	VX219-UL	VX219-XL	VX299-VL	VX299-YL	VX259-WL	VX259-ZL
Sweden/Swedish	VX219-UM	VX219-XM	VX299-VM	VX299-YM	VX259-WM	VX259-ZM
Norway/Norwegian	VX219-UN	VX219-XN	VX299-VN	VX299-YN	VX259-WN	VX259-ZN
France/French	VX219-UP	VX219-XP	VX299-VP	VX299-YP	VX259-WP	VX259-ZP
Spain/Spanish	VX219-US	VX219-XS	VX299-VS	VX299-YS	VX259-WS	VX259-ZS
Portugal/Portuguese	VX219-UV	VX219-XV	VX299-VV	VX299-YV	VX259-WV	VX259-ZV
Australia, New Zealand/English	VX219-AZ/BZ/UZ	VX219-JZ/KZ/XZ	VX259-DZ/EZ/VZ	VX259-MZ/NZ/YZ	VX259-GZ/HZ/WZ	VX259-RZ/SZ/ZZ

VXT 2000/2000+ with 21-inch Diamondtron Monitor

	VR421 Color Monitor	
Country/Language	**Thick/Thin**	**Thick/Twisted**
U.S., U.K./English	VX69T-DA/VA	VX69T-MA/YA
Canada/French	VX69T-DC/ VC	VX69T-MC/YC
Belgium/Flemish	VX69T-VB	VX69T-YB
Denmark/Danish	VX69T-VD	VX69T-YD
U.K./English	VX69T-VE	VX69T-YE
Finland/Finnish	VX69T-VF	VX69T-YF
Germany/German	VX69T-VG	VX69T-YG
Holland/Dutch	VX69T-VH	VX69T-YH
Italy/Italian	VX69T-VI	VX69T-YI
Switzerland/ French	VX69T-VK	VX69T-YK
Switzerland/ German	VX69T-VL	VX69T-YL
Sweden/Swedish	VX69T-VM	VX69T-YM
Norway/Norwegian	VX69T-VN	VX69T-YN
France/French	VX69T-VP	VX69T-YP
Spain/Spanish	VX69T-VS	VX69T-YS
Portugal/Portuguese	VX69T-VV	VX69T-YV
Australia, New Zealand/English	VX69T-DZ/VZ	VX69T-MZ/YZ

VXT 2000/2000+ X Terminals *(continued)*

Step 2—Software Licenses

One software license per VXT 2000/2000+ is required.

QL-XNGA9-AA VXT software license

Step 2a—Optional Software License

QL-0QTA9-AA VXT 3270 Terminal Emulator License

Step 3—Media and Documentation/InfoServer 1000 VXT

Select media and documentation kit for one of the following systems.

Step 3a—Host Media and Documentation

QA-XNGAB-H* OpenVMS systems
QA-XNGAC-H* ULTRIX systems
QA-XNGAD-HP UNIX systems—QIC media
QA-XNGAE-HP UNIX systems—DAT media
QA-XNGAK-H8 OSF/ULTRIX systems—CD-ROM
QA-XNGAD-HA UNIX Systems—Magtape

Note: * denotes media type: A = magtape; 5 = TK50; 8 = CD-ROM

Step 3b—Server Media and Documentation

VXT 2000/2000+ media and documentation for existing InfoServer 100, InfoServer 150, or InfoServer 1000 VXT.

Note: Select media and documentation based on primary host system. Media kits include CD-ROM and media type selected.

QA-XNGAF-H* For OpenVMS systems
QA-XNGAG-H* For ULTRIX systems
QA-XNGAH-H* For UNIX systems
QA-XNGAH-HP For UNIX systems—QIC media
QA-XNGAJ-HP For UNIX systems—DAT media
QA-XNGAL-H8 For ULTRIX/OSF systems—CD-ROM

Note: * denotes media type: A = magtape; 5 = TK50; 8 = CD-ROM

Step 3c—InfoServer 1000 VXT

InfoServer 1000 VXT is preconfigured with VXT software.

SEAV*-AA/AE InfoServer 1000 VXT with no CD-ROM
SEAV*-DA/DE InfoServer 1000 VXT with one RRD43 CD-ROM

Note: * denotes Ethernet connection: B = ThinWire; C = thick wire

VXT 2000/2000+ X Terminals *(continued)*

Step 4—802.3/Ethernet Cables

Order one 802.3/Ethernet cable per VXT 2000/2000+.

BNE4C-XX	Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-XX	Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-XX	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)
BC16M-XX	ThinWire 802.3/Ethernet cable (xx = 06/15/30 refers to length in feet)

Step 5—Memory

The VXT 2000/2000+ ships standard with 4 Mbytes of memory, expandable to a maximum of 18 Mbytes of memory in 2- and 4-Mbyte increments. If additional memory is required for any VXT 2000/2000+ two-box system, a memory controller board (VX20X-MA) must be ordered. This memory controller board has 2 Mbytes of memory on board plus three slots to accommodate additional memory SIMMs. Additional memory can be added, as required, in 2-and 4-Mbyte increments to reach a system total of 18 Mbytes.

VX20X-MA	2-Mbyte memory controller board
MS200-AA	2 Mbytes of additional memory
MS200-BA	4 Mbytes of additional memory

VXT 2000: Minimum Memory Requirements
The following table summarizes the minimum memory requirements for each VXT 2000/2000+ variant. For server-based VXT 2000/2000+ terminals without the DECimage option, no additional memory is necessary.

	Boot from InfoServer	Boot from Host System
Without DECimage option	4 Mbytes (standard configuration)	10 Mbytes
With DECimage option	6 Mbytes	12 Mbytes

Step 6—DECimage Option

The DECimage option is a customer-installable hardware option that provides hardware acceleration for bitonal document imaging.

VX20A-OP	DECimage option for two-box VXT 2000
VX20C-OP	DECimage option for 17-inch monochrome single-box VXT 2000

Note: The DECimage option is not available for the 15-inch monochrome single-box VXT 2000.

Step 7—NI Adapter Cards

Ethernet adapter cards are available for VXT 2000/2000+ systems.

VX20D-AA	Adapts from twisted pair to ThinWire
VX20D-BA	Adapts from ThinWire to twisted pair

VXT 2000/2000+ X Terminals *(continued)*

Step 8—VXT 2000+ Upgrades

High-performance, 8-plane text and graphics accelerator. Upgrades VXT 2000 to VXT 2000+.

Note: Upgraded monochrome systems will display grayscale.

VX25A-CA	VXT 2000+ upgrade kit for monochrome 17-and 19-inch monitors
VX25A-BA	VXT 2000+ upgrade kit for color 15-and 17-inch monitors
VX25A-AA	VXT 2000+ upgrade kit for color 19-inch, grayscale 17-and 19-inch monitors

Step 9—Alpha AXP Companion Packages

Preconfigured Alpha AXP systems with VXT 2000+ X terminals. All software, licenses, and hardware included. Choice of DEC OSF/1 AXP or OpenVMS operating systems. Can be expanded by adding more VXT 2000+ X terminals, additional host memory, or storage.

Alpha AXP Workstation Packages

Note: All Workstation Packages include monitor and two VXT 2000+ X terminals with 10 Mbytes of memory.

Order Number	Alpha AXP Workstation	Operating System	Size/Type of VXT Terminals
VX55A-EA	DEC 3000 Model 300LX	DEC OSF/1 AXP	15-inch, color
VX55B-EA	DEC 3000 Model 300LX	OpenVMS	15-inch, color
VX57A-FA	DEC 3000 Model 300LX	DEC OSF/1 AXP	17-inch, color
VX57B-FA	DEC 3000 Model 300LX	OpenVMS	17-inch, color
VX57A-EA	DEC 3000 Model 300X	DEC OSF/1 AXP	17-inch, color
VX57B-EA	DEC 3000 Model 300X	OpenVMS	17-inch, color
VX59A-EA	DEC 3000 Model 300X	DEC OSF/1 AXP	19-inch, color
VX59B-EA	DEC 3000 Model 300X	OpenVMS	19-inch, color
VX59C-EA	DEC 3000 Model 300X	DEC OSF/1 AXP	21-inch, Diamondtron, color
VX59D-EA	DEC 3000 Model 300X	OpenVMS	21-inch, Diamondtron, color

Alpha AXP Workgroup Packages

Note: All DEC 3000 AXP Workgroup Packages come with five VXT 2000+17-inch, color, X terminals with 4 Mbytes of memory, and InfoServer 1000 VXT.

VX57E-EA	DEC 3000 Model 800S	DEC OSF/1 AXP
VX57F-EA	DEC 3000 Model 800S	OpenVMS

Note: All DEC 2000 AXP Workgroup Packages come with three VXT 2000+ 15-inch, color, X terminals with 10 Mbytes of memory.

Order Number	Alpha AXP Server	Operating System
VX55D-DA	DEC 2000 Model 300	DEC OSF/1 AXP
VX55C-DA	DEC 2000 Model 300	OpenVMS

VXT 2000/2000+ X Terminals *(continued)*

Specifications

Physical Characteristics

System Box

Height	6.1 cm (2.4 in.)
Width	39.1 cm (15.4 in.)
Depth	36.8 cm (14.5 in.)
Weight	4.6 kg (10.15 lb)

Monitors (Monochrome)

	17-inch single-box	15-inch single-box (VR325)	19-inch (VR319)
Height	41.9 cm (16.5 in.)	36.9 cm (14.5 in.)	46.0 cm (18.0 in.)
Width	40.6 cm (16.0 in.)	37.5 cm (14.75 in.)	49.5 cm (19.5 in.)
Depth	39.4 cm (15.5 in.)	38.2 cm (15.0 in.)	45.7 cm (18.0 in.)
Weight	20.0 kg (44.0 lb)	14.6 kg (32.0 lb)	21.8 kg (48.0 lb)

Monitors (Color)

	15-inch (VR425)	17-inch (VR417)	19-inch (VR320)	20-inch (VRC20)	21-inch (VR421)
Height	37.2 cm	41.4 cm	46.0 cm	45.0 cm	49.3 cm
Width	37.0 cm	40.6 cm	49.5 cm	48.0 cm	49.4 cm
Depth	40.0 cm	45.0 cm	50.5 cm	48.0 cm	54.3 cm
Weight	13.5 kg	22.5 kg	29.0 kg	30.0 kg	37.0 kg

Dots-per-inch (dpi)	100
Orientation	Landscape (horizontal)
Resolution	1,280 x 1,024 (VR315, VRM17, VR319, VR320, VRC16) 1,024 x 768 (VR325, VR326)
Refresh rate	72 Hz
Video attributes	Reverse video, underline, bold, and blinking (can be selected individually or in any combination); 2-plane monochrome or 8-plane color/grayscale capability

Power Requirements

Line voltage	120/240 V
Voltage tolerance	88 to 132 Vrms/176 to 264 Vrms
Line frequency	50 - 60 Hz

Operating Environment

Temperature	10° to 40° C (50° to 104° F)
Relative humidity	10% to 90% noncondensing
Max. operating altitude	2.4 km (8000 ft)

Input Devices

Keyboards	Digital standard (LK401); WPS (LK402—Gold Key); UNIX (LK421); PC (LK443/LK444)
Mouse	Three-button mouse, 200 pulses per linear inch

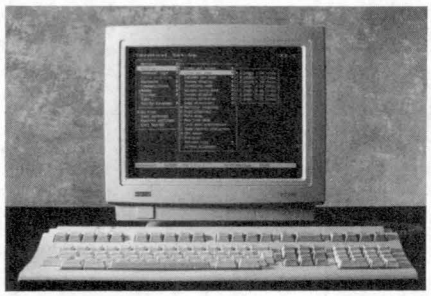
VXT 2000/2000+ X Terminals *(continued)*

Specifications *(continued)*

Operating System/Communication Environments

Operation	Operating System	Communication Protocol
Terminal Session	OpenVMS VAX V4.6	LAT, DECnet Phase IV
	OpenVMS AXP V1.5	LAT, DECnet Phase IV
	DEC OSF/1 AXP V1.2	Telnet, LAT
	ULTRIX V4.1 or later	LAT, Telnet, DECnet Phase IV
	AIX V3.1, V3.2	Telnet
	HP-UX V8.05	Telnet
	SCO UNIX V3.2	Telnet
	SUN Solaris 1.x, 2.x	Telnet
X Window Session	OpenVMS VAX V5.3-1 or later OpenVMS AXP V1.0	LAT (LATmaster recommended for performance improvements)
	DEC OSF/1 AXP V1.0	LAT, DECnet Phase IV
	ULTRIX V4.2	TCP/IP
	AIX V3.1,V3.2	TCP/IP, DECnet Phase IV
	HP-UX V8.5	TCP/IP
	SCO UNIX V3.2 REL 4 with ODT V2.0	TCP/IP
	SUN Solaris 1.x, 2.x	TCP/IP

VT510 Single-Session Text Terminals



The VT510 terminal is a low-cost, single-session terminal for the open enterprise. It supports more than 30 operating systems, ANSI/ASCII and PCTerm protocols, and 25 country languages. It also emulates 17 popular terminals, and offers both VT and PC-style keyboards.

Like every member of the video terminal family, the VT510 is highly reliable, and is ergonomically designed to provide ease of use and user comfort. Every VT510 model has complete programming functionality and supports all 70 keyboards and 25 country languages.

The VT510 is available in three basic models: North American, International, and International Low Emissions. North American and International models are available with green, amber, or paper-white phosphor. The International Low-Emissions model is available with white phosphor. All models are available for Northern or Southern Hemisphere.

Features

- Low cost, high reliability
- ANSI/ASCII and ANSI PCTerm, and ASCII PCTerm protocols
- 17 terminal emulations
- Supports more than 30 operating systems
- Dynamic Focus feature provides perfect focus at screen center, edges, and corners
- All keys programmable to eight levels, contents stored in 804 bytes, non-volatile RAM
- Supports 25 country languages
- Snap-in cartridge for easy firmware upgrades
- Offers both VT- and PC-style keyboards

Ordering Information

Select keyboard separately. A country kit is not required.

The VT510 North American models include the monitor and an attached power cord. The VT510 International and Low-Emissions models include the monitor and a detachable power cord.

Note: To order pallets of 45 units, order numbers should be preceded by "DL-" designation.

Order Number	Country/Region	Description
VT510-AA	North America	White, ASCII/ANSI/PCTERM text terminal, 120 V
VT510-BA		Green, ASCII/ANSI/PCTERM text terminal, 120 V
VT510-CA		Amber, ASCII/ANSI/PCTERM text terminal, 120 V
VT510-DA	North America International	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-EA	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FA		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KA	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-DX	Continental Europe	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-EX	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FX		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KX	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-GX	South America	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-HX	(Southern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-JX		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-NX	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-DD	Denmark	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-ED	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FD		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KD	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-DE	U.K./Ireland	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-EE	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FE		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KE	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V

VT510 Single-Session Text Terminals *(continued)*

Ordering Information *(continued)*

VT510-DT	Israel	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-ET	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FT		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KT	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-DK	Switzerland	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-EK	(Northern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-FK		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-KK	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-GZ	Australia	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-HZ	(Southern Hemisphere)	Green, ASCII/ANSI/PCTERM text terminal120–240 V
VT510-JZ		Amber, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-NZ	Low Emissions	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
	India/South Africa	
VT510-DJ	Northern Hemisphere	White, ASCII/ANSI/PCTERM text terminal, 120–240 V
VT510-GJ	Southern Hemisphere	White, ASCII/ANSI/PCTERM text terminal, 120–240 V

Keyboards (For All Models)

VT108 Keyboard	WPS 108 Keyboard	101/102 Keyboard	Language
LK411-AA	**LK412-AA**		English (U.S./U.K.)
		PCXAL-GA	English (U.S. only)
		PCXAL-GE	English (U.K. only)
LK411-AB	**LK412-AB**		Belgian/Flemish
		PCXAL-GB	Belgian
LK411-AC	**LK412-AC**	**PCXAL-GC**	Canadian/French
LK411-AQ	**LK412-AQ**	**PCXAL-GQ**	Canadian/English
LK411-AD	**LK412-AD**	**PCXAL-GD**	Danish
LK411-AF	**LK412-AF**		Finnish
LK411-AM	**LK412-AM**		Swedish
		PCXAL-JA	Finnish/Swedish
LK411-AG	**LK412-AG**	**PCXAL-GG**	German
LK411-AH	**LK412-AH**	**PCXAL-GH**	Dutch
LK411-AI	**LK412-AI**	**PCXAL-GI**	Italian
LK411-AK	**LK412-AK**	**PCXAL-GK**	Swiss/French
LK411-AL	**LK412-AL**	**PCXAL-GL**	Swiss/German
LK411-AN	**LK412-AN**	**PCXAL-GN**	Norwegian
LK411-AP	**LK412-AP**	**PCXAL-GP**	French
		PCXAL-GR	Latin America
LK411-AS	**LK412-AS**	**PCXAL-GS**	Spanish
LK411-AT		**PCXAL-GT**	Hebrew
LK411-AV		**PCXAL-GV**	Portuguese
LK411-BH		**PCXAL-HH**	Greek
LK411-BL		**PCXAL-HL**	Romanian
LK411-BP		**PCXAL-HP**	Polish
LK411-BQ		**PCXAL-HQ**	Hungarian
LK411-BH		**PCXAL-HT**	Russian
LK411-BV		**PCXAL-HV**	Czech
LK411-BU		**PCXAL-JU**	Turkish Q
LK411-BW	**LK412-BW**		Turkish F
LK411-BY		**PCXAL-HY**	SCS
LK411-CZ		**PCXAL-JZ**	Slovak

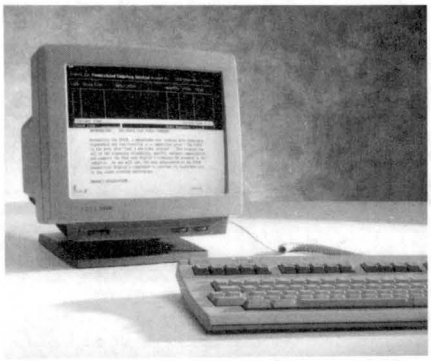
VT510 Single-Session Text Terminals *(continued)*

Specifications

Physical Characteristics						
	Monitor		**Keyboards (LK411/LK412)**			
Height	32 cm (12.6 in.)		4.8 cm (1.9 in.)			
Width	31.5 cm (12.4 in.)		47.0 cm (18.6 in.)			
Depth	33.0 cm (13.0 in.)		20.0 cm (8.0 in.)			
Weight	7.9 kg (17.4 lb)		1.6 kg (3.5 lb)			
Screen Characteristics						
Type	14-inch flat surface, anti-glare CRT, overscan					
Refresh rates	60/72 Hz					
Phosphors	Paper white (P192), amber (P194), green (P31). Low Emissions model available in paper white only					
Resolution	800 pixels x 432 scan lines					
Display format	Full screen of 24, 25, 26, 36, 42, 43, 48, 50 data lines					
Column/rows	80x24	132x24	80x36	132x36	80x48	132x48
	80x25	132x25	80x43	132x43	80x50	132x50
	80x26	132x26	80x53	132x53		
Cell size	10x16	6x16	10x10	6x10	10x8	6x8
Cell size @72 Hz with overscan	10x13	6x13	–	–	–	–
Status lines	1 per session, setup selectable					
Cursor selection	On/off, block/underline, blink/stedy					
Attributes	Normal, reverse, underline, bold, blink, double width, double height, double height/width					
Scrolling	Types: Vertical and horizontal Rates: Jump, scroll 2 (9 lines/sec), scroll 4 (18 lines/sec)					
Memory						
Page configuration	3 pages of VT ANSI or non-embedded ASCII6 pages of embedded ASCII					
Macro buffer	6,000 bytes					
Communication ports	EIA-232 25-pin port or DEC 423 6-pin MMJ port					
Speeds	300 to 115.2 baud					
Printer ports	Full bidirectional communication/printer ports with full modem support from 300 to 115.2K baud. Support Digital desktop printers, IBM Proprinter and compatible parallel interface printers					
Power cord/ Power supply	Detached, auto range 120–240 V; 88–264 V single phase, three-wire design; 47–63 Hz					
Standards	North American—FCC A, UL544, UL1950, CSA 22-2 #950, IEC950, ISO 9241-3 International—All N. American standards, as well as DEMKO, NEMKO, SEMKO, SETI (Nordic countries); FCC B, VDEB, VCCI, worldwide PTT approvals, GS International Low Emissions—All International standards, plus MPR II					
Environment						
	Operating		**Storage**			
Temperature	10° to 40° C (50° to 104° F)		–40° to 66° C (–40° to 151° F)			
Relative humidity	10% –90%		50% –95%			
Maximum wet bulb	28° C (82° F)		46° C (115° F)			
Minimum dew point	2° C (36° F)		No restrictions			
Maximum altitude	3,600 m (12000 ft)		4,900 m (16,000 ft)			
Power cord	Attached, 3-conductor grounded, 5-15P plug; detached for all International and Low Magnetic Field versions.					

* VT420 International and Low Magnetic Field models only

VT420 Text Terminal



The VT420 is a low-cost, dual-session text terminal with award-winning functionality and ergonomic design.

The VT420 terminal improves the standards set by the VT320 terminal by providing many enhancements, including a three-year warranty. Performance, ergonomics, and display features of the VT420 terminal improve application interaction, screen management, viewing comfort, and productivity. Fully formed fonts, higher resolution, overscan, and up to 48 displayable data lines allow text applications to be displayed with clarity and greater functionality comparable to more expensive desktop display devices.

Display characteristics, combined with commands for management of text windows, off-screen memory, and locally stored macros, can enhance the performance of interactive text applications such as online transaction processing, spreadsheets, database inquiries, and word processing.

Digital terminal servers or Session Support Utility software (an OpenVMS layered product) enable two simultaneous sessions to run through a single wire from the same or different hosts on the network. This saves the cost of installing a second wire and the cost of a second port. Two-wire dual sessions are also supported through the independent host communications ports. The user decides how to allocate the communication ports; one can be used for a printer, or both can be used for host communications.

In dual sessions, information can be viewed from each session simultaneously or one at a time with the "flip-screen" function. A total of 48 data lines plus two status lines can be displayed and the number of lines shown in each session on the screen can be adjusted.

Whether the terminal is in single-session or dual-session mode, information can be copied and pasted within and between sessions. Copy and paste are local functions and can be used with existing applications. The paste function sends the copied data to the receiving application as if it had been entered from the keyboard.

The VT420 terminal is fully supported by a complete range of operating systems and applications from Digital and other vendors. Any software that currently supports text-only terminals in the VT100/200/300 families, or the VT52 terminal, will support the VT420. VT420 terminals can be used with OpenVMS V5.3, as well as earlier releases of OpenVMS if they are set up with other VT terminal identification.

The VT420 terminal is available in three models: the North American, the international, and the international Low Magnetic Field (LMF). The North American version with an MMJ modular connector is suitable for most North American requirements where full modem control is not required. The international version includes an EIA-232 25-pin communications port and FCC Class B certification. The Low Magnetic Field version includes conformance to the Swedish Radioprotection Institute (SSI)requirement on low-frequency magnetic fields and low electrostatic fields, in addition to the standard features of the International model. See the *Video Terminals Comparison Chart* for more details.

Features

- 14-inch flat-faced, anti-glare CRT screen, available in paper-white, amber, or green phosphors
- 800 by 414 pixel resolution, 70-Hz refresh rate, and overscan
- Displays 24, 25, 36, or 48 data lines per session in 80 or 132 columns and six different font sizes per session
- Dual-sessions capability with choice of viewing each session independently in flip-screen mode or both simultaneously in split-screen mode
- Two on-screen status lines (one per session) plus a keyboard/session indicator line

VT420 Text Terminal *(continued)*

Features *(continued)*

- Local copy and paste within or between sessions
- Low-profile, narrow LK401 keyboard designed for user comfort and improved productivity provides two operating modes: a "novice" mode which is similar to the LK201, and a new "extended" mode that activates extended reports, a key position mode for alternate layouts, and the ability to take advantage of the new "ALT" keys functions
- Six pages of memory
- Text windowing features and local macros enable efficient implementation of forms management, pop-up menus, help, and dialog boxes for improved user interfaces
- Downloadable macro feature enables frequently used strings of text and control sequences to be stored and executed from a 12-Kbyte memory buffer (6 Kbytes per session). Up to 64 macros can be stored, with a nesting of 16 levels to permit fast screen updates and reduced network traffic
- Includes function keys "hold," "set-up," "print," and "switch session," as well as keys for copy/paste and paging. Applications can clear volatile memory, reset settings, access the terminal's unique serial number, and be informed if the operator attempts to enter dual sessions, or reset or repower the terminal

Ordering Information

The VT420 North American models include: monitor, keyboard (WPS or standard), attached power cord, legend strip, BC16E-10 communications cable and H8571-F adapter, and documentation.

The VT420 International and International LMF models include: monitor, keyboard (WPS or standard), detached power cord, legend strip, and documentation. (Does not include BC16E-10 communications cable and H8571-F adapter.)

Country/Region	Order Number	Description
North America	**VT420-AA**	White, text terminal, standard keyboard, 120 V
	VT420-BA	Green, text terminal, standard keyboard, 120 V
	VT420-CA	Amber, text terminal, standard keyboard, 120 V
	VT420-DA	White, text terminal, WPS keyboard, 120 V
	VT420-EA	Green, text terminal, WPS keyboard, 120 V
	VT420-FA	Amber, text terminal, WPS keyboard, 120 V
North America International	**VT420-GA**	White, text terminal, standard keyboard, 120–240 V
	VT420-HA	Green, text terminal, standard keyboard, 120–240 V
	VT420-JA	Amber, text terminal, standard keyboard, 120–240 V
	VT420-KA	White, text terminal, WPS keyboard, 120–240 V
	VT420-LA	Green, text terminal, WPS keyboard, 120–240 V
	VT420-MA	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SA**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TA**	White, text terminal, WPS keyboard, 120–240 V
Belgium (Flemish)	**VT420-AB**	White, text terminal, standard keyboard, 120–240 V
	VT420-BB	Green, text terminal, standard keyboard, 120–240 V
	VT420-CB	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DB	White, text terminal, WPS keyboard, 120–240 V
	VT420-EB	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FB	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SB**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TB**	White, text terminal, WPS keyboard, 120–240 V
Canada (French)	**VT420-AC**	White, text terminal, standard keyboard, 120–240 V
	VT420-BC	Green, text terminal, standard keyboard, 120–240 V
	VT420-CC	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DC	White, text terminal, WPS keyboard, 120–240 V
	VT420-EC	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FC	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SC**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TC**	White, text terminal, WPS keyboard, 120–240 V

VT420 Text Terminal (continued)

Ordering Information *(continued)*

Country/Region	Order Number	Description
Denmark	**VT420-AD**	White, text terminal, standard keyboard, 120–240 V
	VT420-BD	Green, text terminal, standard keyboard, 120–240 V
	VT420-CD	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DD	White, text terminal, WPS keyboard, 120–240 V
	VT420-ED	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FD	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SD**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TD**	White, text terminal, WPS keyboard, 120–240 V
U.K./Ireland	**VT420-AE**	White, text terminal, standard keyboard, 120–240 V
	VT420-BE	Green, text terminal, standard keyboard, 120–240 V
	VT420-CE	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DE	White, text terminal, WPS keyboard, 120–240 V
	VT420-EE	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FE	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SE**	White, text terminal, standard keyboard 120–240 V
Low Magnetic Field	**VT420-TE**	White, text terminal, WPS keyboard, 120–240 V
Finland	**VT420-AF**	White, text terminal, standard keyboard, 120–240 V
	VT420-BF	Green, text terminal, standard keyboard, 120–240 V
	VT420-CF	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DF	White, text terminal, WPS keyboard, 120–240 V
	VT420-EF	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FF	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SF**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TF**	White, text terminal, WPS keyboard, 120–240 V
Germany/Austria	**VT420-AG**	White, text terminal, standard keyboard, 120–240 V
	VT420-BG	Green, text terminal, standard keyboard, 120–240 V
	VT420-CG	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DG	White, text terminal, WPS keyboard, 120–240 V
	VT420-EG	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FG	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SG**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TG**	White, text terminal, WPS keyboard, 120–240 V
Netherlands	**VT420-AH**	White, text terminal, standard keyboard, 120–240 V
	VT420-BH	Green, text terminal, standard keyboard, 120–240 V
	VT420-CH	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DH	White, text terminal, WPS keyboard, 120–240 V
	VT420-EH	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FH	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SH**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TH**	White, text terminal, WPS keyboard, 120–240 V
Italy	**VT420-AI**	White, text terminal, standard keyboard, 120–240 V
	VT420-BI	Green, text terminal, standard keyboard, 120–240 V
	VT420-CI	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DI	White, text terminal, WPS keyboard, 120–240 V
	VT420-EI	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FI	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SI**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic field	**VT420-TI**	White, text terminal, WPS keyboard, 120–240 V
Switzerland (French)	**VT420-AK**	White, text terminal, standard keyboard, 120–240 V
	VT420-BK	Green, text terminal, standard keyboard, 120–240 V
	VT420-CK	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DK	White, text terminal, WPS keyboard, 120–240 V
	VT420-EK	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FK	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SK**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TK**	White, text terminal, WPS keyboard, 120–240 V

VT420 Text Terminal *(continued)*

Ordering Information *(continued)*

Country/Region	Order Number	Description
Switzerland (German)	**VT420-AL**	White, text terminal, standard keyboard, 120–240 V
	VT420-BL	Green, text terminal, standard keyboard, 120–240 V
	VT420-CL	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DL	White, text terminal, WPS keyboard, 120–240
	VT420-EL	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FL	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SL**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TL**	White, text terminal, WPS keyboard, 120–240 V
Sweden	**VT420-AM**	White, text terminal, standard keyboard, 120–240 V
	VT420-DM	White, text terminal, WPS keyboard, 120–240 V
Norway	**VT420-AN**	White, text terminal, standard keyboard, 120–240 V
	VT420-BN	Green, text terminal, standard keyboard, 120–240 V
	VT420-CN	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DN	White, text terminal, WPS keyboard, 120–240 V
	VT420-EN	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FN	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SN**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TN**	White, text terminal, WPS keyboard, 120–240 V
France	**VT420-AP**	White, text terminal, standard keyboard, 120–240 V
	VT420-BP	Green, text terminal, standard keyboard, 120–240 V
	VT420-CP	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DP	White, text terminal, WPS keyboard, 120–240 V
	VT420-EP	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FP	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SP**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TP**	White, text terminal, WPS keyboard, 120–240 V
South America/ Mexico	**VT420-AR**	White, text terminal, standard keyboard, 120–240 V
	VT420-BR	Green, text terminal, standard keyboard, 120–240 V
	VT420-CR	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DR	White, text terminal, WPS keyboard, 120–240 V
	VT420-ER	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FR	Amber, text terminal, WPS keyboard, 120–240 V
Spain	**VT420-AS**	White, text terminal, standard keyboard, 120–240 V
	VT420-BS	Green, text terminal, standard keyboard, 120–240 V
	VT420-CS	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DS	White, text terminal, WPS keyboard, 120–240 V
	VT420-ES	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FS	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SS**	White, text terminal, standard keyboard, 120–240 V
Low Magnetic Field	**VT420-TS**	White, text terminal, WPS keyboard, 120–240 V
Israel	**VT420-AT**	White, text terminal, standard keyboard, 120–240 V
	VT420-BT	Green, text terminal, standard keyboard, 120–240 V
	VT420-CT	Amber, text terminal, standard keyboard, 120–240 V
Portugal	**VT420-AV**	White, text terminal, standard keyboard, 120–240 V
	VT420-BV	Green, text terminal, standard keyboard, 120–240 V
	VT420-CV	Amber, text terminal, standard keyboard, 120–240 V
Australia/ New Zealand	**VT420-AF**	White, text terminal, standard keyboard, 120–240 V
	VT420-BF	Green, text terminal, standard keyboard, 120–240 V
	VT420-CF	Amber, text terminal, standard keyboard, 120–240 V
	VT420-DF	White, text terminal, WPS keyboard, 120–240 V
	VT420-EF	Green, text terminal, WPS keyboard, 120–240 V
	VT420-FF	Amber, text terminal, WPS keyboard, 120–240 V

VT420 Text Terminal *(continued)*

Accessories and Supplies

For more information, refer to the DEC*direct* catalog.

EK-VT420-RM	VT420 Programmer's Reference Guide
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
VSXXX-HA	DECwand bar code reader, 6-mil aperture, visible red light
VSXXX-HB	DECwand bar code reader, 8-mil aperture, visible red light
VT4XX-GF	VT420 anti-glare screen with static protection
VT3XX-SC	Video screen cleaner
LK4XX-KC	Clear, blank, full keyboard overlay (10/box)
LK4XX-KD	Clear, blank, numeric keypad overlay (15/box)
LK4XX-KH	KED/EDT numeric keypad overlay (10/box)
LK4XX-KJ	Blank keycap set (108/set)

Specifications

Physical Characteristics

	VT420 Terminal	LK401 Keyboard
Height	31.2 cm (12.3 in.)	4.5 cm (1.75 in.)
Width	31.5 cm (12.4 in.)	47.8 cm (18.8 in.)
Depth	33.0 cm (13.0 in.)	17.8 cm (7.0 in.)
Weight	8.5 kg (18.7 lb)	1.4 kg (3.0 lb)

Dual-Session Modes: Single or dual, independent set-up characteristics

Screen Characteristics

Type	14-inch flat-surfaced, anti-glare CRT, overscan					
Refresh rates	70 Hz, 60 Hz (selectable)					
Phosphors	Paper white (P192), amber (P194), or green (P31) Low					
	Magnetic Field model—paper white only					
Resolution	800 pixels x 414 scan lines					
Display format	Full screen of 24, 36, or 48 data lines, terminal indicator line, optional status line each session. Other formats of 25, 40, and 50 data lines depend on font size, page size, and status line display					
Column/rows:	80x24	132x24	80x36	132x36	80x48	132x48
Cell size	10x16	6x16	10x10	6x10	10x8	6x8
Character size	8x10	5x9	8x7	5x7	8x6	5x7
Status lines	1 per session, set-up selectable					
Cursor selection	On/off, block/underline, blink/steady					
Attributes	Normal, reverse, underline, bold, blink, double width, double height, double height/width					
Scrolling: Types	Vertical and horizontal on full display or within defined rectangular region					
Rates	Jump, scroll 2 (9 lines per second), scroll 4 (18 lines per second)					

Keyboard (LK401)

108 keys, tactile feel, full matte finish, sculptured key caps, volume selections for key click, margin bell, and warning bell

Modes	Novice and extended
Character location selections	Set-up choices for: greater than/less than (><),shift comma and period (, and .), tilde/single quote (~`), and escape (ESC)
Copy/paste	Up to a full screen of 24 lines by 132 columns can be copied within or between sessions
Function keys	15 shiftable to 30, 15 host programmable, 256 bytes per session

VT420 Text Terminal *(continued)*

Specifications *(continued)*

Local Memory: Single-Session Mode	
Page configuration	6 pages of 24 lines; 5 pages of 25 lines; 4 pages of 36 lines; 3 pages of 48 lines; 2 pages of 72 lines; 1 page of 144 lines
Macro buffer	6,000 bytes
Local Memory: Dual-Session Mode (per session)	
Page configuration	3 pages of 24 lines; 2 pages of 25 lines; 2 pages of 36 lines; 1 page of 48 lines; 1 page of 72 lines
Macro buffer	6,000 bytes per session
Addressable by	Page(s), rectangle(s), line(s), character(s)
Rectangular operations	Copy, fill, erase, change attributes, insert/delete columns
Character Sets: ASCII, DEC supplemental, DEC special graphics, ISO Latin-1, DEC technical, 7-bit NRCS*	
*International and Low Magnetic Field models only	
Communications	
Full-duplex asynchronous with selectable local echo full modem control.* 7-bit or 8-bit character length, 1 or 2 stop bits	
Speeds	300, 600, 1200, 2400, 4800, 9600, 19,200, and 38,400 baud (set-up selectable). Transmit and receive rates can be set separately.
Parity	Even, odd, none, even no-check (7-or 8-bit); mark, space (7-bit only), set-up selectable. Transmit and receive must be the same.
Interface	North American: 2 DEC-423 (MMJ) (1 as alternate printer port), 10-foot (3-meter) 25-pin adapter cable included; International and Low Magnetic Field: 1 DEC-423 (MMJ), 1 EIA-232 (25-pin), and 1 printer port (MMJ)
Printer Port: Full bidirectional communications; assignable to either session or shared between sessions; supports Digital desktop printers. May alternately be configured as second DEC-423 port for 2-wire dual session.	
Power Cord/Power Supply: North American—attached, 120 V; International and Low Magnetic Field—detached, auto range 120–240 V	
Standards: North American—FCC Class A certification, UL, CSA, IEC; International—FCC Class B, GS certification, UL, CSA, IEC, VDE-B; Low Magnetic Field—Swedish Radioprotection Institute (SSI) conformance on low-frequency magnetic fields and low electrostatic fields, FCC Class B, GS certification, UL, CSA, IEC, VDE-B	

Environment

	Operating	**Storage**
Temperature	10° to 40° C	–40° to 66° C
	(50° to 104° F)	(–40° to 151° F)
Relative humidity	10% –90%	50% –95%
Maximum wet bulb	28° C (82° F)	46° C (115° F)
Minimum dew point	2° C (36° F)	No restrictions
Maximum altitude	2,450 m (8000 ft)	4,900 m (16,000 ft)
Power cord	Attached, 3-conductor grounded, 5-15P plug; detached for all International and Low Magnetic Field versions.	

*VT420 International and Low Magnetic Field models only

VT420 with PCTerm Text Terminal



VT420 with PCTerm is a multi-personality video text terminal adapted to the needs of users in the UNIX and multi-user DOS markets. It is particularly suited to timesharing on INTEL 386/486-based computers using operating systems supplied by the Santa Cruz Operation (SCO) or multi-user DOS companies. This model will be of interest to other UNIX users or to users who prefer a PC-style keyboard.

VT420 with PCTerm includes the industry-standard enhanced 101/102 key PC-style keyboard and PCTerm capabilities. These include: the standard PC character set, 25-line presentation, and XPC XON/XOFF communications protocol. These additional capabilities adapt to operating systems such as SCO/UNIX, UNIX and multi-user DOS.

VT420 with PCTerm provides the user with dual sessions in PC (50 lines)and VT (48 lines) modes, copy and paste, rectangular area operations, and downline loadable macros. Session Support Utility (SSU) is supported in VT mode.

As a multi-personality terminal, the user can operate the terminal with two sessions in either mode:

- PCTerm Mode: This mode is adapted to the standards and expectations of UNIX and multiuser DOS operating system users.
- VT/PC mode: In this mode, VT420 with PCTerm can function as a standard VT420 terminal with a PC keyboard.

Features

- Displays 800-x 414-pixel resolution at a flicker-free 70-Hz refresh rate with full overscan
- Provides superior presentation clarity
- Provides more functionality than the standard VT420 in both the 80-and 132-column settings
- Multi-personality terminal emulation: PCTerm mode and VT/PC mode
- Includes PC character set and PC keyboard scan codes
- Term Cap/Term Info files are available for most popular UNIX operating systems
- 3-year return-to-factory warranty
- Complies with Swedish MPR II low emissions (LE) requirements

Ordering Information

VT420 PCTerm terminal includes paper white screen and international power supply. MPR II low emissions compliance is standard in all models.

VT42A-SA	U.S./English
VT42A-SB	Belgium/Flemish
VT42A-SD	Denmark/Danish
VT42A-SE	U.K., Ireland/English
VT42A-SF	Finland, Sweden/Finnish, Swedish
VT42A-SG	Germany, Austria/German
VT42A-SH	Holland/Dutch
VT42A-SI	Italy/Italian
VT42A-SK	Switzerland/French, German
VT42A-SN	Norway/Norwegian
VT42A-SP	France/French
VT42A-SS	Spain/Spanish
VT42A-SV	Portugal/Portuguese
VT42A-AZ	Australia, New Zealand/English

VT420 with PCTerm Text Terminal *(continued)*

Specifications

Physical Characteristics				
	Weight	**Height**	**Width**	**Depth**
Monitor Box	8.5 kg	31.2 cm	31.5 cm	33.0 cm
	(18.7 lb)	(12.3 in.)	(12.4 in.)	(13 in.)
Keyboard	1.4 kg	4.5 cm	4.78	19.1 cm
	(3 lb)	(1.75 in.)	(18.8 in.)	(7 in.)

Environment		
	Operating	**Storage**
Temperature	10° to 40° C (50°	–40° to 66° C (–40
	to 104° F) ° to 151° F)	
Relative humidity	10% to 90%	50% to 95%
Maximum wet bulb	28° C (82° F)	46° C (115° F)
Minimum dew point	2° C (36° F)	N/A
Maximum altitude	24,000 meters (8000 ft)	49,000 meters (16,000 ft)

Electrical	
Voltage	88 to 264 V –single phase, three wire
Frequency range	47 to 63 Hz
Power cord	Detached 3-conductor grounded, 5-15 plug

Specifications by Mode of Operation

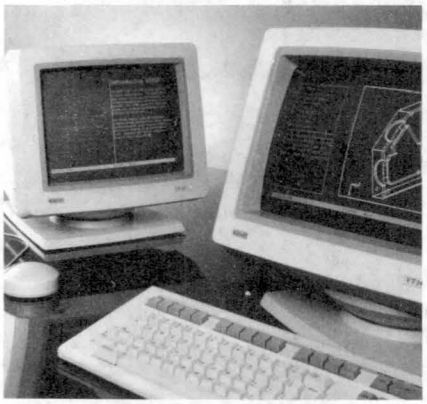
	Single Session		**Dual Session**		**Combined Dual Session**
Screen Characteristics	**VT/PC**	**PCTerm**	**VT/PC**	**PCTerm**	**VT/PC: PCTerm**
Display:					
Data lines per session	24/25/36/48/50	25	24/25/36/48/50	25	24/25/36/48/50:25
Session status line	Yes	No	Yes	No	Yes: No
Terminal indicator line	Yes	Yes	Yes	Yes	Yes: Yes
Page(s):					
Number of columns Rows	80/132	80	80/132	80	80/132:80
Pages per session	6	1	3	1	3:1
Advanced programming functions:					
Text windows (rectangular area op.)	Yes	Yes	Yes	Yes	Yes: Yes
Horizontal/vertical scrolling	Yes	Yes	Yes	Yes	Yes: Yes
Local macros	Yes	Yes	Yes	Yes	Yes: Yes
Redefinable characters sets (RDCS)	2	2	2	2	2:2
Programmable function keys:					
Number keys per session (UDKs)	48	N/A	48	N/A	48: N/A
Memory per session	1.5K	N/A	768 bytes	N/A	768: N/A
Dual sessions:					
Single wire	N/A	N/A	Yes	No	No: No
Dual wire	N/A	N/A	Yes	Yes	Yes: Yes
Split screen viewing:					
Lines per session	N/A	N/A	24–50	25	25:25
Dynamic viewing adjustment	N/A	N/A	Yes	No	Yes: No
Local copy/paste:					
Within session	Yes	No	Yes	No	Yes: No
Between sessions	N/A	N/A	Yes	No	No: No

VT420 with PCTerm Text Terminal *(continued)*

Specifications *(continued)*

Screen Characteristics	
Screen attributes: Cursor selection	On/off, block/underline, blink/steady
Attributes	Normal, reverse, underline, bold, blink, double width, double height, double height/width
Scrolling Types Rates	Vertical and horizontal on full display or within defined rectangular region Jump, scroll 2 (9 lines per second), scroll 4 (18 lines per second)
Keyboards LK443/LK444 (U.S./International)	101-or 102-key, tactile quality, full matte finish, sculptured key caps, volume selection for key click, margin bell, and warning bell
Local memory: Page configuration Macro buffer Page configuration Macro buffer	Single Session Mode: 6 pages of 24 lines; 5 pages of 25 lines; 4 pages of 36 lines; 3 pages of 48 lines; 2 pages of 72 lines; 1 page of 144 lines 6,000 bytes Dual Session Mode (per session): 3 pages of 24 lines; 2 pages of 25 lines; 2 pages of 36 lines; 1 page of 48 lines; 1 page of 72 lines 6,000 bytes
Addressable by	Page(s), rectangle(s), line(s), character(s)
Rectangular operations	Copy, fill, erase, change attributes, insert/delete columns
Character sets	ASCII, DEC supplemental, DEC Special Graphics, ISO Latin-1, DEC technical, 7-bit NRCS, PC International
Communications	Full-duplex asynchronous with selectable local echo and full modem control. 7-bit or 8-bit character
Speeds	300 to 38.4K Baud
Interface	One DEC-423 (MMJ), one EIA-232 25-pin, and one printer port (MMJ).
Printer port	Full bidirectional communications; assignable to either session or shared between sessions; supports Digital desktop printers. May alternately be configured in set up as second DEC-423 port for 2-wire dual session.
Power cord/power supply	Detached, auto range 120--240 V.
Standards	FCC class B, GS certification, UL, CSA, IEC, VDE-B. Low Emissions (LE)—Swedish Radioprotection Institute (SRI)conformance on low frequency magnetic fields and low electrostatic fields.

VT340+ Graphics Terminal



The VT340+ color graphics terminal provides high-resolution and high-quality fully-formed characters. The VT340+ has a 13-inch screen and can display up to 16 colors from a palette of 4096. It features a 25th status line. For operator viewing comfort, it includes a pedestal with tilt and swivel capabilities.

VT340+ terminals offer features such as a bidirectional printer port for connecting a local printer or an alternate input device and the ability to connect to more than one host over a single wire. Because they do not have cooling fans, they are quiet and their covers hide all cables to provide a clean appearance.

A MicroDIN connector is provided with the VT340+ terminal to connect an optional mouse or tablet which is supported in ReGIS and Tektronix 4010/4014 graphics modes.

Improved performance is due to Digital's graphics chipset, the same graphics processors used in Digital's high-end workstations. They offer full text and graphics capabilities including support for the ReGIS and Tektronix 4010/4014 graphics protocols.

VT340+ terminals offer a three-year warranty.

Ordering Information

Order Number	Country	Description
VT340-GA	U.S.	Color graphics terminal with standard keyboard, 120 V
VT340-KA		Color graphics terminal with WPS keyboard, 120 V
VT340-GB	Belgium	Color graphics terminal with standard keyboard, 240 V
VT340-KB		Color graphics terminal with English keyboard, 240 V
VT340-GC	Canada	Color graphics terminal with standard keyboard, 120 V
VT340-KC		Color graphics terminal with French WPS keyboard, 120 V
VT340-GD	Denmark	Color graphics terminal with standard keyboard, 240 V
VT340-KD		Color graphics terminal with English keyboard, 240 V
VT340-GE	U.K./Ireland	Color graphics terminal with standard keyboard, 240 V
VT340-KE		Color graphics terminal with WPS keyboard, 240 V
VT340-GF	Finland	Color graphics terminal with standard keyboard, 240 V
VT340-KF		Color graphics terminal with English keyboard, 240 V
VT340-GG	Germany/	Color graphics terminal with standard keyboard, 240 V
VT340-KG	Austria	Color graphics terminal with English keyboard, 240 V
VT340-GH	Holland	Color graphics terminal with standard keyboard, 240 V
VT340-KH		Color graphics terminal with English keyboard, 240 V
VT340-GI	Italy	Color graphics terminal with standard keyboard, 240 V
VT340-KI		Color graphics terminal with English keyboard, 240 V
VT340-GK	Switzerland	Color graphics terminal with standard keyboard, 240 V
VT340-KK	(French)	Color graphics terminal with English keyboard, 240 V
VT340-GL	Switzerland	Color graphics terminal with standard keyboard, 240 V
VT340-KL	(German)	Color graphics terminal with English keyboard, 240 V
VT340-GM	Sweden	Color graphics terminal with standard keyboard, 240 V
VT340-KM		Color graphics terminal with English keyboard, 240 V
VT340-GN	Norway	Color graphics terminal with standard keyboard, 240 V
VT340-KN		Color graphics terminal with English keyboard, 240 V
VT340-GP	France	Color graphics terminal with standard keyboard, 240 V
VT340-KP		Color graphics terminal with English keyboard, 240 V
VT340-GS	Spain	Color graphics terminal with standard keyboard, 240 V
VT340-KS		Color graphics terminal with English keyboard, 240 V
VT340-GV	Portugal	Color graphics terminal with standard keyboard, 240 V
VT340-KV		Color graphics terminal with English keyboard, 240 V
VT340-GZ	Australia/	Color graphics terminal with standard keyboard, 240 V
VT340-KZ	New zealand	Color graphics terminal with WPS keyboard, 240 V

VT340+ Graphics Terminal *(continued)*

Accessories and Supplies

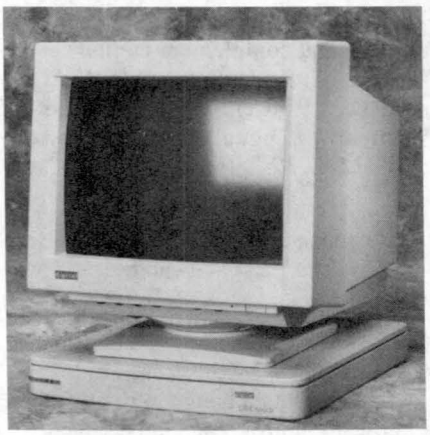
For more information, refer to the DECdirect catalog.

