StorageWorks™ Solutions

Products Catalog

Order Number: EK–BA350–PC. A01

This catalog describes the component parts used in the StorageWorks storage subsystem.

Digital Equipment Corporation
Maynard, Massachusetts

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Preface

The *StorageWorks Solutions Product Catalog* describes the StorageWorks™ products.

Intended Audience

This manual is for use by personnel responsible for selecting StorageWorks products.

Structure

This manual is organized as follows:

Chapter 1 Introduction