VSXXX-AA	Mouse pad
VSXXX-EB	Mouse
VSXXX-AB	Graphics tablet
VSXXX-HA	DECwand bar code reader, 6 mil aperture, visible red light
VSXXX-HB	DECwand bar code reader, 8 mil aperture, visible red light
VT3XX-XX	VT220/VT320 monitor arm
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

VT340+ Specifications

Physical Characteristics		
Height	36.83 cm (14.5 in.)	
Width	39.4 cm (15.5 in.)	
Depth	42.9 cm (16.9 in.)	
Weight	15.4 kg (34.0 lb)	
Screen Characteristics		
Type	13-inch convex anti-glare CRT	
Resolution	800 pixels x 500 lines	
Shades	16 colors from a palette of 4096	
Display format	Full screen, 24 lines plus 25th status line; vertical split screens for session 1 and 2; horizontal split screens (variable) for session 1 and 2	
Column/rows: Cell Size	80-column mode 10 x 20; 132-column mode 6 x 20	
Character Size	80-column mode, 8 or 9 x 11; 132-column mode, 4 or 5 x 9	
Local memory	Single session mode: 6 pages @ 24 lines; 4 pages @ 36 lines; 2 pages @ 72 lines; 1 page @ 144 lines Dual session mode: 3 pages@ 24 lines; 2 pages @ 36 lines; 1 page @ 72 lines Graphics storage: two full screen graphics images	
Operating Environment		
Temperature	10° to 40° C (50° to 104° F)	
Relative humidity	10% to 90%	
Altitude	9.1 km (30,000 ft)	
Power Requirements		
Voltage	120 V	240 V
Frequency	50–60 Hz	50–60 Hz
Phases	Single	Single
Current ac amps (maximum)	1.16	2.1
NEMA receptacle type	5-15R	5-15R
Heat dissipation	222 Btu/h	376 Btu/h
Thermal dissipation (Watts)	60	60

DECtouch Input Device



DECtouch is a new generation touch product that brings the simplicity of touch input to any PC monitor. It is installable in minutes on any PC running MS-DOS V5.0 or MS-Windows V3.1 or greater. When a monitor is placed on top of the DECtouch box, it is instantly converted into a touch input device.

DECtouch is a low profile peripheral that fits directly beneath a PC monitor and plugs into the PC serial port. Unlike other touch input products, there are no additional screens or sensors to install. DECtouch detects the touch of a finger or stylus on the display screen using internal force measurement sensors. There is no electronic connection to the monitor.

DECtouch enables users to interact with their computer applications by simply touching the screen where the information is displayed. Since DECtouch allows users to follow their natural instinct to point, it provides the most intuitive and easy-to-use interface for many computer applications.

Ordering Information

VSXTA-AA	DECtouch end-user option (U.S. only)

Specifications

Hardware	
Resolution	40 touch points per inch (x and y axes), 256 pressure levels
Stylus type	Any
Monitors supported	Any model, 12-inch through 19-inch, <90 lb
Data interface	EIA-232C DB9 serial port (1200–9600 baud)
Power supply	Input: 120 V/60 Hz/18 W Output: AC 12 V 1 Amp
Dimensions (h x w x d)	1.7 x 13.5 x 14.2 inches
Weight	15 lb
Certifications	UL, CSA, TUV, FCC Class B, VDE
MTBF	> than 80,000 hours (MIL-STD 217D)
Software	
Flexible coordinate modes	
Touchdown point mode	Returns the first coordinate after touch
Track mode	Returns all coordinates between touchdown and lift up
Touch up	Mode returns last point touched before lift up
Variable pressure sensitivity	Offers z-axis coordinate corresponding to level of pressure exerted by user
Variable touch threshold	Initial pressure threshold used to detect touch is under software control, allowing users to tailor responsiveness of system
Device emulation	Microtouch and Elographics emulation modes
Coexistence	Can be used concurrently with mouse (MS-Windows)
Operating system support	MS-DOS V5.0 and MS-Windows V3.1 or greater

2D and 3D Programmable Peripherals for CAD/CAM/CAE

The Lighted Programmable Function Keyboard (LPFK) and the Programmable Function Dials (PFD) are workstation peripherals that complement Digital's hardware and software solutions for the Computer-Aided Design (CAD) and Computer-Aided Engineering (CAE) markets. The LPFK and the PFD can be used either individually or simultaneously with any of Digital's OpenVMS or ULTRIX/RISC-based workstations through the EIA-232-D (formerly RS-232-C) serial port.

The Lighted Programmable Function Keyboard consists of 32 individually programmable pushbuttons. Each button has a built-in LED and can be programmed for specific application usage.

The Programmable Function Dial Box consists of eight valuator dials that rotate 360 degrees. The dials divide 360 degrees of rotation by 256 bits (each bit corresponds to approximately 1.4 degrees per incremental change in rotation). The function of each dial is defined by the application program and is typically used to rotate and translate screen images.

The Peripheral Control Module is an intelligent interface box that provides individual or simultaneous access for both the LPFK and the PFD by multiplexing these two peripheral devices to one common EIA-232-D serial port.

Features

- Fully compatible with all Digital workstations running OpenVMS or ULTRIX/RISC.
- Supported by DEC Programmers' Hierarchical Interactive Graphics System (DEC PHIGS) graphics standard. The PFD provides hardware for VALUATOR input and LPFK provides hardware for CHOICE input.
- Fully programmable LPFK and PFD to support a variety of applications.

Ordering Information

The following peripherals may be ordered either in a packaged format or as single units. These packages include the Peripherals Control Module (PCM), exercisers, power supply, cables, and user documentation.

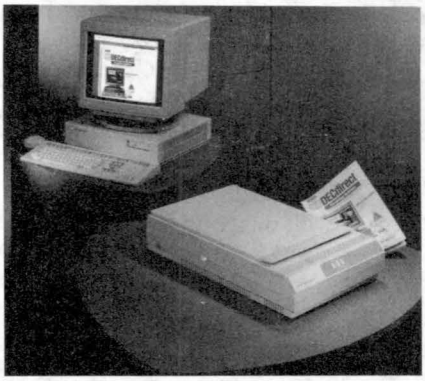
VSX10-AA/A3	Lighted Programmable Function Keyboard, 120 V/240 V
VSX20-AA/A3	Combination LPFK and PFD package, 120/240 V
VSX30-AA/A3	Programmable Function Dial box package, 120/240 V

The following single units include the unit with its integral cable.

VSXXA-KA	Lighted Programmable Function Keyboard and cable.Prerequisites: Peripheral control module and power supply.
VSXXA-DA	Programmable Function Dials and cable. Prerequisites: Peripheral control module and power supply
VSXXA-CA	Peripheral Control Module—includes cable to the workstation, user documentation, and exerciser. Prerequisite: power supply.
H7824-AA/AB	Power supply, 120/240 V.

Note: For additional information, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

MD30C Color Scanner



The MD30C is an affordable, desktop 300-dpi scanner that works with workstations and personal computers running software that transfers scanned data into computer files. The MD30C color scanner and associated software allow scanned- in data to be displayed on the computer screen, then modified, stored, or printed.

In color mode, the MD30C scanner scans full-color images to enhance office documents or create effective illustrations. It also provides accurate representations of black-and-white (bitonal or grayscale) hardcopy information, including photographs. The scanner offers 16.4 million shades of each color or up to 256 shades of gray.

The MD30C scanner works with DECimage Scan Software on workstations in OpenVMS VAX and RISC ULTRIX environments and with Image-In Color scanning software on PCs, to easily transfer scanned data into usable computer files. The scanning software then allows scanned images to be previewed, cropped, rotated, washed, inverted, or magnified.

On OpenVMS VAX and RISC ULTRIX platforms, DECimage character recognition software allows scanned-in hardcopy text to be converted to ASCII, PostScript, or Digital Document Interchange Format (DDIF) files. Scanned-in data can also be integrated into new or existing documents, or mailed electronically over the network. The MD30C scanner can also be used with CDA-compliant publishing software.

Features

- Captures text, line art, and photographs in original hardcopy form and transfers them into the computer system
- Offers color, grayscale and bitonal scanning to give accurate representation of all hardcopy images
- Provides affordable alternative to rekeying text or recreating artwork on the system
- Scans at 300 dpi in 10 seconds in bitonal mode, 37 seconds in grayscale mode, and 130 seconds in color mode
- Requires no special operator training

Prerequisites

Workstations

Hardware	Software
VAXstation 3100	OpenVMS V5.4-2 or later; ULTRIX
VAXstation 4000	V4.2 or later
DECstation 3100	DECwindows Motif V1.0
DECstation 5000	DECnet VAX V5.3-V5.5 Open (Phase IV monitor End Node) for remote
16 Mbytes of memory	Scanning and mail
RZ24 209-Mbyte disk drive	DECimage Scan Software for ULTRIX or OpenVMS V3.0
VT Series color	

Personal Computers

Hardware	Software
DECstation 320, 325, 333, 425	MS-DOS V3.3 or later; Microsoft
DECpc 333sx, 425sx, 433ST, 433dx, 450ST, 450d2, 466d2	Windows V3.0 or later
IBM PC compatibles	
2 Mbytes of memory (four recommended for editing color images)	
70 Mbytes of disk storage	
VGA, 8514, XGA or any Windows- compatible display with resolution of at least 640 x 480; 256-color or true-color; 24-bit display recommended	

MD30C Color Scanner *(continued)*

Ordering Information

Media and documentation kits need to be ordered for MD30C-AA, MD30C-BA, and MD30C-DA. MD30C-CA and MD30C-EA for PCs include Image-In Color software.

MD30C-AA	MD30C scanner for U.S./Canada; with OpenVMS license; for VARS and OEMs only
MD30C-BA	MD30C scanner for U.S./Canada; with OpenVMS license
MD30C-CA	MD30C scanner for U.S./Canada; with Image-In Color and OCR software
MD30C-DA	MD30C scanner for U.S./Canada; with RISC ULTRIX license
MD30C-EA	MD30C scanner for U.S./Canada; with Image-In Color software, OCR software, and SCSI interface and cable

Note: For international models, replace last A with: D = Denmark; E = U.K./ Ireland; I = Italy; J = Japan; K = Switzerland; T = Israel; Z = Australia/ New Zealand; X = Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden

Accessories

MD3XC-HA	Fluorescent bulb, 8 watts
BC19J-06	SCSI cable for PCs, VAXstation 4000
BC09D-06	SCSI cable for DECpc, DECstation 5000
PCTAZ-AA	16-bit SCSI adapter for PCs

Note: When ordering the MD30C scanner, verify that SCSI interface is required. Some systems include the SCSI interface

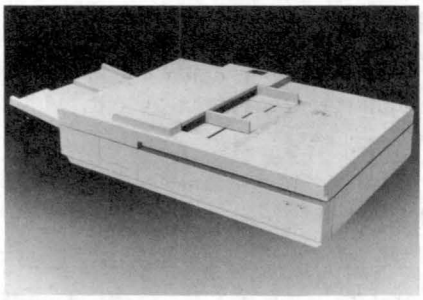
Specifications

Physical Characteristics	
Height	120 mm (4.7 in.)
Width	353 mm (13.9 in.)
Depth	545 mm (21.5 in.)
Weight	11 kg (24 lb)
Performance Characteristics	
Resolution	Up to 300 dpi
Scanning speed	Bitonal (10 s); grayscale (37 s); Color (130 s)
Document size	Up to 8.5 x 14 in. (216 mm x 356 mm)
Operation mode	Bitonal, 8-bit grayscale, 24-bit color
Interface	SCSI-2
Operating Environment	
Noise level	< 55 dBA
Operating temperature	10° to 40° C (50° to 104° F)
Relative humidity	35% to 80%
Power consumption	40 Watts
Regulatory compliance	UL, CSA, FCC, VDE, VCCI, ZZF

Cable Configuration Chart

CPU	Interface Cable	SCSI Adapter (for PCs without SCSI Port)
VAXstation 3100/DECstation 3100	BC56H-06	None
VAXstation 4000	BC19J-06	None
DECstation 5000	BC09D-06	None
DECpc 333sx, 425sx, 433dx, 450d2, 466d2	BC19J-06	PCTAZ-AA
DECstation 433st, 450st, 452st, 466st BC19J-06	BC19J-06	PCTAZ-AB
Industry-standard PCs	BC19J-06	PCTAZ-AA

MD410 Document Image Scanner



The MD410 is a departmental document scanner. The MD410 product is a SCSI, grayscale, 15-page-per-minute (at 200 dots per inch), desktop, document image scanner with automated document feeder (ADF). It is manufactured by Ricoh and distributed by Digital for use with DECimage compatible software solutions to address customer needs in the document image management market.

With an image capture capability (VAXstation or DECstation plus MD410 scanner and DECimage scanning software), information on paper---photographs, line drawings, business forms, engineering sketches, etc.---can be entered into the computer-based information system of the workgroup, department, or enterprise.

The software features pull-down menus and windows, and uses keyboard and mouse input for easy operation. This capability not only scans images but also accepts any image file that conforms to Digital's Document Interchange Format (DDIF).

Once scanned into the system, the image can be displayed on the workstation, modified, stored, mailed electronically, or incorporated into compound documents using DECwrite, VAX DOCUMENT, or a number of third-party compound document editors. It can be used across all industries where there is a requirement to reduce manual paper-intensive operations into automated, image-capable electronic applications.

Features

- Customer installable
- Scanning system: stationary flat bed
- Simplex scanning
- Scanning area: maximum of B size paper (11-inch x 17-inch)
- 50-page automatic document feeder (ADF) for 3-inch x 5-inch to 11-inch x 17-inch documents
- Maximum 15 pages per minute at 200 dpi
- Up to 17,000 pages/month per scanner
- Bitonal and grayscale scanning
- Grayscale: 8 bits per pixel (256 gray levels)
- 75 to 400 dots per inch (dpi) resolution
- Optional hardcopy endorser
- SCSI-2 interface
- Onboard compression

Compatible Applications/Solutions

The MD410-AA scanner is compatible with DECimage Application Services (DAS)V3.0 development toolkit and with the following available DECimage software applications/solutions:

- **Standalone**—The MD410 scanner can be used to capture images with a single- user software application called DECimage Scan Software (DSS).

  The DECimage Scan Software product is a windows-based application for customers who want to operate their MD410 from a VAXstation or DECstation. Images captured and adjusted with DSS are stored in DDIF-compatible files which can be used by other applications (e.g., DECwrite) that use image data.

- **DECimage EXpress**—The MD410 is the primary input device for the multiuser document image management software solution, DECimage EXpress.

DECimage EXpress is Digital's first preconfigured OpenVMS document image management system which uses a combination of standard and custom hardware and software products to satisfy both development and production workgroup needs.

MD410 Document Image Scanner *(continued)*

Performance

Performance is a function of two parameters: speed of the scanner and throughput capabilities of the workstation plus application(s) that drive the scanner. Most typical end-user configurations result in a throughput somewhere in the "nominal" range. The upper end of the throughput range is attainable only with the most streamlined configuration and scanner settings.

Testing configuration:	VAXstation 3100/40 with 16-Mbyte memory running OpenVMS V5.4 and DSS V2.1		
Settings:	Bitonal, scanner compression ON		
Images scanned:	Ten 8.5-x 11-inch pages using ADF mode		
Scanner resolution:	100 dpi	200 dpi	300 dpi
Nominal throughput:	17–14 ppm	15–11 ppm	10.5–10 ppm

Notes:

Average time/sheet calculated, high and low times discarded, translated to pages per minute.

Throughput is defined as scanning the documents and storing the compressed image on internal disk.

Some scanner features (e.g., endorser, grayscale, uncompressed scanning) will significantly slow scanner throughput below the nominal range.

Prerequisites

OpenVMS VAX Hardware

- VAXstation 3100 Models 30, 40, 38, 48, or 76 with one SCSI interconnect cable (BC56H: 68-pin to 50-pin), OR
- VAXstation 4000 Models VLC, 60, 90 with one SCSI interconnect cable (BC19J: 50-pin to 50-pin)
- 50-pin SCSI terminator
- For daisychaining; one BC19J—50-pin to 50-pin interconnect cable

OpenVMS VAX Software

- OpenVMS VAX V5.5-2
- DECimage Scan Software V3.0 for VMS plus associated prerequisites, OR
- DECimage EXpress plus associated prerequisites, OR
- DECimage Application Services V3.0 for VMS

DECstation/ULTRIX Hardware

- DECstation 5000 Model 200
- 50-pin SCSI terminator
- SCSI interconnect cable (BC09D: 68-pin to 50-pin)
- For daisychaining; one BC19J—50-pin to 50-pin interconnect cable

DECstation/ULTRIX Software

- ULTRIX V4.2a
- DECimage Scan Software V3.0 for ULTRIX plus associated prerequisites

Ordering Information

MD410-AA	MD410 document image scanner, includes 120 V power cord; requires prerequisite hardware
MD410-A3	MD410 document image scanner; requires prerequisite hardware, and 240 V power cord from the following list:
BN19P-1K	U.S., Canada power cord for MD410-A3
BN19A-2E	U.K., Ireland power cord for MD410-A3
BN19W-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden power cord for MD410-A3
BN19E-2E	Switzerland power cord for MD410-A3
BN19K-2E	Denmark power cord for MD410-A3
BN19Z-2E	Italy power cord for MD410-A3
BN19U-2E	Israel power cord for MD410-A3

MD410 Document Image Scanner *(continued)*

Accessories and Supplies

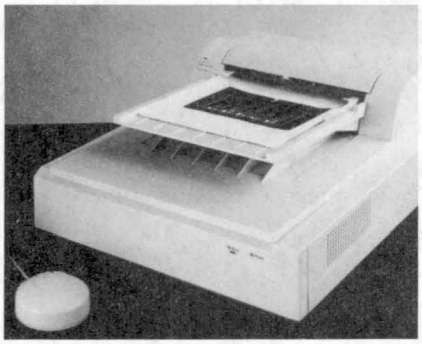
MD41X-EA	Programmable hardcopy endorser for MD410-AA/A3; allows documents to be endorsed after scanning, prints up to 19 characters on each scanned page.
MD41X-RA	5-pack of replacement rollers for MD41X-EA endorser
MD41X-LA	Lamp replacement for MD410-AA/A3
MD41X-SA	User-replaceable separation roller

Specifications

Physical Characteristics	
Height	18 cm (7.1 in.)
Width	69.8 cm (27.5 in.)
Depth	50 cm (19.7 in.)
Weight	38.2 kg (84 lb)
Power Requirements	
Voltage	120 V
Frequency	45–65 Hz
Phases	1
Current ac amps (maximum)	1.5
Thermal dissipation (Watts)	123
Thermal dissipation (Btu/h)	420
Operating Environment	
Temperature	5° to 35° C (41° to 98° F)
Relative humidity	30% to 85%

Note: For additional information on the MD410, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

MD400 Document Image Scanner



The MD400 is a workgroup document scanner for use with DECimage-compatible software solutions. It is a SCSI, grayscale, 6-to 8-page-per-minute desktop, document image scanner for use with VAXstation 3100 Models 30, 40, 38, 48, and 76. An optional automatic document feeder (ADF) is available.

The MD400 is compatible with two currently available DECimage software applications:

- **Standalone**—The MD400 as a standalone image capture device with a single user software application, called DECimage Scan Software (DSS).
- **DECimage EXpress**—The MD400 is an image-capture device for the multiuser document image management software solution called DECimage EXpress V1.0.

Features

- Customer installable
- Scanning system: stationary flat bed
- Simplex (single-sided) scanning
- Scanning area: maximum 8.5 x 14 inches
- Optional 30-page automatic document feeder
- Speed: 7 pages per minute at 300 dots per inch
- Volume: Up to 1000 pages/month per scanner
- Bitonal and grayscale scanning
- Resolution: 75 to 400 dots per inch
- Interface: SCSI

Note: For a custom quote or additional information, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990.

Printers

Overview

The DECprint Architecture is Digital's model for printing. It meets the needs for distributed printing and for management of a variety of printers. The DECprint Architecture supports the ANSI and ISO DPA standards and the defacto industry standard, PostScript page description language, used on Digital's printers. It also supports other page description languages.

Through a wide range of print services, the DECprint Architecture provides standardized software interfaces to the printing system, which enable application developers, OEMs, and ISVs to add new features. Third parties conforming to industry standards can connect directly to the Digital printing system.

The DECprint Architecture offers the following features:

- Integrates networked, heterogeneous systems (OpenVMS, DEC OSF/1 AXP, Windows NT, AS/400, NetWare, UNIX, MS-DOS, Macintosh, and OS/2) and their printers into a single printing system.
- Simplifies the user's interface to the printing system.
- Simplifies the programming interface to the printing system through standardized software interfaces.
- Simplifies the configuration and management of the printing system for system managers.

Note: Within the DECprint Architecture, printers should be selected based on the user and system environments and the network interconnection. Printers must be considered part of the whole system and not just as peripherals.

The following are conditions that must be considered before deciding whichprinter best fits a given application:

- Number of users and their locations
- Types of tasks to be performed
- Amount of floor space or table space available
- Computers to which printers connect
- Geographic location of computers
- Low cost per page (PrintServers) vs. user convenience (desktop printers)
- Method of interconnection among computers
- Type and size of documents printed
- Need for duplex (two-sided) printing
- Need for multiple images on a single side
- Need for multiple and/or mixed forms (letterhead, envelopes, overhead transparencies, etc.)
- How quickly printouts are needed
- Volume of printing (pages per month)
- User care at specific print volume intervals

Consider these printing requirements when selecting a printer from the following technologies:

Nonimpact Printers	Impact Printers
Electrophotographic	Dot-matrix
Laser (PrintServers and desktop)	Line dot-matrix
Ink-jet	
Thermal	

KODAK 1392 Printer



The KODAK 1392 printer is a high-speed production printer that offers high-quality PostScript output and line printing functionality. With DECprint Supervisor for KODAK for OpenVMS (KPS), jobs can be submitted to the KODAK 1392 Model 44 from any computer that runs the OpenVMS operating system. It prints at up to 92 impressions per minute, single-sided or double-sided, and offers a high throughput rate of up to 1,000,000 pages per month.

In PostScript mode, the KODAK 1392 printer prints high-quality documents, incorporating both text and graphics for applications such as technical documentation, catalogs, and manuals. In line printer mode, it is ideal for business printing applications.

- 3500-sheet paper capacity
- 1,000,000 page-per-month throughput rate
- 300 x 300 dpi resolution
- Automatic cover and slipsheet insertion
- Chapterization
- Short, straight paper path lowers risk of paper jams
- Single-pass duplexing
- Advanced LED imaging for darker, more uniform blacks and extremely clean originals
- Offers network access via Distributed Queuing Service (DQS) software

Ordering Information

LPP01-AA/AB KODAK 1392 Model 44 Production Printer

Kodak 1392 Printer Specifications

Host Requirements

OpenVMS	
TCP/IP	DEC TCP/IP Services for OpenVMS
Parallel	Data Products
Print symbiont	DECprint Supervisor for KODAK for OpenVMS (KPS) DECprint Supervisor for OpenVMS (DCPS)
Recommended network support	Distributed Queuing Service (DQS)
Also compatible with:	Imprint Wollongong Excelan

Print and Performance Characteristics	
Printer type	Non-impact page printer
Printing process	Electrophotographic
Imaging source	LED array
Development method	Dry toner and developer
Resolution	300 x 300 dpi
Printing speed	Up to 92 impressions/minute
Duty cycle	Up to 1,000,000 pages per month
Warm-up time	Less than 6 minutes
Duplexing	Single pass (standard)

KODAK 1392 Printer *(continued)*

Paper	
Type	Cut sheet
Input/capacity	
Upper supply	1100 sheets of 20 lb bond
Lower supply	2500 sheets of 20 lb bond
Sizes	8.0 x 10 in.; 8.5 x 11 in., 8.5 x 14 in., A4, B4
Weights	Upper paper supply—16 lb bond to 110 lb index
	Lower paper supply—simplex: 16 to 32 lb; duplex: 16 to 28 lb optional
Output modes	Top exit—up to 500 sheets face up; finisher—up to 2000 sheets; stapling; offset stacking; slip sheeting; cover sheet insertion; separators
Font Library	
DECfonts Typeface Collection, Adobe Type 1 PostScript compatible outline fonts, plus other downloadable fonts	
Physical Characteristics	
Height	41 in. (104.1 cm) work surface
Length	58 in. (147.3 cm); add 30 in. for optional finisher
Width	31 in. (78.7 cm)
Weight	1100 lb (499.0 kg); add 450 lb for optional finisher
Power Requirements	
Voltage	120/240 V or 120/208 Vac
Current	35 amps
AC frequency	60 Hz, single phase
Power	Standby: 1200 W Operating: 2400 W
Heat level	Standby: 4100 Btu/hr Operating: 14,500 Btu/hr
Safety/Performance	
Meets or exceeds:	UL 478, CSA C22.2, No. 143; FCC Part 15, Subpart J. Class M
Environmental Characteristics	
Operating temperature	65° to 85° F (18° to 29°C)
Operating humidity	15% to 75% RH
Decibel range	Standby: 65 dBA Operating: 81 dBA

XEROX Production Print Systems

Product Description

The Xerox 4135, 4890, 4090, 4850 and 4050 are high-speed production printers that offer high performance, general purpose laser printing in cost effective systems. With the Xerox Print Management Facility, VMS version (XPMF-VMS), jobs can be submitted to the Xerox 4050 or 4090 print systems from any VAX processor that runs the OpenVMS V5.5 (or less) operating system. A third party connectivity enabler is required from VAX processors to the 4135, 4890, or 4850.

These print systems offer single-sided (simplex) or double-sided (duplex) printing. The 4135 offers printing at 600 dpi while the 4890 and 4850 offer highlight color printing. The 4090 and 4050 are monochrome simplex or duplex print systems.

Ordering Information

LPN1A-AA	50ppm, 300dpi, simplex/duplex, cut-sheet, laser print system
LPN1B-AA	90ppm, 300dpi, simplex/duplex, cut-sheet, laser print system
LPN1C-AA	50ppm, 300dpi, simplex/duplex, cut-sheet, laser print system with highlight color
LPN1D-AA	90ppm, 300dpi, simplex/duplex, cut-sheet, laser print system with highlight color
LPN1E-AA	135ppm, 600dpi, simplex/duplex, cut-sheet, laser print system

Host Requirements

OpenVMS

4135 - SPUR 534
4090 - XPMF (Requires OpenVMS V5.5) or SPUR 534
4890 - SPUR 534
4050 - XPMF (Requires OpenVMS V5.5) or SPUR 534
4850 - SPUR 534

Specifications

Print and Performance Characteristics

Printer type	Non-impact page printer
Printing process	Electrophotographic
Resolution	
4135	600 x 600 dpi
All others	300 x 300 dpi
Printing speed	
4135	Up to 135 impressions/minute
4090/4890	Up to 92 impressions/minute
4050/4850	Up to 50 impressions/minute
Duty cycle	
4135	Up to 2.5M pages per month
4090/4890	Up to 2.0M pages per month
4050/4850	Up to 750K pages per month
Image Capabilities	Simplex/duplex

XEROX Production Print Systems *(continued)*

Specifications *(continued)*

Paper			
Type	**Cut sheet**		
Input/capacity	Main Tray	Second Tray	High Capacity Tray
4135	1,100	600	5,200
4090/4890	1,000	500	2,000
4050/4850	1,000	500	2,000
Sizes			
4135	14.0 x 17.0 in.; A4, A3, JB4		
All	8.0 x 10 in.; 8.5 x 14 in., A4		
Output modes			
4135	Two high capacity stackers @ 2,500; One sample/purge @ 100		
4090/4890/4050/4850	Dual stackers @ 750 with offset stitcher/stacker @ 2000		
Forms	Created/stored electronically; merge with variable data as printed		

Physical Characteristics	**Width**	**Depth**	**Height**	**Weight**
4135 - Printer module with console	77.3	35.9	55.0	1,404
4090/4050				
System control module	48.0	28.5	41.0	430
Printer module	59.9	34.5	41.0	1,046
4890				
System controller	24.0	28.0	40.5	300
Printer module w/stacker	91.8	35.7	40.8	1,454
4850				
System controller	48.0	28.0	41.0	430
Printer module w/stacker	91.8	35.7	40.8	1,344

Power Requirements	
Voltage/Current	
4135	
System control module	208/240 (1 phase) or 208/220 V (2 phase); 60Hz, 15 amp
Printer module	120/208 or 120/240 V; 60Hz, 50 amp
4090	
System control module	120/208 or 120/240 V; 60Hz, 20 amp
Printer module	120/208 or 120/240 V; 60Hz, 30 amp
4050	
System control module	120/208 or 120/240 V; 60Hz, 20 amp
Printer module	120/208 or 120/240 V; 60Hz, 30 amp
4890	
System control module	208/240 (1 phase) or 208/220 (line 1 to line 2); 60Hz, 15 amp
Printer module	120/208 or 120/240 V; 60Hz, 30 amp
4850	
System control module	120/208 or 120/240 V; 60Hz, 10 amp
Printer module	120/208 or 120/240 V; 60Hz, 30 amp

Safety/Performance	
Agency Certification	UL, CSA, IEC 950, VDE 0871 and 0875, EEL 82/499, and CISPRII

Environmental Characteristics	
Operating temperature	68° to 76° F (18° to 29° C)
Operating humidity	35% to 55% RH
Decibel range	Meets the 70db(A) noise exposure limit

Nonimpact Printers—Laser

Printserver Family Overview

Digital's PrintServer systems are mid-range laser printers that connect directly to Ethernet and support the PostScript page description language by Adobe Systems Inc.

PrintServers enable any user on an Ethernet network to print text, graphics, halftones, and scanned images. Maximum print speeds are 17 pages per minute on the PrintServer 17/600, and 32 pages per minute on the PrintServer 32. PrintServer systems support a variety of the most popular operating systems. DOS and Apple Macintosh systems are supported through PATHWORKS software as well as third-party hardware and software products.

Digital's PrintServer family offers paper-handling features that provide greater productivity and user satisfaction. With the PrintServer family's large paper capacity, workgroups can print many documents without loading and unloading paper.

The right paper combination for print jobs can be obtained by loading the input trays with different paper sizes. The PrintServer provides for dynamic paper tray selection during print jobs. Most of the PrintServer systems have at least two user-selectable output trays.

The PrintServer family can print on a variety of paper and forms—including specified label stock, recycled paper, and transparencies. For special media, where a straight paper path is required, a side output tray is provided.

PrintServer systems bring sophisticated printing capabilities to a wide variety of users. Because they are shared through an Ethernet network, the PrintServer systems provide printing at a low cost per user. And because the PrintServer systems support a wide variety of operating systems, they can satisfy printing needs regardless of the desktop device that is used.

Features

- Connect directly to standard Ethernet networks (ThinWire, thick wire, and twisted pair), supporting both DECnet/OSI and TCP/IP environments
- Support DECconnect ThinWire networks with optional ThinWire Ethernet Station Adapter (DECXM)
- Full support for DECnet and TCP/IP printing coexists in a single PrintServer; no need for a dedicated printer for each protocol
- Printing support for OpenVMS, DEC OSF/1 AXP, Windows NT, ULTRIX, HP-UX, IBM AIX, NetWare, SCO UNIX, SCO UNIX/DECadvantage, SunOS, AT&T Unison, Solaris, Pyramid OSX, Sequent Dynix, Silicon Graphics IRIX, and Unisys System V systems on Ethernet networks; AS/400 systems on Token Ring networks
- Printing support for DOS systems with PATHWORKS for OpenVMS or PATHWORKS for ULTRIX software, or directly through Netware
- Printing support for Apple Macintosh systems with PATHWORKS for Macintosh software; third-party hardware and software solutions are also available: Mac connection using Cayman Systems, Inc. Gator Box or Shiva Fastpath to link AppleTalk to Ethernet; software from Alisa Systems, Inc., or Pacer software installed on OpenVMS network host (Cayman Systems, Inc., 617-494-1999; Shiva Corp., 800-458-3535; Alisa Systems, Inc., 818-792-9474; Pacer Software, Inc., 619-454-0565)
- PostScript page description language from Adobe Systems Inc. with 29 or 43 resident PostScript typefaces; optional typefaces for OpenVMS and ULTRIX clients also available. See product descriptions for DECfonts Typeface Collection and SoftFont at the end of this chapter
- PCL5, or HPIIIsi emulation is provided for Postscript Level 2 PrintServers with thirteen resident scalable typeface and bitmap font support
- Software translators enable printing of ANSI/Sixel, ReGIS, PCL, DDIF, CCITT Groups 3 and 4, and Tektronix 4010/4014 files; ASCII text only (UNIX)

PrintServer Printers *(continued)*

Features *(continued)*

- Access control utility allows system managers to have full control over who may or may not print to a particular PrintServer printer
- DECimage Plus resolution enhancement feature provides output appearance of 1000 dpi printer
- Capability to print multiple page images on a single side of paper with the "number-up" function helps reduce paper consumption
- Management utility allows system managers to monitor print job status and diagnose remotely from the desktop; also assists system managers in determining whether a printer is being under- or over-utilized.
- Per-job accounting utility allows system managers to monitor all access of a PrintServer and bill for printer usage
- Input tray Failover allows printer to automatically select media from an alternate input tray when selected tray becomes empty, allowing for longer, uninterrupted runtime.

If multiple platforms exist, the PrintServer family offers complete solutions for printing environments with moderate to heavy print volumes. The PrintServer family supports Digital's Network Application Support (NAS), enabling many types of systems to share printing facilities via DECnet or TCP/IP Ethernet networks.

PrintServer systems are ideal for department managers and information systems professionals who want the benefits of distributed network printing. The PrintServer family can satisfy a wide assortment of printing needs. Many users can share the same printer while using different applications—printing multiple formats on various sizes and types of media.

Equipped with PCL and the PostScript language, PrintServer systems can produce professional, complex documents, with multiple typefaces in a variety of sizes, weights, and styles, as well as rotated type, textures and patterns, halftones, and other images, in any size or shape. With the appropriate application software, PCL and the PostScript language can help eliminate the trouble and expense of dealing with outside vendors for conventional typesetting, paste-up, and printing tasks.

Because the PostScript language is device-independent, files can be printed on any PrintServer system, DEClaser printer, high-resolution typesetting system, and other printing devices that support the PostScript language.

Many applications supported by Digital take advantage of the power of the PostScript language. These include DECpage (supports simplex printing only at this time), VAX DOCUMENT, DECwrite (Digital's DECwindows-based compound document editor), DECpresent, and many CAD/CAM/CAE packages. Other applications written for the DECwindows operating environment also support the PostScript language, as well as third-party applications such as Technical Publishing Software (TPS) by Interleaf, Inc., Pager by Datalogics, Inc., PageMaker by Aldus, Inc., and Scribe by UNILOGIC, Ltd.

The unique advantage of Digital's network printing solution is that the PrintServer family can be shared across heterogeneous platforms. A diverse set of users working with different operating systems from different hardware platforms can share and print information without worrying about these differences.

The PrintServer system's intelligence resides in the software. New releases of PrintServer Software provide users with additional functions while protecting hardware investments.

PrintServer Software handles all of the system and print management functions, and provides the communication between a computer system with a print job and the PrintServer system. PrintServer software consists of two portions: supporting host and client.

PrintServer Printers *(continued)*

Printserver Software

One system on the network is designated as the supporting host. The supporting host loads the PrintServer Software into the PrintServer controller via the network, and performs management functions such as accounting for the PrintServer. Any system that sends print jobs directly to the PrintServer system or provides distributed printing services for other systems (remote spooling) is known as a *client*. There are typically many print clients per PrintServer printer.

Print Client Features

- Simplex/duplex/tumble printing
- Portrait/landscape orientation
- Input/output tray selection
- Media size selection
- Number-up print capability
- Forms/fonts selections
- ANSI, ASCII, Tektronix, Regis, DDIF, PCL translation selection

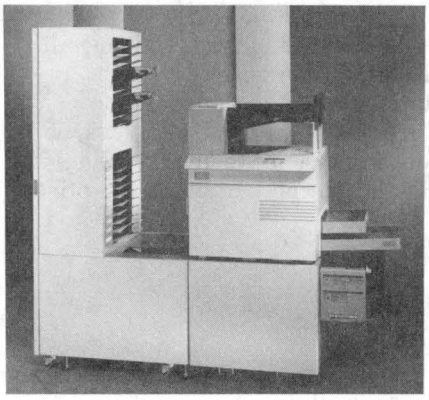
Supporting Host Features

- Postscript
- PCL intepreter
- Fonts
- Input Tray Failover
- Resolution enhancement operator, DECimage Plus
- Access Control utility
- Remote Management utility
- Centralized Accounting utility

New releases of PrintServer Software provide direct print access and management for many different platforms. This promotes a high degree of compatibility across operating systems and network protocols.

For Pre-sales assistance, in the U.S., call the Technical Consulting Center, 800-343-4040 or 603-884-4040.

PrintServer 32



The PrintServer 32 is a high-volume, departmental printer designed to be managed from the desktop. This powerful printer provides shared printing facilities for DECnet, TCP/IP Ethernet, and AS/400 Token Ring networks. It is intended to serve departments that print up to 150,000 pages per month.

The PrintServer 32 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 and PrintGate/32. 3000-sheet input and output trays allow for less frequent loading and unloading of paper. The MailBox option allows pre-sorting of individual and group print jobs, and provides locked trays for confidential material.

The PrintServer 32 is connected directly to Ethernet or AS/400 Token Ring networks, and uses PostScript, by Adobe Systems, Inc.

Ordering Information

LPS32-A*	PrintServer 32 simplex, 1500-input, 1500-output
LPS32-B*	PrintServer 32 simplex, 3500-input, 1500-output
LPS32-CA/CC/CJ/CZ	PrintServer 32 duplex, 1500-input, 1500-output
LPS32-DA/DC/DJ/DZ	PrintServer 32 duplex, 3500-input, 1500-output
LPS32-EA/EC/EJ/EZ	PrintServer 32 duplex, 3500-input, 4500-output
LPS32-GA/GC/GJ/GZ	PrintServer 32 duplex, 3500-input, 1500-output, MailBox
LPS32-H*	PrintGate/32 duplex, 1500-input, 1500-output, AS/400 Token Ring
LPS32-I*	PrintGate/32 duplex, 3500-input, 1500-output, AS/400 Token Ring

* 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

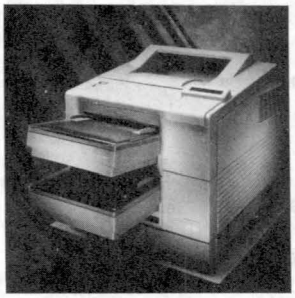
LPS3X-DA	PrintServer 32 duplex upgrade kit
LPS3X-FA/FC	20-bin MailBox with two locking trays (110/220 V)
LPS3X-BB	3000-sheet input tray
LPS3X-EA/EC	3000-sheet output stacker (110/220 V)
LPS3X-FD	Security tray for LPS32 MailBox
LN01X-AB	A size paper, 8.5 by 11.0 in., 5000 sheets (letter)
LN03X-AJ	A size transparencies, 8.5 by 11.0 in., 50 sheets
LPSXX-PA	B size paper, 11.0 by 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)

Software

For PrintServer Software information, see PrintServer Software section.

Note: PrintServer 32 and PrintGate/32 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's the latest in this family of powerful departmental network printers that support multivendor environments.

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.

Ordering Information

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-AA	PrintServer 17/600 toner cartridge
LPS1X-AB	PrintServer 17/600 customer maintenance kit, 110 V
LPS1X-AC	PrintServer 17/600 customer maintenance kit, 220 V/240 V
LPS1X-UB	PrintServer 17/600 duplex upgrade kit (requires 12 Mbytes total RAM)
LPS1X-UC	PrintServer 17/600 4-Mbyte memory upgrade
LPS1X-BA	PrintServer 17/600 1500-sheet input feeder, A size, 110 V
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*	PrintServer Software for OpenVMS VAX and OpenVMS AXP†
QA-0V9AB-H*	PrintServer Software for ULTRIX††
QA-0V9AC-H*	PrintServer Software for SunOS
QA-0V9AD-H*	PrintServer Software for HP-UX
QA-0V9AE-H*	PrintServer Software for IBM AIX
QA-0V9AF-H*	PrintServer Software for SCO UNIX
QA-0V9AG-H*	PrintServer Software for NetWare
QA-0V9AH-H*	PrintServer Software for NT
QA-0V9AJ-H*	PrintServer Software for DEC OSF/1 AXP
QA-0V9AK-H*	PrintServer Software for Solaris
QA-0V9AL-H*	PrintServer Software for AT&T Unison
QA-0V9AM-H*	PrintServer Software for SCO UNIX/DECadvantage
QA-0V9AN-H*	PrintServer Software for Pyramid OSX
QA-0V9AP-H*	PrintServer Software for Unisys System V
QA-0V9AQ-H*	PrintServer Software for Silicon Graphics IRIX
QA-0V9AR-H*	PrintServer Software for Sequent Dynix
QB-0V9AA-E*	PrintServer Source Kit for BSD-UNIX
QT-0V9-****	PrintServer Software Services

* denotes M = magtape, 8 = CD-ROM, 5 = TK50, P = QIC, P = DAT, C = 3.5-inch diskette, 7 = 5.25-inch diskette

† Supporting host only. For Print Client software for OpenVMS, refer to DECprint Supervisor (DCPS) for OpenVMS.

†† Supporting host only. For Print Client for ULTRIX, refer to ULTRIX operating system.

PrintServer 32/PrintGate/32 and 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: 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: 300 x 300 dpi for text, graphics, and images

PrintServer 17/600: 600 x 600 dpi for text, graphics, and images

Paper Handling

PrintServer 32: 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; LPS32 has optional 20-bin MailBox; 3000 sheet capacity input and output trays

* 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/PrintGate/32 and PrintServer 17/600 Specifications *(continued)*

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 (PrintServer 17/600 only)
ITC Bookman with light, demi, light italic, demi italic (PrintServer 17/600 only)
ITC Zapf Chancery with medium italic (PrintServer 17/600 only)
ITC Zapf Dingbats (PrintServer 17/600 only)

Optional Typefaces

SoftFont is a series of bitmap fonts emulating the same font families and sizes as the LN03 and DEClaser 2100 plus/2200 plus printers. Any member of Digital's PrintServer family that operates under DECprint Supervisor (DCPS)for OpenVMS V1.0 or later can use SoftFont.

DECfonts Typeface Collection is a set of PostScript Type 1 font kits that can be used on any Digital networked PostScript printer with applications such as DECwrite and DECpresent in ULTRIX or OpenVMS environments.

See SoftFont and DECfonts Typeface Collection product descriptions at the end of this chapter.

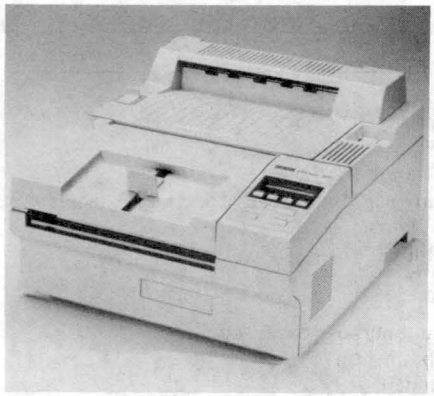
Font cache	256 Kbytes RAM
Postscript Virtual Memory (VM)	1 Mbyte

Note: DECfonts is available for OpenVMS and ULTRIX. It includes the Typeface Pack I fonts.

PrintServer 32/PrintGate/32 and PrintServer 17/600 Specifications *(continued)*

Physical Characteristics		
	PrintServer 32	**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)

DEClaser 1800 (LN11)



The DEClaser 1800 provides high quality and high performance in a desktop laser printer to support a PC computing environment. The printer is ideal for both personal or shared printing. The DEClaser 1800 offers excellent features and functionality to meet the needs of the most demanding of desktop users whether they be a single user or a component of a small work group.

- Support for PCL 5, IBM Proprinter XL-24e and Epson FX-850
- 300 dpi resolution with resolution enhancement for sharper output
- 34 resident fonts (26 bitmapped, 8 scalable)
- Single supplies cartridge for easy maintenance
- Serial and Centronics parallel interfaces (with "Hot Ports")
- 150-sheet input tray with ability to add optional 250 sheets
- Compliance with EPA "Energy Star" criteria
- Ships with customized PCL driver

Ordering Information

Power cord, custom PCL driver for Windows, toner cartridge and User's Manual are included with the printer.

LN11-CA	6ppm laser printer, 120 V, with power cord for U.S. and Canada
LN11-CB	6ppm laser printer, 240 V with power cord for Switzerland
LN11-CC	6ppm laser printer, 240 V with Central European power cord for Sweden, Finland, Norway, Spain, Portugal
LN11-CD	6ppm laser printer, 240 V with Central European power cord for Austria, Belgium, Holland, France, Germany
LN11-AD	6ppm laser printer, 240 V with power cord for Denmark
LN11-AE	6ppm laser printer, 240 V with power cord for UK/Ireland
LN11-AI	6ppm laser printer, 240 V with power cord for Italy
LN11-AT	6ppm laser printer, 240 V with power cord for Israel
LN11-AZ	6ppm laser printer, 240 V with power cord for Australia/New Zealand

Options, Accessories, and Supplies

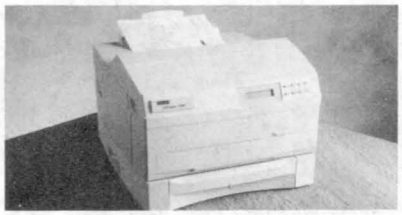
LN11X-AA	Toner/supplies cartridge kit - 6000 pages @ 5% coverage
LN11X-TF	2nd paper feeder cassette with letter paper cassette - 250 sheet
LN11X-TG	2nd paper feeder cassette with A4 paper cassette - 250 sheet
LN11X-TC	Letter size paper cassette - 250 sheet
LN11X-TA	A4 size paper cassette - 250 sheets
LN11X-TB	Legal size paper cassette - 250 sheet
LN11X-TO	Face up output tray - 20 sheets
LN11X-UC	1-Mbyte memory board upgrade
LN11X-UD	4-Mbyte memory board upgrade

DEClaser 1800 (LN11) *(continued)*

Specifications

Print Technology	Laser
Processor	AMD 29200
Resolution	300 x 300 with resolution enhancement
Speed	6 pages per minute
Monthly Usage	Up to 6,000 pages per month
Paper Types	Cutsheet (standard, European A4, executive and legal), labels, transparencies and envelopes
Paper Weights	Standard Paper 16-24 lbs Card Stock 24-41 lbs Recycled Paper 16-24 lbs
Paper Handling	Standard: 150 sheet multipurpose paper tray Optional: 250 sheet optional tray
Memory	Standard: 1 Mbyte standard Optional: 1 Mbyte and 4 Mbyte
Protocols	HP LaserJet III (PCL5), Epson FX-850, IBM ProPrinter XL-24e (with automatic emulation sensing)
Fonts	26 Bitmapped (Portrait, Landscape) Courier Medium (10, 12, 17 cpi) Courier Medium Italic (10, 12, 17 cpi) Courier Bold Upright (10, 12 cpi) Line Printer Medium Upright (16.67 cpi) Prestige Elite Medium Upright (12.20 cpi) Prestige Elite Medium Italic (12.20 cpi) 8 Scalable CG Times Medium (Upright, Italic, Bold Upright, Bold Italic) Universal Medium (Upright, Italic, Bold Upright, Bold Italic)
Interfaces	RS-232 C Serial Centronics Parallel (Automatic port sensing)
Physical Characteristics	
Height, Width, Depth	8.9 inches, 14.1 inches, 17.9 inches
Weight	19 lbs
Power Consumption	Meets EPA Energy Star specifications for energy efficiencies

DEClaser 3500 (LN14)



The DEClaser 3500 offers support for more business-class features than any other printer. Its laser technology with true 600 dpi resolution and resolution enchancement produces crisp, clean output with smooth gradations and crisp black text.

The DEClaser 3500 is an ideal printing solution for networked offices. Standard and optimal interface cards provide compatibility with PC, Macintosh, UNIX, and other propular networking topologies.

Features

- 600 dpi resolution with resolution enhancement for sharper output
- 7 Mbytes of RAM
- 53 resident fonts (35 Adobe PostScript Type 1, 13 TrueType, 5 Bitmap)
- 350-sheet input tray
- Switches automatically between Adobe PostScript Level 2 and HP-PCL5
- FAX capable for sending and receiving FAXes on plain paper
- DECimage software enhances sharpness and enables 256 gray levels

Ordering Information

DEClaser 3500 for Macintosh systems

LN14M-CA	US, Canada, Mexico
LN14M-AD	Denmark
LN14M-AE	UK/Ireland
LN14M-AG	Germany
LN14M-AI	Italy
LN14M-AS	Spain
LN14M-AT	Israel
LN14M-AZ	Australia/New Zealand
LN14M-CB	Switzerland
LN14M-CC	Sweden, Finland, Norway, Portugal
LN14M-CD	Belgium, France, Holland

DEClaser 3500 for Networked Offices

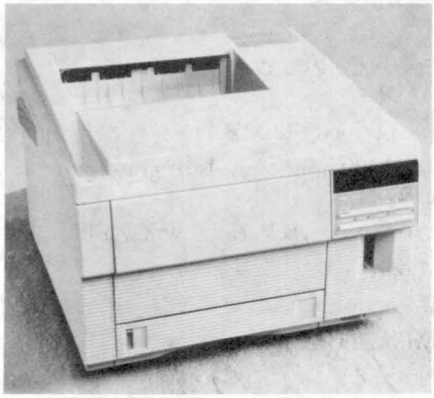
LN14N-CA	US, Canada, Mexico
LN14N-AD	Denmark
LN14N-AE	UK/Ireland
LN14N-AG	Germany
LN14N-AI	Italy
LN14N-AS	Spain
LN14N-AT	Israel
LN14N-AZ	Australia/New Zealand
LN14N-CB	Switzerland
LN14N-CC	Sweden, Finland, Norway, Portugal
LN14N-CD	Belgium, France, Holland

DEClaser 3500 (LN14) *(continued)*

Options, Accessories, and Supplies

LN141X-AA	Toner cartridge (4,500 page life)
LN14X-UD	4-Mbyte memory SIMM
LN14X-UE	8-Mbyte 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-XE	PostScript FAX for UK/Ireland
LN14X-XG	PostScript FAX for Germany
LN14X-XI	PostScript FAX for Italy
LN14X-XP	PostScript FAX for France
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

DEClaser 5100



The DEClaser 5100 is an 8-page-per-minute, 600 dot-per-inch, desktop printer. It offers the latest in desktop laser functionality, and allows users to upgrade as their printing needs change.

The DEClaser 5100 features an "Intelligent Printing System," a powerful combination of high throughput performance, superior print quality, expandability and efficiencies, plus adherence to industry standards.

- Built-in support for 1200 x 1200 resolution enhancement
- "SmartPage" page composition technology
- Works with PCs, Macintosh systems, UNIX workstations, and Digital and IBM systems
- Simultaneous access to high-speed serial, bidirectional parallel, and high-performance AppleTalk ports
- Supports all major desktop applications through support of: Postscript Level 2, HP PCL 5E, ANSI (DEC PPL3), and ASCII
- Automatic emulation switching
- Shared memory I/O slot accomodates optional Ethernet connectivity allowing the DEClaser 5100 to support many environments
- Resident support for DECimage Plus image rendering technology
- Prints ANSI (DEC PPL3) as well as Postscript and PCL in OpenVMS environments
- Meets US "Energy Star" standards for energy conservation
- True Type Rasterizer
- Additional fonts/forms storage available

Ordering Information

DEClaser 5100 Printer—(Power cord, custom PCL 5E driver, PS driver for Windows 3.1, PS driver for Macintosh, and toner cartridge included)

LN09S-CA	North American/English, 120 V
LN09S-CB	Switzerland, 220 V
LN09S-CC	Sweden, Finland, Norway, Portugal, 220 V
LN09S-CD	Austria, Belgium, Holland, France, Germany, 220 V
LN09S-AD	Denmark, 220 V
LN09S-AE	UK/Ireland, 240 V
LN09S-AI	Italian, 220 V
LN09S-AS	Spanish, 220 V
LN09S-AT	Israel, 240 V
LN09S-AZ	Australia/New Zealand, 240 V

Options, Accessories, Supplies

LN0XX-AA	Toner/Supplies Cartridge Kit—6,000 pages @ 5% coverage
LN0XX-EF	Auto envelope feeder—75 envelopes
LN0XX-TA	Universal size paper input tray—250 sheets (legal, letter, A4, and executive)
LN0XX-TB	Large capacity feeder, with universal size paper tray insert
LN0XX-TC	Extra universal size paper tray inserts for LN0XX-TB, legal, letter, A4, and executive, 500-sheet capacity

DEClaser 5100 *(continued)*

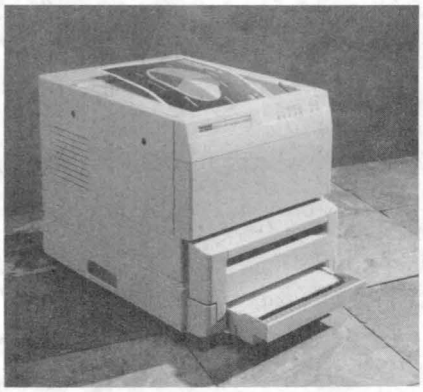
Options, Accessories, Supplies (continued)

LN09X-NW	Multiprotocol Ethernet network card option (Novell, TCP/IP, EtherTalk, LAT)
LN09X-HD	Internal hard disk drive option (128 MB)
LN09X-XF	High-resolution option, 1200 dpi/64 levels of gray (may require additional memory)
LN09X-NR	Non-Roman font card option (Greek, Hebrew, Cyrillic)
LN09X-MA	4 MB memory SIMM option
LN09X-ME	16 MB memory SIMM option
LN09X-MF	32 MB memory SIMM option
BCC46-06	6-foot Macintosh cable
H8575-E	RS232 MMJ adapter
BC16E-10	10-foot DEC 423 MMJ cable
H8585-AD	High-speed serial port adapter; 25-pin male-to-8 pos MJ
BN26X-03	3-meter serial cable, 8-pin MP-to-8-pin MP
BN26X-7E	7.5-meter serial cable, 8-pin MP-to-8-pin MP
BC19M-06	6-foot parallel cable
BC19M-10	10-foot parallel cable

Specifications

Print Technology	Laser
Processor	32-bit RISC processor (20 MHz Intel i960-KB) and graphical coprocessor (Intel 961-KD)
Resolution	600 x 600 dots per inch —standard 1200 x 1200 dots per inch —optional
Speed	8 ppm simplex
Monthly Usage	Up to 20,000 pages/month
Paper Types	Cutsheet (standard, European A4, executive, legal), labels, transparencies, and envelopes
Paper Weights	17 - 24 lb (internal cassette), 17 - 28 lb (multipurpose tray)
Paper Handling	250-sheet internal cassette and 100-sheet multipurpose tray (standard) 500-sheet feeder, 75-envelope feeder, and 250-sheet Universal Cassette (replaces standard cassette) (optional)
Memory	6 Mbytes (standard); Upgradable to 66 MB SIMMs
Protocols	Adobe PostScript Level 2*, HP PCL 5E (standard) ANSI (DEC PPL3) via DCPS-Base* (optional)
Fonts	73 Adobe Type 1 Postscript fonts, 47 PCL and Truetype fonts
Interfaces	RS232/422 Serial, Centronics Parallel, LocalTalk (standard) Ethernet—LAT, Novell, EtherTalk, TCP/IP
Physical Characteristics	
H x W x D	11.7 in x 16.4 in x 15.9 in 29.7 cm x 41.6 cm x 40.3
Weight	17.0 kg (37.4 lb)
Power Consumption—Meets/exceeds EPA Energy Star specs for energy efficiency	
Maximum	100-120 V: 530 W; 220-240 V: 520 W
Average @ 20 pages/hour	100-120 V: 90W; 220-240 V: 90 W
Power Saving Mode	100-120 V: Less than 30 W; 220-240 V: Less than 30 W

DECcolorwriter 1000 (LF02)



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 Mbytes 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

Ordering Information

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

Note: Customers requiring the H8571-E MMJ adapter must order it separately.

DECcolorwriter 1000 (LF02) *(continued)*

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
LF02X-UF	4-Mbyte memory upgrade
LF02X-ET	Network interface: TCP/IP and Ethernet

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%

DECmultiJET 1500 (LJ18P)*

Product Description

The DECmultiJET 1500 bubble ink-jet printer provides fast, quiet, cost-effective printing. his compact, industry-standard PC printer has resident HP DeskJet (PCL 3) emulation, which allows for seamless printing from the most popular PC applications running Microsoft Windows 3.1 (or later), Windows NT and MS-DOS operating systems.

Designed to be used as a personal printer, the DECmultiJET 1500 printer produces laser-quality output at 180 ch/sec.

* The DECmultiJET 1500 printer is **available only in Europe**. Contact your Digital Sales Representative or Authorized Digital Reseller for product availability information.

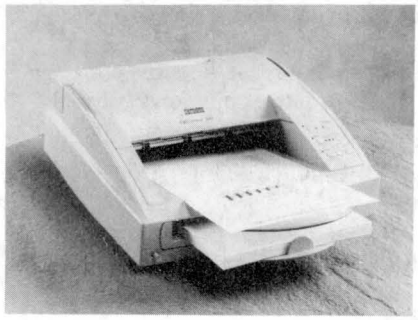
Features

- 300 dpi resolution at 180 ch/sec
- Prints on cut sheet paper (letter, legal and A4 sizes), transparencies, and envelopes
- Built-in HP DeskJet (PCL 3) Plus emulation; optional IBM Proprinter X24 and Epson LQ-850 emulation
- Offers five resident fonts; 42 resident character sets
- Includes MS Windows 3.1 printer driver diskette

Ordering Information

LJ18P-AE	Inkjet monochrome printer, 220 V, 50/60 Hz, with non-detachable power cord for U.K. and Ireland
LJ18P-AT	Inkjet monochrome printer, 220 V, 50/60 Hz with non-detachable power cord for Israel
LJ18P-CC	Inkjet monochrome printer, 220V, 50/60 Hz with non-detachable European power cord for Central Europe

DECwriter 500i (LJ500i)



The DECwriter 500i bubble ink-jet printer delivers text and graphics at up to five pages per minute. It prints on cut-sheet paper, transparencies, envelopes, labels, and comes complete with a 150-page automatic sheet feeder. An optional color kit is also available.

The DECwriter 500i will support virtually any MS-DOS or Windows application. It is an ideal solution for PC users who need high-quality output fast.

- Prints professional quality color text and graphics
- Color kit option available
- 400 ch/s (5 ppm) performance at 300 dpi
- Ultra-quiet operation
- Handles plain paper, envelopes, labels and transparencies
- IBM ProPrinter emulation (optional)
- MS-DOS and Windows compatible
- Two-year warranty

Ordering Information

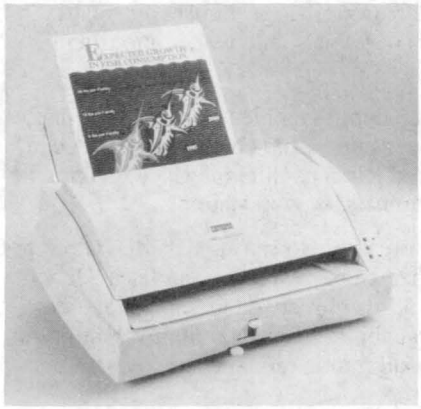
DECwriter 500i Inkjet Printer

LJ500-CA	North America
LJ500-CC	Central Europe
LJ500-AD	Denmark
LJ500-AE	UK/Ireland
LJ500-AG	Germany
LJ500-AI	Italy
LJ500-AP	France
LJ500-AS	Spain
LJ500-AT	Israel
LJ500-AZ	Australia/New Zealand

Options, Accessories, and Supplies

LJ50X-AK	Color printhead
LJ50X-BK	Color upgrade kit
LJ50X-AB	Printhead with two replacement ink cartridges
LJ50X-AC	Two ink cartridges
LJ50X-IE	Emulation cartridge for Epson LQ 860 and IBM Proprinter X24 protocols
LJ50X-SF	Auto sheet feeder—second paper tray
LJ50X-TR	Tractor
LJ50X-SI	Serial interface
LJ50X-DB	256 KB RAM upgrade

DECwriter 110i (LJ110i)



The DECwriter 110i is a monochrome inkjet printer that offers laser quality printing at low cost. The convenient color upgrade enhances its versatility, making the DECwriter 110i ideal for word processing and desktop publishing.

The DECwriter 110i features an automatic sheet feeder than handles a variety of paper types as well as transparencies. The unique monochrome ink cartridge design enable owners to realize substantial savings on ink consumption by allowing up to ten replacement cartridges per printhead. Its superior print quality, high speed, and quietness make the DECwriter 110i equally suitable for home or office.

- Up to 3 pages per minute output
- 300 x 300 dpi
- 5 resident fonts
- Ink low/out indicator light
- Resident HP PCL3 emulation
- Laser-quality text and graphics
- Optional color upgrade
- Handles plain/glossy paper, envelopes, and transparencies
- MS Windows 3.1 driver included
- Built-in 70-page automatic sheet feeder
- Two-year warranty

Ordering Information

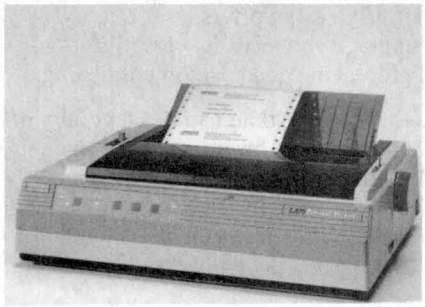
DECwriter 110i InkJet Printer

LJ110-CA	North America
LJ110-CC	Central Europe
LJ110-AE	UK/Ireland
LJ110-AG	Germany
LJ110-AI	Italy
LJ110-AP	France
LJ110-AS	Spain

Options, Accessories, and Supplies

LJ11X-BK	Color kit, includes a color printhead, storage box for two printheaders, and a driver
LJ50X-AK	Color printhead
LJ50X-AB	Monochrome: printhead and two ink cartridges
LJ50X-AC	Monochrome: Two ink cartridges
LJ11X-IE	IBM Proprinter X24 and Epson LQ 860 emulation cartridge
LJ50X-SI	Serial interface
LJ50X-DB	RAM extension card—256 KB
BC19M-10	IBM/Centronics parallel cable (10 ft)
BC19M-06	IBM/Centronics parallel cable (6 ft)

LA70 Personal Printer



The LA70 Personal Printer is a versatile, narrow-cartridge, impact dot-matrix printer. It complements personal computers, terminals, and workstations and supports a wide range of applications.

It is a low-cost, entry-level printer for screen dump graphics printing and simple word processing. The LA70 offers print speeds up to 200 characters per second, in three printing densities. It has both a serial and a parallel interface, making it compatible with industry-standard PCs, terminals, or workstations.

The bidirectional LA70 prints in any one of three text printing densities: draft at 200 characters per second; memo at 100 characters per second; and near- letter-quality at 40 characters per second. It also prints bitmapped graphics. It offers built-in character sets that provide added capabilities for maximum versatility in word processing and other applications. A full multinational character set allows for printing in 14 languages.

The LA70 Personal Printer supports printing in OpenVMS, Windows NT, ULTRIX, SCO UNIX, UNIX, and MS-DOS operating environments. It can print text with superscripts and subscripts, underlines, double underlines, shadow bold, italics, strike-through, and overline. The front panel has well-labeled switches as well as LED indicators that display the printer's operating status.

Features

- Prints up to 1,000 pages per month
- Built-in IBM Proprinter and Digital protocols
- Narrow carriage accommodates standard paper and envelope sizes
- Reliable 9-wire dot-matrix technology
- Printer settings selectable from front panel switches or through software control
- Convenient, versatile paper handling
- Accommodates fanfold, single sheets, labels, envelopes, and multipart forms (original plus two copies)
- Quiet Mode operation less than 52 dBA, activated by a front-panel switch; normal operation is less than 55 dBA
- Document-on-demand printing features: zero tear-off loss and viewing
- Serial and parallel interfaces built in to each printer (parallel cable must be ordered separately: BC19M-10)
- Auto Load feature automatically advances tractor-fed paper
- Viewing feature automatically advances page at end of text for easy reading
- Auto Park feature enables printing on either continuous tractor paper or cutsheet paper without removing the tractor paper

Ordering Information

Order Number	Country or region	Language
LA70-AA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA70-CB	Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden, Switzerland	Flemish, Finnish, French, Dutch, Norwegian, Portuguese, Spanish, Swedish, English, German
LA70-AZ	Australia, New Zealand	English
LA70-AD	Denmark	Danish
LA70-AI	Italy	Italian
LA70-AJ	Japan	Katakana
LA70-AE	U.K., Ireland	English
LA70-AG	Germany, Austria	German
LA70-AT	Israel	Hebrew

LA70 Personal Printer *(continued)*

Accessories and Supplies

LA70R-06	LA70 ribbon (6)
LAXXA-AA	LA70 desktop acoustic cover
LA70X-DP	LA70 desk stand and paper catcher
LA70X-DC	LA70 dust cover (10)
EK-LA70J-RM	Programmer's Reference Manual
LA70X-SF	LA70 single-bin sheet feeder

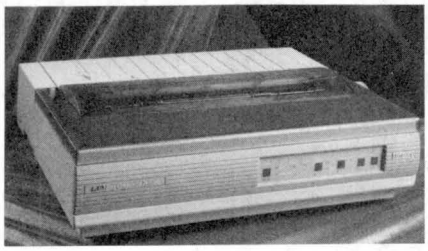
Cables and Adapters

BC19M-10	IBM/Centronics parallel cable
H8575-A	25-pin male-to-MMJ adapter
H8575-B	9-pin male-to-MMJ adapter (Digital)
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
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

Specifications

Physical Characteristics				
H x W x D	4.7 in x 15.5 in x 11.4 in 12.0 cm x 39.3 cm x 29.0 cm			
Weight	7.5 kg (16.0 lb)			
Power Requirements				
Voltage	100 V	120 V	220 V	240 V
Frequency	50–60 Hz	50–60 Hz	50–60 Hz	50–60 Hz
Phases	1	1	1	1
Current ac amps (max)	0.75	0.75	0.51	0.51
Thermal dissipation (watts)	68	69	68	67
Thermal dissipation (Btu/h)	188	188	188	188
Print Characteristics				
Aspect ratio	1:1, 2:1, or 2.5:1			
Print density	(horizontal x vertical dots)			
Draft mode	12 x 9 matrix			
Memo mode	24 x 9 matrix			
Near-letter-quality mode	24 x 17 matrix			
Character sets	U.S. ASCII, IBM Proprinter (Line Drawing, Chart Drawing, Symbol Drawing), Katakana, 14 National Replacement Character Sets (NRC), ISO 8-bit Supplemental, DEC Supplemental, DEC Technical, VT100 Line Drawing, Hebrew			
Communications				
Character code	7-or 8-bit ASCII with odd, even, mark, space, or no parity			
Power Cord: 2.0 m (6.7 ft) long, detachable				
Operating Environment				
FCC Class B, Environmental—Class B (normal office environment)				
Temperature range	10° to 40° C (50° to 104° F)			
Relative humidity	10% to 90%			
Safety/performance	Certified by UL, CSA, FCC, VDE, IEC, and GS			
Buffer Control				
X-ON/X-OFF protocol, READY/OFF LINE switch, DTR buffer control				
Standard Font: Courier 10				

LA75 Plus Companion Printer



The narrow-carriage LA75 Plus Companion Printer is a fast, flexible, dot-matrix printer that can be used as a personal printer or shared with other users. It can handle up to 2,000 pages per month. It uses a 24-wire impact dot-matrix printhead capable of 360 x 180 dots per inch (dpi)resolution for excellent print quality. The LA75 Plus printer supports applications running under OpenVMS VAX, SCO UNIX, UNIX, Windows NT, MS-DOS, and ULTRIX operating systems. The LA75 Plus also supports printing from Digital and other industry-standard personal computers, terminals, and workstations.

The LA75 Plus printer prints professional-looking office reports and graphs in color. It offers optional font cartridges for office documents or optical character recognition. The bar-code capability is resident in the LA75 Plus printer.

Features

- Supports both DEC PPL2 and IBM Proprinter emulation
- Displays last line printed, eliminating the need to move the platen to see the last line
- Advances paper for tearing and repositions it for printing (eliminates wasted forms)
- Handles various sizes of paper and envelopes
- Provides choice of print quality from quick draft to letter-quality
- Allows quick, easy selection of printer settings, either from the front panel or software
- Tractor-fed paper can be temporarily bypassed—single sheets can be fed without removing the continuous-form paper
- Adds color to office documents and graphs through snap-in 4-color ribbon
- Five of the most commonly used ROM-based type fonts are available as options to create professional-looking documents
- Handles downline-loaded fonts
- Prints multipart forms and labels through the bottom feed slot

Ordering Information

Order Number	Country or Region	Language
LA75S-AA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA75S-CB	Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden, Switzerland	Flemish, Finnish, French, Dutch, Norwegian, Portuguese, Spanish, Swedish, English,
LA75S-AZ	Australia, New Zealand	English
LA75S-AD	Denmark	Danish
LA75S-AI	Italy	Italian
LA75S-AJ	Japan	Katakana
LA75S-AE	U.K., Ireland	English
LA75S-AG	Germany, Austria	German
LA75S-AT	Israel	Hebrew

Accessories and Supplies

LA75R-KA	LA75S black ribbon (6)
LA75R-KC	LA75S color ribbon (1)
BC19M-10	Parallel cable
LAXXS-DS	LA75S wire paper catcher
H9850-HP	LA75S dust cover
LAXXS-AB	LA75S floor stand
PCXXA-PC	Platen cleaner
LA75Y-SF	LA75S single bin sheetfeeder
EK-L75PL-DK	Programmer's Reference Manual

LA75 Plus Companion Printer *(continued)*

Font Cartridges

LA75Y-CA	LA75S Letter Gothic
LA75Y-CB	LA75S Orator
LA75Y-CC	LA75S Prestige Elite
LA75Y-CD	LA75S OCR-A
LA75Y-CE	LA75S OCR-B

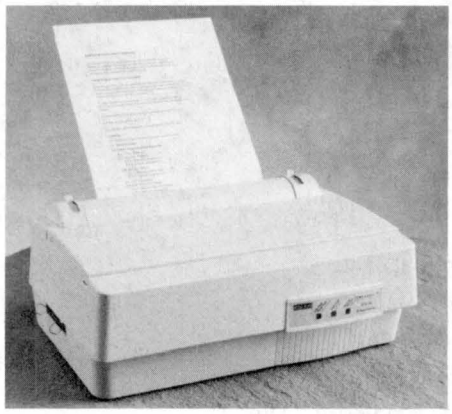
Cables and Adapters

BC19M-10	IBM/Centronics parallel cable
H8571-A	25-pin male-to-MMJ adapter
H8571-B	9-in male-to-MMJ adapter (Digital)
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
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

Specifications

Physical Characteristics		
Height	13.4 cm (5.3 in.)	
Width	36.9 cm (14.5 in.)	
Depth	42.7 cm (16.8 in.)	
Weight	10.5 kg (23 lb)	
Power Requirements		
Voltage/frequency	100 V, 50/60 Hz; 120 V, 50/60 Hz; 220 V, 50/60 Hz;240 V, 50/60 Hz	
Power cord	2.0 m (6.7 ft), detachable	
Operating environment	FCC Class B, Environmental-Class B (normal office environment)	
Temperature range	10 deg. to 40 deg. C (50 deg. to 104 deg. F)	
Relative humidity	10% to 90%	
Safety/performance	Certified by UL, CSA, FCC, VDE, IEC, and GS	
Hardware Characteristics		
Interfaces	EIA-423 (MMJ) and Centronics Parallel Interface	
Noise level	Normal < 53 dBA; quiet < 51 dBA	
Baud rate	200, 300, 600, 1200, 2400, 4800, and 9600	
Buffer control	XON/XOFF protocolDTR buffer control	
Print speed (max.)	Draft mode	250 cps
	Memo mode	125 cps
	Letter-quality mode	83 cps
Print Characteristics		
Horizontal pitch	Standard width characters: 10, 12, 16.5, 17.1 chars/inch Double width characters: 5, 6, 8.25, 8.55 chars/inch	
Vertical pitch	2, 3, 4, 6, 8, and 12 lines/inch	
	1, 2, and 4 lines/cm	
Print density (horizontal x vertical dots)	Draft mode	9 x 24 matrix
	Memo mode	18 x 24 matrix
	Letter-quality mode	30 x 24 matrix
Optional fonts	Orator, Letter Gothic, Prestige Elite, OCR-A, andOCR-B	

DECwriter 65 (LA65)



The DECwriter 65 color printer is ideal for home, school, or office. It features a diamond pattern printhead and special sound-absorbing construction to ensure quiet operation. It comes with six built-in fonts to make every document look its best. A built-in automatic sheet feeder holds 50 pages of plain paper or letterhead, and the optional snap-in tractor feed will handle a full work load of continuous forms. Plus, the DECwriter 65 is compatible with virtually any MS-DOS or Windows application software.

- 24-wire color, dot matrix print technology
- Professional quality color text and graphics with color option
- Print speed up to 240 ch/s
- MS-DOS and Windows compatible
- Two year warranty
- Ultra-quiet operation

Ordering Information

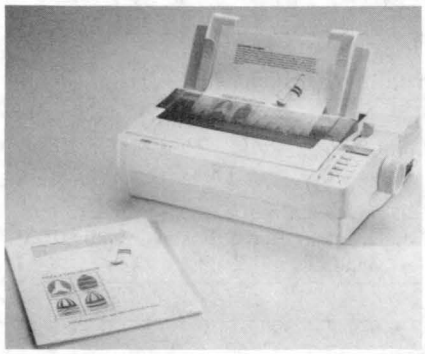
DECwriter 65—24-wire dot matrix printer, 160 ch/s

LA65-CA	110/120 V, 50/60 Hz, U.S. power cord for North America and Canada.
LA65 -CB	220/240 V, 50/60 Hz, European power cord for Continental Europe
LA65 -CC	220/240 V, 50/60 Hz, European power cord, for Middle-East and Eastern Europe
LA65 -AD	220/240 V, 50/60 Hz, with Danish power cord (17-00310-08) for Denmark
LA65 -AE	220/240 V, 50/60 Hz, with U.K. power cord, for UK/Ireland
LA65 -AK	220/240 V, 50/60 Hz, with Swiss power cord (17-00210-13) for Switzerland
LA65 -AT	220/240 V, 50/60 Hz, with Israeli power cord (17-00457-16) for Israel
LA65 -AZ	220/240 V, 50/60 Hz, Australia/New Zealand power cord for Australia/New Zealand

Accessories and Supplies

LA65X-PT	Push tractor option
LA95R-KA	LA65/LA95 black ribbon
LA95R-KC	LA65/LA95 color ribbon 1/box

DECwriter 95 Dot Matrix PC Printer



The DECwriter 95 is a high-resolution, narrow-carriage, impact dot matrix printer with great versatility. Well suited for either home or office, the DECwriter 95 incorporates a 24-wire printhead and 8-bit parallel interface. It is recommended for the demanding PC user who requires quality, speed, and quiet operation, along with ease of use and affordability.

Designed as a companion to industry-standard personal computers, the DECwriter 95 offers state-of-the-art paper handling capabilities and up to 360 dpi resolution, color graphics printing (through optional color kit).

In addition to its resident Epson and IBM Proprinter emulations, each unit of the DECwriter 95 is shipped with a powerful Windows V3.1 printer driver that supports printing from virtually all Windows-based application software.

Features

- Prints up to 1000 pages per month
- An affordable output solution for PC users
- Crisp text and color graphics–360 x 360 dpi resolution
- Prints up to 300 character per second
- IBM Proprinter X24e and Epson LQ emulations
- 13 resident fonts for professional-looking documents
- Color capable–through optional color kit
- Quiet enough for home or office–43 dBA
- Versatile paper handling–including transparency printing
- Simple setup through front LCD panel
- Windows V3.1 printer driver shipped with the unit
- Quarter page printing–prints four-page images on one sheet
- Prints up to four-part forms, envelopes, and labels
- Document on demand print features; zero tear-off
- Auto parking/auto loading of tractor fed paper
- Top, rear, and bottom paper path
- Optional serial interface connects to terminals
- 2-year return-to-Digital warranty

Ordering Information

LA95-CA	U.S., Canada
LA95-CB	Continental Europe
LA95-AD	Denmark
LA95-AE	U.K./Ireland
LA95-AI	Italy
LA95-AK	Switzerland
LA95-AZ	Australia, New Zealand

Accessories and Supplies

LA95R-KA	Ribbon, black
LA95R-KC	Ribbon, color
LA95X-CK	Color-on-command kit (includes motor, color ribbon)
LA95X-DA	128K RAM extension card
LA95X-DS	Desktop stand
LA95X-SF	Automatic sheet feeder (115-sheet capacity)

Cables and Adapters

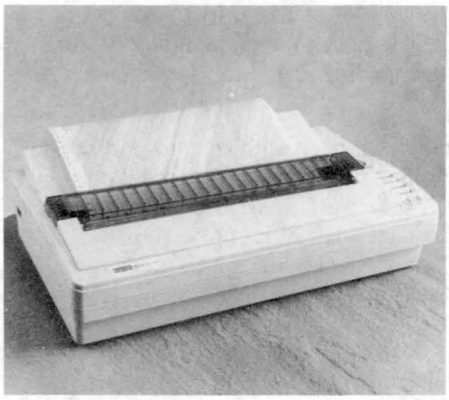
LA95X-SI	Serial interface kit
BC19M-06	IBM/Centronics parallel cable (6 ft)
BC19M-10	IBM/Centronics parallel cable (10 ft)

DECwriter 95 Dot Matrix PC Printer *(continued)*

Specifications

Technology	24-wire dot matrix		
Interface	Parallel Centronics, Serial EIA-232 (Optional)		
Print speeds		Draft	Letter-Quality
	15 char/in.	300	99
	12 char/in	240	80
	10 char/in.	215	66
Character sets	ASCII Standard, ASCII Italic, International, Epson Graphic, IBM Graphic, IBM Code Pages, Windows		
ANSI-USA Physical Characteristics			
Height	11 cm (5.4 in.)		
Width	42.6 cm (17 in.)		
Depth	31.5 cm (12.6 in.)		
Weight	5.17 kg (11.4 lb)		
Power Requirements			
Voltage	95–132 Vac		
Frequency	47–63 Hz		
Power consumption	9 W–33 W		
Operating Environment			
Temperature	41°–91° F (5°–35° C)		
Operating humidity	10–80% relative humidity (noncondensing)		

DECwriter 195 (LA195)



The DECwriter 195 offers a wide carriage for applications such as online transaction processing, billing, accounts receivable, and other high-volume applications. It is an affordable, 24-wire, dot matrix, color-capable printer that prints at 360 x 360 dpi on all types of media, including 4-part forms.

This high-resolution printer prints clear, crisp text and high-quality color graphics (with optional color upgrade kit). Designed to work well with industry-standard PCs, this feature-rich printer is versatile and easy to use. It is quiet enough for even the most noise-sensitive office environments.

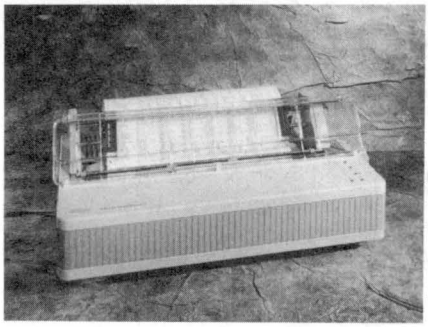
- Prints up to 300 ch/s draft; 99 ch/s letter quality
- Standard, convertible push/pull tractor and manual sheet feeder
- Top, rear, and bottom paper feed paths
- Paper parking, fully automatic paper loading and tear-off
- Epson LQ, ESC/P 2, and IBM Proprinter X24E emulations
- Standard 8K buffer; 128K option (136K total)
- Standard parallel and serial communication interfaces
- 13 resident standard fonts
- User installable color kit option for seven-color printing
- Ultra-quiet; only 43 dBA
- Easy-to-use LCD control panel
- Windows 3.1 driver included
- Memory Recall to automatically recall commonly used printer set-ups

Ordering Information

DECwriter 195—24-wire dot matrix printer, 240 ch/s

LA195-CA	110/120 V, 50/60 Hz with U.S. power cord for North America and Canada
LA195-CB	220/240 V, 50/60 Hz with European power cord for Continental Europe
LA195-CC	220/240 V, 50/60 Hz with European power cord for Middle East and Eastern Europe
LA195-AD	220/240 V, 50/60 Hz with Danish power cord for Denmark
LA195-AE	220/240 V, 50/60 Hz with with U.K. power cord for U.K. and Ireland
LA195-AK	220/240 V, 50/60 Hz with Swiss power cord for Switzerland
LA195-AT	220/240 V, 50/60 Hz with Israeli power cord for Israel
LA195-AZ	220/240 V, 50/60 Hz with Australia/New Zealand power cord for Australia and New Zealand

LA310 MultiPrinter



The LA310 MultiPrinter is a versatile, 9-wire, dot-matrix, wide-carriage replacement for the LA210 LetterPrinter. Rugged and durable, it is ideal for high-volume applications such as billing, invoicing, data processing, and accounts receivable.

The LA310 handles multi-part forms, and is equipped with an auto-port sensing feature that allows simultaneous connection to both serial and parallel ports. Fully compatible with the LA210 LetterPrinter, the LA310 also supports a wide range of software applications through resident DEC PPL2 (ANSI), IBM Proprinter III, and Epson FX-1050 emulations. It supports applications running under OpenVMS, SCO UNIX, ULTRIX, OS/2, Windows NT, and MS-DOS operating systems.

Features

- Simultaneous connection to multiple hosts
- Resident DEC PPL2 (ANSI), IBM Proprinter III, and Epson FX-1050 emulation
- Supports applications running under OpenVMS VAX, SCO UNIX, UNIX, ULTRIX, OS/2, MS-DOS
- Built-in serial and parallel interfaces
- Backward-compatible with LA70, LA75 Plus, LA100, LA120, and LA210 printers
- High-speed draft mode of 300 cps, draft mode of 240 cps, and letter-quality mode of 55 cps
- Auto port sensing
- Auto-park, auto-load, and zero-tear paper handling technologies

Ordering Information

LA310 Multiprinter—9-wire dot matrix printer

LA310-CA	North America (U.S., Canada)
LA310-AD	Denmark
LA310-AE	U.K., Ireland
LA310-AG	Germany
LA310-AI	Italy
LA310-AK	Switzerland
LA310-AT	Israel
LA310-AZ	Australia/New Zealand
LA310-CB	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, Sweden, Greece, Iceland, Turkey, Yugoslavia

Accessories and Supplies

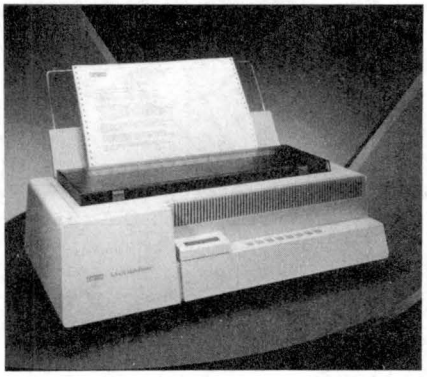
LA31R-06	LA310 ribbon cartridge, black (x6)
LA31X-PT	LA310 pull tractor
LA31X-CA	LA310 ISO Latin2/Cyrillic character set cartridge
BC19M-10	Parallel interface cable
EK-LA310-PM	LA310 Programmer Reference Manual
LA31X-AC	Acoustic cover, 120 V
LA31C-DC	Dust cover
LA31X-DS	Desktop stand
LA31X-SW	Paper tray

LA310 MultiPrinter *(continued)*

Specifications

Physical Characteristics	
Height	11.0 cm (4.33 in.)
Width	60.5 cm (23.8 in.)
Depth	37.8 cm (15 in.)
Weight	10 kg (22 lb)
Power Requirements	
Voltage	120 V
Frequency	50 Hz
Power consumption	50 W
Current ac amps (max)	4 A
Thermal dissipation	34 W, 116 Btu/h
Operating Environment	
Operating temperature	10° to 40° C (50° to 104° F)
Operating humidity	10% to 90%

LA424 MultiPrinter



The LA424 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 LA424 MultiPrinter incorporates a 24-wire printhead.

It is a heavy-duty forms printer designed for average usage of up to 6000 pages per month. The LA424 MultiPrinter is also designed for the IBM personal computer environment with its built-in IBM Proprinter XL24 emulation mode and parallel interface. The LA424 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 LA424 MultiPrinter offers a wide carriage and multi-color printing capability.

The rugged modular design of the LA424 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 color or monochrome PostScript output with optional DECprint Utility software
- Prints in black or color ink using snap-in ribbon cartridges
- Compatibility with Digital and IBM Proprinter applications through Digital and IBM protocols
- Plug-in font cartridges for varying type styles
- Built-in bar code 39 printing capability
- Wide carriage enables printing 17-inch (43.2-centimeter)wide paper
- Equipped with built-in serial (DEC-423) and parallel (Centronics) interfaces
- Quiet printing mode at 51 dBA (front bystander position)
- Handles up to six-part forms as well as envelopes and labels
- Superior paper handling such as document-on-demand, autoload, autopark, and optional three-bin automatic sheetfeeder
- Automatic switching of universal power supply from 120 V, 220 V, or 240 V
- DECprint Utility for PostScript to Sixel Printing for VMS extends printing capabilities; see product description at the end of this chapter

Ordering Information

Order Number	Country or Region	Language
LA424-CA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA424-AB	Belgium	Flemish
LA424-AD	Denmark	Danish
LA424-AE	U.K., Ireland	English
LA424-AG	Germany, Austria	German
LA424-AH	Holland	Dutch
LA424-AI	Italy	Italian
LA424-AS	Spain	Spanish
LA424-AT	Israel	Hebrew
LA424-AZ	Australia, New Zealand	English
LA424-AP	France	French
LA424-CB	Switzerland	English, French, German
LA424-CC	Finland, Norway, Portugal, Sweden	Finnish, Norwegian, Portuguese, Swedish

LA424 MultiPrinter *(continued)*

Accessories and Supplies

LA24X-CA	DEC Letter Gothic font cartridge
LA24X-CB	DEC Orator font cartridge
LA24X-CC	DEC Prestige Elite font cartridge
LA24X-CG	DEC OCR-A font cartridge
LA24X-CH	DEC OCR-B font cartridge
LA24X-CD	Font cartridge emulating IBM OCR-A
LA24X-CE	Font cartridge emulating IBM OCR-B
LA24X-CF	Font cartridge emulating IBM Presentor
LA24R-KA	Ribbon, black: up to 5M characters (six/box)
LA24R-KC	Ribbon, color: yellow, magenta, cyan, and black; up to 500,000 characters per color band (six/box)
LA24X-AC	Acoustic cover
LA24X-PS	Printer stand (pedestal style)
LA24X-DS	Desktop stand
LA24X-SF	Three-bin sheetfeeder
EK-LA324-PM	Programmer's Reference Manual

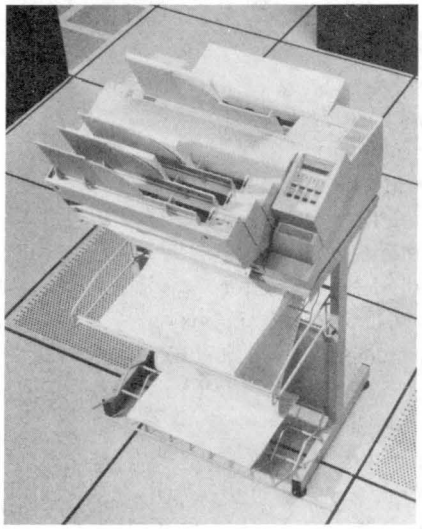
Cables and Adapters

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	17.0 cm (6.7 in.)	
Width	61.5 cm (24.2 in.)	
Depth	31.0 cm (12.2 in.)	
Weight	14.3 kg (31.5 lb)	
Power Requirements		
Voltage	120 V	240 V
Frequency	50/60 Hz	50/60 Hz
Phases	1	1
Current ac amps (maximum)	1.4	0.7
Thermal dissipation (watts)	120	120
Thermal dissipation (Btu/h)	41	41
NEMA receptacle type	5–15R	5–15R
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.

- 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

Ordering Information

LA600 Multiprinter

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)

Desktop Printer Cable and Adapter Guide

The following chart is a guide for connecting printers to video terminals, hosts, and terminal servers (cables and adapters are included with most Digital printers).

Serial Connections

Connector Type Video Device/Server	LA95, LA70, DEClaser Series,[2] LA310, LA75, LA424, LF01,[2] DECcolorwriter 1000, LA75 Plus
DEC-423 (MMJ) DECserver 300/90L/200 DL VT420, VT1200, VT300 Family VAX/VAXservers with CXY16 VAXstation 3100 MicroVAX 3100/DECsystem 5100 DECsystem 5000 Series with CXY16 DECstation 3100/2100/5000	BC16E(1) male 25-pin EIA-232-type connector
25-pin female (EIA-232) VXT 2000/2000+ DECserver 200/MC (DSRVB-AA) VAX with CXY08 DECsystem with CXY08 IBM PC and PS/2, or compatible[5]	H8575-A and BC16E[1]
9-pin serial (PC/AT type) DECstation PCs IBM PC/AT or compatible[5]	H8571-J and BC16E[1]
25-pin male (EIA-232) Modems[4]	H8571-D and BC16E[1]
Open DECconnect RJ45 MJJ	BN24H-*03*
20 mA Active Host Mate-N-Lok	H8673-AA
20 mA Active Host RJ11	H8673-AB
MMJ to *EIA*-232	H8671-A
Connector Type	**DEClaser 5100 Only**
25-pin male (EIA-422) to Open DECconnect (RJ45)	H8585-AD and BN24H (DECconnect, MMJ) or BN26X (Open DECconnect, RJ45)

Parallel Connections (PC-Type)

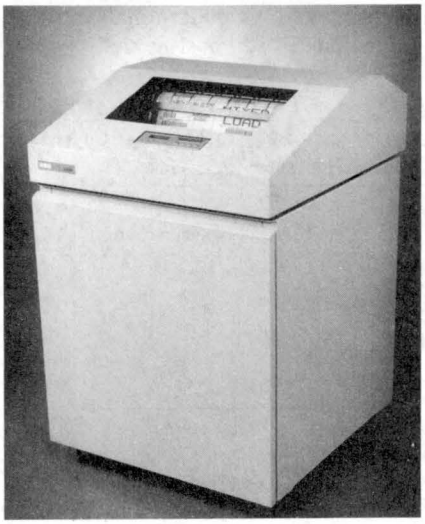
Connector Type Video Device/Server	LA95, LA75 Plus,(3) LA70, LA310, DEClaser Series, LA424, LF01, DECcolorwriter 1000, DECmultiJET 1000/2000
25-pin PC port Centronics parallel DECstation *PCs* IBM PC or compatible IBM PS/2 VXT 2000/2000+	BC19M-10

Ethernet Connections

Connector Type	DEClaser Series, LA310, LA424, LF01, DECcolorwriter 1000, LA75 Plus
LATprint ThinWire Ethernet interface (includes 2-ft MMJ cable), 100 V –120 V power supply	LNXXD-AA
AppleTalk Connections	DEClaser 2000 family only: LNXX-AT
Novell Connections	DEClaser 2000 Family: LNXX-NE DEClaser 3000 Family: NL08X-NE

[1] BC16E-10 is included with LA70, LA75, LA424, LF01, and the DEClaser family printers.
[2] Use the H8571-E adapter included with these printers.
[3] BC19M-10 is included with LA75P.
[4] DECconnect (MMJ) does not provide full modem control; this combination works with Digital modems and many non-Digital modems.
[5] To connect the LA75, LA210, LN03, LN03 PLUS, ScriptPrinter, or LQP45 to non-Digital PCs, XON-XOFF serial flow is required. This is supported by many application packages, including Digital's PCSA client software (check your application).
[6] Order H8575-A for a printer.

LG06 Line-Matrix Printer



The LG06 is an 800-line-per-minute shuttle-matrix text and graphics impact printer. As a text printer, the LG06 printer offers data processing and correspondence mode printing, multiple-characters-per-inch print selections, and 7-or 8-bit character sets. In graphics mode, the LG06 printer provides up to 13 styles of barcoding including POSTNET, custom forms creation, superscript and subscript, portrait and landscape mode, and many other graphics functions including sixel graphics. The LG06 is compatible with OpenVMS V5.5 or higher for all applications.

The LG06 printer's low noise level (52 dBA), small footprint, and rugged design allows placement virtually anywhere---open office, laboratory, or shop floor. It can be placed in a networked environment utilizing the DECserver 250 printer server. The LG06 printer is offered with either Data Products-style parallel interface, Centronics-style parallel interface for connection to DEC and other IBM-compatible PCs or EIA-232 serial interface.

- 800 lines per minute
- 75,000 pages per month workload
- Compressed or expanded print
- 5, 10, 12, 13.3, 15, or 16.7 characters per inch (cpi); 17 and 20 cpi supported in IBM Proprinter emulation mode
- Underlining, strikethrough, and bolding
- Multipart forms (1–6 parts)
- Multiple fonts
- Multiple character sets
- OCR character sets
- 7-or 8-bit character sets
- ANSI/ISO compatible
- Subscripts and superscripts
- Rotation of text for spreadsheets
- Ability to create custom forms and logos
- 13 styles of bar codes including POSTNET
- LG02 compatibility
- IBM Proprinter XL III emulation
- Triple interfacing (EIA-232, Data Products, Centronics)
- Epson FX 1040 emulation (limitations exist)

Performance

Print Speeds	600 lines/minute (lpm) (standard)	
High Speed	Uppercase Upper-and lowercase	800 lpm 685 lpm
Data Processing	Uppercase Upper-and lowercase	600 lpm 480 lpm
Correspondence	Uppercase Upper-and lowercase	320 lpm 245 lpm
OCR-A	Uppercase Upper-and lowercase	300 lpm 155 lpm
OCR-B	Uppercase Upper-and lowercase	300 lpm 155 lpm
Barcodes and Graphics	60 x 75 dpi 100 x 100 dpi	56 inches per minute 33 inches per minute

LG06 Line-Matrix Printer *(continued)*

Ordering Information

LG06-AA/AB	UNIBUS parallel text and graphics printer with LP11 controller, BC27A-30 30-ft (9.1-m) data cable; 120/240 V.
LG06-BA/BB	Q-bus (MicroPDP-11 and MicroVAX II) parallel text and graphics printer with LPV11 controller, BC27A-30 30-ft (9.1-m) data cable. For use with BA23 or BA123 enclosures; 120/240 V.
LG06-CA/CB	Parallel text and graphics printer with BC27A-30 30-ft (9.1-m) data cable for use with DECserver 250 and VAXBI systems. Prerequisite for VAXBI systems: DMB32 controller (not included); 120/240 V.
LG06-DA/DB	Serial 800-line/minute text and graphics printer for connection to EIA-232 serial interface. Includes 25-ft (7.6-m) BC22D-25 cable; 120/240 V.
LG06-EA/EB	Parallel text and graphics printer with LPV11-SA dual-ported controller, BC27L-30 30-ft (9.1-m) data cable, for use with BA2xx or VAX 4000 enclosures; 120/240 V.
LG06-JA/JB	Parallel text and graphics printer with 30-ft (9.1-m)BC27L-30 data cable to be used as a second printer connected to an LG06-EA LPV11-SA controller. Prerequisite: LG06-EA; 120/240 V.
LG06-PA/PB	Text and graphics printer with Centronics-type BC19M-10 10-ft data cable for use with DEC personal computers; 120/240 V.

Note: 240 V variants require the purchase of a country-specific power cord:

BN02A-2E	U.K./Ireland
BN03A-2E	Austria/Belgium/Finland/France/Germany/Netherlands/Norway/Portugal/Spain/Sweden
BN04A-2E	Switzerland
BN05A-2E	Australia/New Zealand
BN06A-2E	Denmark
BN07A-2E	Italy

Accessories and Supplies

LG6XX-BC	Ribbons (6/box)

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 8, Networks, Communications, and Cables, for more information and software prerequisites.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for VMS
QA-VZEAA-HX	VAX Vertical Forms Printing media and documentation

Note: x denotes media type; 5 = TK50; M = magtape.

Configuring Information

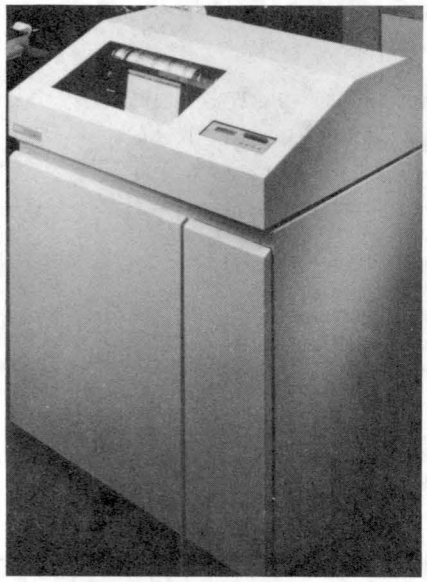
Order Number	Mounting Requirements	dc Amps Drawn @			Bus Loads Drawn	I/O panel Units
		5 v	15 v	–15 v		
LG06-AA/AB	1 quad slot	1.5	0.0	0.0	1.0	1
LG06-BA/BB	1 quad slot	1.5	0.0	0.0	1.0	1 A
LG06-EA/EB	1 quad slot	1.5	0.0	0.0	1.0	N/A
LG06-JA/JB	1 quad slot	1.5	0.0	0.0	1.0	N/A

LG06 Line-Matrix Printer *(continued)*

Specifications

Physical Characteristics		
Height	103 cm (40.6 in.)	
Width	69 cm (27 in.)	
Depth	73 cm (28.7 in.)	
Weight	102 kg (225 lb)	
Power Requirements		
Voltage	120 V	240 V
Frequency	47–63 Hz	47–63 Hz
Phases	1	1
Current ac amps (maximum)	8	4
Thermal dissipation (watts)	300	300
Thermal dissipation (Btu/h)	1000	1000
NEMA receptacle type	5-15R	
Operating Environment		
Temperature	10° to 40° C (50° to 104° F)	
Relative humidity	10% to 90%	
Altitude	2.4 km (8000 ft)	

LG12 Line Printer



The LG12 is a 1200-line-per-minute shuttle-matrix, text and graphics, impact printer that combines superior print quality with high speed and quiet operation. In text mode, the LG12 offers data processing and correspondence mode printing as well as a selection of character-per-inch and line-per-inch print options. In graphics mode, the LG12 offers a wide range of barcodes including POSTNET, super/subscripts, bolding, double wide and double high characters, and underlining. The LG12 is compatible with OpenVMS VAX (V4.7 or higher) for all applications.

The low acoustic level (55 dBA) and rugged design of the LG12 allows for flexibility of printer placement into any environment. The printer is compatible with the DECserver 250 print server and can be utilized in a network configuration. The LG12 offers three resident industry-standard interface options: either Data Products-style parallel interface, Centronics-style parallel interface for connections to DEC and other IBM-compatible PCs, or EIA-232 serial interface.

- 1200 lines per minute
- 150,000 pages per month workload
- Compressed or expanded print
- 5, 10, 12, 13.3, 15, or 16.7 characters per inch (cpi); 17 and 20 cpi supported in IBM Proprinter emulation mode
- Underlining, strikethrough and bolding
- Multipart forms (1–6 parts)
- Multiple fonts
- Sparse font (1200 lines per minute)
- Multiple character sets
- OCR character sets
- 7-or 8-bit character sets
- ANSI/ISO compatible
- Subscripts and superscripts
- Rotation of text for spreadsheets
- Ability to create custom forms and logos
- 13 styles of bar codes including POSTNET
- Triple interfacing (EIA-232, Data Products, Centronics)
- Auto ranging power supply
- LG02/LG06 compatibility
- IBM Proprinter XL III emulation
- Epson FX 1040 emulation (limitations exist)

Performance

Print speeds	1200 lines/minute (lpm) (standard)	
High speed	Uppercase Upper and lowercase	1200 lpm 1025 lpm*
Data processing	Uppercase Upper and lowercase	900 lpm* 720 lpm
Correspondence	Uppercase Upper and lowercase	475 lpm 365 lpm
OCR-A	Uppercase Upper and lowercase	450 lpm 250 lpm
OCR-B	Uppercase Upper and lowercase	450 lpm 250 lpm
Barcodes and graphics	60 x 75 dpi 100 x 100 dpi	84 inches per minute 52 inches per minute

* EIA-232 serial connections will not support these speeds in certain applications.

LG12 Line Printer *(continued)*

Prerequisite Hardware

Parallel—Data Products Style

Unibus	M7258-00 Unibus controller + BC27A-30 cable
Q-bus BA23/BA123	M8027-00 Q-bus controller + BC27A-30 cable
Q-bus BA2xx/BA4xx	LPV11-SA Q-bus controller + BC27L-30 cable
VAXBI	DMB32-M controller + BC27A-30 cable
DECserver 250	BC27A-30 cable

Parallel—Centronics Style

Centronics port	BC19M-10 cable

Serial

EIA-232 port	BC22D-25 or BC22D-50 cable

Ordering Information

LG12-A9	1200-line-per-minute shuttle-matrix text and graphics printer, auto ranging power supply, U.S. power cord. Prerequisites: Interconnect cable, controller board for parallel interface.
LG12-CA	Parallel 1200-line-per-minute shuttle-matrix text and graphics printer with BC27A-30 30-ft (9.1-m) data cable for use with DECserver 250 and VAXBI systems; auto ranging power supply, U.S. power cord. Prerequisite for VAXBI systems: DMB32 controller.
LG12-DA	Serial 1200-line-per-minute shuttle-matrix text and graphics printer with BC16E-25 cable and H8575-A adapters for connection to EIA-232 serial ports; auto ranging power supply, U.S. power cord.
LG12-JA	Parallel 1200-line-per-minute shuttle-matrix text and graphics printer with BC27L-30 30-ft (9.1-m) data cable for use with LPV11-SA dual-ported controller in BA2xx or VAX 4000 enclosures; auto ranging power supply, U.S. power cord. Prerequisite: LPV11-SA controller.
LG12-PA	1200-line-per-minute shuttle-matrix text and graphics printer with Centronics-type BC19M-10 10-ft (3-m) data cable for use with DEC personal computers; auto ranging power supply, U.S. power cord.

LG12 Line Printer *(continued)*

Power Cords

Note: The LG12 has an auto ranging power supply. A power cord MUST be ordered separately for 240-V operation.

BN27V-4E	United States
BN20E-2E	U.K./Ireland
BN20D-2E	Austria/Belgium/Finland/France/Germany/Netherlands/ Norway/Portugal/Spain/Sweden
BN22F-2E	Switzerland
BN20C-2E	Australia/New Zealand
BN22H-2E	Denmark
BN22J-2E	Italy
BN22L-2E	Israel

Accessories and Supplies

LG6XX-GC	Ribbon (6/box)

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 7, *Networks, Communications, and Cables*, for more information and prerequisite software.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for OpenVMS VAX
QA-VZEAA-H5/HM	VAX Vertical Forms Printing media and documentation

Specifications

Physical Characteristics	
Height	108.0 cm (42.5 in.)
Width	86.4 cm (34.0 in.)
Depth	73.7 cm (29.0 in.)
Weight	156 kg (345 lb)

Power Requirements	
Voltage	120/240 V
Frequency	50/60 Hz
Phases	1
Current ac amps (maximum)	15/8
Thermal dissipation (watts)	750
Thermal dissipation (Btu/h)	2500
NEMA receptacle type	5–15R

Operating Environment	
Temperature	5° to 40° C (41° to 104° F)
Relative humidity	10% to 90%
Altitude (maximum)	2.4 km (8000 feet)

DECprint Supervisor for OpenVMS (DCPS)

SPD: 44.15

DECprint Supervisor (DCPS) for OpenVMS VAX and OpenVMS AXP, V1.0, 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 V5.3 or greater.

Note: DCPS is offered in three packages: DCPS-Base, DCPS-Open, DCPS-Plus. See chart for highlights of each package. Refer to SPDs 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 processors 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 Hew- lett-Packard and Apple, respectively) and supports their device-specific features while printing PostScript and DEC ANSI (PPL3). (Currently supported printers listed in the SAA portion of 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.

Ordering Information

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 AXP (traditional license)
QL-09MA*-AA	DCPS-Plus for OpenVMS AXP (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	

** OpenVMS VAX only.

DECprint Supervisor for KODAK Printers (KPS) for OpenVMS VAX, V1.0

DECprint Supervisor for KODAK Printers for OpenVMS VAX is a layered software product required to access the KODAK 1392 Model 44 production printer. It is a supplement to Digital's DECprint Supervisor for OpenVMS (DCPS).

DECprint software reads the document data on the host and sends it to the printer for page description language interpretation, response to error and status conditions, and notification to the job scheduler of the printer and job status.

DECprint Supervisor for KODAK Printers for OpenVMS VAX supports printing complex pages, forms, and graphics through standard OpenVMS VAX interfaces, such as the DCL PRINT command and the DECwindows print widget. It also supports Microsoft Windows and Macintosh computers through Digital's PATHWORKS or third-party products.

Hardware Requirements

- At least one KODAK 1392 Model 44 printer
- An Ethernet controller interface for the client system
- An Ethernet physical channel for the printer, and one of the following:
  - Thick wire Ethernet transceiver (H4005 or equivalent)
  - ThinWire Ethernet Media Access Unit (DECXM or equivalent)
  - Twisted pair Ethernet Media Access Unit (DETPM or equivalent)
  - Fiber Ethernet Media Access Unit (DEFLM or equivalent)
  - Ethernet Concentrator or Repeater Port (DELNI, DEMPR,
  - DEMON, DECrepeater 90C/90T or equivalent)

Software Requirements

Installation of this product (KPS) REQUIRES pre-installation of other Digital software products:

- OpenVMS V5.5 –V5.5-2 or Desktop-VMS Software V1.0 –V1.2
- DECprint Supervisor (DCPS) for OpenVMS VAX V1.0(SPD 25.A4.xx)
- DEC TCP/IP Services for OpenVMS VAX V2.0 (SPD 25.A4.xx)

Note: Although the DCPS product must be installed, no DCPS-Plus or DCPS-Open license is necessary for using the advanced printing features of DECprint Supervisor for KODAK Printers software.

Ordering Information

QA-0WEAA-H5	DECprint KPS V/V TK50 kit
QA-0WEAA-GZ	DECprint KPS V/V documentation kit
QL-0WEA9-AA	DECprint KPS V/V traditional license
QL-0WEA9-RA	DECprint KPS V/V traditional upgrade license

PrintServer Software

A PrintServer printer includes hardware and licensed software. The PrintServer Software delivers PostScript printing and handles all the print management and network communication functions for PrintServers in AS/400, HP-UX, IBM AIX, NetWare, Windows NT, OpenVMS, DEC OSF/1 AXP, SCO UNIX, SCO UNIX/ DECadvantage, Solaris, Pyramid Osx, Unisys System V, Silicon Graphics IRIX, Sequent Dynix, SunOS, ULTRIX, and AT&T Unison operating environments. PC and Macintosh printing support is also provided. 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 downline loads the PostScript interpreter 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 Token Ring protocols. Many types of systems can share the same Print- Server system via TCP/IP, DECnet Ethernet, and Token Ring networks.
- 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 data-type 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.
- 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.
- 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.
- Remote console utility that provides monitoring and manage- ment 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.

For additional information on Digital's PrintServer Software, refer to the following SPDs:

- PrintServer Software SPD 48.09

PrintServer Software *(continued)*

Ordering Information

QL-0V9A9-AA	PrintServer Software Traditional License
QL-0V9A9-RA	PrintServer Software Update License
QA-0V9AA-H*	PrintServer Software for OpenVMS VAX and OpenVMS AXP†
QA-0V9AB-H*	PrintServer Software for ULTRIX (VAX and RISC)†
QA-0V9AC-H*	PrintServer Software for SunOS
QA-0V9AD-H*	PrintServer Software for HP-UX
QA-0V9AE-H*	PrintServer Software for IBM AIX
QA-0V9AF-H*	PrintServer Software for SCO UNIX
QA-0V9AG-H*	PrintServer Software for NetWare††
QA-0V9AH-H*	PrintServer Software for Windows NT††
QA-0V9AJ-H*	PrintServer Software for DEC OSF/1 AXP
QA-0V9AK-H*	PrintServer Software for Solaris
QA-0V9AL-H*	PrintServer Software for AT&T Unison
QA-0V9AM-H*	PrintServer Software for SCO UNIX/DECadvantage
QA-0V9AN-H*	PrintServer Software for Pyramid OSx
QA-0V9AP-H*	PrintServer Software for Unisys System V
QA-0V9AQ-H*	PrintServer Software for Silicon Graphics IRIX
QA-0V9AR-H*	PrintServer Software for Sequent Dynix
QB-0V9AA-E*	PrintServer Source Kit for BSD-UNIX
QT-0V9-****	PrintServer Software Services

* denotes M = magtape, 8 = CD-ROM, 5 = TK50, P = QIC, P = DAT, C = 3.5-inch diskette, 7 = 5.25-inch diskette

† Supporting Host only. For Print Client software for OpenVMS, refer to DECprint Supervisor (DCPS) for OpenVMS. For ULTRIX, refer to ULTRIX operating system.

†† Print client only. Supporting host features and services are provided by one of the other supported platforms. DEC Image Print-PLUS Software

DEC Image Print-PLUS Software

DEC Image Print-PLUS is a software solution that allows printing of bitonal images on Digital's image-capable PrintServers at engine speeds.

The DEC Image Print-PLUS software solution takes advantage of the hardware decompression capability of Digital's image-capable PrintServers. The solutions include enhanced versions of DEC PrintServer Supporting Host Software for VMS and DECprint Supervisor for OpenVMS.

The supporting host component enables an OpenVMS VAX system on the network to boot and provide support functions for an image-capable PrintServer for compressed images, as well as other file types currently supported. It provides the same capabilities that are provided by the DEC PrintServer Supporting Host Software for VMS. In addition, it accepts compressed bitonal image print requests from the OpenVMS VAX client.

The client services component of the DEC Image Print-PLUS software solution is installed on a VMS system that is on the same network as an image-capable PrintServer. It provides the capability for processing print requests from the client OpenVMS system. Print requests are processed by the DEC Image Print-PLUS print symbiont which accepts DCL PRINT command requests from the user. The /PARAMETERS qualifier in the PRINT command allows specific parameters to be passed to the printer, as in the existing symbiont. PostScript conversion for DDIF files is not required—the client software passes compressed images directly to the PrintServer where they are decompressed and printed at up to near engine speed.

DEC Image Print-PLUS Software *(continued)*

Features

- Supports printing of compressed and uncompressed DDIF images on Digital's image-capable PrintServers at engine speed
- PrintServer 17 and PrintServer 32 supported with V1.2
- Image data is passed directly to the PrintServer, avoiding extra time for PostScript conversion
- Provides a faster network-wide resource for image printing
- Prints all file types supported by the PrintServer
- Prints in duplex and simplex mode
- Prints multiple page image files
- Supports multiple paper sizes
- Supports scaling, rotation and cropping of images
- Software-only solution
- Compatible with existing print capabilities through DCL PRINT commands—no changes necessary to existing applications or operations
- Coexists on same network with other PrintServers and clients

Ordering Information

A license is required for each PrintServer that is to be upgraded for image printing. The license permits execution of the software on any processor (i.e., OpenVMS VAX system) or VAXcluster within a local area network.

FW-IPPL9-AA	License
FW-IPPK0-H*	Media and documentation
FW-IPPK0-GZ	Documentation only

Distributed Queuing Service

SPD: 28.80 (for OpenVMS VAX Systems), 45.86 (for Alpha AXP Systems)

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 AXP platforms, DQS is compatible with the user's local print command, 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 AXP.
- Supports wide area and local area networks.
- Distributes reports to geographically distributed sites faster.
- 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.

Distributed Queuing Service *(continued)*

Ordering Information

VAX Distributed Queuing Service

QL-VENA9-XX	Single-user license
QA-VENAA-H5	TK50
QA-VENAA-HM	9-track magtape

DEC Distributed Queuing Service (DQS AXP)

QL-0HPA*-AA	Single-user license
QA-0HPAA-GZ	Software documentation

DECprint Utility for PostScript to Sixel Printing for VMS

SPD: 31.56—UPI: YZP

DECprint Utility for PostScript to Sixel Printing for VMS (also known as DECprint Utility) is a software product that extends the capabilities of Digital printers by allowing PostScript files to be printed to sixel printers. It also provides users with a low-cost solution to the problem of printing color PostScript files.

Selected Digital graphics printers can print PostScript files, attached directly to a VAX system, remotely via DECnet, or to printers attached to remotely located terminals and PCs.

Features

- Provides a low-cost Digital color PostScript output solution in combination with the LJ250/LJ252 Companion Color Printers, and also with the LA324 and LA424 MultiPrinters
- Supports printing PostScript files to LAxx, LJxx, and LNxx ANSI (PPL-3) sixel printers
- Expands Digital's printer capabilities by supporting PostScript printing on printers attached to terminals or shared on the network
- Is less expensive than a dedicated PostScript printer, making it ideal for occasional low volume PostScript printing needs
- Provides access to PostScript printing for remote locations or can print confidential information right at the desk
- Easy to install and use
- Runs on any VAX, MicroVAX, VAXstation, or VAXserver running OpenVMS V5.1 or later

Ordering Information

QL-VZPA9-PB	Single-user license
QA-VZPAA-H*	Media and documentation kit

DECfonts Typeface Collection for VMS and ULTRIX

SPD: 33.50—UPI: YX4

DECfonts Typeface Collection for VMS AND ULTRIX provides applications with a library of PostScript Type 1 Typefaces by Adobe Systems Inc. These are the first optional scalable typefaces for Digital's PostScript platforms; they can be used on any PostScript language imaging device including PostScript printers, Display PostScript software, or host-based PostScript software interpreters. DECfonts Typeface Collection includes a consolidated distribution media containing a number of typeface kits. The first release of the DECfonts Typeface Collection includes one kit, the Apple LaserWriter emulation kit, and the additional typefaces necessary to give Digital PostScript printers complete compatibility with LaserWriters. LaserWriter emulation kit contains the following typeface families: Palatino, ITC Bookman, Helvetica Narrow, ITC Zapf Chancery Medium Italic, and ITC Zapf Dingbats. Palatino, ITC Bookman, and Helvetica Narrow are available in upright, slanted, upright bold, and slanted bold versions.

Adobe's Type 1 Typefaces contain outlines, font metrics, and screen bitmaps. The outline description of the typeface characters used by the printer are contained in the printer font files. This outline description is scalable and device independent. Scalability allows the typeface to be printed in any point size supported by the application. Device independence means the characters can be reproduced on any PostScript language device. The font metric files contain information on size and shape characteristics of the font. This includes data that may be required by application programs in determining the spacing between characters (kerning) and the spacing between lines (leading). Screen bitmaps of corresponding sizes can be used by applications to provide WYSIWYG (What You See Is What You Get) video displaying of documents.

Features

- Optional PostScript Type 1 Typeface outlines can be used by PostScript software interpreters such as Display PostScript software, PostScript printers or the DECprint Utility for PostScript to Sixel printing.
- Incorporates matching screen bitmaps for both 75 and 100 dot/inch video displays in a number of standard DECwindows sizes (10, 12, 14, 18, and 24 points) for WYSIWYG screen representation. The LaserWriter emulation kit also includes 8 points.
- Associated font metric files used by formatting software such as DECwrite and DECpresent.

Ordering Information

QL-YX499-PB	DECfonts LaserWriter emulation kit (single-user license)
QA-YX6AA-HX	DECfonts for VMS media and documentation
QA-YX6AB-HX	DECfonts for ULTRIX media and documentation

Note: x denotes media type; M = magtape, 5 = TK50.

SoftFont

SoftFont is a series of bitmap fonts emulating the font capabilities of the LN03 and DEClaser 2100 plus and 2200 plus printers. Any of Digital's PostScript printers that operate under DECprint Printing Services software V4.0 or higher can use SoftFont.

The standard SoftFonts are available on TK50 or 9-track magtape media. Installed and specified through VMSINSTAL, they are further specified through an extension to the standard VMS PRINT command. The fonts are then available to all ANSI documents such as those produced by WPS-PLUS and printed under DECprint Printing Services to a Digital PostScript printer.

Prerequisites

DECprint Printing Services Software V4.0 or higher.

Ordering Information

LNSFT-AX	CG Times 8, 10, 12 CG Times 14, 18 CG Times 24
LNSFT-BX	CG Triumvirate 8, 10, 12 CG Triumvirate 14, 18 CG Triumvirate 24
LNSFT-CX	ITC Souvenir 8, 10, 12 English Embassy 14, 18
LNSFT-DX*	Mono Swiss 14, 18 Mono Swiss 24 Letter Gothic 10, 14 OCR-A, OCR-B 10 Barcode 3 of 9, 18, 36 U.S. Legal

Note: x denotes media type; M = magtape, 5 = TK50
*Does not include U.S. Legal Gothic

VAX Vertical Forms Printing

VAX Vertical Forms Printing for VMS (VAX VFP) is an online software utility designed for users who want to take advantage of the Vertical Forms Unit (VFU) capabilities of the printers listed in the Systems Support Addendum (SSA 31.26) (LG31, LG01, LP37, and LP29). VFU controls the vertical motion of the paper, which enables faster throughput.

VFP provides DCL-like commands to set up a generic VFU load file and to convert generic load and data files into device-specific load and data files. A generic VFU load file describes the format of the page. The page format is described by specifying the line numbers and the channel numbers associated with the line.

To order VAX VFP the UPI is VZE. Refer to SPD 31.26. For more information, call Digital Services Sales Support at 800-832-6277 or 603-884-8990. Documentation and Publication Management (DPM)

Documentation and Publication Management (DPM)

DPM allows users to print high-mix documentation retrieved from an electronic database at high speeds in a production environment. It consists of four subsystems.

The Scanning Subsystem provides for the creation of electronic files through the use of a duplex high-speed scanner with speeds of up to 50 impressions per minute (CCITT G4.2).

The Image Editing Subsystem provides manipulation and pixel-level editing of page images retrieved from either the Scanning or the Processing and Storage Subsystem.

The Printing Subsystem provides hard-copy output. A Kodak 1392 LED printer is driven by a VAX-based print controller permitting operation at 92 pages/minute for any mix of documents or images.

The Host Processing and Storage Subsystem allows scanned documents to be stored on a combination of magnetic disks (up to 126,000 pages of archival storage)and WORM DRIVES (up to 75,000 pages of magnetic disk storage). It also provides high-speed conversion of electronically created documents into image from PostScript, ASCII, Sixel and others.

Ordering Information

DPM is available by custom quote only. For additional information, contact Digital Services Sales Support at 800-832-6277 or 603-884-8990. ON-TAP—Bar Code Printing Software

ON-TAP—Bar Code Printing Software

ON-TAP software enables users to print bar codes anywhere in a document by placing a mark at each position where a bar code is to be printed. Because ON-TAP software is application- independent, the information that is marked for bar coding can be part of a letter produced by word processing software, information from an accounting program, or part of virtually any off-the-shelf program or custom-written application. ON-TAP software prints the following symbologies: Code 39, Codabar, Code 128, Interleaved 2 of 5, Straight 2 of 5, MSI, UPC, POSTNET, and EAN.

One of ON-TAP software's greatest features is its intrinsic ease of use. No programming or technical expertise is required. Once ON-TAP is installed on the system and a symbology is selected, bar codes can be printed anywhere on a page by simply entering a tilde (~) character at the beginning and the end of the data which is to be bar coded.

Features

- POSTNET symbology for 5-, 9-, and 11-digit zip codes, advanced bar code (cost savings on mail up to 20 percent)
- Ability to print the most commonly used bar code symbologies
- Available for VMS systems, DECstation 200/300 personal computers, and PATHWORKS local area networks
- Easy to change bar code height, ratio, plot density, and use of check digits
- Supports LA424 MultiPrinter, LA75/LA75P/LA75 Plus, LA324, LA95 Printers, LA210 Letterprinter, LA310, LN03 PLUS desktop laser printer, and LJ250/LJ252 Companion Color Printers, LA70 Personal Printer, DECmultiJET 1000/2000 printers, and the DEClaser family
- Supports the ScriptPrinter, PrintServer 20, PrintServer 17, PrintServer 32, and the PrintServer 40 Plus in ANSI mode

ON-TAP— Bar Code Printing Software *(continued)*

Ordering Information

QB-GADAD-WB	ON-TAP/DOS (5.25-inch floppy disk)
QB-GADAD-WA	ON-TAP/DOS (3.5-inch floppy disk)
QB-GADAV-WG	ON-TAP/VMS MicroVAX (TK50)*
QB-GADAV-WH	ON-TAP/VMS MicroVAX (magtape)*
QB-GADAV-WL	ON-TAP/VMS VAX 4xxx (TK50)
QB-GADAV-WM	ON-TAP/VMS VAX 4xxx (magtape)
QB-GADAV-WA	ON-TAP/VMS VAX 6xxx (TK50)
QB-GADAV-WB	ON-TAP/VMS VAX 6xxx (magtape)
QB-GADAV-WC	ON-TAP/VMS VAX 7xx (TK50)
QB-GADAV-WD	ON-TAP/VMS VAX 7xx (magtape)
QB-GADAV-WE	ON-TAP/VMS VAX 8xxx (TK50)
QB-GADAV-WF	ON-TAP/VMS VAX 8xxx (magtape)
QB-GADAV-WJ	ON-TAP/VMS VAX 9xxx (TK50)
QB-GADAV-WK	ON-TAP/VMS VAX 9xxx (magtape)
QB-GADAV-WQ/WR	ON-TAP/OpenVMS VAX 10xxx (TK50/magtape)
QB-GADAV-WN/WP	ON-TAP/OpenVMS VAX 7xxx (TK50/magtape)

*MicroVAX order numbers include the MicroVAX II, MicroVAX 2000, and MicroVAX 3000 series.

JetForm Software

The JetForm Forms Development System is a set of tools for designing, developing, and completing electronic forms. Electronic forms can be used to collect, store, share, and retrieve information for every kind of form, including insurance claims, job applications, invoices, and shipping labels.

The JetForm Forms Development System provides four different, specialized products that work either alone or together, depending on user requirements. The four products are:

- JetForm Design, a forms design and fill tool based on the Microsoft Windows interface
- JetForm Filler, which provides interactive data entry on the forms created by JetForm design
- JetForm Server, a VAX VMS based server that monitors the system for new printing tasks and then locates the form, enters the data, controls the assigned laser printers, downloads the fonts, and prints the required number of completed forms
- JetForm Merge, which enables merging of variable data (from files created by host application programs) with electronic forms created with JetForm Design, and then prints the completed form

Prerequisites

Intel 386-or 486-based PC running MS-DOS V3.0 or higher, 2-Mbyte RAM minimum; hard disk, mouse, graphics monitor; JetForm server runs on OpenVMS V5.3 (or higher) or in a PC environment; Windows 3.0 or higher; Digital's PrintServer 17, PrintServer 20, turbo PrintServer 20, PrintServer 40 Plus, DEClaser 1150, DEClaser 2150 plus, DEClaser 2250 plus, DEClaser 3250, LN03 ScriptPrinter, and ColorMate PS. Digital's PATHWORKS PC integration software products are required to print from a PC to a PrintServer printer; JetForm server supports any MS-DOS LAN or OS/2 LAN server.

JetForm Software *(continued)*

Ordering Information

QB-XBNAD-WA	JetForm Design MS-DOS 3.5-inch, 5.25-inch diskette
QB-XL6AD-WA	JetForm Filler MS-DOS 3.5-inch, 5.25-inch diskette
QB-XBPAD-WA	JetForm Server MS-DOS 3.5-inch, 5.25-inch diskette
QB-XW9AV-WE	JetForm Server VAX Class 2 TK50
QB-XW9AV-WF	JetForm Server VAX Class 3 TK50
QB-XW9AV-WG	JetForm Server VAX Class 4 TK50
QB-XW9AD-WH	JetForm Merge MS-DOS 3.5-inch, 5.25-inch diskette
QB-XW9AV-WB	JetForm Merge VAX Class 2 TK50
QB-XW9AV-WC	JetForm Merge VAX Class 3 TK50
QB-XW9AV-WD	JetForm Merge VAX Class 4 TK50

VAX Class 2: VAXstation, MicroVAX, VAX-11/725, VAX-11/730, 2000, MicroVAX 3100
VAX Class 3: DEC VAX-11/750, 78x 3xxx, VAX 4000, VAX 62xx, VAX 6320, VAX 6410, VAX 82xx/83xx/85xx/86xx
VAX Class 4: DEC VAX 6330, 6340, 6420-6460, 86xx, 87xx, 88xx, 89xx, 9xx

Chapter 10
Environmental Products

Environmental Products Software

UPS System Configuration Guidelines

Desktop/Office Systems—PUPS, Smart-UPS, Back-UPS

On-line Desktop/Office Systems—PUPS

Standby Desktop/Office Systems—Smart UPS/Back-UPS

Office/Data Center Line Interactive Systems—Matrix UPS

Office/Data Center On-line Systems

Prestige Model 3000 UPS Systems

Powerware Plus Series (PUPS Plus) Systems

UPS Hardware Options/upgrade Kits

Data Center Systems—HA4000 3-Phase UPS

Distribution, Environmental Monitoring, and TVSS

Receptacle Reference Chart

For telephone ordering and pre-purchase technical assistance in the U.S., call 800-DIGITAL and ask for an Environmental Support Specialist

Digital's environmental products solve power-related problems and prevent system downtime and damage from occurring. These products simplify system installations and ensure efficient, reliable system operation. For supplementary product information, call 800-Digital (800-344-4825) and ask for Environmental Products Support or contact a local Business Protection Services Representative.

Environmental Products Summary Chart

	Office/ Data center UPS Systems[1]	Desktop/ Office UPS Systems(1)	CDM[2]	PDM[3]	TVSS[4]	EMS[5]	UPS Software7
High energy transients, impulses and spikes	X	X	–	–	X	–	
High/low voltage, sags, surges	X	X	X	–	–	–	
Phase rotation	X	–	X	X	X	–	
Improper/inadequate wiring or grounding	X	X	X	X	X	–	
Electrical noise	X	X	X	X	–	–	
Power outage	X	X	–	–	–	–	
Environmental monitoring	–	–	X	X	–	X	REMS
Software link with REMS(6)	X	X	–	–	–	X,	–
Auto-CPU shutdown	–	–	–	–	–	–	X
System type	All systems single-phase 3-phase systems	Single-phase small to mid-range	3-phase mid-range to large systems	3-phase mid-range to large systems	All Digital systems	All Digital OpenVMS VAX systems	All Ditital and most non-Digital systems

[1] UPS protects against blackouts, conditions, distributes
[2] CDM, conditions, distributes, monitors
[3] PDM distributes, monitors
[4] TVSS suppresses
[5] EMS environmental monitoring system
[6] REMS remote environmental monitoring, software
[7] See software matrix

UPS Systems Overview

Digital has a full range of UPS systems to meet a variety of needs ranging from low-cost, dependable protection for the desktop to premium power protection for the most critical applications. See Step 2 for system load data and recommended UPS.

Desktop/Office Systems Matrix

System	Technology	Load Range	Phase	Available Single Outlets	Input Voltage	Output Voltage
PUPS (Personal and Prestige)	On-line	650–2000 VA	1	4	120	120
Smart-UPS	Line Interactive	400–2000 VA*	1	4 to 6	120 or 230††	115 or 230††
Back-UPS	Standby	200–1250 VA	1	2 to 6	120 or 230††	115 or 230††

Office/Data Center Systems Matrix

System	Technology	Load Range	Output Phases	Available Outlets**	Input Voltage	Output Voltage
MATRIX	Line Interactive	3–5 kVA	1	6 (expandable)	208–240††	120/208–120/240††
Prestige 3000	On-line	3 kVA†††	1	3 (expandable)	208–240††	120/208–120/240††
PUPS Plus	On-line	3.6–12 kVA†	1	4 to 8	176–276	100/200–120/240 (5 selections)
PUPS Plus	On-line	15–18 kVA	3	up to 9	176–253	115/201–127/220 (3 selections)
PUPS Plus	On-line	24–36 kVA	3	via PDU	176–253	120/208 or 277/480††
HA4000	On-line	11–125 kVA	3	via PDU	208 or 480††	120/208 or 277/480††

* 2000 VA Smart-UPS requires L5--30R receptacle; 2000 VA PUPS requires 5-20R at full rating.
** Hardware output to remote panel also available for office/data systems. All 15- and 20-Amp outlets are duplex type.
† PUPS Plus input for 3.6-12 kVA models may be 2 or 3 phases.
†† Model dependent.
†††† 4.5 and 6 kVA Prestige also offered, call for availability

Note: All of Digital's UPS systems meet UL and FCC regulatory requirements and have excellent lightning surge protection. Monitoring software is available to enable unattended orderly CPU shutdown should battery backup time be exceeded before utility power returns. For systems above 36 kVA, contact a local Business Protection Specialist.

Environmental Products Software

The following chart shows the available software and the applicable Environmental Product/UPS system. Several products are available to support basic UPS monitoring and CPU shutdown. Select the product that meets the requirements of the UPS system and operating platform. See detailed descriptions below and Software Selection Charton on next page.

Environmental Products Software Matrix

Software Product	Order Number[1]		Operating System	Applicable Environmental Products	UPS to CPU Cable[5]	Required UPS Communications Port	Function
REMS[2]	**QA-VI5AA-Hx** **QL-VI5A9-AA** **QP-LBHAA-*** **QA-VD8AA-H5** **QT-VI5A9-****	Media and doc Software license REMS/FMS license FMS Media Support services	OpenVMS[3]	HA3X, HA4X, PUPS, PUPS Plus, EMS, H7317, H7318 Prestige	BC22E-25 (except PUPS), BC31D-25 (PUPS) to serial port on VAX[4]	EIA-232	Full environmental monitoring, extended UPS monitoring (multi-CPU)
PowerMon	**4N-JBBBB-**** (See order chart)		OpenVMS, DEC OSF/1 AXP, UNIX, SCO, ULTRIX, XENIX, Novell , OS/2	HA3X, HA4X, PUPS, PUPS Plus, or any UPS with dry contacts	DB9 to DB25 pin DB9 @ Personal DB25 @ PUPS Plus and Prestige Hardwire @ HA3X, HA4X	LAN Relay or EIA-232	Basic UPS monitoring and CPU shutdown only
PowerChute Plus	**4N-APAOA-**** (See order chart)		All except OpenVMS VAX OpenVMS AXP	Back-UPS (LAN) Smart-UPS/MATRIX (EIA-232) except 250 VA model	DB9 to DB9 pin	LAN Relay or EIA-232	Extended UPS monitoring via EIA 232
Onlinet and Onlisafe	**4N-AEAES-**** (See order chart)		All[3]	Prestige, Personal and PUPS Plus	DB9 to DB25 pin DB9 @ Personal Pers DB25 @ PUPS Prestige and PUPS Plus	LAN Relay (Onlisafe) or EIA-232 (Onlinet)	Extended UPS monitoring via EIA 232

x Denotes media type: 5 = TK50, M = magtape.
* Processor rating dependent.
** Denotes service type: I9 = installation, L9 = LPS. Installation does not include customization.
1 All sotware kits include media documentation
2 See EMSII for optional monitoring hardware.
3 Call for REMS and Onlinet availability on OpenVMS AXP and DEC OSF/1 AXP.
4 Call 800-Digital for cable to connect to other system types.
5 All kits except REMS include cables and DB9 to 25-pin adapters.

Note: PowerMon and PowerChute Plus are for one system per UPS. PowerChute Plus for Novell has multiple CPU shutdown capability via the network manager. Multiple shutdown for PowerMon or other PowerChute Plus operating systems is also available.
Communications port on the CPU is always the EIA-232 or serial port.
LAN Relay port refers to UPS-to-CPU communication protocol and does not denote direct network connectivity.

Remote Environmental Monitoring Software (REMS)

VAX Remote Environmental Monitoring Software (REMS) is a high-performance, OpenVMS-based, centralized monitoring and control system for use with Digital's UPS systems. REMS monitors/communicates with HA4000 PUPS, PUPS, PUPS-Plus, PCS/PDS-Plus and EMS (Environmental Monitoring Systems). REMS is ideal for use with UPS systems as it will monitor and report such conditions as **on-battery, inverter failure, on-static-bypass**, and many other alarms. It will also initiate an automatic CPU system shutdown on multiple CPUs in an unattended setting, and protect valuable data. REMS is ideal for OpenVMS Cluster environments.

When used with EMS and EMSII, REMS will report on environmental anomalies within the computing environment, provide detailed reports of these disturbances, and automatically execute actions (i.e., send mail, initiate a spawn routine, or signal systems such as DECalert or DECtalk) upon any preset user-defined threshold. To operate, REMS requires any OpenVMS VAX system with FMS installed. REMS/FMS kits also available. See Environmental Products Software Matrix for ordering information.

Note: REMS V1.5 requires OpenVMS VAX V5.0 and FMS V2.4 or higher.

PowerMon Software Basic Monitoring for any UPS System

PowerMon software is a software interface that allows the UPS to communicate with most operating systems. PowerMon will perform an unattended automatic system shutdown at a user-defined time or upon receipt of a low battery signal from the UPS system. It also keeps a record of power outages.

PowerMon operates as a background task and continually polls the UPS via its EIA-232 or LAN relay port and communicates to the EIA-232 port of the CPU. When power fails, a countdown timer (user-defined) is activated and a message "**on battery backup**" is broadcast to all users on the system. A final "**system shutdown**" message will appear prior to automatic powerdown. PowerMon has four user-modifiable scripts that can be activated during power loss to execute functions toward an orderly system shutdown. **Note:**PowerMon requires a dedicated asynchronous EIA-232 port that supports modem control to detect low battery signal.

PowerChute PLUS Software for Back UPS/Smart UPS/Matrix UPS Systems

PowerChute Plus software for Back-UPS/Smart-UPS/Matrix UPS systems provides the same auto shutdown features as PowerMon software. However, when used with Smart-UPS or MATRIX UPS systems, the software allows UPS-scheduled self-tests, remote diagnostics, and graphics display of UPS parameters. All Back-UPS models and all OS2 and AppleShare applications require ports that support modem control. All models require asynchronous communication. See Environmental Products Software Matrix on previous page and order chart below for ordering information.

OnliNet and OnliSafe for Personal, Prestige and PUPS Plus On-line UPS Systems

OnliNet software provides the same extended monitoring and self test features as PowerChute Plus. Onlinet requires a UPS with an EIA 232 port.

OnliNet Basic: Full power monitoring in addition to basic "single CPU" shutdown, user friendly graphic interface allows remote tests and diagnostics:

OnLiNet Network: Same as OnliNet basic except multipe CPU shutdown and Network power management provisions.

Onlisafe: Basic CPU shutdown with same features as PowerMon noted above except power-loss event history graph and pager interface. Works with LAN relay or asynchronous RS232 port.

Software Order Chart for UPS Systems

	One-UPS[1]	PUPS Personal LAN Models	PUPS Personal Serial Models	All Prestige Models	Powerware Plus (PUPS Plus)	Smart-UPS Back-UPS[2] Matrix	HA3000 HA4000 (EPE)
SUN-OS Sparc	**4N-AEAES-CC** OnliSafe	**4N-AEAES-DC** OnliSafe	**4N-AEAES-AD/BD** OnliNet[3]	**4N-AEAES-AD/BD** OnliNet[3]	**4N-AEAES-AD/BD** OnliNet[3]	**4N-APAOA-AD** PowerChute	**4N-JBBBB-AF** PowerMon
SUN-Solaris Sparc	**4N-AEAES-CC** OnliSafe	**4N-AEAES-DC** OnliSafe	N/A	**4N-AEAES-EC** OnliSafe	**4N-AEAES-FC** OnliSafe	**4N-APAOA-AD** PowerChute	N/A
SUN-Solaris x86	**4N-AEAES-CG** OnliSafe	**4N-JBBBB-AB** PowerMon	**4N-JBBBB-AA** PowerMon	**4N-JBBBB-AG** PowerMon	**4N-JBBBB-AE** PowerMon	**4N-APAOA-AD** PowerChute	**4N-JBBBB-AF** PowerMon
IBM-AIX	**4N-AEAES-CC** OnliSafe	**4N-AEAES-DC** OnliSafe	**4N-AEAES-AC/BC** OnliNet[3]	**4N-AEAES-AC/BC** OnliNet[3]	**4N-AEAES-AC/BC** OnliNet[3]	**4N-APAOA-AD** PowerChute	**4N-JBBBB-AF** PowerMon
HP-UX	**4N-AEAES-CC** OnliSafe	**4N-AEAES-DC** OnliSafe	**4N-AEAES-AE/BE** OnliNet[3]	**4N-AEAES-AE/BE** OnliNet[3]	**4N-AEAES-AE/BE** OnliNet[3]	N/A	N/A
SCO Unix	**4N-AEAES-CG** OnliSafe	**4N-JBBBB-AB** PowerMon	**4N-AEAES-AG/BG** OnliNet[3]	**4N-AEAES-AG/BG** OnliNet[3]	**4N-AEAES-AG/BG** OnliNet[3]	**4N-APAOA-AD** PowerChute	**4N-JBBBB-AF** PowerMon
Digital Ultrix V4.0 or later	**4N-AEAES-CL** OnliSafe	**4N-AEAES-DL** OnliSafe	**4N-JBBBB-CA** PowerMon	**4N-AEAES-EL** OnliSafe	**4N-AEAES-FL** OnliSafe	**4N-JBBBB-CB** PowerMon	**4N-JBBBB-CF** PowerMon
DEC OSF/1 AXP CD-ROM	**4N-AEAES-CD** OnliSafe	**4N-AEAES-DD** OnliSafe	**4N-JBBBB-FA** PowerMon[5]	**4N-AEAES-ED** OnliSafe[5]	**4N-AEAES-FD** OnliSafe[5]	**4N-APAOA-AF** PowerChute	**4N-JBBBB-FF** PowerMon
OpenVMS AXP CD-ROM	**4N-JBBBB-GA** PowerMon	**4N-JBBBB-GB** OnliSafe	**4N-JBBBB-GA** PowerMon[5]	**4N-JBBBB-GG** PowerMon[5]	**4N-JBBBB-GE** PowerMon[5]	**4N-JBBBB-GB** PowerMon	**4N-JBBBB-GF** PowerMon

Software Order Chart for UPS Systems *(continued)*

	One-UPS[1]	PUPS Personal LAN Models	PUPS Personal Serial Models	All Prestige Models	Powerware Plus (PUPS Plus)	Smart-UPS Back-UPS[2] Matrix	HA3000 HA4000 (EPE)
OpenVMS VAX (TK50) V5.1 or later	**4N-AEAES-CE** OnliSafe	**4N-AEAES-DE** OnliSafe	**4N-JBBBB-DA** PowerMon	**4N-AEAES-EE** OnliSafe	**4N-AEAES-FE** OnliSafe	**4N-JBBBB-DB** PowerMon	**4N-JBBBB-DF** PowerMon
OpenVMS VAX (Mag) V5.1 or later	**4N-JBBBB-EA** PowerMon	**4N-JBBBB-EB** PowerMon	**4N-JBBBB-EA** PowerMon	**4N-JBBBB-EG** PowerMon	**4N-JBBBB-EE** PowerMon	**4N-JBBBB-EB** PowerMon	**4N-JBBBB-EF** PowerMon
Windows NT AXP	N/A	N/A	**4N-AEAES-AA** OnliNet	**4N-AEAES-AA** OnliNet	**4N-AEAES-AA** OnliNet	**4N-APAOA-AE** PowerChute	N/A
Windows NT x86	N/A	N/A	**4N-AEAES-AB/BB** OnliNet[3]	**4N-AEAES-AA/BB** OnliNet[3]	**4N-AEAES-AB/BB** OnliNet[3]	**4N-APAOA-AE** PowerChute	N/A
Win DOS	N/A	N/A	**4N-AEAES-AH** OnliNet	**4N-AEAES-AH** OnliNet	**4N-AEAES-AH** OnliNet	**4N-APAOA-AG** PowerChute	N/A
OS/2	**4N-AEAES-CJ** OnliSafe	N/A	**4N-AEAES-AJ** OnliNet	**4N-AEAES-AJ** OnliNet	**4N-AEAES-AJ** OnliNet	**4N-APAOA-AB** PowerChute	N/A
Novell V2.0 or later Netware 3.11 or later	**4N-AEAES-CF** OnliSafe	**4N-JBBBB-BB** PowerMon	**4N-AEAES-BF** OnliNet[4]	**4N-AEAES-BF** OnliNet[4]	**4N-AEAES-BF** OnliNet[4]	**4N-APAOA-AA** PowerChute	**4N-JBBBB-BF** PowerMon

Note: Part numbers noted OnliSafe and PowerMon are CPU shutdown with limited monitoring. Part numbers noted OnliNet and PowerChute are full graphics display and extended UPS monitoring. Media is 3.5- and 5.25-inch disk unless otherwise noted.

1 All models except 250 VA One-UPS

2 All models except 250 VA Back-UPS. Limited UPS monitoring on all Back-UPS models

3 Part numbers shown for OnliNet Basic / Network Power Management Software available for these operating systems. OnliNet Network allows single point management and multi-CPU shutdown interface.

4 Novel NVX OnliNet Netowork Software allows network power management/multi-CPU shutdown interface.

5 Call for availability of onliNet Basic and Network for VAX and Alpha systems.

Step 1—Minimum UPS Systems

- Select recommended UPS system for corresponding CPU system from chart below. Minimum UPS system will support fully configured CPU and video device. External devices may require larger rating.
- For custom configurations, see Step 2.

Note: Shown are U.S. order numbers.

Digital System[1]	Video Receptacle	Minimum UPS Order Number	UPS Type	Estimated VA load with monitor
DEC 7000/VAX 7000 VAX 6000*	No No	**4N-AEAAN-BA**[2] **4N-AEAAN-BA**[2]	PUPS plus 15kVA PUPS plus 15kVA	5200 2800
AlphaServer 2100	No	**4N-AEAAH-AM**	Prestige 3000	1540
AlphaServer 2000	No	**4N-AEAAG-AF**	PUPS Personal 2000	1270
AlphaServer 1000	No	**4N-AEABD-AF**	PUPS Prestige 1250	820
AlphaStation 400/AlphaServer 400	Yes	**4N-AEABD-AF**	PUPS Prestige 800	725
AlphaStation 200	No	**4N-AEABC-AF**	PUPS Prestige 650	470
DEC 4000 Model 600/700*	No	**4N-AEAAH-AM**[5]	Prestige 3000	1940
DEC 3000 Model 500/800/900	Workstation only	**4N-AEABF-AB**	PUPS Prestige 1500	1135
DEC 3000 Model 400/600/700	Workstation only	**4N-AEABF-AA**	PUPS Prestige 1250	1060
DEC 3000 Model 300	Yes	**4N-AEABD-AF**	PUPS Prestige 800	640
DEC 2000 Model 500	Yes	**4N-AEABF-AB**	PUPS Prestige 1500	1400
DEC 2000 Model 300	Yes	**4N-AEABC-AF**	PUPS Prestige 650	575
VAX 4000 Model 500A/600A/700A	Yes	**4N-AEABF-AB**	PUPS Prestige 1500	1340
VAX 4000 Model 100A/105A	Yes	**4N-AEABC-AF**	PUPS Prestige 650	450
MicroVAX 3100	Yes	**4N-AEABC-AF**	PUPS Prestige 650	450
VAXstation 4000 Model 60/90/90A	Yes	**4N-AEABD-AF**	PUPS Prestige 800	630
VAXft 810	No	**4N-AEAAH-PA**[2]	PUPS Plus 3.6	3000 each
VAXft 110	No	**4N-AEABC-AF**	PUPS Prestige 650[2]	928 total
DECsystem 5900	Yes	**4N-AEAAH-AM**	Prestige 3000	1910
DECsystem/DECstation 5000	DECstation only	**4N-AEABC-AF**	PUPS Prestige 650	400
VAXstation VLC	Yes	**4N-APACA-AB**	Smart-UPS 450	300
VXT 2000/2000+	Yes	**4N-APAAF-AA**	Back-UPS 400	300
applicationDEC 433MP	No	**4N-AEABF-AA**	PUPS Prestige 1250	990
applicationDEC 433XP	Yes	**4N-AEABD-AF**	PUPS Prestige 800	700
DECpc AXP 150	Yes	**4N-AEABC-AF**	PUPS Prestige 650	575
DECpc 4xx/5xx MT/ST)	Yes	**4N-APACB-AB**	Smart-UPS 700	990
DECpc 4xx/5xx-XL	Yes	**4N-APACB-AB**	Smart-UPS 700	575
DECpc LPx, Venturis FP, Celebris FP	Yes	**4N-APAAF-AA**	Back-UPS 400	330
DECpc LPv, Venturis LP 4xx / 560, Celebris LP	Yes	**4N-APAAF-AA**	Back-UPS 400	250

[1] All systems except 6000, 7000 and DEC 4000 require standard NEMA configuration 5-15R (15 Amp) outlet. See system list under _____ and for outlet requirement.

[2] Requires additional order numbers for distribution module selection. See PUPS plus section Step 3.

[3] VAXft 810 uses a special preconfigured 3.6 kVA PUPS plus package. Two required per system.

[4] The VAXft 110 requires two UPS to maintain fault tolerant system.

[5] Requires optional output extension module 4N-AEACH-AD.

* Systems noted dhave power factor corrected power supplies (i.e., VA = Watts for CPU)

Step 2—Loads for Custom Configurations

- Determine present load requirements by adding VA components of CPU cabinet, external expansion, video console, and other equipment to be supported by UPS. Use the chart below for VA values. CPU cabinet and storage loads are for maximum internal devices and, unless noted, do not include video monitor.
- Determine future load potential by adding load requirement of any planned free-standing equipment.

Note: Desktop UPS systems should not be used to support laser printers, large line printers, or RA/TA/TU devices.

Single-Phase Systems and Storage Estimated Load Ratings

Systems	Estimated Load (Volt-Amps)	Special Receptacle*
AlphaServer Pedestal 2100[1] (1 ps/2 ps)	880/1280	(1) 5-15R/ (2) 5-15R
AlphaServer Cabinet/Rackmount 2100[1] (1 sys/2 sys)	3700/3900 (1700/3400 typical)	(2) L5-30R
AlphaServer 2000[1] (1 ps/2 ps)	700/1020	(1) 5-15R/ (2) 5-15R
AlphaServer 1000[1] (1 ps/2 ps)	560/560	(1) 5-15R/ (2) 5-15R
AlphaStation 400	575	
AlphaStation 200	320	
VAX/DEC 7000 Rackmount[1] (1 sys w storage)	4500	(2) L6-30R
VAX/DEC 7000 Rackmount[1] (2 sys w/o external storage)	4000	(2) L6-30R
DEC 4000 Model 600/700[1]	1740 VA	(1) 5-20R
DEC 3000 Model 500/800	935 VA	
DEC 3000 Model 400/600	800 VA	
DEC 3000 Model 300X/300LX	380 VA	
DEC 2000 Model 300	375 VA	
DEC 2000 Model 500	1230 VA (includes two power supplies, requires one 5-15R receptacle)	
VAX 4000 Model 500A/600A/700A	1140 VA	
VAX 4000 Model 100A	250 VA	
MicroVAX 3100	250 VA	
MicroVAX 3300	530 VA	
MicroVAX 3400/3500/3800	1030 VA	
MicroVAX 3600/3900	2880 VA	(1) L5-30R
MicroVAX II (BA23)	400 VA	
MicroVAX II (BA123)	800 VA	
VAXft 110 (2 CPU power supplies)	928 VA (total)	(2) 5-15R
VAXft 810[4] (dual-cabinet system)	3000 VA/2400 W per system zone	(1) L5-30R/ (1) 5-20R per zone
VAXstation 4000 Model 60/90	357 VA	
VAXstation VLC	100 VA	
DECsystem 5900	1630 VA	(1) L5-30R
DECsystem 5400/5500	855 VA	
DECsystem 5100	480 VA	
DECsystem/DECstation 5000	300 VA	
DECsystem 3100/DECstation 2100	250 VA	
VXT 2000/2000+	300 VA**	
applicationDEC 433MP	990 VA**	
applicationDEC 433XP	700 VA**	
DECpc AXP 150	575 VA**	
DECpc (deskside 4xx-MT/ST)	575 VA**	
DECpc XL models	700 VA**	
Venturis FP 4xx, DECpc Lpx	330**	
Venturis LP 4xx/560, DECpc Lpv	250**	
Expansion Boxes/CD-ROM (one cabinet)	**Estimated Load**	**Special Receptacle***
BA350	250 VA	
BA353	150 VA	
B400X, R400X	1140 VA	
SZ12, PCXAR-xx	300 VA	
SZ18	200 VA	
SZ16	570 VA	
MD410	180 VA	
RRD42x	60 VA	
RRD40, RW504/51-	200 VA	
RW100/514/516	330 VA	
RF72B/31B/30B/73B/R215F	520 VA	
SF35	420 VA	
SF7x	250 VA	

Step 2—Loads for Custom Configurations *(continued)*

Other Storage Devices	Estimated Load	Special Receptacle*
SA/SF/SZ 100	430 VA	
SZ 200/SWD-SE	500 VA	(2) 5-15R (3) 5-15R optional for SZ200
SA/SF 300	2520 VA	(1) L5-30R
TF, TA, TZ85/86	100 VA	
TF, TA, TZ857/867	160 VA	
TK50Z-GA	200 VA	
TLZ06/04	100 VA	
TLZ08/09	200 VA	
RA8X 3-high cabinet	2500 VA	(1) L5-30R
RA9X 3-high cabinet	2200 VA	(1) L5-30R
SW300	1440	
SW500	1920	L5-20R[3]
Printers	**Estimated Load**	**Special Receptacle***
LA50/70/75/95/LJ2x	70 VA	
LA120/324/424	190 VA	
LA210/310	230 VA	
LG01/02	960 VA	
LG31/06/12	500 VA	
LP29	1460 VA	(1) L5-30R
LP37	1000 VA	
LJ16P	35 VA	
LJ32P	60 VA	
LPS20/32[2]	1400 VA	
LPS17(2)	300 VA	
LN03(2)	1200 VA	5-15R or 5-20R
Video Monitors/Terminals	**Estimated Load**	**Special Receptacle***
VRT19	260 VA	
VR320	200 VA	
VR319	200 VA	
VRM17	100 VA	
VT220/VT420	80 VA	
VT320	60 VA	
VR297	190 VA	
VR299	260 VA	
Decservers/Routers	**Estimated Load**	**Special Receptacle***
DEChub 90 (DEHUB)	240 VA	
DECserver 90L (DSRVD)	100 VA	
DECserver 90L (DSRVG), 100, 200, 250, DELNI	40 VA	
DECserver 300, 700, 900	120 VA	
DECserver 500/550	1140 VA	
InfoServer 100, 150	350 VA	
DEChub 900 (DMHUB)	650 VA	
HSC 60/65/90	1400 VA	(1) L5-30R

* Other than 5-15R (15 Amp, 120 V)

** Includes one color video monitor

[1] For these systems, wattage and VA are approximately equal. Do not exceed UPS wattage or VA rating.

[2] Laser printers require UPS oversizing to handle continuous surge from heating element and limit full capacity of UPS. Recommended minimum size UPS is PUPS Plus series.

Step 2—Loads for Custom Configurations *(continued)*

Three-Phase Systems and Storage Estimated Load Ratings

Systems	Estimated Load	Special Receptacle*
DEC 7000/VAX 7000[1]	5200 VA(2)	L21-30R
VAX 6000	2800 VA	L21-20R
Expansion Boxes (one cabinet)	**Estimated Load**	**Special Receptacle***
VAX/DEC 7000 expansion[1] (H9F00)	4300 VA	L21-30R
VAX 6000 expansion (H9657)	4300 VA	L21-20R
Other Storage Devices	**Estimated Load**	**Special Receptacle***
SF200/SF210	1870 VA	L21-30R
SF220	2840 VA	L21-30R
SF400	4200 VA	L21-30R[3]
SF500	3100 VA	L21-30R
SA600/SA800	3300 VA	L21-30R
SA900	4000 VA	L21-30R
SA482	3400 VA	L21-30R
SW800	4800 VA	L21-30R[3]
RA8X 4-high cabinet	3400 VA	L21-30R

* Other than 5-15R (15 Amp, 120 V)

[1] For these systems, wattage and VA are approximately equal. Do not exceed UPS maximum wattage or rating.

[2] Loads range from 1000--5200 VA. Typical load is 2400 VA.

[3] Two receptacles required for optional redundant power controller.

[4] These systems include power factor corrected CPUs and non-power factor corrected storage devices.

Step 3—UPS Selection and Battery Time

- For custom loads from Step 2, select UPS system based on total VA load, voltage and phase of equipment, receptacle quantity/type, and battery time. See On-Line and Standby UPS Comparison Chart for on-line vs. standby UPS comparison.

Note: General-purpose outlets are simplex for desktop systems and duplex for PUPS Plus. Maximum rating of 15 A and 20 A simplex or duplex receptacles is 1440 VA and 1920 VA, respectively.

- For recommended system models from Step 1, and for custom loads from Step 2, estimate battery time by comparing actual load requirement from Step 1 or 2 to UPS rating and associated support times from chart below.

Note: UPS systems have two ratings: VA (or kVA) and watts (or kW), typically 60–70% of VA (or kVA). This ratio meets all product requirements but may not meet the requirement for power factor corrected devices. These devices are noted in the equipment list in Step 2. Do not exceed maximum wattage or VA rating of UPS.

Exide PUPS/PUPS-Plus On-Line Systems(3)

		Output Receptacles			
Rating	**Order Number**	**Quantity**	**Type**	**Time (Full/Half Load)(1)**	
PUPS					
650 VA	**4N-AEABC-AF**	Four	5-15R	15/30	
800 VA	**4N-AEABD-AF**	Four	5-15R	11/20	
1000 VA	**4N-AEABE-AF**	Four	5-15R	7/14	
1000 EXT	**4N-AEABE-AG**	Four	5-15R	10/20	
1250 EXT	**4N-AEABF-AA**	Four	5-15R	9/17	
1500 EXT	**4N-AEABF-AB**	Four	5-15R	8/18	
2000 VA	**4N-AEAAG-AF**	Four	5-15R	5/15	
PUPS-PLUS					
3.6 kVA	**4N-AEAAH-PC(4)**	Four	5-20R2	14/30	
6.0 kVA	**4N-AEAAJ-PC(4)**	Four	5-20R2	6/19	
10.0 kVA	**4N-AEAAL-BA**	Select optional PDM		9/27	
12.0 kVA	**4N-AEAAM-BA**	Select optional PDM		7/22	
15.0 kVA	**4N-AEAAN-BA**	Select optional PDM		10/28	(1- and 3-phase loads)
18.0 kVA	**4N-AEAAP-BD**	Select optional PDM		7/22	(1- and 3-phase loads)
24.0 kVA	**4N-AEAAR-AA**	Dist cab option		12/30	(1- and 3-phase loads)
36.0 kVA*	**4N-AEAAS-AA**	Dist cab option		5/18	(1- and 3-phase loads)

* For loads > 36 kVA call your local Business Protection Specialist

Prestige Series 3000					
3000 VA	**4N-AEAAH-AM**	(2) 5-15R[2], (1) L5-30R expandable		14/30	
APC Smart-UPS Matrix Line Interactive and Back-UPS Standby Systems[3]					
400 VA	230 V standard model only	Four	IEC 320	5/22	
450 VA	**4N-APACA-AB**	Four	5-15R	5/30	
600 VA	230 V standard model only	Four	IEC 320	6/20	
700 VA	**4N-APACB-AB**	Four	5-15R	5/17	
900 VA	**4N-APACC-AA**	Six	5-15R	7/20	
1250 VA	230 V standard model only	Four	IEC 320		
1400 VA	**4N-APACD-AB**	Six	5-15R	7/21	
2000 VA	**4N-APACE-AA**	Four 5-15R, one L5-30R	5-15R	8/22	
Back-UPS Standby[3]					
200 VA	**4N-APAAA-AC**	Two	5-15R	5/18	
250 VA	230 V models only	Two	5-15R	7/17	
280 VA	**4N-APAAA-AD**	Two	5-15R	7/17	
400 VA	**4N-APAAF-AA**	Four	5-15R	5/19	
450 VA	**4N-APAAB-AA**	Four	5-15R	8/25	
600 VA	**4N-APAAC-AA**	Four	5-15R	5/22	
700 VA	N/A				
900 VA	**4N-APAAD-AA**	Six	5-15R	10/24	
1250 VA	**4N-APAAE-AA**	Six	5-15R	9/25	

Step 3—UPS Selection and Battery Time *(continued)*

Matrix Line Interactive UPS[3]

		Output Receptacles		
Rating	**Order Number**	**Quantity**	**Type**	**Time (Full/Half Load)(1)**
3 kVA	**4N-APMX3-AA/AC[5]**	(3) 5-15R[2] , (2) L6-30R, (1) L14-30r (345 kVA) expandable		7/18
5 kVA	**4N-APMX5-AB/AD[5]**	See order information	8/20	8/20
Smart-UPS Extended Battery Models (For PBX Applications)[3]				
900 VA XL	**4N-APACF-AA**	Six	5-15R	30-minute / expands to 10 hours
2000 VA XL	**4N-APACG-AA**	Four 5-15R, one L5-30R		12-minute / expands to 4 hours
900 XL BATT	**4N-APAEA-AA**			Add up to 9
2000 XL BATT	**4N-APACG-AC**	N/A		Add up to 9

Notes:

1. Support times for minimum duration models at full/half load.
2. All systems (except Back-UPS 250-VA models) support CPU unattended shutdown.
3. See applicable product section for additional option and order number information, specifications, including wattage, input plug, and battery extensions available. U.S. variants shown.
4. Prepackaged 3.6 and 6 kVA PUPS Plus units include input cord with L14-30P. Other configurations available
5. Choose suffix to match warranty; 2-year hot swap; 3-year on-site, U.S. variants.

Step 4—Software for Unattended Orderly CPU Shutdown

- Select software order number for associated UPS product and operating system from the software order chart in the environmental products software section.

REMS—Total environmental/UPS monitoring and control---OpenVMS VAX only; all models except Back-UPS/Smart-UPS/Matrix.

Low cost UPS monitoring and CPU shutdown

- PowerMon: (any UPS) 4N-JBBB-**
- PowerChute Plus: BackUPS/Smart UPS/Matrix 4N-APAOA-**
- Onlinet/Onlisafe: All Prestige, Personal, and PUPS Plus 4N-AEAES-**

Multiple CPU shutdown also available.

Step 5—Select Other Options

- Select TVSS Surge Suppressor for other devices not requiring a UPS; or to protect UPS system itself, critical communications, and modem applications from high energy transients. See pages 11.38 through 11.40 for appropriate models.
- If using REMS, select EMSII for environmental monitoring. See page 11.36 for information.
- See applicable product section for other available options.

For other configuration assistance, call 800-Digital and ask for an Environmental Products Support Specialist.

Online Systems (PUPS)

Digital's Online Personal and Prestige Desktop UPS (PUPS) systems provide premium power-line conditioning and outage protection for critical applications. This type of UPS continuously monitors and controls the flow of power to the computer to provide the highest level reliable, dependable operation. Designed by Exide Electronics, the "true online" design is a compact microprocessor-based system utilizing the latest sine wave output technology. Because of its "true online" configuration, voltage regulation and isolation against all types of power disturbances is assured. A static bypass allows the system to support applications even during overload or inverter failure. In addition, the high input power factor of this design allows the 2-kVA model to be used with a standard 5-20R input plug. Prestige models feature LED display with meters and alarms, touch panel control, and auto self-test.

Line-Interactive/Standby Systems (Smart-UPS/Back-UPS)

Digital's line-interactive/standby UPS systems provide power outage protection and computer grade power conditioning in two basic models, Smart-UPS and Back-UPS. Specifically designed by American Power Conversions for the best price/performance in the industry, the Smart-UPS and Back-UPS are the products of choice when supporting critical LAN server applications at an affordable price. These systems engage within 2 to 4 milliseconds after a utility power failure to provide dependable power outage protection. Extended duration Smart-UPS XL models feature stackable battery packs.

The Smart-UPS model features an aesthetically pleasing user-monitoring and self-test interface and includes smart boost/trim under/over voltage and "brown-out" protection, standard EIA-232 communications port, and true sine wave output. The Back-UPS is Digital's lowest-cost UPS model and provides dependable, economical outage protection for PC-client applications.

UPS Comparison Chart

Features	PUPS	SMART-UPS	BACK-UPS
Topology	On-line	Line interactive	Standby
Power conditioning and voltage regulation	Superior performance	Good performance	Value performance
Equipment selection	High-end workstations, VAX 4000, MicroVAX 3xxx, Alpha AXP systems, point of sale, standby generator applications	LAN servers, workstations, mini-systems, telecommunications systems, internet-working hardware	PC-clients,internet- working hardware
Site conditions	All chronic power aberrations	Chronic brownouts/blackouts	Occasional brownouts/blackouts
VA ranges available	650–2000 VA	400–2000 VA[1]	200–1250 VA
Upgradable models	Yes; 2 ranges: 650–1000; 1000 EXT—1500 EXT	No	No
Full load battery time (model dependent)	5–15 minutes; 2–3 hours (Prestige EXT)	5–8 minutes[5] 12 minutes–10 hours (XL models)	5–10 minutes[5]
Rackmount application	Kit available all models	600, 1200, and 2000 VA rackmount models;Kit available kit available—400 and 600 VA models	
EIA-232[2]	Standard	Standard	No
LAN Relay port[2]	Standard	Standard via EIA-232	Yes, except 250 VA
Warranty[3]	3 years	2 years	2 years
Output V normal operation (120 V units)	120 V ± 3%	@>103 V: 103-136 V @92-103 V: 103-115 V @132-145V: 115-127V (450, 700, 1400 models	103 V–132 V[4]
Transfer to battery (full load)	98 V and 132 V (Personal models) 85 V and 144 V (Prestige models)	88/92 V @ 115/120 V input setting 130–136 V sel	<98–103 V sel; 132 V[4]
Audible/visual alarms	Yes	Yes	Yes, audible only
Foreign models	Yes	Yes	Yes
Visual load/volt indicator	No (Personal); Yes (Prestige) LED meter	Yes, LED meter	No
Output V on battery	120 V ± 3% sine wave	115 V ± 5% sine wave	115 V ±5% Step-sine wave

1 Smart-UPS 2000 VA models require 5--30R, 30 amp rated input receptacle for full rated output.

2 EIA-232 serial interface allows remote diagnostics, monitoring, and auto shutdown. LAN relay port allows auto shutdown feature only and does not denote direct network connectivity.

3 Each UPS system includes "Hot Swap" return-to-factory warranty (batteries included), allowing a new unit to be received within 48 hours and a $25,000 equipment protection guarantee.

4 Back-UPS 900 and 1250 VA models only, have high voltage limit.

5 Smart-UPS models 450, 700 and 1400 and Back-UPS 600VA and below have user replaceable batteries.

PUPS Ordering Information

UPS with Standard Internal Battery 60 Hz 120 V / 50 Hz 230 V models suffixes shown where applicable

Order Number	Model (Output VA Shown)	Upgrade Range	Optional Extended Battery Pack	Rackmount Kit Order Number
4N-AEABC-AF	Prestige 650	To 1000 VA	N/A	**4N-AEAEO-RA/RB**
4N-AEABC-BF	Prestige 600 50 Hz 230 V only		N/A	**4N-AEAEO-RA/RB**
4N-AEABD-AF/BF	Prestige 800		N/A	**4N-AEAEO-RA/RB**
4N-AEABD-BG	Prestige 800 EXT 50 Hz 230 V only		Up to 4 per unit	**4N-AEAEO-RA/RB**
4N-AEABE-AF/BF	Prestige 1000	To 1500 VA	N/A	**4N-AEAEO-RA/RB**
4N-AEABE-AG/BG	Prestige 1000 EXT		Up to 4 per unit; see chart below	**4N-AEAEO-RA/RB**
4N-AEABF-AA/BF	Prestige 1250 EXT		Up to 4 per unit; see chart below	**4N-AEAEO-RA/RB**
4N-AEABF-AB/BG	Prestige 1500 EXT	N/A	Up to 4 per unit; see chart below	**4N-AEAEO-RA/RB**
4N-AEAAG-AF	Personal 2000 with EIA-232 and LAN relay port		One included	**4N-AEAEO-AG**
4N-AEAAG-AH/BH	Personal 2000 EXT		One included	**4N-AEAEO-AH**

1. All models include LAN-relay and EIA-232 UPS monitoring provisions as standard features.
2. All models may be used with UPS monitoring and shutdown software.
3. Rackmount kits fit standard 19-inch racks. Prestige models have adjustable depths: RA = 22- to 27-inches; RB = 28- to 34-inches
4. CPU to UPS comm protocol, does not denote network connectivity.

4N-AEAEO-PA/PB Power Pass Wraparound bypass option 120/240 V (Prestige models only)

See also UPS Network Adapters/Hardware options

Prestige EXT Model Run Times in Minutes[1]			STD Unit	STD +1/2	STD +1	STD +1 1/2	STD +2	STD +2 1/2	STD +3	STD +3 1/2	STD +4
	Run times	@.Full load	10	34	55	78	98	124	147	170	194
1000 EXT		@.Half load	20	73	120	175	225	275	326	376	427
	Run times	@.Full load	9	23	40	56	72	90	108	127	146
1250 EXT		@.Half load	17	54	95	137	180	225	262	310	355
	Run times	@.Full load	8	20	33	48	63	79	95	110	125
1500 EXT		@.Half load	18	45	67	100	128	161	194	230	275

[1] Run times based on typical computer type load @ 0.65 PF.

Extended	Battery Packs for Prestige EXT Models	
Half Pack	**4N-AEABF-BA (60 Hz)**	**4N-AEABF-BC (50 Hz)**
Full Pack	**4N-AEABF-BB (60 Hz)**	**4N-AEABF-BD (50 Hz)**

UPS Network Adapters/Hardware Options

PUPS* / PUPS Plus / Prestige On-line UPS Options

Refer to UPS Software section for available UPS monitoring software offerings

4N-AEAEO-CA Ethernet adapter (1 UPS to Network) ThinWire
4N-AEAEO-CB Ethernet adapter (1 UPS to Network) Twisted pair
4N-AEAEO-CC Ethernet SNMP adapter includes MIB, ThinWire
4N-AEAEO-CD Ethernet SNMP adapter includes MIB, Twisted pair
4N-AEAEO-CE Ethernet network adapter (2 UPS to Network)
4N-AEAEO-CF Ethernet network SNMP adapter (2 UPS to Network)
4N-AEAEO-CG Token Ring SNMP adapter
4N-AEAEO-CG Token Ring Network adapter

* Network adapters shown are compatible with all models except PUPS Personal Models. Ethernet Network adapters include connection for thinWire and twisted pair. All adapters require Onlinet network or SNMP software.

UPS Network Adapters/Hardware Options *(continued)*

Options for PUPS Prestige desktop models (650 - 1500 VA) only

4N-AEAEO-PA*	Prestige PowerPass hot-swap module for 120 V UPS systems
4N-AEAEO-PB*	Prestige PowerPass hot-swap module for 240 V UPS systems
4N-AEAEO-RA	Prestige rackmount kit (22-27-inch deep), side by side. All rackmount kits fit standard 19-inch racks
4N-AEAEO-RB	Prestige rackmount kit (28-23-inch deep), side by side. All rackmount kits fit standard 19-inch racks

* Includes (4) 5-15R outlets on UPS and (1) 5-15R off UPS for laser printer. All outlets have built in surge protection.

Options for Smart-UPS/Matrix and AC Power Surge Suppressors

4N-APAOA-BK	SNMP adapter for ThinNet connections (two UPS)
4N-APAOA-BN	SNMP adapter for 10BaseT (one UPS)
4N-APAOA-BM	SNMP rackmount kit
4N-APAOA-BL	Measure-UPS environmental monitoring unit[1]
4N-APAOA-BP	Call-UPS II remote UPS management device for Matrix and Smart-UPS (600VA and above)
4N-APAOA-AC	Power Doctor for MS-DOS (diagnostic software only)
4N-APATS-BA	POW6 Powermanager with surge protection[2]
4N-APATS-BB	POW6T Powermanager with telephone and surge protection[2]
4N-APAOA-CA	Share-UPS multiple CPU shutdown device[3]

[1] Measure-UPS allows remote monitoring of temperature, humidity, and four contact closures. Requires SNMP adapter, Power Doctor, or PowerChute Plus for Novell, OS/2, Windows NT.

[2] Provides power cord management, separate control, site wiring, and surge protection fault indication for up to 5 peripherals.

[3] Prevodes UPS monito5ring and unattended shutdown of up to 8 CPUs connected to the same Smart-UPS or Matyrix UPS. Requires PowerChute software on each CPU.

[4] Allows remote boot, dial back and paging. When used with PowerChute software, provides full UPS monitoring and management.

Upgrade Kits for PUPS Plus

4N-AEAAH-CA	3.6 to 6 kVA
4N-AEAAL-CA	10 to 12 kVA
4N-AEAAN-CA	15 to 18 kVA

AC Power "Surge Arrest"

4N-APATS-AA	Personal series strip with (7) 5-15R; non-computer applications only
4N-APATS-AC	Pro series intermediate grade strip with tel (7) 5-15R
4N-APATS-AB	Network series premium strip with (7) 5-15R
4N-APATS-AD	Network series premium grade strip with tel (7) 5-15R

PUPS On-line Personal Systems Specifications

	Prestige Models						Personal Model
Models[6]	**650 VA**	**800 VA 800 VA EXT**	**1000 VA**	**1000 VA EXT**	**1250 VA EXT**	**1500 VA EXT**	**2000 VA**
System Input Characteristics							
Input Voltage	120 Vac (North American models); 220/230/240 V (International models) +20% to –30%						120 Vac +10% to –20%
Max Amps Continuous	4.8	5.6	7.1	7.1	8.85	10.6	16
Input Frequency	50/60 Hz ±3%						
Input Cord	1.8 m (6 ft) with standard plug 5-15P 600 VA permanent; 800–1500 VA detachable						1.8 m (6 ft) 5-20P (detachable)
System Output Characteristics							
Output Voltage	120 Vac (North American models); 220/230/240 V (International models) ±3						
Voltamps/Watts	650/455	800/560	1000/700	1000/700	1250/900	1500/1000	2000/1300
Amps/Continuous	5.4 A	6.7 A	8.3 A	8.3 A	10.4 A	12 A	16 A
Amps/Peak @<5% THD 3:ICF	16.2 A	20	25	25	31	35	47 A
Output Frequency	50 Hz or 60 Hz[1] ±3 Hz[2] (±0.1%)[3]						
Receptacles (single)	4 5–15R						
Overload Before Bypass Transfer	>106% to < 110% 4 min; ≥ 10% 4 seconds						
Transient Response	±18% nominal output V. for 100% load Step or drop on battery						
Noise Rejection @ 100 kHz Normal/Common Mode	80/60						80/40
Environmental Specifications							
Temperature and Humidity	10°C to 40°C operation; –20°C to 60°C storage; 5% to 95% noncondensing						
Altitude	4000 ft without						
Btu/hour Line/Battery	185/200	236/480	295/600	295/421	380/541	421/602	887/920
Audible Noise @ 1 meter	<45 dBA						
Agency Compliance							
Surge/Electrostatic (ESD)	IEEE 587/ANSI C6 2.41 CAT A&B/ESD withstand 200 kV						
EMI Suppression	FCC Part 15, Subpart J, Class A						
Safety	UL 1778, Canadian Standards Assoc. Listed; EN50091-1						
Weight and Dimensions UPS System (Including Internal Battery)							
Weight	12.9 kg (28.5 lb)			14.9 kg (33 lb)			29.2 kg (65 lb)
Dimensions (H x W x D)	252 x 143 x 400 mm (9.9 x 5.6 x 15.8 inches)						343 x 133 x 559 mm 13.5 x 5.25 x 22 inches
Extended Battery Pack							
Weight	Not available			13.4 kg (29.5 lb) half (each) 23.6 kg (52 lb) full (each)			20.5 kg (45 lb)
Dimensions (H x W x D)	Note: 800 EXT 240 V model same as other Prestige models			252 x 143 x 400 mm (9.9 x 5.6 x 15.8 inches)			343 x 67 x 559 mm (13.5 x 2.75 x 22 inches)
Batteries—sealed lead acid type							
Recharge Time to 90%[4]	Standard	3 hrs					8 hrs
	Extended	N/A		Call for information			16 hrs
Duration Full/ Half Load Min.[5]	Standard	15/30	11/20	7/14	10/20	9/17	8/18	5/15
	Extended	N/A		See chart, page 11.11			10/28

Notes:

[1] Input frequency automatically sensed. Output frequency same as input.

[2] Normal operation; output synchronized to input.

[3] Input frequency out of acceptable limits or input not present.

[4] Recharge time after discharge into 100% load.

[5] Battery time within +-10% based on system wattage and normal ambient temperature.

[6] 240 V models include selectable 220/230/240 V output, (4) IEC 320 10A receptacles and include (2) ouput jumpers with IEC 320

[7] 600 Va/420 Watts for 240 V models

Smart UPS Ordering Information

All Smart-UPS include standard capability to interface with PowerChute Plus or PowerMon software.

4N-APACA-AB	Smart-UPS 450/450 VA	60 Hz only
4N-APACB-AB	Smart-UPS 700/700 VA	60 Hz only
4N-APACC-AA/BA*	Smart-UPS 900/900 VA	
4N-APACD-AB	Smart-UPS 1400/1400 VA	60 Hz only
4N-APACE-AA/BA*	Smart-UPS 2000/2000 VA	
4N-APACA-BA	Smart-UPS 400/400 VA	50 Hz only
4N-APACB-BA	Smart-UPS 600/600 VA	50 Hz only
4N-APACD-BA	Smart-UPS 1250/1250 VA	50 Hz only

Rackmount UPS Models

4N-APABC-AA/BA*	Smart-UPS 600 Rackmount 600 VA	
4N-APABD-AB	Smart-UPS 1400 Rackmount 1400 VA	60 Hz only
4N-APACH-AA/BA*	Smart-UPS 2000 Rackmount 2000 VA	
4N-APABD-BA	Smart-UPS 1250 Rackmount 1250 VA	50 Hz only

Extended Run UPS Models

4N-APACF-AA/BA*	Smart-UPS 900XL/900 VA with battery pack
4N-APACG-AA/BA*	Smart-UPS 2000XL/2000 VA with battery pack
4N-APAEA-AA	Extender battery pack for 900XL
4N-APACG-AC	Extender battery pack for 2000XL

*** Note:** -AA = 60 Hz; -BA = 50 Hz

Back-UPS Ordering Information

4N-APAAA-AC	Back-UPS 200/200 VA	60 Hz only
4N-APAAA-BA	Back-UPS 250/250 VA	50 Hz only
4N-APAAA-AD	Back-UPS 280/280 VA	60 Hz only
4N-APAAF-AA/BA*	Back-UPS 400/400 VA	
4N-APAAB-AA/BA*	Back-UPS 450/450 VA	
4N-APAAC-AA/BA*	Back-UPS 600/600 VA	
4N-APAAD-AA/BA*	Back-UPS 900/900 VA	
4N-APAAE-AA/BA*	Back-UPS 1250/1250 VA	

* Note: A* = 60 Hz; -BA = 50 Hz. All Back-UPS (except models 200, 250, 280) include capability to interface with PowerChute *Plus* or PowerMon software.

Smart-UPS Specifications

120 V 60 Hz Models	**450 VA**	**700 VA**	**900 VA**	**1400 VA**	**2000 VA**
Maximum Capacity Watts	280 W	450 W	630 W	950 W	1500 W
230 V 50 Hz Models	**400 VA**	**600 VA**	**900 VA**	**1250 VA**	**2000 VA**
Maximum Capacity Watts	250 W	400 W	630 W	900 W	1500 W
Output receptacles (single) NEMA 5–15R (120-V) IEC 320 (230 V)	4 4	4 4	6 4	6 4	4 5–15R 4 IEC 1 L5-30R, for 230V Other options avail.
Approvals	UL listed, CSA certified, TUV certified, VDE certified, FCC Class A compliance, Novell-approved				
Input line cord	6 ft detachable (5–15P) for 120-V units, male IEC 320 for 230-V units				6 ft attached (L5–30P)
Operational Characteristics					
Nominal input voltage	120 [230] Vac, user adjustable using dip switches to 115 [240]Vac, single-phase				
Input voltage window	103 [196] Vac 136 [260] Vac, user adjustable using dip switches to 98 [204]–130 [271] Vac				
Output frequency	50 or 60 Hz ± 0.1% based on auto-sensed input frequency 50 or 60 Hz ± 5%				
Transfer time (typical/maximum)	2/4 milliseconds, includes detection time				
On-battery output voltage	Pure sine wave output at 115 [225] Vac ±5%, –10% after low battery warning, synchronized to utility line				
SMART AVR operation All models 450, 700 and 1400 VA only	On Utility 12% boost above input if 90-103 V (173-196 V) 12% trim below input if 132-145 V (253-278 V) transfer points user adjustable via software (450, 700 and 1400 VA models) or on all other models via dip switches				
Load power factor/Crest factor range	0.5 to 1.0/<5				
Surge energy/peak current capability	320 Joules/26KA		480 Joules/39KA		
Normal/common mode noise suppression at 300 kHZ	40/5 dB	45/5 dB 60/30 dB[4]	45/5 dB 65/30 dB[(5)]	75/35 dB 60/30 dB[4]	60/40 dB
Ambient operations	10,000 ft (3,000 meters) maximum elevation, 0–95% humidity non-condensing, 32–113° F (0–45° C)				
Audible noise at 3 ft	<40 dBA		<45 dBA		
Btu/hr on utility/on battery	32/200	60/200	60/500	60/800	100/1000
Battery Characteristics					
Battery type[8] Sealed lead acid 3-6 yr life	4@6V,4AH	2@12V, 6.5AH	4@6V 10AH	2 @12v,17AH	4@12v,17AH
Battery times, full/half load[2]	5/20	5/17	7/20	7/21	8/22
Extended runtime (XL) models	N/A	N/A	Up to 10 hours[3]	N/A	Up to 4 hours[3]
Recharge time to 90% capacity after discharging to 50% capacity	4 hours	5 hours	6 hours 3.7 hours (XL)	10 hours	10 hours 2.2 hours (XL)
Physical Characteristics					
Maximum dimensions (H x W x D-inches) Standard models 60 Hz Standard models 50 Hz	 6.29 x 5.43 x 14.13" 2.25 x 11.9 x 15.5"	 6.29 x 5.43 x 14.13" 6.6 x 4.7 x 14.2"	 9.1 x 6.9 x 17.8 " 9.1 x 6.9 x 17.8	 8.53 x 6.7 x 17.2" 9.1 x 6.9 x 17.8"	 18 x 6.9 x 17.8"[6] 18 x 6.9 x 17.8"[6]
Maximum dimensions(H x W x D-inches) Rackmount models 60 Hz Rackmount models 50 Hz	 N/A	 8.7x19.0x8.5	 N/A	 5.2 x 19 x 15" 8.7x19.0x8.5	 17.4x19.0x8.5[6]
Extended runtime (XL) models 50 / 60 Hz	N/A	N/A	18.2x6.9x17.8[6]	N/A	27.1x6.9x17.8[6]
Net / Shipping Weight lbs Standard models 60 Hz Standard models 50 Hz	 29 / 32 lbs 17 / 20 lbs	 29 / 32 lbs 27 / 30 lb	 43 / 48 lbs 43 / 48 lbs	 52 / 57 lbs 52 / 57 lbs	 100 / 110 lbs 100 / 110 lbs
Net / Shipping Weight (lbs) Rackmount models 60 Hz Rackmount models 50 Hz	 N/A N/A	 38 / 43 lbs 38 / 43 lbs	 N/A N/A	 55 / 61 lbs 59 / 64 lbs	 108 / 118 lbs 108 / 118 lbs
Extended runtime (XL) models 50 / 60 Hz	N/A	N/A	94 lb 94/104 lb[6]	N/A	125 lb 125/137 lb[6]

[1] Where appropriate, specifications for 220/240-Vac models are given in brackets following those of 120-Vac models. A 208-Vac model is available for 2000 VA model only.
[2] Assumes computer type non-linear load.
[3] Extra time available for Model 900XL and 2000XL only, via 900XL and 2000XL battery pack.
[4] Rackmount model.
[5] XL model.
[6] **Important:** For these models, the UPS electronics and battery(ies) are housed separately in matching stackable units.
- The dimensions and weights listed in the chart above reflect the combined heights and weights for the separate electronics and battery(ies) units.
- Battery unit maximum dimensions for the 900XL, 2000XL, and Standard 2000: 9.1 x 6.9 x 17.8 in. [23.1 x 17.5 x 45.2 cm]; Battery unit dimensions for the 2000RM: 8.7 x 17.0 x 7.2 in [19.6 x 43.1 x 17.5 cm]
- Typical battery unit weight: 65 lb [29.5 kg]; (shipping weight: 70 lb [31.8 kg]).

[7] 2000 VA 60 Hz units include a re-wirable 5-20P and 5-15P plug which derates unit to 1850 VA and 1440 VA respectively
[8] 450, 700, and 1400 VA models include user replaceable batteries.

Smart-UPS XL Models—Run and Recharge Times in Hours at Full/Half Load[1] with up to 9 added extended battery packs

	STD[2] Unit	STD +1	STD +2	STD +3	STD +4	STD +5	STD +6	STD +7	STD +8	STD +9
900XL recharge times[3]	3.7	6.4	9.1	11.8	14.6	17.4	20.2	23.0	25.8	28.6
2000XL recharge times[3]	2.2	4.5	6.8	9.2	11.8	14.2	16.5	19.2	21.9	24.0
900XL Battery										
Times: Full load	0.8	1.9	3.0	4.1	5.2	6.3	7.6	8.8	10.0	11.4
Half load	1.9	4.1	6.4	8.9	11.5	14.9	18.2	21.6	24.9	28.1
2000XL Battery										
Times: Full load	0.2	0.6	1.0	1.4	1.8	2.3	2.7	3.1	36	4.0
Half load	0.6	1.5	2.4	3.3	4.2	5.1	6.0	7.0	8.0	9.0

[1] Support times shown based on typical computer type load @ 0.65 pf.
[2] STD models include one extended battery pack.
[3] Recharge to 90% capacity after discharge into 50% rated load.

Back-UPS Specifications

120 V 60 Hz Models	**200 VA**	**280 VA**	**400 VA**	**450 VA**	**600 VA**	**900 VA**	**1250 VA**
Maximum Capacity Watts	130 W	180 W	250 W	300 W	400 W	630 W	900 W
230 V 50 Hz Models	**N/A**	**250 VA**	**400 VA**	**450 VA**	**600 VA**	**900 VA**	**1250 VA**
Maximum Capacity Watts		170 W	250 W	300 W	400 W	630 W	900 W
Approvals	UL listed, CSA certified, Novell-approved						
Input line	6-ft (1.8-m) line input cord (5–15P)						
Receptacles (NEMA 5–15R single)	2		4		6		
Maximum dimensions (H x W x D)	6 x 3.4 x 13.1 in. (151 x 86 x 333 mm)		6.6 x 4.7 x 14.2 in. (168 x 119 x 361 mm)		8.5 x 6.8 x 17 in. (216 x 172 x 432 mm)		
Net / Shipping Weight lbs Standard models 50 / 60 Hz	9 / 10 lb	10 / 12 lb	18 / 20 lb	25 / 27 lb	25 / 27 lb	47 / 53 lb	52 / 58 lb
Operational Characteristics							
Nominal input voltage	120 Vac, single-phase (60 Hz) 230 Vac (50 Hz)						
Nominal input frequency	60 Hz (60 Hz models) 50 Hz (50 Hz models)						
Output frequency	60 Hz ± 3%;						
Input voltage limit for utility operation (user adjustable)	103 Vac [196 Vac] 60 Hz / 50 Hz					103, 132 Vac[1] @ 60 Hz [196 Vac, 253 Vac] 50 Hz	
On-battery output voltage	Step-sine wave output at 115 Vac ±5% 5[225 Vac ± 5%] 50 Hz						
Load power factor/Crest factor range	0.5 to 1.0/<5						
Surge energy rating, peak current capability	240 Joules, 6500 A						
Transfer time, typical/maximum	2/4 milliseconds (includes detection time)						
Normal/common mode noise suppression @ 1 MHz	40/5 dB	55/5 dB	45/5 dB			65/5 dB	60/5 dB
Recharge time to 90% capacity after discharge into 50% load	6 hours	7 hours	10 hours			5 hours	7.5 hours
Ambient operations	10,000 ft (3,000 meters) maximum elevation, 0–95% humidity non-condensing, 32–104°F (0–40° C)						
Audible noise at 3 ft	<40 dBA						
Btu/hr On-line/on battery	8/200	10/230	15/270	20/275	25/430	50/610	50/860
Battery Characteristics							
Battery type[3] Sealed lead acid 3-6 year life	2@6 V 4AH	2@6V 4AH	1@12V 6.5AH	2@6v 10AH	2@6v 10AH	4@6V,10AH	2@12v 17AH
Battery times full/half load minutes	5 / 18	7 / 17	5 / 19	8 / 28	5 / 22	10 / 24	9 / 25

[1] Back-UPS 900 VA and above have high voltage limit.
[2] Assumes computer type non-linear load
[3] Models 600 VA and below feature user replaceable batteries

Office/Data Center Line-Interactive Systems: Matrix Model UPS System

Product Description

The Matrix UPS series from American Power Conversion is available in 3-kVA and 5-kVA ratings in North America (60HZ) and worldwide models (50/60 HZ). Matrix is a fully modular UPS system.

A basic Matrix unit is made of an isolation module with a mean time to failure of approximately 99 years, an electronics module with MTBF of about 12 years, and external SmartCell packs with lifetimes of approximately six years. The modular design of the Matrix product line allows the unit to be safely swapped-out without interrupting power to the loads. This reduces Mean Time to Repair (MTTR) to seconds. In addition, the Matrix unit provides continuous no-break regulation and filtering over a wide input voltage range. It does this in both normal and utility failure modes with full isolation in maintenance bypass mode.

A small microprocessor in each SmartCell automatically monitors the operation of the battery and warns the system manager of any irregularities. Replacement SmartCell warnings are delivered via the front control panel, via local alerts on each SmartCell, and via optional monitoring software. If a SmartCell needs replacing, users can simply disconnect and replace the failed pack.

An additional benefit of the Matrix modular design is long battery life. SmartCells are in a separate package away from the enclosure with heat dissipating circuits. With a lifetime of approximately six years, SmartCells may need replacement only once during the UPS' service life. The SmartCell replacement date may be stored in the UPS memory for future reference via the remote interface or by the front panel controls. Each modular SmartCell battery pack provides additional runtime, allowing users to purchase only as much runtime as they need.

Matrix gives users 100% capacity in either 120, 208, or any mixture of each. Cord connected power distribution units (CCPDU) can be added to the standard plug configuration for additional outlets. These CCPDU can be easily swapped as equipment needs change. The world wide model can also be programmed to output 120, 220, 230, or 240 Vac.

FineLine microprocessor-based voltage regulation adapts the Matrix to specific corporate site power characteristics. Building intelligence into the voltage regulator, in FineLine adaptive mode, Matrix learns the power characteristics of the site, then models its transfer behavior to maximize user protection and minimize unnecessary battery usage.

There is no need to oversize the UPS to plan for inrush current.

The Matrix product line is fully compatible with the PowerMon or PowerChute family of power management software for safe shutdown and power monitoring. In addition, Matrix supports Simple Network Management Protocol (SNMP) via the SNMP adapter, delivering warnings regarding power events and UPS status to any NMS whether the Matrix unit is located 20 feet or 2000 miles away.

The Matrix is manufactured in Compliance with ISO 9002 standards.

Refer to following pages for SNMP and other options available

Matrix UPS Ordering Information

Step 1—Select UPS (with packaged battery and standard output receptacle panel)

4N-APMX3-AA/BA 3-kVA Matrix MX3000, single-phase output model with two-year hot swap warranty
4N-APMX3-AC 3-kVA, with three-year, on-site, next day service (U.S. only)
4N-APMX5-AB/BB 5-kVA Matrix MX5000, single-phase output model with two-year hot swap warranty
4N-APMX5-AD 5-kVA, with three-year, on-site, next day service (U.S. only)

Note: Ax = 60Hz North American, Bx = 50/60 Hz Worldwide. 60Hz models include line cord with L6-30P plug. 50 Hz models are hardwired. All units may be optionally hardwired on the input. See specifications for receptacle configurations.

Step 2—Optional Cord-Connected Power Distribution Units/Outlet Configurations

Hardwire Output

4N-APMXH-AA MX 3 hardwired kit for 3 kVA unit
4N-APMXH-AB MX 5 hardwired kit for 5 kVA unit

Plug-In Output Extensions (plugs into receptacle on unit)

4N-APMXO-AA† PDU with output: (5) 5-15R2, L14-30R, input plug: L14-30P
4N-APMXO-AB PDU with output: (4) L6-20R, input plug: L6-30P
4N-APMXO-AC PDU with output: (4) 5-20R2, input plug: L14-30P
4N-APMXO-AD PDU with output: (4) L6-30R, input plug: L6-30P
4N-APMXO-AE PDU with output: (4) L5-30R, input plug: L14-30P

† This PDU can be daisychained.

Step 3—Additional Battery Packs for Extra Runtime

Consult runtime chart for additional packs, if necessary.

4N-APMXB-AA/BA Smart Cell 60/50 Hz

Matrix Run and Recharge Times in Hours	STD*	STD +1	STD +2	STD +3	STD +4	STD +5	STD +6	STD +7	STD +8	STD +9
MX3000 recharge times†	1.5	2.8	2.7	3.8	4.9	6.0	7.0	8.1	9.1	10.2
MX5000 recharge times†	2.3	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.8	N/A
MX3000 battery times										
full load	0.10	0.2	0.3	0.48	0.68	1.0	1.2	1.4	1.6	1.9
half load	0.37	0.75	1.1	1.9	2.6	3.7	4.5	5.3	6.0	7.1
MX5000 battery times										
full load	0.13	0.2	0.33	0.47	0.67	0.8	0.93	1.1	1.3	N/A
half load	0.43	0.65	1.1	1.5	2.2	2.6	3.1	3.5	4.2	N/A

* Standard 3000-VA UPS includes one SmartCell battery pack; standard 5000-VA UPS includes two SmartCell battery packs. Runtimes typical at 25° C.
† Recharge to 90% of capacity subsequent discharge into 50% of rated full load. < two SmartCells charging at 500 W; > two SmartCells charging at 1000 W.
Note: Optional extended XL battery modules available for applications requiring ≥ four battery packs, call for information.

Step 4—Select Software

4N-APAOA-AA AP9003 PowerChute Plus for Novell
4N-APAOA-AB AP9002 PowerChute Plus for OS/2
4N-APAOA-AC AP9100 Power Doctor Diagnostics for MS-DOS
4N-APAOA-AD AP9004 PowerChute Plus for UNIX and XENIX
4N-APAOA-AE AP9009 PowerChute Plus for Windows NT (x86 and Alpha); 4N-APAOA-AG PowerChute Plus for Windows DOS
4N-APAOA-AF AP9010 PowerChute Plus for DEC OSF/1
4N-JBBB-xB PowerMon Shutdown Software for OpenVMS VAX

Note: x denotes media type: D = TK50, E = magtape for OpenVMS VAX, G = CD-ROM for Alpha AXP

Matrix UPS Specifications

Operation	Matrix 3000	Matrix 5000
Topology	Line Interactive	Line Interactive
Output power capacity[1] (single phase loads)	3000 VA/2250 W	5000 VA/3750 W
Galvanic isolated bypass	Yes	Yes
Nominal input voltage, frequency[2]	208/240 Vac, 60 Hz or 208/220-240, 50/60 Hz	
Input voltage range (% of nominal) for mains operation	-25% to +15%	-25% to +15%
Input frequency range (% of nominal) for mains operation	+-5%	+-5%
Input connection (includes 6 ft cord for 60 Hz model)	L6-30P for 60 Hz; 30A-2P CB for hardwired 50/60 Hz	
Output connection[3] (includeds 4 IEC jumbers for 50/60 Hz model)	Output PDU (3) 5-15R2, (2) L6-30R, (1) L14-30R (60 Hz); IEC 320, (8) 10A (50/60 Hz), or hardwire kit	
Nominal output voltage–208/240 Vac, 60 Hz versions	120 and 208 Vac; or 120 and 240 Vac	
Nominal output voltage–208/230 Vac, 50/60 Hz versions	120 and 208 Vac; or 220, 225, 230, and 240 Vac	
Output voltage regulation	+-5% adjustable	+-5% adjustable
Output voltage distortion (on-battery)	<5% THD	<5% THD
Output frequency regulation	Synchronized, 0.1% of nominal during mains failure	
Typical transfer time	0 ms	0 ms
Normal/common mode let-through voltage percentage of applied 6-kV IEEE 587 (ANSI C62.41) Category A, B test surge	<0.7%/<1.0%	<0.7%/<1.0%
Normal/common mode noise attenuation range over 100 kHz–30 MHz	60-80 dB (80-100 dB)	60-80 dB (80-100 dB)
Smartcell Battery System		
Nominal battery system	48 Vdc, sealed, maintenance-free lead acid	
Number of packs supplied/recharge times	1 pack/1.5 hrs	2 packs/3 hrs
Standard run times @ full/half wattage load	7/18 min	8/20 min
Features		
User display	Load power, voltage, intelligent runtime meters; Programmable 2 x 16 character back lit LCD, 4 languages	
Intelligent bypass	Automatic upon failure or user switchable	
Diagnostics	Intelligent serial interface, auto and requested self tests, adj. warnings	
Emergency Power Off (EPO) capability	Input for external EPO closure	
50/60-Hz version input/output voltage selection via front panel	Settable to 220, 230, or 240 Vac; frequency selection automatic	
Adjustable sensitivity	High, low, or adaptive via FineLine	
Environment and Physical		
Efficiency at full load/heat dissipation (Btu/hr)	>93%, 540 Btu/hr	>93%, 900 Btu/hr
Operating ambient temperature	0° -45° C (32° -113° F)	0° -45° C (32° -113° F)
Operating ambient relative humidity	0% to 95% non-condensing	0% to 95% non-condensing
Electromagnetic immunity	IEC 801-2, 801-3, 801-4, 801-5; severity level IV	
Audible noise	<55 dBA	<55 dBA
UPS dimensions (electronics, isolation modules mated) (H x W x D)	27.3 in. x 13.8 in. x 17.8 in. (69.3 cm x 35.1 cm x 45.2 cm)	
UPS electronics module weigh—-all versions	40 lb (18.1 kg)	45 lb (20.4 kg)
UPS isolation module weight -208/240 Vac, 60 Hz	104 lb (47.2 kg)	130 lb (59.0 kg)
UPS isolation module weight -208/230 Vac, 50/60 Hz	113 lb (51.3 kg)	146 lb (66.2 kg)
SmartCell dimensions (H x W x D)	9.1 in. x 6.9 in. x 17.8 in. (23.1 cm x 17.5 cm x45.2 cm)	
SmartCell weight (Add 1 for 3-kVA and 2 for 5-kVA)	Each 64 lb (29 kg)	Each 64 lb (29 kg)
Safety approvals	UL per 1778, CSA per C22.2, TUV per IEC 950	
EMC verification	FCC Part 15 subpart J class A, CDC, EN55022	
Standard Product Warranty	2 years, $25,000 Lifetime Equipment Protection Policy	

[1] 5-kVA models are derated to 4700VA when configured for 208V input.

[2] 60 Hz models are wired for 208 V input. Specify if 240 V is desired. 50/60 Hz models are wired for 220/240 V. Specify if 208 V is desired.

[2] All output receptacles have individual circuit breaker protection.

Office/Data Center On-Line Systems: Prestige Model 3000

Product Description

The Powerware Prestige 3000, 3kVA UPS is the first on-line UPS that offers a hot-swappable modular design.

The standard North American Unit is made up of three plug and play modules which can be easily diagnosed and swapped out or upgraded by the user.

- The electronics module containing automatic bypass and communications port
- The battery module which can be monitored through the software
- The power pass maintenance by-pass module which allows the electronics to be safely disconnected without interrupting the critical load

The standard international version does not currently include the Power pass module.

The North American unit is available in 208 or 240 volts input and 120, 120/208, 120/240 VAC output models. The International unit is switch selectable for 208/220/230/240 volts in and out.

Double-conversation online technology provides regenerated, clean power at all times for consistent performance.

The user-friendly front panel features visual and audible alarms for battery, overload, and change of state, LED bar graph display of percent load, battery time remaining and operational status. The unit also provides an automatic battery self test feature. Optional Network power management and UPS monitoring/shutdown software and Network adaptors allows safe shutdown, remote status display and control of UPS parameters in an NMS or SNMP environment.

The modular battery packs be changed, added or removed without turning off the UPS providing regulated on-line power while the battery is being serviced or upgraded.

An exclusive "second generation" on-line design extends battery life and the "cell saver" utility interface gives the Powerware Prestige the ability to accept lower input voltages when the UPS load is at less than 100% capacity. The battery is used only during the most severe brownouts and blackouts, running cooler and increasing battery life.

The PowerPass Distribution Module houses an isolation transformer to provide galvanic isolation while on auto or maintenance bypass. It also contains the output receptacles and protects the critical load by allowing it to be manually transferred to the utility power source (bypass) without interruption. Extra output receptacles are provided by extendable plug-in distrubiton modules. Each receptacle has individual circuit breaker protection for maximum flexibility. These modules are Ul 1778 approved for safe handling by the user.

The Prestige is manufactured by Exide Electronics in accordance with ISO9001 standards for quality throughout the design, documentation, and manufacturing processes.

Prestige Model 3000 Ordering Information

- All models except -AR include line cord W/L6-30P, electronics, battery, and Powerpass module with isolation XPMR and output receptacle panel.
- -AR variant does not currently include the Powerpass module and comes with a stripped pig tail line cord.
- None of the models has hardwired input provisions
- All UPS models include 3-year hot-swap warranty when sold in the continental U.S. Models sold outside the continental U.S. include a 1-year warranty with return to certified service center
- Digital on-site exchange service contracts are also available.

Step 1—Select UPS (with packaged battery and receptacle panel shown)

Order Number	Description	Output Rating	Output Receptacle
4N-AEAAH-AL	3kVA Prestige 208 V Model: 208 V in: 120/208 V out	3KW / 2KW 60 Hz	(1) L6-30R (2) 5-15R2
4N-AEAAH-AM	3kVA Prestige 208 V Model: 208 V in: 120 V out only	3KW / 2KW 60 Hz	(1) L5-30R (2) 5-15R2
4N-AEAAH-AN	3kVA Prestige 240 V Model: 240 V in: 120/240 V out	3KW / 2KW 60 Hz	(1) L14-30R (2) 5-15R2
4N-AEAAH-AP	3kVA Prestige 240 V Model: 240 V in: 120 V out only	3KW / 2KW 60 Hz	(1) L5-30R (2) 5-15R2
4N-AEAAH-AR	3kVA Prestige 200-240 V Model 220/230/240 in and out (International Version)	3KW / 2.1KW 50/60 Hz	Optional HV power strips See below
4N-AEWAR-G2	5-year on-site exchange warranty upgrade option Upgrades standard 3-year hot-swap return warranty Continental U.S. only. Available at time of UPS sale		

Step 2—Additional Power Distribution Units/Outlet Configurations (Optional)

Plug-In Output Extensions (plugs into receptacle on unit)

Used with UPS Model	Extension Model*	Output Receptacles	Extension plug type
4N-AEAAH-AL	**4N-AEACH-AK**	Two L6-20R and two l6-30R	L6-30P (all)
	4N-AEACH-AL	Hardwired output module	
4N-AEAHH-AM	**4N-AEACH-AA**	Four 5-15R2	L5-30P (all)
	4N-AEACH-AB	Four 5-20R2	
	4N-AEACH-AC	Two L5-30R, Two 5-20R2	
	4N-AEACH-AD	Two L5-20R, Two 5-20R2	
	4N-AEACH-AE	Hardwired output module	
	4N-AEACH-AF	One 5-15R2, Three L5-30R	
4N-AEAHH-AP	**4N-AEACH-AG**	One L14-30R, Three 5-15R2	L14-30P (all)
	4N-AEACH-AH	One L14-30R, Two L6-30R, One 5-15R2	
	4N-AEACH-AJ	Hardwired output module	
	4N-AEACH-AM	Four 5-15R2	
4N-AEAAH-AR	**4N-AEACH-DA**	Schuko outlets six @ 16 Amp	IEC320 20A (all)
	4N-AEACH-DB	French outlets six @ 16 Amp	
	4N-AEACH-DC	British outlets six @ 13 Amp	

Note: Extensions may also be used with any custom power pass module 4N-AEAAJ-D* for building block configuration.

Step 3—Additional Battery Packs for Extra Runtime (Optional)

4N-AEAAH-AB 3kVA Extended battery cab (up to 3 total maximum)

Battery Times	One	Two	Three
Full load	7 minutes	18 minutes	30 minutes
Half load	14 minutes	35 minutes	55 minutes
Recharge time @ 90% capacity	5 hours	12 hours	21 hours

Step 4—Select UPS Monitoring/Shutdown Software and Network Options (Optional)

4N-AEAES-AA OnliNet Windows NT AXP
4N-AEAES-AB/BB OnliNet Windows NT x86 Basic/Network
4N-AEAES-AH OnliNet Windows DOS
4N-AEAES-EE OnliSafe Open VMS VAX (TK50)*
4N-JBBBB-GG PowerMon OpenVMS AXP*

See Environmental products software section for full listing of available operating systems and package descriptions.
Refer to PUPS Network Adapters/Hardware Options for network power menagement and other devices.

Office/Data Center On-Line Systems—Prestige Model 3000 Specifications

Electrical		
Nominal Input Voltage	208 V, 220 V, 230 V, 240 V	
Input Voltage Range	160 – 276 without using batteries	
Input Frequency Range	45 Hz to 65 Hz	
Input Power Factor	0.90 Typical @ full load, and nominal line	
Surge Protection	Per EN 50082-1, meets IEC 801 – 4, IEEE 587	
Output Voltage	120/208 V, 120/240 V ± 3% Sinewave	208 V, 220 V, 230 V, 240 V ± 3% Sinewave
Output Rating	3000 VA/2000 W	3000 VA/2100 W
Output Current	25A/120 V, 14.4A/208 V, 12.5A/240 V	14.4A/208 V, 13.6A/220 V, 13.0A/230 V, 12.5A/240 V
Output Voltage THD	< 3% linear load	
Load Crest Ratio	3:1	
Common Mode Noise Rejection	> 60 dB	
Transverse Mode Noise Rejection	< 89 dB	
Mechanical		
Weight: UPS Electronics only	7.5 kg/16.5 lbs	
Weight: Standard Battery Pack	23.6 kg/52 lbs	
Weight: PowerPass Distribution Module	21.4 kg/47 lbs	N/A
Dimensions: UPS Electronics and Standard Battery Pack (Stacked)	N/A	286 x 252 x 400 (mm) 11.2 x 9.9 x 15.8 (in)
Dimensions: UPS Electronics, Standard Battery, and PowerPass Distribution Modules	428 x 252 x 400 (mm) 16.8 x 9.9 x 15.8 (in)	N/A
Battery		
Battery Type	Sealed lead-acid/maintenance free	
Full Load Support Time	6.5 min.	
Recharge Time	6 hours to 90% capacity	
Diagnostics	Automatic on-line test without exposing the load	
General		
Architecture	On-line, double-conversion, power isolated	
User Interface	5 segment LED display with meters and alarms	
Operation	Fully automatic, touch-pad control	
Diagnostics	Full system self test on power up	
UPS Bypass	Automatic on overload or UPS failure	
Replacement Bypass	Hot swap battery and electronics modules	Hot swap battery modules
Communications	RS-232, LAN contacts, AS/400, Novell, 3COM	
Networks	Connectivity via Ethernet and Token Ring SNMP Adapter	
Input	Detachable 2 meter (6-foot) line cord with L6-30P, British, or Schuko plugs	
Output Power Strip PowerPass Distribution Module	 N/A 1 L6-30R, 4 5-15R; 1 L14-30R, 4 5-15R; or 1 L5-30R, 4 5-15R	 5 British, 5 Schuko, or 5 French receptacles N/A
Safety	UL 1778, CAS C22.2 No. 107.1, EN 60950, EN 50091-1	
Environmental		
Audible Noise	50 dBA	
Ambient Operating Temperature	10° C to 40° C	
Ambient Storage Temperature	-20° C to 60° C	
Relative Humidity	5 – 95% non-condensing	
EMI Suppression	FCC Part 15, Sub Part J Class A, CISPR22B	
Packaging	No CFCs, recyclable	

Office/Data Center On-Line Systems: Powerware PLUS (PUPS Plus) UPS Systems

Product Description

The Personal Series-PLUS UPS systems are available in eight ratings: 3.6-, 6-, 8-, 10-, and 12-kVA models support single-phase loads and 15-, 18-, 24-and 36-kVA models support both single-and three-phase applications. 3.6, 8, 10, 15, and 24 kVA units are upgradable to 6, 12, 18, and 36 kVA respectively. It is the highest quality and most advanced design in the industry.

The employment of insulated gate bipolar transistor (IGBT) technology makes these UPS products the smallest and lightest in their class. Combining the attributes of high switching speed and high current-carrying capability, IGBT technology provides the most efficient design and quietest operation available—frequency switching is above the hearing range of the human ear. Its quiet, compact design and portable operation make it suitable for both office and computer room environments requiring anywhere from 176 V to 276 V single- or 3-phase input at 50 or 60 Hz.

The Personal Series-PLUS UPS is a highly reliable, fully automatic On-line system. All units feature Bypass Plus, increasing MTBF to over 250 khrs.

It is also the unit of choice for frequency conversion, phase shift applications or special siesmic requirements.

In the event of a complete power blackout, the UPS inverter continues to feed the computer system via the battery without any interruption to critical load. This allows time to ride out the outage, switch to an auxiliary power source, or perform a controlled shutdown of the system without any danger to valuable data. A wide range of battery support times are available for all types of applications.

In addition to battery backup protection, its double conversion design ensures maximum isolation from the utility source and provides precision control of voltage and frequency during normal operation, while supporting 100% non-linear load without derating.

The 3.6-to 18-kVA models offer convenient plug-in connection to the critical load with a wide range of individually protected receptacles on the power distribution module (PDM). The PDM is attached to the back of the UPS cabinet on 3.6-and 6-kVA models and on the back of the battery cabinet on 8 through 18-kVA models. The 15-and 18-kVA models may have up to two PDMs. The output may also be hardwired.

The 24-and 36-kVA models may be hardwired to a remote distribution panel or an optional auxiliary cabinet may be selected.

The optional auxiliary cabinet contains such features as "wrap-around" maintenance bypass, 30 pole distributor panel with provision for square D bolt-on or plug-in circuit breakers, input current reduction filer and a variety of input/output voltage options.

In case of emergency, an Emergency Power Off (EPO) switch located on the Personal Series-PLUS unit disconnects the critical load from both the UPS and the bypass. Remote Emergency Power-Off Stations (REPO) interface is also provided for remote power off.

The full featured front panel offers a programmable visual menu-driven display of UPS conditions and a communications interface that allows transmission of UPS alarm conditions to a remote terminal. This communications interface also allows unattended automatic "soft" shutdown or event monitoring through the use of UPS monitoring software (see software section).

Personal Series-PLUS UPS Ordering Information (3.6-To 18-KVA Models)

Step 1—Select UPS (with packaged battery)

Note: 3.6-to 12-kVA models include minimum duration battery. See specifications on page 11.23 for available durations.

Prepackaged Systems

4N-AEAAH-PC	3.6 kVA with (4) 5-20R2 and L14-30P
4N-AEAAJ-PC	6.0 kVA with (4) 5-20R2 and L14-30P
4N-AEAAH-PA/PB	3.6 kVA custom configuration for U.S./non-U.S. VAXft 810 systems(two required)

Single-Phase Output Models		Three-Phase Output Models	
4N-AEAAH-BD	3.6 kVA	**4N-AEAAN-BA**	15 kVA, minimum duration
4N-AEAAH-BE	3.6 kVA, hardwired I/O	**4N-AEAAN-BC**	15 kVA, standard duration
4N-AEAAJ-BD	6.0 kVA	**4N-AEAAN-BD**	15 kVA, extended duration
4N-AEAAJ-BE	6.0 kVA, hardwired I/O	**4N-AEAAP-BA**	18 kVA, minimum duration
4N-AEAAL-BA	10.0 kVA	**4N-AEAAP-BC**	18 kVA, standard duration
4N-AEAAM-BA	12.0 kVA	**4N-AEAAP-BD**	18 kVA, extended duration

Step 2—Select Input/Output Options[1]

Note: Not required for prepackaged systems (-PA, -PB, -PC), and -BE hardwired I/O models

Step 2a—Select Input Cords and Plugs for other 3.6-and 6.0-KVA Models

4N-AEACH-BC	6 ft with L14-30P (single phase)
4N-AEACH-BD	6 ft with L21-30P (three phase)

Step 2b—Select Output Power Distribution Modules (PDM) for U.S. and 60-Hz Configurations[1]

Required for 3.6-and 6-kVA PDM (except -BE Models)—Select one

Order Number	Description
4N-AEACH-BE	(4) 5-15R2
4N-AEACH-BF	(4) L5-30R, (3) 5-15R2
4N-AEACH-BH	(3) L5-30R, (1) 5-15R2
4N-AEACH-BJ	(2) 5-15R2, (2) L5-15R
4N-AEACH-BK	(4) 5-20R2
4N-AEACH-BL	(2) L6-30R
4N-AEACH-BM	(4) 6-15R
4N-AEACH-BN	(3) 5-15R2, (1) L6-15R
4N-AEACH-BR	(2) 5-20R2, (2) L5-30R
4N-AEACH-BS	(2) L5-20R, (2) 5-20R
4N-AEACH-CA	(2) IEC C19, (2) C13

Optional for 10-and 12-kVA PDM—Select one

4N-AEACK-BA	(8) 5-15R2
4N-AEACK-BB	(1) L5-15R, (2) L5-30R, [4] 5-15R2
4N-AEACK-BC	(6) L5-30R, (2) 5-15R2
4N-AEACK-BD	(4) 5-15R2, (4) L5-15R
4N-AEACK-BE	(4) L6-15R, (4) 5-15R2
4N-AEACK-BF	(4) 5-20R2, (4)5-15R2
4N-AEACK-BG	(2) 5-20R2, (2) L5-30R, (4) 5-15R2
4N-AEACK-BH	(2) 5-20R2, (3) L5-30R, (3) 5-15R2
4N-AEACK-BL	(2) L5-20R, (6) 5-20R2
4N-AEACK-BN	(4) L6-30R, (2) L5-30R2, (2) L5-20R

Step 2a—Select Input Cords and Plugs for other 3.6-and 6.0-KVA Models *(continued)*

Optional for 15-and 18-kVA PDM—Select one or two[2]

4N-AEACM-BA (6) 5-20R2
4N-AEACM-BB (6) 5-15R2, (1) L21-20R
4N-AEACM-BC (4) 5-20R2, (2)L14-30R
4N-AEACM-BD (2) 5-15R2, (1) L5-30R, (1) L21-30R, and (1) L21-20R
4N-AEACM-BE (1) 5-15R2, (3) L5-30R, (1) L21-30R
4N-AEACM-BF (5) 5-15R2, (1) L5-30R
4N-AEACM-BG (4) 5-15R2, (1) L21-30R
4N-AEACM-BH* (3) 5-20R2 with conduit mount kit
4N-AEACM-BJ* (1) 5-20R2, (1) L21-30R with conduit mount kit
4N-AEACM-BK (3) 5-20R2, (2) L21-30R
4N-AEACM-BL (1) 5-15R2, (3) L5-30R, (1) L21-20R
4N-AEACM-BM (2) L5-20R, (2) 5-20R2, (1) L21-30R
4N-AEACM-BN (2) L21-30R, (2) L21-30R, (2) L6-30R

* This PDM required when both "plug in" and "hardwire" outputs are desired and/or when daisychaining up to two PDMs. A PDM is not required for hardwire only output.

Note: All systems shown include emergency power off, full featured front panel, and Bypass Plus with static and maintenance bypass.

[1] 3.6-and 6.0-kVA models require input cord and output power distribution module; -BE models are not compatible with the above PDM. 10-, 12-, 15-, and 18-kVA models require hardwire input and may be optionally hardwired on the output.

[2] When choosing up to two PDMs, a minimum of one conduit mount kit is required.

[3] Other configurations are available. Call 800-Digital and ask for Environmental Products Support

Step 3—Select Optional Extended Battery Cabinets

See specifications for range of battery duration and associated cabinet selections.

Add up to a total of five extended battery cabinets (EBC2) to increase support time; 15-and 18-kVA units use preconfigured order numbers with minimum, standard, and extended duration. For extra extended applications on these units, add up to two EBC2 to extended duration models.

4N-AEACH-BA EBC1 for 3.6-and 6.0-kVA models
4N-AEACH-BB EBC2 for all models

Step 4—Select Software and Network Options

See Software section and order chart for available operating systems; see UPS Hardware Options section

Step 5—Hardwire Output

For hardwire output to remote distribution applications, select optional modular power distribution unit. See 4N-CMCC* Distribution Section.

Personal Series-PLUS UPS Specifications (3.6-to 18-KVA Models)

Models	3.6 KVA	6.0 KVA	10.0 KVA	12.0 KVA	15.0 KVA	18.0 KVA
Input						
Input voltage	176–276 Vac				176–253 Vac	176–253 Vac
Phases	Single-or 3-phase				3-phase	
Frequency range	45–65 Hz					
Power factor	95 typical					
Input plug	L14–30P (single-phase) or L21–30P (3-phase)		Hard-wired			
Input circuit breaker, 2-or 3-pole	30 amps		60 amps		60 amps (3 pole only)	
Maximum input current	15	25.5	42	50	42	50

Personal Series-PLUS UPS Specifications (3.6-to 18-KVA Models) *(continued)*

Models	3.6 KVA	6.0 KVA	10.0 KVA	12.0 KVA	15.0 KVA	18.0 KVA
Output						
kVA/kW	3.6/2.4	6.0/4.0	10.0/7.0	12.0/8.0	15.0/10.0	18.0/12.0
Voltages (selectable)	208/120, 240/120, 230/115, 220/110, 200/100 Vac				208/120, 201/115, 230/ 127 Vac	
Phases	Single				Three	
Continuous Amps	15	25	42	50	42	50
Sustained overload before bypass transfer	106 to 125% FLA @ 10 minutes; 126 to 149% @ 30 seconds; >150% @ 10 cycles					
Fault clearing	75 A @ 10 cycles; >75 A @ 3 milliseconds		150 A @ 10 cycles; >150 A @ 3 milliseconds			
Transient response	<5% for 100% load Step within 1 millisecond; full recovery within 1 cycle					
Voltage regulation	<+-2%					
THD	<5% for full nonlinear loads and 3.0 crest factor					
Frequency regulation	50 or 60 Hz +-0.1% (free run)					
Noise attenuation	Common mode: -120 dB up to 100 kHz; transverse mode: -60 dB up to 100 kHz					
Agency Compliance						
Surge/electrostatic (GSD)	Meets IEEE 587/ANSI C62.41 Class A, B; 25 kV withstand for ESD					
EMI suppression	Meets FCC Part 15, Subpart J, Class A					
Safety	IEC 950, UL 1778, Canadian Standards Association listed					
Batteries						
Manufacturer/type/life	YUASA, NP series/sealed, maintenance-free lead acid/5 year design life					
Approvals	Meets IATA Special Provision 67, U.S. DOT, and IMDG test standards					
DC voltage	240 Vdc; 120 cells, 2.25 V/cell float					
Battery Cabinet Contents and Recharge Times to 80%						
Minimum duration	Internal	2 hours	(1) EBC2	2 hours	(1) EBC1, (1) EBC2	2 hours
Standard duration	(1) EBC1	4.5 hours	(2) EBC2	3 hours	(2) EBC2	3 hours
EXT duration	(1) EBC2	6 hours	(3) EBC2	6 hours	(3) EBC2	6 hours
Extra EXT 1 duration	(2) EBC2	10 hours	(4) EBC2	9 hours	(4) EBC2	9 hours
E xtra EXT 2 duration	(3) EBC2	13 hours	(5) EBC2	13 hours	(5) EBC2	14 hours
Battery Times, Full/Half Loads in Minutes						
Minimum duration	14/30	6/19	9/27	7/22	10/28	7/22
Standard duration	36/70	20/46	26/60	22/52	16/40	12/33
EXT duration	59/110	35/73	44/95	37/83	29/65	22/53
Extra EXT duration 1	103/180	63/128	61/129	52/113	41/89	33/71
Extra EXT duration 2	148/250*	92/182*	78/163	68/144	53/113	43/94
Environmental and Physical						
Size++ (H x W x D+++)	28.1 x 8.5 x 24.6 in. (714 x 216 x 625 mm)		28.1 x 17 x 28.6 in. (714 x 432 x 625 mm)		28.1 x 25.5 x 28.6 in. (714 x 648 x 625 mm)	
System weight++ minimum duration other models	270 lb (123 kg) 270 lb + battery weights		475 lb (216 kg) 180 lb + battery weights		655 lb (298 kb) 180 lb + battery weights	
Battery weight (EBC1)	171 lb (76 kg)		N/A			
Battery weight (EBC2)	295 lb (134 kg)					
Altitude	5,000 ft (1,500 m) without derating					
Audible noise	Typically <50 dB at 1 meter				<60 dB at 1 meter	
Ambient temperature Operating Nonoperating Relative humidity	0° C to +40° C –20° C to +60° C 5%–95% noncondensing					
Btus/hour	2048	2601	3890	4081	5101	5063

* Additional time available up to 4 hours @ 3.6 kVA; 2.5 hours @ 6 kVA at full load.

++ Sizes and weights are for models with minimum duration battery. Weights include 180 lb for UPS electronics. For combined weights of other models, add additional battery cabinet weight as shown.

+++ Depth dimension is for UPS base cabinet. PDM adds 3.2 inches to UPS on 3.6-and 6-kVA models and 4 inches to battery cabinets for 10--18 kVA models.

Note: Service clearance required = 4 inches rear, 36 inches left, side facing unit.

Personal Series-PLUS UPS Ordering Information (24-and 36-KVA Models)

Step 1—UPS with packaged battery—all 208 V in, 208 V out (see step 2 for other options)

4N-AEAAR-AA/AB/AC 24 kVA, one/two/three battery cabinets 12, 30 and 50 minutes respectively

4N-AEAAB-AA/AB/AC 36 kVA, one/two/three battery cabinets 5, 15, and 30 minutes respectively

Step 2—Additional Auxiliary Options Cabinet with Input/Output Options (Optional)

All base cabinets contain external wraparound bypass. PDMs accept square D plug in, or bolt on circuit breakers.

Note: Option cabinets cannot be ordered as a field upgrade.

with Transformers

4N-AEACP-AC Auxiliary cabinet, 480 input/208 output

4N-AEACP-AD Auxiliary cabinet, 480 input/208 output with PDM (30-pole)

4N-AEACP-AE Auxiliary cabinet, 480 input/480 output

4N-AEACP-BC Auxiliary cabinet, 480 input/208 output with THD inputfilter

4N-AEACP-BD Auxiliary cabinet, 480 input/208 output with PDM (30-pole) and THD input filter

4N-AEACP-BE Auxiliary cabinet, 480 input/480 output with THD input filter

without Transformers

4N-AEACP-AA Auxiliary cabinet with ext bypass only

4N-AEACP-AB Auxiliary cabinet with PDM (30-pole)

4N-AEACP-BA Auxiliary cabinet with THD input filter

4N-AEACP-BB Auxiliary cabinet with PDM (30-pole) and THD input filter

Step 3—Select Additional Battery Cabinets

Add battery packs to packaged models for increased support time (Maximum of three total including package battery)

4N-AEACN-AA Add-on matching battery cabinet

Run and Recharge Time Chart—Support time @ full/half in minutes

	With 1 Cab	With 2 Cabs	With 3 Cabs
24 kVA / 16 KW run times	12 / 30	30 / 80	50 / 130
36 kVA / 24 KW run times	5 / 18	15 / 30	30 / 80
Common Recharge Times	1 hour	2 hours	5 hours

Note: Additional support time may be custom configured. Please call for assistance.

Step 4—Select Software

See software section and order chart for applicable operating system. See UPS Hardware options for Network adapters.

For hardwire output to remote distribution applications, select optional modular power distribution unit. 4N-CMCC* see distribution section.

Personal Series-PLUS UPS Specifications (24 and 36 kVA Models)

Models	24 kVA		36 kVA	
Input				
Nominal voltage VAC	208 V	480 V	208 V	480 V
Input voltage range	176-253 V	410-580 V	176-253 V	410-580 V
Phases	3-phase			
Frequencies	45--65 Hz			
Power factor	95 typical			
Input connection	Hardwire at rear of unit			
Input circuit breaker 3-pole	125A-3P	75A-3P	125A-3P	75A-3P
Maximum input current	58A	28A	87A	42A
Voltages (selectable)				
Input current THD	Less than 10% with optional THD reduction filter			
Output				
kVA / KW	24 / 16		36 /24	
Voltages (selectable)				
Phases	3			
Continuous Amps	67A	29A	100A	44A
Sustained overload before bypass transfer	106% to 125% FLA @ 10 minutes, 126% to 149%@ 30 seconds, >150%, 10 cycles			
Fault clearing	300 A @ 12 cycles, >300 A, 3 ms			
Transient response	<5% for 100% load Step, recovery in 1/4 cycle (4 ms)			
Voltage regulation	±2%			
THD	<5% maximum for full non-linear and 100% load			
Frequency regulation	50 or 60 Hz ±0.1% (free run)			
Noise attenuation to 100kHz	Common/Normal mode >100/60 dB			
Agency Compliance				
Surge/electrostatic (GESD)	Meets IEEE 587/ANSI C62.41 Class A, B; 25 kV withstand for ESD			
EMT suppression	Meets FCC Part 15, Subpart J, Class A			
Safety	IEC 950, UL 1778, Canadian Standards Association listed			
Batteries				
Manufacturer/type/life	YUASA, NP series/sealed, maintenance-free lead acid/5-year design life			
Approvals	Meets IATA Special Provision 67, U.S. DOT, and IMDG test standards			
DC voltage	240 Vdc; 120 cells, 2.25 V/cell float			
Battery Cabinet Contents (Rechargeable Times to 90%)				
Minimum duration (standard)	1 cabinet, 1 hour (see battery runtime chart for additional cabinets)			
Battery Times, Full/Half Loads in Minutes				
Minimum duration (standard)	12/30 (24 kVA), 5/18 (36 kVA)			
Environmental and Physical				
Size (same for electronics, or auxiliary or battery cabinet)	39 in. H x 17 in. W x 31 in. D (each cabinet)			
System weights				
Electronics module Auxiliary cabinet	UPS: 400 lb (180 kg) 1300 lb (590 kg) maximum with all options			
Battery weight (EBCI)	900 lb per cabinet			
Altitude	5000 ft (1500 m)			
Audible noise @ 1 meter	65 dBA			
Ambient temperature				
Operating	0° to +40° C			
Nonoperating	–20° to 60° C			
Relative humidity	5% to 95% noncondensing			
Btus/hour	10,402 (24 kVA), 15,602 (36 kVA)			

Note: Service clearance required = 4 inches rear, 36 inches left side facing unit.

[1] Add 6.2 inchest to depth of electronics, and auxiliary cabinet for wiring through.

[2] 24 kVA unit is field upgradable to 36 kVA

Data Center Systems—HA4000 3-Phase UPS

Product Description

The HA4000 3-Phase Uninterruptible Power System (UPS) is a data center protection system for Digital and non-Digital environments.

The HA4000 protects the computer system and data against everyday power aberrations—voltage surges, voltage spikes, high energy transients, electrical noise, and low voltage conditions.

This system is designed and tested specifically to support nonlinear power loads with no derating. The static bypass feature automatically transfers the load to utility during a UPS system fault or overload condition. The latest microprocessor-controlled operations and diagnostics are featured to maximize system uptime. The system status and control panel features easy menu-driven instructions, in five languages, for operation, test, monitoring, and diagnosis. Remote status and remote alarm panels are also available. The HA4000 provides state-of-the-art Pulse Width Modulation (PWM) inverter technology for optimum system performance and includes standard emergency power-off switch and dry contacts for external monitoring and interface.

The HA4000 features high efficiency ratings at both full-and half-load. It has a small footprint and quiet operation for an easy fit into the computer room environment.

To accommodate both single-and 3-phase loads, seven sizes are available for 11-, 20-, 40-, 60-, 80-, 100-, and 125-kVA power requirements. All systems include maintenance bypass as a standard feature, which allows full computer system operation during routine UPS maintenance. The self-contained, compact 11-kVA model combines all UPS attributes including an 11-minute battery and optional distribution in one cabinet, providing one of the smallest footprints in the industry. The 20–125 kVA systems utilize matching bolt-on auxiliary, distribution, and battery cabinets.

The HA4000 employs high-quality, flame-retardant batteries that have been tested to Federal health and safety standards. Battery racks roll out to facilitate quick, safe battery service in computer environments. For the 20--125-kVA models, batteries provide up to five levels of support time from 5 to 75 minutes at full load.

When used with Remote Environmental Monitoring Software (REMS), the HA4000 provides unattended ``soft'' system shutdown and the unique capability to provide a complete environmental information and tracking system for all occurrences associated with building systems inside and outside of the computer room.

Optional Features

Optional features are combined in the auxiliary and distribution cabinets, minimizing floorspace requirements. Optional features include:

- Input THD reduction filter to minimize the impact of waveform distortion on sensitive equipment and backup generators (filter is standard on 100-and 125-kVA systems)
- Isolation transformer to perform voltage conversion and to isolate the load from the utility during bypass operation

Flexible Power Cabinets

Distribution cabinets with 84-pole positions are available in both 208-and 480-volt inputs and come with or without an isolation transformer. They supply an efficient and modular method of power distribution, ensuring the most reliable means of delivering power throughout the computer room through the use of insulated, isolated branch circuit conductors and single-point grounding provisions. Power distribution cables offer a portable means of equipment connection and come pre-assembled with circuit breakers and receptacles attached for quick, easy installation.

Remote Power Distribution Unit

The power distribution unit (PDU) has the same capabilities as the distribution cabinet described above. However, it is intended for remote placement and is not bolted to the HA4000 system. The PDU cabinet is on permanent casters and may be utilized as a standalone distribution option with or without a UPS system. The unit comes with an EPO switch, input cable, and junction-box.

Data Center Systems—HA4000 3-Phase UPS *(continued)*

Shipping, Delivery, AND Installation

When assessing access routes from the unloading point to the final location of the HA4000 system, it's extremely important to consider:

- Stairs/elevator capacities, doorway sizes, floor loading during movement
- Possible need for rigging
- Static floor loading at the final location

Note: Installation of the HA4000 must be performed by a licensed electrician. Systems startup is provided by Digital and includes HA4000 system verification and operator training.

HA4000 Quick Configurator

Step 1—Select UPS with Bolt-On Distribution or with Hardwired Output.

- Refer to Chart A on page XX.XX for bolt-on power distribution or Chart B on page XX.XX for hardwired output to remote panelboard or PDU.
- Select power distribution cables, if applicable. (See pages 11.28 and 11.41.)

Step 2—Total the KVA.

Add up the kVA requirements for systems, peripherals, and options to be supported by the UPS. Make allowances for future load growth. Select the appropriate size unit (11, 20, 40, 60, 80, 100, or 125 kVA) to meet the load requirement.

Step 3—Select Voltage.

Determine the input voltage at the facility and the output voltage required by the equipment the UPS will support.

Step 4—Select UPS Configuration.

Depending on kVA and input/output voltage requirements, choose the UPS base cabinet plus additional cabinet(s) from the Option columns in Charts A or B. Choose from one of the four Option columns except where a dash (–) appears. A dash indicates that no auxiliary cabinets are required to meet minimum configuration.

Step 5— Select Battery

Based on kVA range and desired battery duration time, refer to the HA4000 Battery Options Chart on page 11.31 to determine the appropriate battery cabinet order number(s).

Note: 11-kVA units include internal 11-minute battery.

Step 6—Select Shutdown Software and Other Options.

Refer to the HA4000 Options on page XX.XX and Software Selection Section on page XX.X.

For Branch Circuit Distribution:

If an integral distribution panelboard or remote PDU is required:

- Determine type (1, 2, or 3 pole) of circuit breaker, NEMA receptacle, and cable length for each piece of equipment served.
- List cable order numbers (refer to the cable section of the Digital Environmental Power Products catalog, EB-M4442-79; or cable receptacle chart on page XX.X).
- Determine total number of circuit breaker poles required. All integral distribution (except 11-kVA unit @ 30 poles) contains 84 poles. Remote PDUs contain 84 poles (except 20-kVA unit @ 42 poles).

Notes:

1. All systems are configured with maintenance bypass as standard (no options). 100-and 125-kVA units are configured with maintenance bypass and input filter as standard via an auxiliary cabinet.
2. Systems will consist of the following minimum configurations: 20--80 KVA: UPS base and battery cabinet(s). 100--125 KVA:UPS, battery cabinet(s), and auxiliary cabinet with maintenance bypass.
3 All 20--80 kVA UPS systems utilize 208/208-V or 480/480-V base UPS cabinets. 100/125-kVA systems use 480/480-V base cabinets. Additional cabinets are required to provide other configuration voltages.

Distribution Cabinet Output Configuration Chart

This chart configures UPS systems requiring bolt-on OUTPUT DISTRIBUTION cabinets.

See battery chart for battery cabinet selection (required with 20–125 kVA models).

Chart A: UPS with Bolt-On Distribution Cabinet

Select UPS Base Cabinet Plus One of These Four Options:			Option 1	Option 2	Option 3	Option 4
KVA	UPS System Input/output (v)	UPS Base Cabinet	(Distribution Only) No Option	Input filter, Distribution	Isolation Transformer, Distribution	Input filter, Isolation Transformer, Distribution
11	208/208	HA42A-AB	—	N/A	N/A	N/A
20	208/208	HA42A-AH	HA42K-AT	HA42K-AT & HA42E-PH	HA42K-AH	HA42K-AH & HA42E-PH
	480/208	HA42A-CH	HA42K-BH	HA42K-BH & HA42E-PH	HA42K-BH	HA42K-BH & HA42E-PH
	600/208	HA42A-AH	HA42K-AT & HA42D-EH	HA42K-AT & HA42C-EH	HA42K-AT & HA42D-EH	HA42K-AT & HA42C-EH
40	208/208	HA42A-AK	HA42K-AT	HA42K-AT & HA42E-PK	HA42K-AK	HA42K-AK & HA42E-PK
	480/208	HA42A-CK	HA42K-BK	HA42K-BK & HA42E-PK	HA42K-BK	HA42K-BK & HA42E-PK
	600/208	HA42A-AK	HA42K-AT & HA42D-EK	HA42K-AT & HA42C-EK	HA42K-AT & HA42D-EK	HA42K-AT & HA42C-EK
60	208/208	HA44A-AM	HA44K-AT	HA44K-EM	HA44K-AM	HA44K-CM
	480/208	HA44A-CM	HA44K-BM	HA44K-DM	HA44K-BM	HA44K-DM
	600/208	HA42A-AM	HA44K-AT & HA44D-EM	HA44K-AT & HA44C-EM	HA44K-AT & HA44D-EM	HA44K-AT & HA44C-EM
80	208/208	HA44A-AN	HA44K-AT	HA44K-EN	HA44K-AN	HA44K-CN
	480/208	HA44A-CN	HA44K-BN	HA44K-DN	HA44K-BN	HA44K-DN
	600/208	HA42A-AN	HA44K-AT & HA44D-EN	HA44K-AT & HA44C-EN	HA44K-AT & HA44D-EN	HA44K-AT & HA44C-EN
100	208/208	HA44A-CP	HA44M-BR & HA44L-GR	Included in Option 1	Included in Option 1	Included in Option 1
	480/208	HA44A-CP	HA44M-BR	Included in Option 1	Included in Option 1	Included in Option 1
	600/208	HA44A-CP	HA44M-BR & HA44L-HR	Included in Option 1	Included in Option 1	Included in Option 1
125	208/208	HA44A-CR	HA44M-BR & HA44L-GR	Included in Option 1	Included in Option 1	Included in Option 1
	480/208	HA44A-CR	HA44M-BR	Included in Option 1	Included in Option 1	Included in Option 1
	600/208	HA44A-CR	HA44M-BR & HA44L-HR	Included in Option 1	Included in Option 1	Included in Option 1

Hardwire Output Configuration Chart

This chart configures UPS systems with HARDWIRED OUTPUT.

See battery chart (page 11.31) for battery cabinet selection (required with 20–125 kVA models).

Chart B: UPS with Hardwired Output to Remote Distribution

Select UPS base cabinet plus one of these four options			Option 1	Option 2	Option 3	Option 4	Remote PDU Option (Optional for Chart B)	
KVA	UPS System Input/Output (V)	UPS Base Cabinet	Minimum Configuration	Input Filter	Isolation Transformer	Filter and Isolation Transformer	Without Isolation Transformer	With Isolation Transformer
11*	208/208	HA42A-AA	—	N/A	N/A	N/A	4N-CMCCC-AA	4N-CMCCA-AA
20	208/208	HA42A-AH	—	HA42E-PH	HA42D-AH	HA42C-AH	4N-CMCCC-AA	4N-CMCCA-AA
	480/208	HA42A-AH	HA42D-BH	HA42C-BH	HA42D-BH	HA42C-BH	4N-CMCCC-AA	4N-CMCCA-AA
	480/480	HA42A-CH	—	HA42E-PH	HA42D-CH	HA42C-CH	N/A	4N-CMCCA-BA
	600/208	HA42A-AH	HA42D-EH	HA42C-EH	HA42D-EH	HA42C-EH	4N-CMCCC-AA	4N-CMCCA-AA
40	208/208	HA42A-AK	—	HA42E-PK	HA42D-AK	HA42C-AK	4N-CMCCD-AB	4N-CMCCB-AB
	480/208	HA42A-AK	HA42D-BK	HA42C-BK	HA42D-BK	HA42C-BK	4N-CMCCD-AB	4N-CMCCB-AB
	480/480	HA42A-CK	—	HA42E-PK	HA42D-CK	HA42C-CK	N/A	4N-CMCCB-BB
	600/208	HA42A-AK	HA42D-EK	HA42C-EK	HA42D-EK	HA42C-EK	4N-CMCCD-AB	4N-CMCCB-AB
60	208/208	HA44A-AM	—	HA44E-PM	HA44D-AM	HA44C-AM	4N-CMCCD-AC	4N-CMCCB-AC
	480/208	HA44A-CM	HA44D-BM	HA44C-BM	HA44D-BM	HA44C-BM	4N-CMCCD-AC	4N-CMCCB-AC
	480/480	HA44A-CM	—	HA44E-PM	HA44D-CM	HA44C-CM	N/A	4N-CMCCB-BC
	600/208	HA44A-AM	HA44D-EM	HA44C-EM	HA44D-EM	HA44C-EM	4N-CMCCD-AC	4N-CMCCB-AC
80	208/208	HA44A-AN	—	HA44E-PN	HA44D-AN	HA44C-AN	4N-CMCCD-AD	4N-CMCCB-AD
	480/208	HA44A-CN	HA44D-BN	HA44C-BN	HA44D-BN	HA44C-BN	4N-CMCCD-AD	4N-CMCCB-AD
	480/480	HA44A-CN	—	HA44E-PN	HA44D-CN	HA44C-CN	N/A	4N-CMCCB-BD
	600/208	HA44A-AN	HA44D-EN	HA44C-EN	HA44D-EN	HA44C-EN	4N-CMCCD-AD	4N-CMCCB-AD
100	208/208	HA44A-CP	HA44L-NR & HA44L-GR	Included in Option 1	HA44N-BR & HA44L-GR	Included in Option 3	4N-CMCCD-AE	4N-CMCCB-AE
	480/208	HA44A-CP	HA44N-BR	Included in Option 1	Included in Option 1	Included in Option 1	4N-CMCCD-AE	4N-CMCCB-AE
	480/480	HA44A-CP	HA44L-PR	Included in Option 1	**	**	N/A	4N-CMCCB-BE
	600/208	HA44A-CP	HA44L-HR & HA44N-BR	Included in Option 1	Included in Option 1	Included in Option 1	4N-CMCCD-AE	4N-CMCCB-AE
125	208/208	HA44A-CR	HA44L-NR & HA44L-GR	Included in Option 1	HA44N-BR & HA44L-GR	Included in Option 3	**	**
	480/208	HA44A-CR	HA44N-BR	Included in Option 1	Included in Option 1	Included in Option 1	**	**
	480/480	HA44A-CR	HA44L-PR	Included in Option 1	**	**	N/A	4N-CMCCB-BF
	600/208	HA44A-CR	HA44L-HR & HA44N-BR	Included in Option 1	Included in Option 1	Included in Option 1	**	**

* The 11-kVA model (HA42A-AA) does not include an EIA-232 communications port.

** Call 800-Digital (800-344-4825) for ordering information and ask for Environmental Products Support.

Battery Options Chart

HA4000 Battery Options Chart

Battery Duration	Battery Cabinet Order Number	Cabinet Width	Circuit Breaker Rating	Battery Times (in minutes at full/half load)			
For 20 and 40 KVA Systems				**20 KVA**	**40 KVA**		
Short:	HA42B-BA	31.5 inches	125 A	23/55	8/22		
Standard:	HA42B-BB	45.0 inches	225 A	35/75	12/35		
Extended 1:	HA42B-BC	45.0 inches	225 A	64/132	24/60		
Extended 2:	HA42B-EA(1)	90.0 inches	2 @ 225 A	75/168	35/78		
Extended 3:	HA42B-EB(2)	90.0 inches	2 @ 225 A	—	62/139		
For 60—125-KVA Systems				**60 KVA**	**80 KVA**	**100 KVA**	**125 KVA**
Short:	HA44B-AH	45.0 inches	125 A	10/28	5/17	—	—
Standard:	HA44B-AT	45.0 inches	250 A	20/50	12/20	9/22	5/18
Extended 1:	HA44B-CT	52.0 inches	250 A	28/64	20/45	13/35	10/27
Extended 2:	HA44B-ET[3]	90.0 inches	2 @ 250 A	55/123	36/80	26/60	19/48
Extended 3:	HA44B-FT[4]	104.0 inches	2 @ 250 A	—	50/113	40/83	28/67

[1]HA42B-EA = two [2] HA42B-BB, [3]HA42B-EB = two (2) HA42B-BC, (3)HA44B-ET = two (2) HA44B-AT, [4]HA44B-FT = two (2) HA44B-CT

Notes:

- All battery times are approximate and based on 0.8 power factor (pf). Battery times may vary depending on age, temperature, load, and use.
- Battery cabinets for 20-and 40-kVA systems and battery cabinets for 60–125-kVA systems cannot be interchanged.
- Batteries in all 45-inch cabinets are mounted on two pull-out rack assemblies for ease of transportability.
- Refer to HA4000 Specifications Chart (page 11.31)for maximum battery current per kVA.

HA4000 Options

HA420-A3	Remote alarm panel up to 1000 feet from UPS
HA420-AA	Remote status panel with 150-foot cable
HA420-AB	Remote status panel with 300-foot cable

Remote Emergency Power-Off Stations (REPO)

H7317-JA	REPO without monitoring
H7317-JB	REPO with temperature monitoring
H7317-JC	REPO with temperature and humidity monitoring

Remote Environmental Monitoring and Shutdown software (REMS) or Powermon Shutdown Software

See pages XX.X and XX.X for ordering information

HA4000 Cabinets Weight Chart

All weights in pounds; dimensions are indicated in parentheses; see chart on the following page.

Cabinet Type	Models						
	11 KVA	20 KVA	40 KVA	60 KVA	80 KVA	100 KVA	125 KVA
UPS Cabinet (HA42A/HA44A)							
Base System 208/208	1100 (A)	1075 (A)	1385 (A)	1774 (E)	2224 (E)	N/A	N/A
480/480	N/A	1075 (A)	1385 (A)	1336 (E)	1648 (E)	2250 (E)	2250 (E)
Battery cabinets (ha42b/ha44b)							
Short duration	N/A	1295 (A)	1295 (A)	2620 (E)	2620 (E)	N/A	N/A
Standard duration	N/A	1835 (B)	1835 (B)	3100 (E)	3100 (E)	3100 (E)	3100 (E)
Extended duration 1	N/A	2280 (B)	2280 (B)	3300 (G)	3300 (G)	3300 (G)	3300 (G)
Extended duration 2	N/A	2 @ 1835 (B)	2 @ 1835 (B)	2 @ 3100 (E)	2 @ 3100 (E)	2 @ 3100 (E)	2 @ 3300 (E)
Extended duration 3	N/A	N/A	2 @ 2280 (B)	N/A	2 @ 3300 (G)	2 @ 3300 (G)	2 @ 3300 (G)
Auxiliary Cabinets for 20–80-KVA Systems							
With filter and isolation transformer (HA42C/HA44C)	N/A	591 (C)	724 (C)	889 (F)	1149 (F)	N/A	N/A
With isolation transformer only (HA42D/HA44D)	N/A	450 (C)	550 (C)	559 (F)	796 (F)	N/A	N/A
With filter only (HA42E/HA44E)	N/A	341 (C)	374 (C)	330 (F)	353 (F)	N/A	N/A

HA4000 Cabinets Weight Chart ***(continued)***

Cabinet Type	Models						
	11 KVA	20 KVA	40 KVA	60 KVA	80 KVA	100 KVA	125 KVA
Auxiliary Cabinets for 100-and 125-KVA Systems							
With filter and maintenance bypass (HA44L-PR)	N/A	N/A	N/A	N/A	N/A	383 (F)	383 (F)
With auto transformer only (HA44L-GR/HR)	N/A	N/A	N/A	N/A	N/A	646 (F)	646 (F)
With filter, auto transformer, and maintenance bypass(HA44L-NR)	N/A	N/A	N/A	N/A	N/A	830 (F)	830 (F)
With isolation transformer, filter, and maintenance bypass (HA44N-BR)	N/A	N/A	N/A	N/A	N/A	1418 (D)	1418 (D)
Distribution Cabinets (84 poles)							
With isolation transformer (HA42K/HA44K)	N/A	800 (A)	885 (A)	1060 (D)	1300 (D)	N/A	N/A
Without transformer (HA42K-AT/HA44K-AT)	N/A	525 (A)	525 (A)	525 (D)	525 (D)	N/A	N/A
With filter and isolation transformer (HA44K-CX/DX)	N/A	N/A	N/A	1260 (D)	1500 (D)	N/A	N/A
With filter only (HA44K-Ex)	N/A	N/A	N/A	700 (D)	700 (D)	N/A	N/A
With isolation transformer, maintenance bypass, and filter (HA44M-BR)	N/A	N/A	N/A	N/A	N/A	1500 (D)	1500 (D)
Remote Power Distribution Unit Cabinets							
With transformer (480/208) (4N-CMCCA-xx/4N-CMCCB-xx)	N/A (42 pole)	745 (B) (84 pole)	885 (B) (84 pole)	1015 (B) (84 pole)	1205 (B) (84 pole)	1375 (B) (84 pole)	1535 (B)
Without transformer (4N-CMCCC-xx/4N-CMCCD-xx)	N/A	495 (B)	525 (B)	525 (B)	525 (B)	525 (B)	N/A

Note: Remote alarm panel adds less than 10 pounds to system weights. Empty auxiliary cabinet for special applications are available (200 lb); call 800-Digital (800-344-4825)and ask for Environmental Products Support.

HA4000 Cabinet Dimensions Chart

All dimensions in inches. Shipping dimensions in parentheses.

Cabinet Code	Height	Depth	Width
Cabinet Sizes for 11–40-kva systems:			
A	55.25 (66.50)	32.25 (34.50)	31.50 (33.50)
B	55.25 (66.50)	32.25 (34.50)	45.00 (47.00)
C	55.25 (66.50)	32.25 (34.50)	18.75 (21.00)
Cabinet Sizes for 60–125-KVA Systems:			
D	56.75 (66.50)	32.25 (34.50)	31.50 (33.50)
E	56.75 (66.50)	32.25 (34.50)	45.00 (47.00)
F	56.75 (66.50)	32.25 (34.50)	18.75 (21.00)
G	56.75 (66.50)	32.25 (34.50)	52.00 (54.00)

Note: Cabinets for 20–40-kVA systems include removable casters. Cabinets for 60–125-kVA systems include permanent casters (included in height dimensions). For 11-kVA units, add 2 inches to the height for permanent casters.

Modular Power Distribution/Conditioning Distribution (PDM/CDM)

Product Description

These power distribution modules and conditioning distribution modules are designed to be the central source of distribution and conditioning of electrical power to computer equipment. They replace the H7317 (PDS+ and H7318 PCS+) product set.

Features

- Microprocessor monitoring and isolation
- Optional environmental monitoring package
- LCD display of many different power parameters
- Audible/visual alarms
- Emergency power-off circuit
- Shielded isolation transformer for electrical noise reduction
- Output distribution panels with 42 pole positions at 30 kVA and 84 poles at all other levels, up to 100 kVA
- Completely compatible with the present "BC" series of flexible power distribution cables; offer a portable and reliable equipment connection and come pre-assembled with circuit breakers and receptacles
- Conditioning distribution module provides electronic voltage regulation with auto-bypass control, in case of regulator failure; can accept input voltage range from –27% to +15% while maintaining an output voltage of ±3% of nominal
- Ideal for facilitating computer room consolidations, including DECmove and DECsite projects

Configuration Information

Determine NEMA plug type and select cables with breakers and receptacles from the Power Distribution Cable/Receptacle Chart on page 11.41. Note the number of poles required to select appropriate order number

Ordering Information

Power Distribution Modules (PDM)

208-V Input Models

4N-CUPDM-AB	30-kVA power distribution unit, 42 poles, 3 phase, 208/120-V output
4N-CUPDM-AJ	50-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CUPDM-AD	75-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CUPDM-AE	100-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output

480-V Input Models

4N-CUPDM-HB	30-kVA power distribution unit, 42 poles, 3 phase, 208/120-V output
4N-CUPDM-HJ	50-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CUPDM-HD	75-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CUPDM-HE	100-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output

Modular Power Distribution/Conditioning Distribution (PDM/CDM) (*continued*)

Conditioning Distribution Modules (CDM)

208 V Input Models

4N-CUCDM-AB,	30-kVA power conditioning unit, 42 poles, 3 phase208/120-V output
4N-CUCDM-AJ,	50-kVA power conditioning unit, 84 poles, 3 phase208/120-V output
4N-CUCDM-AD	75-kVA power conditioning unit, 84 poles, 3 phase, 208/120-V output
4N-CUCDM-AE,	100-kVA power conditioning unit, 84 poles, 3 phase208/120-V output

480-V Input Models

4N-CUCDM-HB	30-kVA power conditioning unit, 42 poles, 3 phase, 208/120-V output
4N-CUCDM-HJ	50-kVA power conditioning unit, 84 poles, 3 phase, 208/120-V output
4N-CUCDM-HD	75-kVA power conditioning unit, 84 poles, 3 phase, 208/120-V output
4N-CUCDM-HE	100-kVA power conditioning unit, 84 poles, 3 phase, 208/120-V output

Power Distribution without monitoring
With Transformer 480-V Input Models

4N-CMCCA-BA	20-kVA power distribution unit, 42 poles, 3 phase, 208/120-V output
4N-CMCCB-BB	40-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CMCCB-BC	60-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CMCCB-BD	80-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output
4N-CMCCB-BE	100-kVA power distribution unit, 84 poles, 3 phase, 208/120-V output

Dimensions and Weights for PDM, CDM, and PDU

PDM and CDM (with Monitoring)

KVA	H x W x D	Unit Weight (PDM)	Unit Weight (CDM)
30	62 x 27 x 27 inches (157 x 68 x 68 cm)	540 lb (245 kg)	1160 lb (527 kg)
50	69 x 34 x 34 inches (175 x 86 x 86 cm)	795 lb (361 kg)	1675 lb (761 kg)
75	69 x 34 x 34 inches (175 x 86 x 86 cm)	935 lb (426 kg)	1975 lb (898 kg)
100	69 x 34 x 34 inches (175 x 86 x 86 cm)	1055 lb (480 kg)	2360 lb (1073 kg)

PDU (Distribution Only)

		Unit Weight (PDU)	
KVA	H X W X D	Without Transformer	With Transformer
20	55 x 32 x 32 inches	495 lb	745 lb (352 kg)
40	69 x 84 x 34 inches	525 lb (261 kg)	885 lb (402 kg)
60	69 x 84 x 34 inches	525 lb (261 kg)	1015 lbs (461 kg)
80	69 x 84 x 34 inches	525 lb (261 kg)	1205 lb (548 kg)
125	69 x 84 x 34 inches	N/A	1535 lb (696 kg)

Environmental Monitoring System (EMSII)

Product Description

The Environmental Monitoring System is a microprocessor-based system built to handle the electronic environmental surveillance of any computer site and its supporting equipment. User-defined thresholds may be set for temperature, humidity, water detection, and any miscellaneous external alarms (which can be detected up to 5000 feet away) to provide early warning of potentially costly damage.

Each system includes a Remote Sensing Unit (RSU) with an integral EMS host processor and up to five additional slave RSUs for a total of 112 monitoring points per system. The EMSII system is an enhanced replacement for the H7310/H7317 EMS system featuring preassigned internal monitoring ports for ac power and communications loss.

Features

- One-box design with input/output flexibility
- Worldwide power supply with a detachable country cord provision
- 20 minutes of battery backup to support all RSU functions, including the EMS processor
- Expandable in units of 10 interface card slots, up to 30 per RSU; first five slots may be used for output relays which can be programmed in response to any selected input signal to provide remote interlock, control, or signal capability
- May be used as a standalone unit or daisychained with any combination of up to seven additional EMSII and/or existing H7310 EMS and H7317/7318 systems to form an 896-point monitoring network
- Ideal for computer sites that have conventional wiring and for interacting with any third-party UPS system
- Output signals from the EMSII may interface with a standalone terminal, printer, or with VAX REMS (Remote Environmental Monitoring software)for automated activity and historic tracking of events (see page 11.3)

EMSII Application Information

Electrical Interface Adapter (EIA) Cards

The Electrical Interface Adapter cards mount in the input slots of the RSU and convert external sensor voltage or signal levels to proper data levels required by the RSU. There are two types of adapters, digital and analog. The digital type has only two states to be programmed, active or normal alarm. The analog type may be used to convert input sensor levels to usable measurements such as temperature levels and voltage. The analog inputs also allow four user-programmable threshold levels (high, high-high, low, low-low).

Ordering Information

H7311-BA*	Remote Sensing Unit II with 10 input slots
H7311-BB	Remote Sensing Unit II with built-in EMS host processor and 10input slots
H7311-BC	EMSII Starter Kit: one Remote Sensing Unit with processor, fourEIA dry contact sensor closures, one output relay, twotemperature probes, one humidity probe, one water detector
H7311-MA**	Output relay single pole double throw (up to five per RSU II)
H7311-MB	10-slot expansion board for H7311 RSU II (-AA or -BB)
H7317-KD	Wall-mounted humidity probe and EIA card

* H7311-BA is available for separate purchase for those needing to expand the monitoring capabilities of an existing PCS+ or PDS+ or EMS system. The H7311-BA must be used in conjunction with a PCS+/PDS+, H7311-BB, or older H7310/H7317 EMS systems. Select individual options as required; there is no starter kit for the H7311-BA.

** Each output relay may be configured for normally open or normally closed contact operation. A movable jumper also allows latching provisions for critical lockout applications (i.e., air-conditioner start lockout).

Additional Options

Probes

Order Number	Type	Description
H7317-KC	Analog	Temperature probe wall mounted with EIA card
H7317-KF	Analog	Water detector, under floor probe with EIA card
H7317-KD	Analog	Wall-mounted humidity probe and EIA card

Sensor Cards

Order Number	Type	Card	Description
H7317-KJ	Digital	EIA 1	Dry contact closure sensor
H7317-KK	Digital	EIA 2	Presence/non-presence of 1 milliamp current
H7317-KL	Digital	EIA 3	Presence/non-presence of 12 Volt ac/dc
H7317-KM	Digital	EIA 4	Presence/non-presence of 24 Volt ac/dc
H7317-KN	Analog	EIA 12	Allows 0–400-Hz frequency measurement; requires 12 Volt ac maximum signal interface
H7317-KP	Digital	EIA 15	Presence/non-presence of 5 Volts dc
H7317-KR	Analog	EIA 17	4–20 milliamp standard industrial probe interface
H7317-KS	Analog	EIA 8	Analog buffer allows measurement of 0–12 Volts ac
H7317-KT	Analog	EIA 9	Isolated buffer allows measurement of 0–5 Amps ac

Note: All sensors, probes, and EIA cards are common for EMS as well EMSII configurations.

Digital installation includes final terminations, EMS probe configurations, and system verification. Physical wiring and mounting of EMS/RSU and probes by customer. Belden 8641 cable or equivalent may be used for wiring of packaged probes. BC22E-XX or BC22F-XX cable may be used for VAX serial port communication.

Call 800-Digital for other configurations.

EMSII Specifications

Input Voltage	Height	Width	Depth	Weight	Shipping Weight
120 V/240 V 50/60 Hz	19.9 in. 50.6 cm	15.6 in. 39.7 cm	5.6 in. 14.2 cm	42 lb 19 kg	55.1 lb 24.9 kg

One external voltage selector 100 V, 120 V, 220 V, 240 V; internal gel cell battery. One detachable IEC 310 power cord for flexible worldwide input connection. Approvals: UL, CSA, IEC

Transient Voltage Surge Suppressors

The 4N-GAXXX family of Transient Voltage Surge Suppressor (TVSS) products prevent high-energy impulses that can damage a computer system or corrupt data. ZoneGuardian, ZoneMaster, and ZoneSentinel devices include user-friendly LED diagnostics to indicate faulty wiring and operational readiness.

ZoneMaster power panel devices include redundant parallel modules and auxiliary contacts for remote annunciation. Flexible ``plug and play'' power strip and snap-in data communication modules ensure total desktop protection. All devices carry a full 5-year warranty.

TVSS Quick Selection Chart

	Model	Application	Configuration	Maximum Surge	Peak clamp[4] (Voltage maximum)
ZoneGuardian	**4N-GA350-XX****	Terminals, PCs, desktop UPS systems, fax machines, printers	3 and 7 5-15R	10 kA	400 V (L-N)[1] 330 V (L-N)[2]
ZoneGuardian Plus	**4N-GA420/ 430-XX**	Workstations, servers	3 and 7 5-15R	10 kA	270 V (L-N)[1] 240 V (L-N)[2]
ZoneGuardian CPP	**4N-GA240-XX***	Desktop data/tel	Up to 4 per receptacle	2 kA	10–27 V(data)[3] 105–270 (tel)
ZoneMaster	**4N-GA171-XX**	Primary power panel	1 per panel	140 kA	400–1500 V[1]
ZoneMaster	**4N-GA112-XX**	Primary or secondary power panel***	1 per panel	75 kA	400–800 V[1]
MDL Series	**4N-GA250-XX**	Data/telephone trunk line (rackmount)	3 and 20 modules/encl.	1.9–3 kA	12–27V (data)[3] 105–270 (tel)
DLM Series	**4N-GA210-XX**	Hardwired comm line	8 modules/encl.		12–27 V
ZoneSentinel	**4N-GA121**	Secondary power panel	1 per panel	40 kA	400–1000 V
SCP Series	**4N-GA249**	Comm port only; standalone comm port	Plugs into std 15 A receptacle, up to 4 per receptacle		10–27 V(data)[3] 105–270 (tel)

* 4N-GA240 data protection modules must be used in combination with 4N-GA350/420/430 plug surge protectors. Number of modules unlimited on strip models.

** Use 4N-GA440-AD for systems with 5-20R plug.

*** For any system requiring 3-phase power or non-standard plug types.

1 Clamp V at 6 kV (1.2/50 ms) and 3 kA (8/20 ms) IEEE CAT B impulse test. UL 1449 for panel devices.

2 Clamp V at 6 kV (1.2/50 ms) and 500A (8/20 ms) UL 1449 for receptacle devices.

3 Clamp V at 2 kV (1.2/50 ms) and 1000A (8/20 ms)

4 Minimum Clamp V threshold of power modules is 150

Note: All power protector models feature protection on all models (L-N, L-G,G-N) at 330 V maximum let through voltage.

Application Information

Panelboard Protection

Use the ZoneMaster 75 series at the service entrance of small single three-story facilities and at sub-panels feeding sensitive equipment. Use the 140 series at the service entrance of larger facilities or where lightning is more prevalent, such as the southeastern and southern areas of the U.S.

Desktop Power and Data/Network Protection

As long as there is a communications port available on the device to be protected, it is important that BOTH power AND the communications port are protected. Protecting power or data/telephone alone in these situations increases the likelihood of voltage potential differences and resulting damage to equipment.

4N-GA3XX-XX	ZoneGuardian power module
4N-GA4XX-XX	ZoneGuardian Plus power module
4N-GA240-XX/	ZoneGuardian communications protection modules (CPP)
4N-GA249-XX	Standalone communications protectors (SCP)

AC TVSS Desktop Protector Options

ZoneGuardian Plus—Premium Performance

4N-GA420-AD	Three-outlet, 15-A wall plug
4N-GA430-AF	Three-outlet, 15-A power strip**
4N-GA430-AG	Seven-outlet, 15-A power strip**
4N-GA440-AD*	One 20-A 5-20R outlet with wall plug**
4N-GA440-AE	One 20-A L5-20R outlet with wall plug**

ZoneGuardian—High Quality Performance

4N-GA350-CK	Three-outlet, 15-A wall plug
4N-GA350-DA	Three-outlet, 15-A power strip
4N-GA350-DB	Seven-outlet, 15-A power strip

* Not ZoneGuardian Series Devices—will not accept CPP modules.
** All Power Strips and GA440 devices furnished with 6-foot cord.

ZoneMaster 140—Facility Protection

4N-GA171-AA	120/240-V 1-phase 3W, 400-V clamp
4N-GA171-AB	120/208-V 3-phase 4W WYE, 400-V clamp
4N-GA171-AC	120/240-V 3-phase 4W Delta, 400-V clamp
4N-GA171-AD	240-V 3-phase 3W Delta, 800-V clamp
4N-GA171-AE	277/480-V 3-phase 4W WYE, 800-V clamp
4N-GA171-AF	350/600-V 3-phase 4W WYE, 1500-V clamp
4N-GA171-AG	480-V 3-phase 3W Delta, 1500-V clamp

ZoneMaster 75—Main and Secondary Panel Protection

4N-GA112-AA	120/240-V 1-phase 3W, 400-V clamp
4N-GA112-AB	120/208-V 3-phase 4W WYE, 400-V clamp
4N-GA112-AC	120/240-V 3-phase 4W Delta, 400-V clamp
4N-GA112-AD	240-V 3-phase 3W Delta, 800-V clamp
4N-GA112-AE	277/480-V 3-phase 4W WYE, 800-V clamp
4N-GA112-AF	350/600-V 3-phase 4W WYE, 1500-V clamp
4N-GA112-AG	480-V 3-phase 3W Delta, 1500-V clamp

ZoneSentinel—Secondary Panel Protection

4N-GA121-AA	120/240-V 1-phase 3W, 400-V clamp
4N-GA121-AB	120/208-V 3-phase 4W WYE, 400-V clamp
4N-GA121-AC	120/240-V 3-phase 4W Delta, 400-V clamp
4N-GA121-AD	240-V 3-phase 3W Delta, 600-V clamp
4N-GA121-AE	277/480-V 3-phase 4W WYE, 1000-V clamp

Communication Port Protection

ZoneGuardian Series CPP and SCP modules are snap-on devices to be used for communications port protection. Wall plug models limited to four modules per suppressor.

CPP Modules

4N-GA240-AB	2W dial-up, RJ11
4N-GA240-AC	2-2W dial-up, RJ11
4N-GA240-AD	4W leased line, RJ11
4N-GA240-AE	4W leased line, term strip

CPP Modules *(continued)*

4N-GA240-AF	4W digital data, RJ45
4N-GA240-AG	4W data, term strip
4N-GA240-AH	4W T1 RJ48C
4N-GA240-AJ	4W T1 term strip
4N-GA240-AK	EIA-232 4W+SH, term strip
4N-GA240-BA	EIA-232 5W, term strip
4N-GA240-BB	EIA-232 8W, RJ45
4N-GA240-BC	EIA-232 6W, MMJ
4N-GA240-BD	EIA-422 4W+SH, term strip
4N-GA240-BE	EIA-232 4W RJ45
4N-GA240-BF	EIA-232 6W RJ45
4N-GA240-BG	EIA-423 4W+SH, term strip
4N-GA240-BH	EIA-423 6W, MMJ
4N-GA240-BJ	EIA-485 2W+GRD term strip
4N-GA240-CA	E-NET 4W 10BaseT, RJ45
4N-GA240-CB	IBM 3270 one-wire with shield, BNC
4N-GA240-CH	EIA-232 4W RJ45

SCP Modules

4N-GA249-BB	**EIA-232 8W RJ45**
4N-GA249-BH	**EIA-232 6W RJ45**

Miscellaneous

4N-GA510-BF	**Ethernet ThinWire**
4N-GA700-BH	**DB25 F/M, EIA-232**

Note: All order numbers include one 7-foot data cable with mating connectors. CPP modules must be used with ZoneGuardian series AC TVSS devices. SCP modules plug into wall receptacle for standalone protection.

Accessories for DB25 and DB9 EIA-232 Communication Interfaces

H8575-A	MMJ-to-DB25 EIA-232 adapter
H8571-J	MMJ-to-DB9 EIA-232 adapter
BC16E-10	10-foot 6-wire jumper cable with MMJ connectors

Note: Use of these adapters will not allow full modem control.

Technical Data

General/Environmental

Operating temperature range	–40° to 85° C (–40° to 185° F)
Operating humidity range	0 to 95% (non-condensing)
Maximum continuous oper volts	25% above nominal service voltage
Safety cutout	Thermal protection against sustained overvoltages above maximum continuous but below clamp level
Enclosures	Durable lightweight plastic UL94-5V flame retardant. ZoneMaster products meet NEMA 1, 2, 3R, 3S, 12, and 13 classifications
Three-function LEDs on power module	red = gnd not present or L-N reversal; green = normal operation Note: communication protector modules failsafe via short circuit to gnd.
Maximum let-through V*	See TVSS quick selection chart

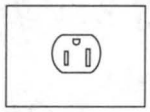
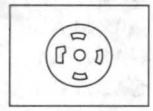
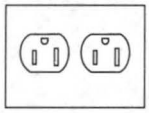
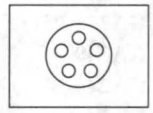
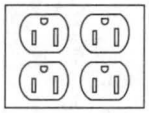
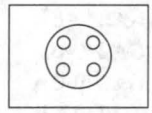
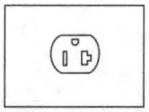
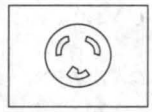
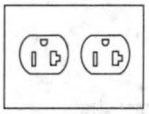
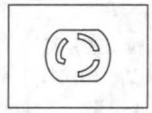
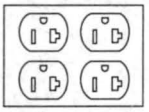
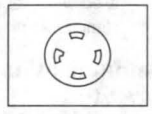
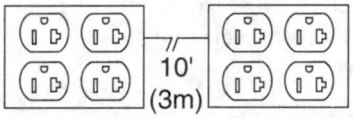
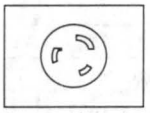
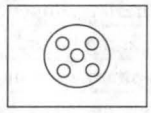
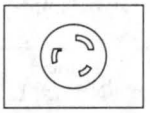
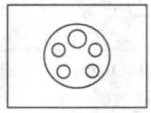
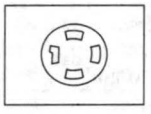
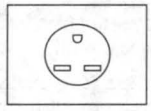
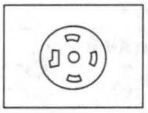
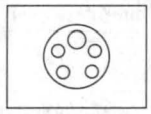
* Clamp levels given for L-N and L-L modes, where most damage occurs.

	ZoneGuardian 4N-GA350*	**ZoneGuardian Plus \4N-GA420, 4N-GA430***
Hybrid clamp circuit (MOV, coil, capacitor)	3 stage	5 stage

	ZoneMaster 75	**ZoneMaster 140**	**ZoneSentinel**
Weight	6 lb (2.72 kg)	10 lb (4.54 kg)	4 lb (1.8 kg)
Size	10 x 8 x 4 in.	12 x 12 x 6 in.	8 x 6 x 4 in.
Stage/clamp component	Single stage MOV	Same as ZoneMaster 75	Single stage MOV
No. redundant components	2 @40 kA	4@40 kA	1@40 kA

	ZoneMaster	**ZoneSentinel**
Required input circuit breaker	60 Amps	30 Amps

Receptacle Reference Chart[3]

RECEPTACLE TYPE	PART NO. ①	RECEPTACLE TYPE	PART NO. ①
 NEMA No. 5-15R	BC24J-xx	 NEMA No. L21-30R (3 pole)	BC24W-xx
 NEMA No. 5-15R(2)	BC24K-xx	 ZPLT-6C24-49PR	BC24X-xx
 NEMA No. 5-15R(4)	BC24L-xx	 RUSSELL STOLL 7428	BC26D-xx
 NEMA No. 5-20R ②	BC24M-xx	 NEMA No. L6-30R	BC26E-xx
 NEMA No. 5-20R(2) ②	BC24N-xx	 NEMA No. L5-15R	BC26F-xx
 NEMA No. 5-20R(4) ②	BC24P-xx	 NEMA No. L14-30R (2 pole)	BC28Z-xx
 NEMA No. 5-20R Dual ② Duplex 10 ft. (3 m) apart, NEMA No. 5-20R(8) ②	BC24R-xx		
 NEMA No. L5-30R	BC24S-xx	 RUSSELL STOLL DF6516FP (3 pole)	BC29A-xx
 NEMA No. L6-20R (2 pole)	BC24T-xx	 HUBBELL No. 5609CW (3 pole)	BC29B-xx
 NEMA No. L14-20R (2 pole)	BC24U-xx	 NEMA No. 6-15R (2 pole)	BC29C-xx
 NEMA No. L21-20R (3 pole)	BC24V-xx	 HUBBELL No. 51009CW (3 pole)	BC29D-xx

BU-3162

① Refer to U.S. price list for cable lengths. xx denotes cable length, where:

-10 = 10 ft (3 m)	-60 = 60 ft (18.3 m)
-20 = 20 ft (6 m)	-70 = 70 ft (21.3 m)
-30 = 30 ft (9.1 m)	-80 = 80 ft (24.4 m)
-40 = 40 ft (12.2 m)	-90 = 90 ft (27.4 m)
-50 = 50 ft (15.2 m)	-A0 = 100 ft (30.5 m)

② U.S. only. For Canada, order BC28D for BC24M; BC28E for BC24N; BC28F for BC24P; BC28G for BC24R.

③ Cables include circuit breaker and receptacle. Circuit breakers not otherwise noted are single (1) pole.

Chapter 11
Network Application Support and Services

Network Application Support (NAS)

Services

Network Application Support (NAS)

Overview

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 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.

NAS Client 150

The 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.

NAS Base Server 200

The 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.

NAS Client 250

Extends the NAS Client 150 base environment with database, system management, forms interface, and enhanced printing services.

NAS Server 300

Extends the NAS Base Server 200 with the following services; database, system management, forms interface, clusters, mail server, and enhanced printing.

NAS Production Server 400

Extends the 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 NAS Client/Server Packages provide the following customer benefits:

- Simplified ordering—Each NAS 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—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—NAS Client/Server Packages are sold as line item software products, and can be included in complete hardware/software systems. The NAS Client 150 or 250 ships with OpenVMS VAX, OpenVMS AXP and DEC OSF/1 AXP workstations, while the NAS Base Server 200 ships with server systems.

NAS Packages—by Platform

NAS Package	OpenVMS VAX	OpenVMS AXP	DEC OSF/1 AXP
NAS Client 150	X	X	X
NAS Base Server 200	X	X	X
NAS Client 250	X	X	X
NAS Server 300	X	X	X
NAS Production Server 400	X	X	X

Ordering Information

NAS Server 300 or NAS Production Server 400 are included as key components of ADVANTAGE-SERVER systems. Additionally, they are available as line item software products. NAS Client 250 ships with VAX and Alpha AXP workstations. For a complete listing of order numbers, SPD numbers, contents of packages and platforms supported, refer to the "NAS Packages at a Glance" charts on the following pages.

NAS Packages At A Glance

NAS Product	License and/or Media	Contents Service/Component Product	Standards Supported	Upgrades/ Migration
NAS Client 150 V6.0		**Presentation Services**		
for OpenVMS VAX Workstations	L&M	** VMS DECwindows Motif	X-Windows Motif, PEX	
QL-36PA*-**		**Communication and Control Services**		
SPD 62.99	L&M	*** ObjectBroker (ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS VAX		
		Network Transports		
	L&M	DECnet/OSI for OpenVMS VAX End System	OSI	
	L&1	DECnet-VAX End Node		
Target:	L&M	DEC TCP/IP Client for OpenVMS	TCP/IP, NFS	
Delivers base client services to		**Operating System Specific**		
workstations to match the NAS	L&1	VMScluster Client		
Base Server 200 and is included		(DCE Runtime Services are licensed with		
with most workstations		OpenVMS and shipped as a separate kit)		
NAS Base Server 200 V6.0		**Presentation Services**		NAS Component to
for OpenVMS VAX systems	L&M	** VMS DECwindows Motif	X-Windows Motif, PEX	200 Migration
QL-MC1A*-**		**Printing Services**		**QL-MNRA*-****
SPD 36.86	1&M	DECprint Suypervisor for OpenVMS, Base		
	L&M	DECprint Supervisor for OpenVMS, Open	ISO SPDL;	
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	
	4&M	PrintServer Software for VMS	Postscript	
		Communication and Control Services		
	L&M	**** ObjectBroker ((ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS VAX		
		Information Services		
		Management Services		
	L&3	POLYCENTER Software Distribution (Client)		
		Network Transports		
	L&M	*** DECnet/OSI for OpenVMS VAX End System	OSI	
	L&1	DECnet-VAX End Node		
	2&M	PATHWORKS for VMS (Macintosh)	Appletalk	
	2&M	PATHWORKS for VMS (LAN Manager)	LAN Manager	
Target:	2&M	PATHWORKS for OpenVMS (Netware)	PX	
Provides the base client/server	L&M	DEC TCP/IP Services for OpenVMS	TCP/IP, NFS	
services to match the NAS Client		**Operating System Specific**		
150 and is bundled with most		(DCE Runtime Services are licensed with		
server systems		OpenVMS and shipped as a separate kit)		
NAS Client 250 V6.0		**Presentation Services**		NAS component to
for OpenVMS VAX Workstations	L&M	DECforms Run-Time System	RMS	250 Migration
QL-XVDA*-**	L&M	** VMS DECwindows Motif	X-Windows Motif, PEX	**QL-MKSA*-****
SPD 36.89		**Printing Services**		
	1&M	DECprint Suypervisor for OpenVMS, Base	ISO SPDL;	NAS 150-250 Upgrade **QL-**
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	**37NA*-****
	L&M	DEC Distributed Queuing Services (DQS)	Postscript	
		Communication and Control Services		
	L&M	**** ObjectBroker ((ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS VAX		
	L&M	Reliable Transaction Router for OpenVMS (Client)		
		Information Services		
	L&M	DEC Rdb for OpenVMS Run-Time Option	SQL	
		Management Services		
	L&M	POLYCENTER Performance Data Collector		
	L&3	POLYCENTER Software Distribution (Client)		
		Network Transport		
	L&M	*** DECnet/OSI for OpenVMS VAX End System	OSI	
	L&1	DECnet-VAX End Node		
	L&M	DEC TCP/IP Services for OpenVMS	TCP/IP, NFS	
		Operating System Specific		
Target:	L&1	VAXcluster Software		
Extends the NAS Client 150	1&M	POSIX for OpenVMS	POSIX	
including additional services to		(DCE Runtime Services are licensed with		
match the NAS Server 300		OpenVMS and shipped as a separate kit)		

NAS Packages At A Glance *(continued)*

NAS Product	License and/or Media	Contents Service/Component Product	Standards Supported	Upgrades/ Migration
NAS Server 300 V6.0 for OpenVMS VAX Systems **QL-MC2A*-**** SPD 36.85		**Presentation Services**		NAS Component to 300 Migration **QL-MNSA*-****
	L&M	DECforms Run-Time System	RMS	
	L&M	** VMS DECwindows Motif	X-Windows Motif, PEX	
		Printing Services		
	1&M	DECprint Supervisor for OpenVMS, Base	ISO/SPXL;P	NAS 250-300 Upgrade **QL-29PA*-****
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	
	L&M	DECprint Supervisor for OpenVMS, Open	Postscript	
	L&M	DEC Distributed Queuing Service (DQS)	Postscript	NAS 200-300 Upgrade **QK-MC3A*-****
	4&M	PrintServer Software for VMS		
		Communication and Control Services	X400, XAPI	
	L&M	DEC MAILworks Server	OMG/CORBA	
	L&M	*** ObjectBroker (ACA Services)		
	L&M	DECmessageQ for OpenVMS VAX		
	L&M	Reliable Transaction Router for OpenVMS (Client)		
		Information Services		
	L&M	DEC Rdb for OpenVMS Run-Time Option	SQL	
		Management Services		
	L&M	POLYCENTER Performance Advisor		
	L&M	POLYCENTER Performance Data Collector	MSL; CMP; SNMP	
	L&3	POLYCENTER Software Distribution (Client)		
	L&M	POLYCENTER Software Distribution (Server)		
		Network Transports		
	L&M	*** DECnet/OSI for OpenVMS VAX Extended Function	OSI	
	L&1	DECnet-VAX Full Function		
	2&M	PATHWORKS for VMS (Macintosh)	Appletalk	
	2&M	PATHWORKS for VMS (LAN Manager)	LAN Manaager	
	2&M	PATHWORKS for OpenVMS (Netware)	IPX	
	L&M	DEC TCP/IP Services for OpenVMS	TCP/IP, NFS	
Target: Management focused server which extends the NAS Base Server 200 to match the NAS Client 250		**Operating System Specific**		
	L&1	VAXcluster Software		
	1&M	POSIX for OpenVMS (DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)	POSIX	
NAS Production Server 400 V6.0 for OpenVMS VAX Systems **QL-MC5A*-**** SPD 40.63		**Presentation Services**		NAS Component to 400 Migration **QL-MNTA*-****
	L&M	DECforms Run-Time System	RMS	
	L&M	** VMS DECwindows Motif	X-Windows Motif, PEX	
		Printing Services		
	1&M	DECprint Suypervisor for OpenVMS, Base	ISO SPDL;	NAS 200-400 Upgrade QL-MKRA*-**
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	
	L&M	DECprint Supervisor for OpenVMS, Open	Postscript	
	L&M	DEC Distributed Queuing Service 9DQS)		NAS 300-400 Upgrade QL-MC4A*-**
	4&M	PrintServer Software for VMS		
		Communication and Control Services		
	L&M	DEC MAILworks Server	X400, XAPI	
	L&M	**** ObjectBroker (ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS VAX		
	L&M	VAX ACMS Run-time System	MIA, STDL	
	L&M	Reliable Transaction Router for OpenVMS (Full Funct.)		
	L&M	Reliable Transaction Router for OpenVMS (Client)		
		Information Services		
Target: Extends NAS Server 300 with services to enhance reliability and availability of applications, data, and systems for business critical environments such as transaction processing	L&M	DEC Rdb for OpenVMS Run-Time Option	SQL	
		Management Services		
	L&M	POLYCENTER Performance Advisor	MSL, CMIP, SNM	
	L&M	POLYCENTER Performance Data Collector		
	L&M	POLICENTER Software Diostribution (Client)		
	L&3	POLYCENTER Software Distribution (Server)		
	L&M	DECtrace for OpenVMS Collecttor		

NAS Packages At A Glance *(continued)*

NAS Product	License and/or Media	Contents Service/Component Product	Standards Supported	Upgrades/ Migration
NAS Production Server 400 V6.0		**Network Transports**		
for OpenVMS VAX Systems	L&M	*** DECnet/OSI for OpenVMS VAX Extended Function		
QL-MC5A*-**	L&1	DECnet-VAX Full Function		
SPD 40.63	2&M	PATHWORKS for VMS (Macintosh)		
(continued)	2&M	PATHWORKS for VMS (LAN Manager)		
	2&M	PATHWORKS for OpenVMS (Netware)		
	L&M	DEC TCP/IP Services for OpenVMS		
		Operating System Specific		
	L&1	VAXcluster Software		
	1&M	POSIX for OpenVMS		
	L&1	RMS Journaling for OpenVMS		
	L&1	Volume Shadowing for OpenVMS		
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
NAS Client 150 V6.0		**Presentation Services**		
for OpenVMS AXP Workstations	L&M	** DECwindows Motif for OpenVMS AXP	X-Windows Motif, PEX	
QL-36NA*-**		**Communication and Control Services**		
SPD 62.98	L&M	*** ObjectBroker (ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS AXP		
		Network Transports		
	L&1	DECnet for OpenVMS AXP End System		
	L&M	DECnet/OSI for OpenVMS AXP End Node	OSI	
Target:	L&M	DEC TCP/IP Client for OpenVMS AXP	TCP/IP, NFS	
Delivers base client services to		**Operating System Specific**		
workstations to match the NAS	L&1	VMScluster Client		
Base Server 200 and is included		(DCE Runtine Services are licensed with		
with most workstations		OpenVMS and shipped as a separate kit)		
NAS 200 Base Server V6.0		**Presentation Services**		
for OpenVMS AXP systems	L&M	** DECwindows Motif for OpenVMS AXP	X-Windows Motif, PEX	
QL-23EA*-**		**Printing Services**		
SPD 44.54	1&M	DECprint Suypervisor for OpenVMS, Base		
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO SPDL;	
	L&M	DECprint Supervisor for OpenVMS, Open	ISO/ECMA DPA;	
	4&M	PrintServer Software	Postscript	
		Communication and Control Services		
	L&M	**** ObjectBroker ((ACA Services)	OMG/CORBA	
	L&M	DECmessageQ for OpenVMS AXP		
		Information Services		
		Management Services		
	L&3	POLYCENTER Software Distribution (Client)		
		Network Transports		
	L&1	DECnet for OpenVMS AXP End System	CSI	
	L&M	DECnet/OSI for OpenVMS AXP End Node		
Target:	2&M	PATHWORKS for OpenVMS (LAN Manager)	LAN Manager	
Provides base client/server services	L&M	DEC TCP/IP Services for OpenVMS AXP	TCP/IP, NFS	
to match the NAS Client 150 and is		**Operating System Specific**		
bundled with most server systems		(DCE Runtime Services are licensed with		
		OpenVMS and shipped as a separate kit)		
NAS Client 250 V6.0		**Presentation Services**		NAS 150-250 Upgrade **QL-37NA*-****
for OpenVMS AXP Workstations	L&M	DECforms Run-Time System	RMS	
QL-XVEA*-**	L&M	** DECwindows Motif for OpenVMS AXP	X-Windows Motif, PEX	
SPD 44.57		**Printing Services**		
	1&M	DECprint Suypervisor for OpenVMS, Base	ISO SPDL;	
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	
	L&M	DEC Distributed Queuing Service (DQS)	Postscript	
Target:		**Communication and Control Services**		
Extends NAS Client 150 including	L&M	**** ObjectBroker ((ACA Services)	OMG/CORBA	
additional services to match the	L&M	DECmessageQ for OpenVMS AXP		
NAS Server 300	L&M	Reliable Transaction Router for OpenVMS (Client)		

NAS Packages At A Glance *(continued)*

NAS Product	License and/orMedia	Contents Service/Omponent product	Standards Supported	Upgrades/ Migration
NAS Client 250 V6.0		**Information Services**	OSI	
for OpenVMS AXP Workstations	L&M	DEC Rdb for OpenVMS Run-Time Option		
QL-XVEA*-**		**Management Services**	TCP/IP, NFS	
SPD 44.57	L&3	POLYCENTER Software Distribution (Client)		
(continued)	L&M	POLYCENTER Performance Data Collector		
		Network Transport	POSIX	
	L&1	DECnet for OpenVMS AXP End System		
	L&M	DECnet/OSI for OpenVMS AXP End Node		
	L&M	DEC TCP/IP Services for OpenVMS AXP		
		Operating System Specific		
	L&1	VAXcluster Software		
	1&M	POSIX for OpenVMS AXP		
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
NAS Server 300 V6.0		**Presentation Services**		NAS 250-300 Upgrade
for OpenVMS AXP Systems	L&M	DECforms Run-Time System	RMS	**QL-29PA*-****
QL-XV9A*-**	L&M	** DECwindows Motif for OpenVMS AXP	X-Windows Motif, PEX	
SPD 44.55		**Printing Services**		
	1&M	DECprint Suypervisor for OpenVMS, Base	ISO/SPXL;P	NAS 200-300 Upgrade
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	**QL-29SA*-****
	L&M	DECprint Supervisor for OpenVMS, Open	Postscript	
	L&M	DEC Distributed Queuing Service (DQS)		
	4&M	PrintServer Software		
		Communication and Control Services		
	L&M	DEC MAILworks Server		
	L&M	*** ObjectBroker (ACA Services)	OMG/COBRA	
	L&M	DECmessageQ for OpenVMS AXP		
	L&M	Reliable Transaction Router for OpenVMS (Client)		
		Information Services		
	L&M	DEC Rdb for OpenVMS Run-Time Option	SQL	
		Management Services		
	L&3	POLYCENTER Software Distribution (Client)		
	L&M	POLYCENTER Software Distribution (Server)		
	L&M	POLYCENTER Performance Advisor		
	L&M	POLYCENTER Performance Data Collection		
		Network Transports		
	L&1	DECnet for OpenVMS AXP Extended Function		
	L&M	DECnet/OSI for OpenVMS AXP Extended Function	OSI	
	2&M	PATHWORKS for VMS (LAN Manager)	LAN Manaager	
	L&M	DEC TCP/IP Client for OpenVMS AXP	TCP/IP, NFS	
		Operating System Specific		
Target:	L&1	VMScluster Software		
Management focused server which extends NAS Base Server 200 to match NAS Client 250	1&M	POSIX for OpenVMS AXP	POSIX	
		(DCE Runtime Services are licensed with OpenVMS and shipped as a separate kit)		
NAS Production Server 400 V6.0		**Presentation Services**		NAS 200-400 Upgrade
for OpenVMS AXP Systems	L&M	DECforms Run-Time System	RMS	**QL-29TA*-****
QL-23RA*-**	L&M	** DECwindows Motif for OpenVMS AXP	X-Windows Motif, PEX	
SPD 44.56		**Printing Services**		NAS 300-400 Upgrade
	1&M	DECprint Suypervisor for OpenVMS, Base	ISO SPDL;	**QL-29UA*-****
	L&M	DECprint Supervisor for OpenVMS, Plus	ISO/ECMA DPA;	
	L&M	DECprint Supervisor for OpenVMS, Open	Postscript	
	4&M	DEC Distributed Queuing Service (DQS)		
		PrintServer Software		
Target:		**Communication and Control Services**		
Extends NAS Server 300 with	L&M	DEC MAILworks Server		
services to enhance reliability and	L&M	**** ObjectBroker (ACA Services)	OMG/CORBA	
availability of applications, data,	L&M	DECmessageQ for OpenVMS VAX		
and systems for business critical	L&M	ACMS Run-time System	MIA, STDL	
environments such as transaction	L&M	Reliable Transaction Router for OpenVMS (Full Funct.)		
processing	L&M	Reliable Transaction Router for OpenVMS Client		

NAS Packages At A Glance *(continued)*

NAS Product	License and/or Media	Contents Service/Omponent product	Standards Supported	Upgrades/ Migration
NAS Production Server 400 V6.0		**Information Services**		
for OpenVMS AXP Systems	L&M	DEC Rdb for OpenVMS Run-Time Option **Management**		
QL-23RA*-**		**Services**		
SPD 44.56	L&3	POLYCENTER Software Diostribution (Client)		
(continued)	L&M	POLYCENTER Software Distribution (Server)		
	L&M	DECtrace for OpenVMS Collector		
	L&M	POLYCENTER Performance Data Collector		
	L&M	POLYCENTER Performance Advisor		
		Network Transports		
	L&1	*** DECnet for OpenVMS AXP Extended Function		
	L&M	DECnet/OSI for OpenVMS AXP Extended Function		
	2&M	PATHWORKS for VMS (LAN Manager)		
	L&M	DEC TCP/IP Services for OpenVMS AXP		
		Operating System Specific		
	L&1	VAXcluster Software		
	1&M	POSIX for OpenVMS AXP		
	L&1	Volume Shadowing for OpenVMS		
	L&1	RMS Journaling for OpenVMS		
		DCE Runtime Services are licensed with		
		OpenVMS and shipped as a separate kit)		
NAS Client 150 V6.0		**Communication and Control Services**		
for DEC OSF/1 AXP Workstations	L&M	Ditigal DCE runtime Services for DEC OSF/1	OSF DEC	
QL-36MA*-**	L&M	**** ObjectBroker	OMG/CORBA	
SPD 62.97	L&M	DECmessageQ for DEC OSF/1		
		Operating System Specific		
Target:		MOTIF, NFS, TCP/IP, CDA in base O/S)		
Delivers base client service to workstations to match the NAS Base Server 200 and is included with most workstations				
NAS Base Server 200 V6.0		**Printing Services**		
for DEC OSF/1 AXP systems	4&M	PrintServer Software		
QL-306A*-**		**Communication and Control Services**		
SPD 62.73	L&M	Ditigal DCE runtime Services for DEC OSF/1	OSF DCE	
	L&M	**** ObjectBroker	OMG/COBRA	
	L&M	DECmessageQ for DEC OSF/1		
		Management Services		
	L&M	POLYCENTER Network Save and Restore for DEC OSF/1 AXP (Server)		
	L&M	POLYCENTER Advanced File System Utilities		
		Network Transport		
Target:	2&M	PATHWORKS for OSF/1		
Provides base client/server services		**Operating System Specific**		
to match NAS Client 150 and is	L&1	Logical Storage Manager		
bundled with most server systems	L&1	DEC OSF/1 Server Extensions		
		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		
NAS Client 250 V6.0		**Communications and Control Services**		NAS 150-250 Upgrade QL-37LA*-**
for DEC OSF/1 AXP Systems	L&M	Ditigal DCE runtime Services for DEC OSF/1	OSF DCE	
QL-06PA*-**	L&4	**** ObjectBroker	OMG/COBRA	
SPD 44.38	L&M	DECmessageQ for DEC OSF/1		
		Management Services		
	L&M	POLYCENTER Scheduler Agent		
	L&M	POLYCENTER Advanced File System Utilities		
Target:		**Network Transport**		
Extends NAS Client 150 including	L&M	DECnet OSI for DEC OSF/1 AXP End System	OSI	
additional services to match NAS		**Operating System Specific**		
Server 300		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		

NAS Packages At A Glance *(continued)*

NAS Product	License and/or Media	Contents Service/Omponent product	Standards Supported	Upgrades/ Migration
NAS Base Server 300 V6.0		**Printing Services**		NAS 200-300 Upgrade
for DEC OSF/1 AXP system	4&M	PrintServer Software		QL-309A*.**
QL-06RA*-**		**Communications and Control Services**		
SPD 44/30	L&M	Ditigal DCE runtime Services for DEC OSF/1	OSF DCE	NAS 250-300 Upgrade
	L&M	**** ObjectBroker	OMG/COBRA	QL-29RA*.**
	L&M	DECmessageQ for DEC OSF/1		
		Management Services		
	L&M	POLYCENTER Scheduler Agent		
	L&M	POLYCENTER Network Save and Restore for DEC OSF/1 AXP (Server)		
	L&M	POLYCENTER Adv. File System Utilities		
		Network Services		
	L&M	DECnet/OSI for DEC OSF/1 AXP Extended Function	OSI	
	2&M	PATHWORKS for OSF/1		
Target:		**Operating System Specific**		
Management focused server which	L&1	Logical Storage Manager		
extends NAS Base Server 200 to	L&1	DEC OSF/1 Server Extensions		
match NAS Client 250		(MOTIF, NFS, TCP/IP, CDA in Base O/S)		

* Media is available either with 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 supercedes DECnet-VAX Extensions

**** ObjectBroker (New name for ACA Services starting with V2.5. ACA available until V2.5)

1 Provided with OpenVMS.

2 PATHWORKS is licensed separately on a per client basis or with concurrent use server licenses, not provided with 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.

Services from Digital

Overview

Digital Equipment Corporation—an international company that does more than half its business outside the United States—provides one of the most comprehensive worldwide portfolios of professional and multivendor services to help customers plan, design, implement, manage, maintain, and support their information technology resources and solutions. These services are delivered through a global network of more than 38,000 employees located at more than 450 locations in 97 countries around the world.

Through Digital's Professional Services organization (approximately 17,000 people), customers are provided with quality, solutions-focused services on a global basis—either directly or in partnership with a number of key alliances. Among this full range of global services are: systems integration (large and small), management, information systems, applications, technology consulting services, design services, global learning services, program and project management, business protection and disaster recovery services, outsourcing, and facilities management.

Through Digital's Multivendor Customer Services Business, customers around the world are provided with quality support services such as: traditional on-site hardware and software maintenance services, multivendor system and network support, desktop services, and all types of customized support services. Digital services and supports more than 14,000 hardware and software products from more than 1,300 vendors.

More than two decades of experience creating and supporting networks has made Digital an industry leader in networking. Digital's own EASYnet—the world's largest non-military network encompassing more than 77,500 nodes at nearly 600 sites, in more than 40 countries—provides an ideal platform for testing and refining network tools, products, and services. As a networking leader, Digital is committed to open systems and industry standards. Digital was the first vendor to agree to make its proprietary network architecture comply fully with the Open Systems Interconnection (OSI) model.

Digital has an established track record for creating multivendor networks, supporting third-party hardware and software, and using other vendors' products. With this expertise, solutions that ensure interconnectivity and interoperability are offered for diverse computing.

Digital has a tradition of working cooperatively with other vendors. These alliances ensure that products and services are available to complement Digital's offerings. When expertise is required that is not available from Digital, assistance is requested from a partner.

Consulting Services and Systems Integration experts provide assistance in areas such as manufacturing, distribution, service administration and support, applications development, business systems, data center management, and training development.

Open Services

Digital recognizes that consideration of three elements is essential to the realization of open solutions: the business, the people, and the technology. Digital's Open Advantage is to provide services that address all three throughout the life cycle of the solution—from planning and design through implementation and management.

The bottom line is that "open services" is Digital's commitment to make sure its customers get solutions that always work—multivendor systems integration, flexibility of choice, consistent standards, and unqualified accountability.

Digital defines "open services" by these characteristics:

- A single source of responsibility for all support
- Complete support for multivendor environments

Services from Digital *(continued)*

Open Services *(continued)*

- Flexible support tailored to each customer's needs
- Worldwide standards of support, from desktop to enterprise

Systems Integration

Systems Integration (SI) involves applying technology to solve business problems and may require the realignment of organizational structure and business processes so that every aspect of the enterprise—people, technology, and business—supports strategic goals.

As a leading technology vendor and a business innovator, Digital has the resources to implement large-scale SI projects that incorporate multiple projects and span multiple business functions and geographies.

Digital's approach to SI includes:

- Dedicated program management
- A comprehensive and flexible program methodology
- Strategic alliances with other market leaders to deliver joint solutions
- Resource centers that focus Digital's vast resources in support of major integration efforts

Consulting Services

Consulting is an integral part of many information technology solutions and provides specialized expertise when and where it is needed—for only as long as it is required.

Consulting Services can include:

- Analyzing current environment and defining overall information needs
- Designing business processes
- Developing guidelines and standards for an enterprise-wide information architecture
- Developing a solution architecture that specifies technologies and applications required to support those business goals
- Creating a functional requirements definition

Digital offers four major categories of consulting services:

- **Management Consulting**—helps articulate clear business objectives, develop business processes, and identify technology opportunities.
- **Applications Consulting**—employs industry and applications expertise to define solutions that solve specific problems or support business processes. Services include application analysis and design, selection of an application portfolio, and application programming.
- **Information Technology (IT) Consulting**—provides assistance in designing and implementing enterprise-wide IT systems. Digital's areas of expertise include:
  - database design, implementation, and management
  - transaction processing
  - network planning and design
  - enterprise-wide messaging systems
- **Information Service (IS) Consulting**—assists in optimizing the use of technology resources. Areas of focus include IS strategy, IS organizational design, and operations planning; Computer-Aided Software Engineering (CASE); and performance, capacity, and security services.

Services from Digital *(continued)*

Customized Solutions

Because "off-the-shelf" solutions seldom provide a strategic advantage, custom-designed solutions can provide a competitive edge. Digital has been developing customized solutions for more than 25 years. These solutions include customized hardware, applications, training, and support. Digital brings together a team of professionals with the skills to design and implement a solution to meet defined specifications. Digital's commitment to industry standards and use of proven tools and methods ensure quality, consistency, and long-term supportability.

Examples of customized solutions include:

- Modifying Digital hardware for a special purpose such as "ruggedizing" for use in a harsh industrial setting, or providing more computing power in a smaller footprint.
- Developing a software application that embodies the knowledge of company experts.
- Creating a training solution that teaches students about proprietary information or company-specific procedures.
- Developing a customized support solution that helps an organization improve its service call-handling or its service warranty and service contract administration systems.

Facilities Management

Facilities Management Services (FMS) provides the benefit of Digital's experience in managing information systems and data centers. Computing resources are operated by professionals whose skills are "state-of-the-practice." In addition, FMS can help achieve efficiencies and control costs while providing a higher level of service to internal IS customers.

Warranty, Installation, and Startup

Startup period is a critical time; Digital offers a range of warranty, installation, and startup services that ensure an efficient startup and smooth operation during the first year.

Learning Services

Digital's training curriculum addresses the needs of technology planners, technical professionals, and non-technical end users. More than 250 courses are offered, covering a range of technical topics and organizational and professional development training.

- Digital training offers the following benefits:
- Convenient training formats
- Training-plan assistance
- Discounts for volume purchases
- Many languages and at many training sites worldwide
- The option to train at a Digital facility or on site

Software Product Services

Digital's family of product support services ensure maximum availability for multivendor systems and applications. Through the combined resources of the U.S. Customer Support Centers and local service offices, Digital delivers remedial and preventive maintenance, advisory support to answer questions and solve problems, technical information, and services to keep computing environments up to date.

For multivendor configurations, Digital provides hardware support for thousands of non-Digital devices when they are are linked to or co-located with a covered Digital system. Software support is also extended to cover non-Digital operating systems and layered software running on Digital hardware.

Services from Digital *(continued)*

Software Product Services *(continued)*

Advanced Electronic Support (AES) is a key element of product support. AES provides remote diagnosis of system problems; predictive service tools that identify problems before they cause an outage; electronic submission of software service requests; and electronic access to flash messages, software patches, and Digital's extensive product databases.

Network Services

Digital's network services include network integration as well as network support. Skilled network consultants assist in designing and implementing multi-protocol, multivendor LANs and WANs. Digital can design and manage installation of the network physical layer and aid in developing distributed applications.

When comprehensive support is required for a complex network environment, Digital offers network operations management services. These NETsupport Services provide network service tools, service planning assistance, fault isolation and fault resolution management, network configuration management, and network performance monitoring.

PC Integration and Desktop Services

Digital provides complete PC solutions which include design and implementation of PC networks and development and delivery of specialized multivendor hardware/software platforms. Digital also provides ongoing support for PC environments comprising 100 or more systems.

Digital's Desktop Services portfolio provides installation service, on-site and remote maintenance, and telephone software support for the most popular PC hardware and software products. Support is provided for products from vendors such as Apple, Ashton-Tate, Borland, COMPAQ, Epson, IBM, Lotus Development Corp., Microsoft, WordPerfect, and Zenith.

Business Recovery Services

Digital can help safeguard computing resources against unpredictable events that can shut down operations for days or weeks at a time. Consultants will assist in designing and implementing an effective business recovery plan for the data center, facility, or enterprise.

In case of disaster, a range of services are available to help return systems to normal operations quickly. Some examples are: RESTART Service, which provides access to a backup configuration at a "hot site" to run critical applications; RECOVER-ALL service which covers the repair or replacement of equipment damaged during a disaster.

Performance, Capacity, and Security

Digital uses proven tools and methods to assess current computing environments and propose changes that will help meet stated goals. Both custom-quoted and predefined, packaged consulting services are available to help keep systems and networks responsive to evolving business needs.

Digital Assisted Services

Digital Assisted Services offers products, services, and programs to customers who participate in the maintenance of their computer equipment.

Components of Digital Assisted Services include:

- Spare parts and kits
- Diagnostics and documentation
- Tools and test equipment
- Parts repair services, including Field Change Orders
- Off-site product repair
- Other Digital Assisted Services programs

Note: Specifications and detailed descriptions on Digital's service offerings can be found in The *Digital Services Reference Guide*.

Leasing Services

Overview

Providing the right financial solutions to meet the specific needs of customers requires responsiveness, flexibility, strong resources, and a positive track record in the delivery of service. Digital Financial Services (DFS) fulfills all these requirements.

Programs

To address customer issues around technology acquisition, DFS has created LeaseWorks, a suite of flexible financing programs for today's technology. LeaseWorks is designed to provide customers with unprecedented investment protection through a series of complementary financial products.

LeaseWorks products include:

AlphaBridge Option—Offers customers the ability to use current VAX technology with the same low rates currently available for a DEC 7000 AXP system. In addition, customers have a well defined, optional, migration path to Alpha technology. Customers can move to Alpha when they feel its best for their business.

Equity Upgrade Option—Allows customers the flexibility to upgrade equipment during the term of a lease with predetermined financial credits for payments made, the ability to right-size the system configuration and trade-in options at market prices.

SLG Upgrade Option—Provides the same features as the Equity Upgrade Option but is geared to State and Local Governments and their particular needs.

Technology Proterction Option—Offers customers the flexibility to refresh technology as computing needs change with investment protection through equipment credits. These operating leases include a streamlined process to add additional desktops or capacity or downsize as required by the customer.

Customers Supported

- State and Local Governments
- Commercial (for-profit businesses)
- Nonprofit (Hospitals, Associations, Private)
- Educational Institutions
- Prime Contractors

Field/Customer Support

Digital Leasing Managers are conveniently located throughout the country. They work with customers and Digital account managers in developing financial strategies which best meet customer needs.

DFS supports Digital's Distributors and VARs. For more information, please contact a District Leasing Manager or call 1-800-343-3451.

Information Services

Electronic Connection

The Electronic Connection is Digital's free online information and purchasing service that provides immediate access to the convenience of electronic shopping for Digital's services, hardware, and software products. Users can evaluate, select, configure, quote, and purchase products online. It is also a convenient way to obtain new product announcements, news, and special offers from Digital.

The Electronic Connection has information on Digital and complementary solutions and services through product descriptions, product demonstrations, selection charts, prices, and configuration aids. The information is organized in an easy-to-use system of menus; rapid search methods, such as keywords and order numbers, are also available.

The Electronic Connection saves user time and money because orders are placed online. Critical ordering information, such as order numbers, pricing, and product availability can be displayed. Once the order is placed, it is immediately entered into Digital's order-processing system, allowing users to monitor their order.

To register online for a free account, dial 800-234-1998 at 1200 through 9600 baud from 7 a.m. to midnight, Eastern Time, with any Digital-compatible terminal or PC. For access assistance, call 800-DIGITAL (800-344-4825).

DECdirect Catalogs

To complement a Digital computer system, supporting products such as add-ons and upgrades, software, networking and communications, desktop products, accessories, and supplies are available through the DECdirect catalogs. With a colorful, informative format that's easy to read and use, DECdirect catalogs make buying high-quality Digital products and services simple. For more information on DECdirect catalogs, in the U.S., call 800-Digital (press 2).

Digital Reference Service

Overview

The Digital Reference Service (DRS) is a one stop source for up-to-date information on all hardware, software, and service solutions for Digital systems. DRS specializes in collecting, distributing, and organizing information on all Digital products and services into a convenient desktop reference library.

As subscribers to the DRS Literature update Service, customers are assured the latest Digital information delivered directly every 6-8 weeks.

Contents

- Systems and Options Catalogs
- Price Lists
- DECdirect catalogs
- Software Source Books
- Network Products Guide
- Educational and Training Catalogs
- PC Catalogs
- *Intro* and *Customer Update* magazines
- Plus just released product brochures and information sheets

Free with a subscribtion...

- A set os sturdy 3-ring binders to store your DRS literature library
- Eight issues of ***DRS UPDATE***—a newsletter that highlights new product solutions
- **DRS** Information Directory—unique cross-referenced tables to help you find the information you need. *Includes an essential list of direct dial Digital phone numbers*

Digital SPDs

Digital Software Product Descriptions (SPDs) are ideal for researching software features, systems compatibility and support information for every Digital software release. DRS SPDs are updated quarterly. This multi-volume collection is available in book format or on a dual-file system CD-ROM that is compatible with all operating systems.

Ordering Information

Order Number	Description	Price
ED-23800-18	DRS Literature Update Service with SPD books	$695
ED-00896-18	DRS Literature Update Service with SPD CD-ROM	$595
ED-02128-18	DRS Literature Update Service (without SPDs)	$395
ED-02127-18	DRS Software Product Descriptions—book format	$395
ED-00897-18	DRS Software Product Descriptions—CD-ROM format	$295

Note: Prices valid in U.S. only. Call for prices outside U.S. Please allow 6-8 weeks for delivery. Digital discounts do not apply. Rates subject to change; call to verify prices.

For more information, or to place an order, contact DRS:

Phone: 1-800-494-4DRS (800)-494-4377. Outside U.S. (508)-429-3015

FAX: 508-429-6921

Mail: Digital Reference Services, P.O. Box 6464, Holliston, MA 01746-6464

Payment by check, corporate purchase order, VISA, MasterCard, American Express accepted.

Index

2D and 3D Programmable Peripherals for CAD/CAM/CAE, 728
2T-7JARC, 321
2T-7JARD, 321
2T-7JARE, 321
2T-7JARH, 321
2T-7KAMC, 228
2T-7KAMD, 228
2T-7KAME, 228
2T-7KAMH, 228
2T-RAKPC, 444
7JAMC, 310
7JAMD, 310
7JAME, 310
7JAMH, 310
7KAMC, 217
7KAMD, 217
7KAME, 217
7KAMH, 217
802.3/Ethernet Network Access Server Selection Guide, 493
ADVANTAGE-UPGRADE Program, 353
AdvantageCluster Compute Server (ACCS) Model 1000, 20
AdvantageCluster Compute Servers, 465
Alpha AXP Servers Comparison Chart, 3
Alpha AXP Systems, 1
Alpha AXP Workstations Comparison Chart, 2
AlphaServer 1000 4/200 Rackmount and Cabinet Systems, 94
  Diagram, 98
  PB7RB, 95
  PB7RC, 95
  Specifications, 99
AlphaServer 1000 4/200 System Upgrades, 366
AlphaServer 1000 4/200 Systems, 82
  Diagrams, 91
  PB70B, 83
  Specifications, 92
AlphaServer 2000 4/200 System Upgrades, 367
AlphaServer 2000 4/200 Systems, 100
  DA-241D1-B9, 108
  DEC OSF/1 AXP, 108
  Diagrams, 124
  DN-241D1-B9, 101
  DY-241D1-B9, 115
  EISA Bus IRQ Address Table, 123
  OpenVMS AXP, 115
  Specifications, 127
  Windows NT, 101
AlphaServer 2100 4/200 and 4/275 Cabinet Systems, 177
  DA-261C1, 179
  DA-262C1, 179
  Diagrams, 189
  DN-261C1, 178
  DN-262C1, 178
  DY-261C1, 179
  DY-262C1, 179
  EISA Bus IRQ Address Table, 188
  Specifications, 190
AlphaServer 2100 4/200 and 4/275 Rackmount Systems, 163
  DA-251W1, 165
  Diagrams, 175
  DN-251W1, 164
  DY-251W1, 165
  EISA Bus IRQ Address Table, 174
  Specifications, 176
AlphaServer 2100 4/200 and 4/275 Storage Diagrams, 156
AlphaServer 2100 4/200 and 4/275 Systems, 129
  DA-251P1, 137
  DA-252P1, 137
  DEC OSF/1 AXP, 137
  Diagrams, 155
  DN-251P1, 130
  DN-252P1, 130
  DY-251P1, 145
  DY-252P1, 145
  EISA Bus IRQ Address Table, 154
  OpenVMS AXP, 145
  Specifications, 160
  Storage Diagrams, 156
  Windows NT, 130
AlphaServer 2100 4/200 System Upgrades, 367
AlphaServer 2100 4/275 System Upgrades, 368
AlphaStation 200 4/166 and 4/233 Desktop Workstations, 60
  Diagrams, 69
  PB41A, 62
  PB420, 61
  PB421, 61
  PB422, 61
  PB42A, 62
  PB430, 61
  PB431, 61
  PB432, 61
  Specifications, 70
AlphaStation 200 4/166 Workstation Upgrades, 356
AlphaStation 200 4/233 Workstation Upgrades, 357
AlphaStation 400 4/233 Mini Tower Workstations, 71
  Diagrams, 80
  PB51A, 72
  PB520, 72
  PB521, 72
  PB522, 72
  Specifications, 81
AlphaStation 400 4/233 Workstation Upgrades, 358
Back-UPS Ordering Information, 806
Battery Options Chart, 828
Cables, 561
CD-ROM Devices, 663
Channelworks
  Ethernet Over Cable TV, 540
Communications, 567
Comparision Charts
  Alpha AXP Servers, 3
  Alpha AXP Workstations, 2
  DECpc Personal Computers, 421
  DECstation/DECsystem, 328
  EtherWORKS, 412
  Impact Printers, 702
  MicroVAX 3100 Systems and Servers, 264
  Multiprotocol Router/Bridge, 511
  Nonimpact Printers, 700
  SCSI Disk Drive, 576
  Storage Array Cabinet Capacity and Performance, 575
  Tape, 578
  UPS, 802
  VAX 4000 Systems and Servers, 274
  VAX Systems, 236
  Video Terminals, 698
Concentrators and Multistation Access Units
  DECconcentrator 900MX FDDI Concentrator, 538
  DECmau 900TL, 538
  DELNI (Digital Ethernet Local Network Interconnect), 539
Conferencing for Windows, 409
CX Asynchronous Communications Controllers (Q-bus), 545
DA-241D1-B9, 108
DA-251P1, 137
DA-251W1, 165
DA-252P1, 137
DA-261C1, 179
DA-262C1, 179
DA-47104, 195
DA-47106, 194
DA-471A1, 201
DA-471A2, 201
DA-471C3, 200
Data Center Systems
  Battery Options Chart, 828
  Distribution Cabinet Output Configuration Chart, 826
  HA4000 3-Phase UPS, 823
  HA4000 Quick Configurator, 824
  Hardwire Output Configuration Chart, 827
DEC 2000 Model 300 AXP Server Upgrades, 365
DEC 2000 Model 300 AXP Server, 10
  Diagram, 16
  PB221, 11
  PB222, 11
  PB223, 11
  PB224, 11
  PB22B, 11
  PB22C, 11
  Specifications, 17
DEC 2000 Model 500 AXP Server Upgrades, 365
DEC 3000 Model 300X/300LX AXP Desktop Workstations, 18
  AdvantageCluster Compute Server (ACCS) Model 1000, 20
  Diagram, 27
  PE320, 19
  PE321, 19
  PE32B, 19
  Specifications, 28
DEC 3000 Model 300X/300LX AXP Workstation Upgrades, 359
DEC 3000 Model 600 and 700 AXP Desktop Workstations, 29
  Diagrams, 41
  PE420, 31
  PE421, 30
  PE440, 31
  PE441, 30
  Specifications, 42
DEC 3000 Model 600 AXP Workstation Upgrades, 361
DEC 3000 Model 600S AXP Server Upgrades, 369
DEC 3000 Model 700 AXP Workstation Upgrades, 362
DEC 3000 Model 900 AXP Deskside Workstations, 43
  Diagrams, 54
  PE540, 44
  PE541, 44
  Specifications, 55
DEC 3000 Model 900 AXP Workstation Upgrades, 363
DEC 4000 Model 700 AXP Distributed/Departmental Server Upgrades, 369
DEC 4000 Model 700 AXP Distributed/Departmental Servers, 192
  DA-47104, 195
  DA-47106, 194
  DA-471A1, 201
  DA-471A2, 201
  DA-471C3, 200
  Diagrams, 209
  DY-47105, 195
  DY-47107, 194
  DY-471A1, 201
  DY-471A2, 201
  DY-471C3, 200
  DY-471C4, 200
  Specifications, 211
DEC 7000 and 10000 AXP Symmetric Multiprocessing (SMP) Upgrades, 372
DEC 7000 Model 700 AXP Enterprise Server Upgrades, 371
DEC 7000 Model 700 AXP Enterprise Servers (Rackmount), 228
  2T-7KAMD, 228
  2T-7KAME, 228
  2T-7KAMH, 228
  Diagrams, 232
  Specifications, 233
  2T-7KAMC, 228

DEC 7000 Model 700 AXP Enterprise Servers, 215
7KAMC, 217
7KAMD, 217
Diagrams, 226
KAME, 217
KAMH, 217
Specifications, 227
DEC Commserver 100/150 Network Access Servers, 507
DEC FDDIcontroller
EISA, 414
PCI, 415
DEC FDDIcontroller 400 Controller (DEMFA—XMI-to-FDDI), 484
DEC FDDIcontroller/FUTUREBUS+, 483
DEC FDDIcontroller/TURBOchannel (DEFTA), 485
DEC Image Print-PLUS Software, 782
DEC LANcontroller 200 (DEBNI—VAXBI-to-Ethernet), 481
DEC LANcontroller 400 (DEMNA—XMI-to-Ethernet), 480
DEC MAILworks for PCs, 407
DEC MAILworks Server, 407
DEC SNA Domain Gateway for Channel Transport (-CT), 543
DEC TRNcontroller 100 (DEQRA—Q-bus-to-Token-Ring), 482
DEC TRNcontroller 100, 417
DEC WANcontroller 720 Synchronous Controller (TURBOchannel), 547
DEC WANrouter 250 8-Port Multiprotocol Router, 522
DECagent 90, 488
DECarray 300 Family (SDI/DSSI), 633
DECbridge 90, 529
DECbridge 90FL, 528
DECbrouter 90—Multiprotocol Bridge/Router, 520
DECcolorwriter 1000 (LF02), 753
DECconcentrator 900MX FDDI Concentrator, 538
DECdirect Catalogs, 863
DECfax Mail for OpenVMS, 553
DECfonts Typeface Collection for VMS and ULTRIX, 785
DEChub 90 (Ethernet), 487
DEChub 900 Multiswitch Family, 486
DEChub ONE—Ethernet Single-slot Hub, 487
DEClaser 1800 (LN11), 747
DEClaser 3500 (LN14), 749
DEClaser 5100, 751
DECmau 900TL, 538
DECmodem V32, 552
DECmultiJET 1500 (LJ18P), 754
DECNIS 500 Multiprotocol Router/Bridge, 518
DECNIS 600 Multiprotocol Router/Bridge, 512
DECpacketprobe 90 and PROBEwatch, 491
DECpc 4xx MT Personal Computers PCT62, 433
DECpc 4xx MT Personal Computers, 432
PCT63, 433
PCT64, 433
DECpc 4xx MTE Personal Computers, 436
PC74M, 437
PCT7M, 437
DECpc AXP 150 Deskside PC, 4
PB220, 5
PB224, 5
PB22A, 5
PB230, 5
DECpc MT, MTE and XL Systems
2T-RAKPC-AA, 444
Rackmountable Slide Shelf Assembly, 444
DECpc Personal Computers, 420
Comparison Chart, 421
DECpc System
Diagrams, 443
DECpc XL Personal Computers, 440
FR-775AA, 440
FR-780AA-, 440
FR-781AA, 440
DECprint Supervisor for KODAK Printers (KPS) for OpenVMS VAX, V1.0, 780
DECprint Supervisor for OpenVMS (DCPS), 778
DECprint Utility for PostScript to Sixel Printing for VMS, 784
DECraid+ Rackmount Storage Subsystems, 623
DECrepeater 900FP, 525
DECrepeater 900GM, 525
DECrepeater 900SL, 513
DECrepeater 900TL, 513
DECrepeater 900TM—32-port 10BaseT Repeater, 523
DECrepeater 90C/DECrepeater 90T, 526
DECrepeater 90FA, 527
DECrepeater 90FL, 527
DECrepeater 90FS, 524
DECsafe Available Server, 468
Diagrams, 471
DECserver 700 8/16 Port Network Access Server, 502
DECserver 900TM—32-Port Network Access Server, 501
DECserver 90L+ Terminal Server, 499
DECserver 90M Terminal Server, 497
DECserver 90TL Telnet/LAT Terminal Server, 495
DECstation 5000 Model 133 Workstations, 329
PM339, 330
DECstation 5000 Workstations
Diagrams, 344
Model 240, 336
PM390, 337
Specifications, 345
DECstation/DECsystem
Comparison Chart, 328
DECswitch 900EE—6-port Ethernet Switch, 532
DECswitch 900EF—7-port Ethernet to FDDI Switch, 532
DECsystem 5000 Model 240 Servers, 346
PM399, 347
DECsystems, 327
DECtalk Speech Synthesizers (Voice), 559
DECtouch Input Device, 727
DECvoice and DECtalk Speech Synthesizer
DECtalk Speech Synthesizers (Voice), 559
DECvoice, 554
DECvoice, 554
DECwanrouter 90 Multiprotocol Router, 521
DECwriter 110i (LJ110i), 757
DECwriter 195 (LA195), 765
DECwriter 500i (LJ500i), 756
DECwriter 65 (LA65), 762
DECwriter 95 Dot Matrix PC Printer, 763
DELNI (Digital Ethernet Local Network Interconnect), 539
Desktop Printer Cable and Adapter Guide, 771
DESQA Controller (Q-bus-to-Ethernet), 481
Diagrams
AlphaServer 1000 4/200 Rackmount and Cabinet Systems, 98
AlphaServer 1000 4/200 Systems, 91
AlphaServer 2000 4/200 Systems, 124
AlphaServer 2100 4/200 and 4/275 Cabinet Systems, 189
AlphaServer 2100 4/200 and 4/275 Rackmount Systems, 175
AlphaServer 2100 4/200 and 4/275 Systems, 155
AlphaStation 200 4/166 and 4/233 Desktop Workstations, 69
AlphaStation 400 4/233 Mini Tower Workstations, 80
DEC 2000 Model 300 AXP Server, 16
DEC 3000 Model 300X/300LX AXP Desktop Workstations, 27
DEC 3000 Model 600 and 700 AXP Desktop Workstations, 41
DEC 3000 Model 900 AXP Deskside Workstations, 54
DEC 4000 Model 700 AXP Distributed/Departmental Servers, 209
DEC 7000 Model 700 AXP Enterprise Servers (Rackmount), 232
DEC 7000 Model 700 AXP Enterprise Servers, 226
DECpc System, 443
DECsafe Available Server, 471
DECstation 5000 Model 133 Workstation, 344
MicroVAX 3100 Systems and Servers, 271
VAX 4000 Model 105A Systems (Rack-Mountable), 302
VAX 4000 Model 505A/705A Systems (Rack-Mountable), 306
VAX 4000 Model 505A/705A Systems and Servers, 294
VAX 4000 Systems and Servers, 284
VAX 7000 Enterprise Servers (Rack-Mount), 325
VAX 7000 Enterprise Servers, 319
Diagrams *(continued)*
VAXstation 4000 Model 60 and 90A Systems, 260
VAXstation 4000 VLC Systems, 243
Digital's Automated Storage Library, 679
Digital CELEBRIS Personal Computers, 428
FR-821AA, 429
FR-822AA, 429
Digital Ethernet Multiport Office Network Repeater, 523
Digital HiNote Notebook Computers, 424
FR-P60WA, 425
FR-P61WB, 425
FR-P63WB, 425
FR-P64WC, 425
Digital HiNote Ultra Notebook Computers, 424
FR-P70WA, 426
FR-P71WB, 426
FR-P72WC, 426
FR-P73WC, 426
FR-P74WC, 426
Digital Linear Tape (Tx800 Family), 665
Digital Reference Service, 852
Digital Storage Architecture, 573
Digital Storage Solutions
Digital Storage Architecture, 573
Digital Storage System Interconnect (DSSI) Family, 574
Small Computer System Interface (SCSI), 574
Standard Interconnect Series Family (SDI/STI), 573
Storageworks Architecture and Products, 572
Digital Storage System Interconnect (DSSI) Family, 574
Disk Devices
EF5x Solid State Disk, 641
ESE50 Solid State Disk, 639
EZ5x Solid State Disk, 644
RF36 Integrated Storage Element (DSSI), 647
RX23 Flexible Diskette Drive (SCSI), 652
RX26 Flexible Diskette Drive (SCSI), 652
RX33 Flexible Diskette Drive (SCSI), 651
RZ-Series Disk Drives (SCSI), 649
Distributed Queuing Service, 783
Distribution Cabinet Output Configuration Chart, 826
Distribution, Environmental Monitoring, and TVSS
Modular Power Distribution/Conditioning Distribution (PDM/CDM), 830
Receptacle Reference Chart, 837
Transient Voltage Surge Suppressors, 834
DLT Family of Magazine Tape Subsystems, 668
DMB32 Multifunction Controller (VAXBI), 547
DN-241D1-B9, 101
DN-251P1, 130
DN-251W1, 164
DN-252P1, 130
DN-261C1, 178
DN-262C1, 178
Documentation and Publication Management (DPM), 787
DRB32 Parallel Interface (VAXBI), 548
DRQ3B Parallel Interface (Q-bus), 550
DRV11 and DRV1W Interfaces (Q-bus), 551
DRV1J Parallel Interface (Q-bus), 551
DSU/CSU (Data Service Unit/Channel Service Unit), 552
DSV11 Synchronous Controller (Q-bus), 545
DV-31GAA, 264
DV-31GCA, 264
DV-31JAA, 264
DV-31JCA, 264
DV-31RAA, 264
DV-31RCA, 264
DV-415AA, 275
DV-415CA, 275
DV-41VAA, 301
DV-41VCA, 301
DV-41VDB, 301
DV-41VT1, 301
DV-41VU1, 301
DV-41VV1, 301
DV-45AEA, 286
DV-45AFA, 286
DV-45REA, 305

DV-45RFA, 305
DV-45RFB, 305
DV-45RV2, 305
DV-47AEA, 286
DV-47AFA, 286
DV-47REA, 305
DV-47RFA, 305
DV-47RFB, 305
DV-47RV2, 305
DY-241D1-B9, 115
DY-251P1, 145
DY-251W1, 165
DY-252P1, 145
DY-261C1, 179
DY-262C1, 179
DY-47105, 195
DY-47107, 194
DY-471A1, 201
DY-471A2, 201
DY-471C3, 200
DY-471C4, 200
EF5x Solid State Disk, 641
EIA-423 Open DECconnect Communications Interfaces, 567
Electronic Connection, 863
Environmental Products, 791
  Back-UPS Ordering Information, 806
  Line-Interactive/Standby Systems (Smart-UPS/Back-UPS), 802
  Online Systems (PUPS), 802
  OnliNet and OnliSafe for Personal, Prestige and PUPS Plus On-line UPS Systems, 794
  PowerChute PLUS Software for Back UPS/ Smart UPS/Matrix UPS Systems, 794
  PowerMon Software Basic Monitoring for any UPS System, 794
  PUPS Ordering Information, 803
  Remote Environmental Monitoring Software (REMS), 793
  Smart UPS Ordering Information, 806
  Software Matrix, 793
  Software Order Chart for UPS Systems, 794
  Summary Chart, 792
  UPS Comparison Chart, 802
  UPS Network Adapters/Hardware Options, 803
  UPS Systems Overview, 792
ESE50 Solid State Disk, 639
Ethernet Over Cable TV, 540
EtherWORKS
  Comparison Chart, 412
  Network Interface Cards, 413
  Router/DECnet, 418
eXcursion for Windows, 410
Expansion Boxes (SCSI)
  SZ12 Expansion Boxes, 605
EZ5x Solid State Disk, 644
Fiber Media Access Unit, 542
Fiber Optics, 569
Flexible/Optical Media Specifications, 580
FR-775AA, 440
FR-780AA, 440
FR-781AA, 440
FR-821AA, 429
FR-822AA, 429
FR-P60WA, 425
FR-P61WB, 425
FR-P63WB, 425
FR-P64WC, 425
FR-P70WA, 426
FR-P71WB, 426
FR-P72WC, 426
FR-P73WC, 426
FR-P74WC, 426
GIGAswitch/FDDI Networking Switch, 534
H4005 Transceiver (Ethernet), 541
HA4000 3-Phase UPS, 823
HA4000 Quick Configurator, 824
Hardwire Output Configuration Chart, 827
Host-Based Communications Controllers
  CX Asynchronous Communications Controllers (Q-bus), 545
  DEC WANcontroller 720 Synchronous Controller (TURBOchannel), 547
  DMB32 Multifunction Controller (VAXBI), 547
  DRB32 Parallel Interface (VAXBI), 548
  DRQ3B Parallel Interface (Q-bus), 550
  DRV11 and DRV1W Interfaces (Q-bus), 551
  DRV1J Parallel Interface (Q-bus), 551
  DSV11 Synchronous Controller (Q-bus), 545
HSC Intelligent I/O Servers, 627
HSC Rack-Mountable Subsystems, 632
HSD30 array controller, 593
HSD30, 594
Hubs, Hub Management, and LAN Monitoring Products
  DECagent 90, 488
  DEChub 90 (Ethernet), 487
  DEChub 900 Multiswitch Family, 486
  DEChub ONE—Ethernet Single-slot Hub, 487
  DECpacketprobe 90 and PROBEwatch, 491
  HUBwatch Management Software, 489
HUBwatch Management Software, 489
Impact Printers
  Comparison Chart, 702
Impact Printers—Dot Matrix
  DECwriter 195 (LA195), 765
  DECwriter 65 (LA65), 762
  DECwriter 95 Dot Matrix PC Printer, 763
  Desktop Printer Cable and Adapter Guide, 771
  LA310 MultiPrinter, 766
  LA424 MultiPrinter, 768
  LA600 MultiPrinter, 770
  LA70 Personal Printer, 758
  LA75 Plus Companion Printer, 760
Impact Printers—Line Matrix
  LG06 Line-Matrix Printer, 772
  LG12 Line Printer, 775
Information Services
  DECdirect Catalogs, 851
  Electronic Connection, 851
InfoServer 1000 Network Storage Servers, 653
Internetworking Products
  DEC SNA Domain Gateway for Channel Transport (-CT), 543
JetForm Software, 788
KDM70 XMI Disk/Tape Controller (SDI/STI), 607
KFMSA XMI Disk/Tape Adapter (DSSI), 608
KFMSB XMI to DSSI Disk/Tape Adapter, 610
KFQSA Q-bus Storage Adapter (DSSI), 612
KODAK 1392 Printer, 735
KZMSA XMI Storage Adapter (SCSI), 611
KZPAA PCI-to-SCSI Host Bus Adapter, 613
KZQSA Q-bus Storage Adapter, 613
KZTSA TURBOchannel to SCSI-2 Adapter, 614
LA310 MultiPrinter, 766
LA424 MultiPrinter, 768
LA600 MultiPrinter, 770
LA70 Personal Printer, 758
LA75 Plus Companion Printer, 760
LAN-Based Applications, 409
  Conferencing for Windows, 409
  eXcursion for Windows, 410
LATprint ThinWire Ethernet Interface, 504
Leasing Services, 850
LG06 Line-Matrix Printer, 772
LG12 Line Printer, 775
Line-Interactive/Standby Systems (Smart-UPS/Back-UPS), 802
Matrix Model UPS System, 809
MD30C Color Scanner, 729
MD400 Document Image Scanner, 733
MD410 Document Image Scanner, 731
MicroVAX 3100 Desktop Server Upgrades, 375
MicroVAX 3100 Systems and Servers, 263
  Comparison Chart, 264
  Diagrams, 271
  DV-31GAA, 264
  DV-31GCA, 264
  DV-31JAA, 264
  DV-31JCA, 264
  DV-31RAA, 264
  DV-31RCA, 264
  Model 40, 85, and 95 Systems, 264
  Specifications, 272
MMJ Accessories, 566
Modems
  DECfax Mail for OpenVMS, 553
  DECmodem V32, 552
  DSU/CSU (Data Service Unit/Channel Service Unit), 552
Modular Power Distribution/Conditioning Distribution (PDM/CDM), 830
Multiprotocol Router/Bridge
  Comparison Chart, 511
MUXserver 90/320/380/DECmux 300 Remote Terminal Server, 505
NAS 200 Base Server V6.0 for OpenVMS AXP systems, 854
NAS Base Server 200 V6.0 for DEC OSF/1 AXP systems, 856
NAS Base Server 200 V6.0 for OpenVMS VAX systems, 852
NAS Base Server 300 V6.0 for DEC OSF/1 AXP system, 857
NAS Client 150 V6.0 for DEC OSF/1 AXP Workstations, 856
NAS Client 150 V6.0 for OpenVMS AXP Workstations, 854
NAS Client 150 V6.0 for OpenVMS VAX Workstations, 852
NAS Client 250 V6.0 for DEC OSF/1 AXP Systems, 856
NAS Client 250 V6.0 for OpenVMS AXP Workstations, 854
NAS Client 250 V6.0 for OpenVMS VAX Workstations, 852
NAS Packages At A Glance, 852
NAS Production Server 400 V6.0 for OpenVMS AXP Systems, 855
NAS Production Server 400 V6.0 for OpenVMS VAX Systems, 853
NAS Server 300 V6.0 for OpenVMS AXP Systems, 855
NAS Server 300 V6.0 for OpenVMS VAX Systems, 853
Network Access and Communications Servers
  802.3/Ethernet Network Access Server Selection Guide, 493
  DEC Commserver 100/150 Network Access Servers, 507
  DECserver 700 8/16 Port Network Access Server, 502
  DECserver 900TM—32-Port Network Access Server, 501
  DECserver 90L+ Terminal Server, 499
  DECserver 90M Terminal Server, 497
  DECserver 90TL Telnet/LAT Terminal Server, 495
  LATprint ThinWire Ethernet Interface, 504
  MUXserver 90/320/380/DECmux 300 Remote Terminal Server, 505
Network Application Support (NAS), 838
  NAS 200 Base Server V6.0 for OpenVMS AXP systems, 842
  NAS Base Server 200 V6.0 for DEC OSF/1 AXP systems, 846
  NAS Base Server 200 V6.0 for OpenVMS VAX systems, 840
  NAS Base Server 300 V6.0 for DEC OSF/1 AXP system, 845
  NAS Client 150 V6.0 for DEC OSF/1 AXP Workstations, 844
  NAS Client 150 V6.0 for OpenVMS AXP Workstations, 842
  NAS Client 150 V6.0 for OpenVMS VAX Workstations, 840
  NAS Client 250 V6.0 for DEC OSF/1 AXP Systems, 856
  NAS Client 250 V6.0 for OpenVMS AXP Workstations, 842
  NAS Client 250 V6.0 for OpenVMS VAX Workstations, 840
  NAS Packages At A Glance, 840
  NAS Production Server 400 V6.0 for OpenVMS AXP Systems, 843
  NAS Production Server 400 V6.0 for OpenVMS VAX Systems, 841

Network Application Support (NAS) *(continued)*
NAS Server 300 V6.0 for OpenVMS AXP Systems, 843
NAS Server 300 V6.0 for OpenVMS VAX Systems, 841
Network Application Support and Services, 837
Network Interface Cards and Adapters for VAX/DECsystems/Alpha AXP, 480
Network Personal Computing, 384
Network Storage Servers
InfoServer 1000 Network Storage Servers, 653
Networks, Communications, and Cables, 479
Non-Impact Printers—Ink Jet
DECmultiJET 1500 (LJ18P), 754
DECwriter 110i (LJ110i), 757
DECwriter 500i (LJ500i), 756
Non-Impact Printers—Thermal
DECcolorwriter 1000 (LF02), 753
Nonimpact Printers
Comparison Chart, 700
Nonimpact Printers—Electrophotographic
KODAK 1392 Printer, 735
XEROX Production Print Systems, 737
Nonimpact Printers—Laser, 739
DEClaser 1800 (LN11), 747
DEClaser 3500 (LN14), 749
DEClaser 5100, 751
PrintServer 17/600, 743
PrintServer 32, 742
PrintServer Software, 744
Office/Data Center Line-Interactive Systems:Matrix Model UPS System, 809
Office/Data Center On-Line Systems—Prestige Model 3000Specifications, 815
Office/Data Center On-Line Systems: Powerware PLUS (PUPS Plus) UPS Systems, 816
Office/Data Center On-Line Systems: Prestige Model 3000, 812
ON-TAP—Bar Code Printing Software, 787
Online Systems (PUPS), 802
OnliNet and OnliSafe for Personal, Prestige Systems, 794
OPEN DECconnect Products and Cables
Cables, 561
Communications, 567
EIA-423 Open DECconnect Communications Interfaces, 567
Fiber Optics, 569
MMJ Accessories, 566
PC Products, 569
Printers, 570
Storage Devices, 569
Terminals, 570
OpenVMS Cluster Options, 477
Optical Devices
StorageServer 100 Optical Storage System, 658
StorageWorks RW500 Optical Library Family, 660
Pacer for ULTRIX, 403
PATHWORKS
Client Software, 387
DEC OSF/1 AXP (LAN Manager), 402
Desktop Backup, 399
DOS (NetWare Coexistence), 389
DOS and Windows (LAN Manager and NetWare), 387
ISDN (DOS), 391
Macintosh, 395
OpenVMS (LAN Manager), 398
OpenVMS (Macintosh), 401
OpenVMS (NetWare), 399
OS/2, 406
OS/2 (Client), 393
PC Networks, 385
SCO UNIX, 404
Server Software, 397
TCP/IP (OS/2), 394
ULTRIX, 403
Windows NT (Client), 392
Windows NT (Server), 405
X.25 (DOS and Windows), 390
PB220, 5
PB221, 11
PB222, 11
PB223, 11
PB224, 11
PB224, 5
PB22A, 5
PB22B, 11
PB22C, 11
PB230, 5
PB41A, 62
PB420, 61
PB421, 61
PB422, 61
PB42A, 62
PB430, 61
PB431, 61
PB432, 61
PB51A, 72
PB520, 72
PB521, 72
PB522, 72
PB70B, 83
PB7RB, 95
PB7RC, 95
PC Networking Hardware, 412
PC Products, 569
PC74M, 437
PCT62, 433
PCT63, 433
PCT64, 433
PCT7M, 437
PE320, 19
PE321, 19
PE32B, 19
PE420, 31
PE421, 30
PE43B, 57
PE440, 31
PE441, 30
PE44B, 57
PE540, 44
PE541, 44
PE54B, 57
PE54C, 57
Personal Computer Mail Solutions, 407
Personal Computing, 383
Personal Series
PLUS UPS Ordering Information (24-AND 36-KVA Models), 821
PEswitch 900TX—6-port full speed Ethernet to FDDI Switch, 533
PLUS UPS Ordering Information, 821
PM339, 330
PM390, 337
PM399, 347
POLYCENTER Console Manager, 473
PowerChute PLUS Software for Back UPS/Smart UPS/Matrix UPS Systems, 794
PowerMon Software Basic Monitoring for any UPS System, 794
Powerware PLUS (PUPS Plus) UPS Systems, 816
Prestige Model 3000, 812
Printer Software
DEC Image Print-PLUS Software, 782
DECfonts Typeface Collection for VMS and ULTRIX, 785
DECprint Supervisor for KODAK Printers (KPS) for OpenVMS VAX, V1.0, 780
DECprint Supervisor for OpenVMS (DCPS), 778
DECprint Utility for PostScript to Sixel Printing for VMS, 784
Distributed Queuing Service, 783
Documentation and Publication Management (DPM), 787
JetForm Software, 788
ON-TAP—Bar Code Printing Software, 787
PrintServer Software, 781
SoftFont, 786
VAX Vertical Forms Printing, 786
Printers
Introduction, 734
Printers, 570
Printers, 697
PrintServer 17/600, 743
PrintServer 32, 742
PrintServer 32/PrintGate/32 and PrintServer 17/600 Specifications, 744
PrintServer Software, 744
PrintServer Software, 781
PrintServers, 739
PrintServer 17/600, 743
PrintServer 32, 742
PrintServer Software, 744
ProNet Family, 416
PUPS
Back-UPS Ordering Information, 806
HA4000 3-Phase UPS, 823
HA4000 Quick Configurator, 824
Line-Interactive/Standby Systems (Smart-UPS/Back-UPS), 802
On-line Personal Systems Specifications, 805
Online Systems, 802
Ordering Information, 803
Personal Series-PLUS UPS Ordering Information, 821
Plus On-line UPS Systems, 794
Powerware PLUS (PUPS Plus), 816
Smart UPS Ordering Information, 806
Software Order Chart, 794
PUPS On-line Personal Systems Specifications, 805
PUPS Ordering Information, 803
PUPS Plus On-line UPS Systems, 794
PV31U, 239
PV61A, 247
PV71A, 254
Rackmountable DEC 3000 AXP Workstations and Servers, 56
PE43B, 57
PE44B, 57
PE54B, 57
PE54C, 57
Specifications, 59
Rackmountable Slide Shelf Assembly for DECpc MT, MTE and XL Systems, 444
RAID Array 110, 617
RAID Array 210 Subsystem, 620
RAID Storage Subsystems
DECraid+ Rackmount Storage Subsystems, 623
StorageWorks RAID Array 110, 617
StorageWorks RAID Array 210 Subsystem, 620
Receptacle Reference Chart, 837
Remote Environmental Monitoring Software (REMS), 793
Repeaters, Bridges, Routers, and Brouters
DEC WANrouter 250 8-Port Multiprotocol Router, 522
DECbridge 90, 529
DECbridge 90FL, 528
DECbrouter 90—Multiprotocol Bridge/Router, 520
DECNIS 500 Multiprotocol Router/Bridge, 518
DECNIS 600 Multiprotocol Router/Bridge, 512
DECrepeater 900FP, 525
DECrepeater 900GM, 525
DECrepeater 900SL, 513
DECrepeater 900TL, 513
DECrepeater 900TM—32-port 10BaseT Repeater, 523
DECrepeater 90C/DECrepeater 90T, 526
DECrepeater 90FA, 527
DECrepeater 90FL, 527
DECrepeater 90FS, 524
DECwanrouter 90 Multiprotocol Router, 521
Digital Ethernet Multiport Office Network Repeater, 523
Multiprotocol Router/Bridge Comparison Chart, 511
RoamAbout Wireless-to-Wired Access Point, 512
RF36 Integrated Storage Element (DSSI), 647
RoamAbout Wireless-to-Wired Access Point, 512
RX23 Flexible Diskette Drive (SCSI), 652
RX26 Flexible Diskette Drive (SCSI), 652
RX33 Flexible Diskette Drive (SCSI), 651
RZ-Series Disk Drives (SCSI), 649
SA900 DECarray (SDI), 635

Index

Scanners
MD30C Color Scanner, 729
MD400 Document Image Scanner, 733
MD410 Document Image Scanner, 731
Scanners, 697
SCSI Disk Drive
Comparison Chart, 576
Services
Digital Reference Service, 852
Information Services, 851
Leasing Services, 850
Services from Digital, 846
Services from Digital, 846
SF36 Storage Array Building Blocks (DSSI), 638
SF400 DECarray (DSSI), 636
Small Computer System Interface (SCSI), 574
Smart UPS Ordering Information, 806
SoftFont, 786
Software Order Chart for UPS Systems, 794
Specifications
AlphaServer 1000 4/200 Rackmount and Cabinet Systems, 99
AlphaServer 1000 4/200 Systems, 92
AlphaServer 2000 4/200 Systems, 127
AlphaServer 2100 4/200 and 4/275 Cabinet Systems, 190
AlphaServer 2100 4/200 and 4/275 Rackmount Systems, 176
AlphaServer 2100 4/200 and 4/275 Systems, 160
AlphaStation 200 4/166 and 4/233 Desktop Workstations, 70
AlphaStation 400 4/233 Mini Tower Workstations, 81
DEC 2000 Model 300 AXP Server, 17
DEC 3000 Model 300X/300LX AXP Desktop Workstations, 28
DEC 3000 Model 600 and 700 AXP Desktop Workstations, 42
DEC 3000 Model 900 AXP Deskside Workstations, 55
DEC 4000 Model 700 AXP Distributed/Departmental Servers, 211
DEC 7000 Model 700 AXP Enterprise Servers (Rackmount), 233
DEC 7000 Model 700 AXP Enterprise Servers, 227
DECstation 5000 Model 133 Workstation, 345
Flexible/Optical Media, 580
MicroVAX 3100 Systems and Servers, 272
Office/Data Center On-Line Systems—Prestige Model 3000, 815
PrintServer 32/PrintGate/32 and PrintServer 17/600, 744
PUPS On-line Personal Systems, 805
Rackmountable DEC 3000 AXP Workstations and Servers, 59
VAX 4000 Model 105A Systems (Rack-Mountable), 303
VAX 4000 Model 505A/705A Systems (Rack-Mountable), 307
VAX 4000 Model 505A/705A Systems and Servers, 296
VAX 4000 Systems and Servers, 285
VAX 7000 Enterprise Servers (Rack-Mount), 326
VAX 7000 Enterprise Servers, 320
VAXstation 4000 Model 60 and 90A Monitors, 262
VAXstation 4000 Model 60 and 90A Systems, 260
VAXstation 4000 VLC Systems Models 60 and 90A Monitors, 245
VAXstation 4000 VLC Systems, 244
Standard Interconnect Series Family (SDI/STI), 573
Storage Array Building Blocks
SF36 Storage Array Building Blocks (DSSI), 638
Storage Array Cabinet Capacity and Performance Comparison Chart, 575
Storage Arrays
DECarray 300 Family (SDI/DSSI), 633
SA900 DECarray (SDI), 635
SF400 DECarray (DSSI), 636
Storage Controllers/Adapters
KDM70 XMI Disk/Tape Controller (SDI/STI), 607
KFMSA XMI Disk/Tape Adapter (DSSI), 608
KFMSB XMI to DSSI Disk/Tape Adapter, 610
KFQSA Q-bus Storage Adapter (DSSI), 612
KZMSA XMI Storage Adapter (SCSI), 611
KZPAA PCI-to-SCSI Host Bus Adapter, 613
KZQSA Q-bus Storage Adapter, 613
KZTSA TURBOchannel to SCSI-2 Adapter, 614
VELOCITOR Storage Subsystems, 615
Storage Devices, 569
Storage Devices, 571
Storage I/O Servers
HSC Intelligent I/O Servers, 627
HSC Rack-Mountable Subsystems, 632
StorageServer 100 Optical Storage System, 658
StorageTek 4400 ACS Automated Tape Library, 677
StorageWorks
Building Blocks Shelf/Deskside Expansion, 582
Data Center Cabinet, 590
Departmental Cabinet, 588
Deskside Cabinet, 585
Desktop Expansion Unit—BA353 Family, 602
HSD05 Array Controller, 591
HSD30 Array Controller, 593
HSJ-Series Array Subsystems, 597
HSZ40 Array Subsystems, 599
InfoServer 1000, 601
Modular Storage Expansion, 581
SCSI Signal Converter, 595
StorageWorks
RAID Array 110, 617
RAID Array 210 Subsystem, 620
StorageWorks
RW500 Optical Library Family, 660
Storageworks Architecture and Products, 572
Switches
DECswitch 900EE—6-port Ethernet Switch, 532
DECswitch 900EF—7-port Ethernet to FDDI Switch, 532
GIGAswitch/FDDI Networking Switch, 534
PEswitch 900TX—6-port full speed Ethernet to FDDI Switch, 533
SZ12 Expansion Boxes, 605
TA92 Cartridge Tape Subsystem, 676
Tape Comparison Chart, 578
Tape Devices
Digital's Automated Storage Library, 679
KZ15 and TKZ09 8-mm Helical Scan Tape Drives (SCSI), 689
LZ06 4-mm DAT Tape Drive (SCSI), 682
LZ07 4-mm DAT Tape Drive (SCSI), 685
LZ6L 4-mm DAT Tape Autoloader, 684
StorageTek 4400 ACS Automated Tape Library, 677
TKZ60 Cartridge Tape Drive, 679
Wolfcreek Automated 3480/3490 Tape Library from StorageTek™, 678
ZK10 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI), 691
ZK11 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI), 692
Tape Devices (Cartridge Subsystems)
Digital Linear Tape (Tx800 Family), 665
DLT Family of Magazine Tape Subsystems, 668
TL820 DLT Automated Tape Library, 674
Tape Devices (Cartridge Subsystems)TA92 Cartridge Tape Subsystem, 676
Tape Devices (Reel-to-Reel)
SZ07 Magnetic Tape Drive (SCSI), 693
Tape Selection Chart, 577
TeamLinks Mail for Microsoft Windows, 408
Terminals, 570
Terminals, 697
ThinWire Media Access Unit, 541
TKZ15 and TKZ09 8-mm Helical Scan Tape Drives (SCSI), 689
TKZ60 Cartridge Tape Drive, 679
TL820 DLT Automated Tape Library, 674
TLZ06 4-mm DAT Tape Drive (SCSI), 682
TLZ07 4-mm DAT Tape Drive (SCSI), 685
TLZ6L 4-mm DAT Tape Autoloader, 684
Token Ring Cards, 416
DEC TRNcontroller 100, 417
ProNet Family, 416
Transceivers/Media Access Units
Fiber Media Access Unit, 542
H4005 Transceiver (Ethernet), 541
ThinWire Media Access Unit, 541
Twisted-Pair Media Access Unit, 541
Transient Voltage Surge Suppressors, 834
TSZ07 Magnetic Tape Drive (SCSI), 693
Twisted-Pair Media Access Unit, 541
TZK10 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI), 691
TZK11 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI), 692
UPS
Comparison Chart, 802
Network Adapters/Hardware Options, 803
Overview, 792
UPS Network Adapters/Hardware Options, 803
UPS Systems Overview, 792
VAX 10000 Symmetric Multiprocessing (SMP) Upgrades, 381
VAX 4000 Expansion Pedestals (R400X/B400X), 298
VAX 4000 Model 105A System Upgrades, 377
VAX 4000 Model 105A Systems (Rack-Mountable), 300
Diagrams, 302
DV-41VAA, 301
DV-41VCA, 301
DV-41VDB, 301
DV-41VT1, 301
DV-41VU1, 301
DV-41VV1, 301
Specifications, 303
VAX 4000 Model 50 In-Cabinet Upgrades, 376
VAX 4000 Model 505A/705A Systems (Rack-Mountable), 304
Diagrams, 306
DV-45REA, 305
DV-45RFA, 305
DV-45RFB, 305
DV-45RV2, 305
DV-47RFA, 305
DV-47RFB, 305
DV-47RV2, 305
Specifications, 307
VAX 4000 Model 505A/705A Systems and Servers, 286
Diagrams, 294
DV-45AEA, 286
DV-45AFA, 286
DV-47AEA, 286
DV-47AFA, 286
Expansion Pedestals (R400X/B400X), 298
Specifications, 296
VAX 4000 Models 505A/705A Board Upgrades, 378
VAX 4000 Models 505A/705A System Upgrades, 378
VAX 4000 Systems and Servers, 273
Comparison Chart, 274
Diagrams, 284
DV-415AA, 275
DV-415CA, 275
Model 105A Systems, 275
Specifications, 285
VAX 6000 In-Cabinet Board Upgrades, 379
VAX 7000 Enterprise Servers (Rack-Mount), 321
2T-7JARC, 321
2T-7JARD, 321
2T-7JARE, 321
2T-7JARH, 321
Diagram, 325
Specifications, 326
VAX 7000 Enterprise Servers, 308
7JAMC, 310
7JAMD, 310
7JAME, 310
7JAMH, 310
Diagrams, 319
Specifications, 320
VAX 7000 Symmetric MultiProcessing (SMP) Upgrades, 380
VAX 7000 System Upgrades, 380

VAX Systems, 235
Comparison Chart, 236
VAX to VAX ADVANTAGE-UPGRADES
MicroVAX 3100 Desktop Server Upgrades, 375
VAX 10000 Symmetric Multiprocessing (SMP) Upgrades, 381
VAX 4000 Model 105A System Upgrades, 377
VAX 4000 Model 50 In-Cabinet Upgrades, 376
VAX 4000 Models 505A/705A Board Upgrades, 378
VAX 4000 Models 505A/705A System Upgrades, 378
VAX 6000 In-Cabinet Board Upgrades, 379
VAX 7000 Symmetric MultiProcessing (SMP) Upgrades, 380
VAX 7000 System Upgrades, 380
VAXstation 4000 Upgrades, 373
VAX Vertical Forms Printing, 786
VAX, DECsystem, and Alpha AXP to Alpha AXP ADVANTAGE-UPGRADES
AlphaServer 1000 4/200 System Upgrades, 366
AlphaServer 2000 4/200 System Upgrades, 367
AlphaServer 2100 4/200 System Upgrades, 367
AlphaServer 2100 4/275 System Upgrades, 368
AlphaStation 200 4/166 Workstation Upgrades, 356
AlphaStation 200 4/233 Workstation Upgrades, 357
AlphaStation 400 4/233 Workstation Upgrades, 358
DEC 2000 Model 300 AXP Server Upgrades, 365
DEC 2000 Model 500 AXP Server Upgrades, 365
DEC 3000 Model 300X/300LX AXP Workstation Upgrades, 359
DEC 3000 Model 600 AXP Workstation Upgrades, 361
DEC 3000 Model 600S AXP Server Upgrades, 369
DEC 3000 Model 700 AXP Workstation Upgrades, 362
DEC 3000 Model 900 AXP Workstation Upgrades, 363
DEC 4000 Model 700 AXP Distributed/Departmental Server Upgrades, 369
DEC 7000 and 10000 AXP Symmetric Multiprocessing (SMP) Upgrades, 372
DEC 7000 Model 700 AXP Enterprise Server Upgrades, 371
VAX/DECsystems LAN Communications Controllers
DEC FDDIcontroller 400 Controller (DEMFA—XMI-to-FDDI), 484
DEC FDDIcontroller/FUTUREBUS+, 483
DEC FDDIcontroller/TURBOchannel (DEFTA), 485
DEC LANcontroller 200 (DEBNI—VAXBI-to-Ethernet), 481
DEC LANcontroller 400 (DEMNA—XMI-to-Ethernet), 480
DEC TRNcontroller 100 (DEQRA—Q-bus-to-Token-Ring), 482
VAX/DECsystems LAN Communications Controllers Summary Chart, 480
VAXstation 4000 Model 60 Systems, 246
PV61A, 247
VAXstation 4000 Model 90A Systems, 253
Model 60 and 90A Diagrams, 260
Model 60 and 90A Monitor Specifications, 262
Model 60 and 90A Specifications, 260
PV71A, 254
VAXstation 4000 Upgrades, 373
VAXstation 4000 VLC Systems, 238
Diagram, 243
Models 60 and 90A Monitor Specifications, 245
PV31U, 239
Specifications, 244
VELOCITOR Storage Subsystems, 615
Video Terminals
Comparison Chart, 698
VT340+ Graphics Terminal, 725
VT420 Text Terminal, 716
VT420 with PCTerm Text Terminal, 722
VT510 Single-Session Text Terminals, 713
VXT 2000/2000+ X Terminals, 704
Wolfcreek Automated 3480/3490 Tape Library from StorageTek™, 678
X Terminals and Video Terminals, 704
2D and 3D Programmable Peripherals for CAD/CAM/CAE, 728
DECtouch Input Device, 727
VT340+ Graphics Terminal, 725
VT420 Text Terminal, 716
VT420 with PCTerm Text Terminal, 722
VT510 Single-Session Text Terminals, 713
VXT 2000/2000+ X Terminals, 704
XEROX Production Print Systems, 737

digital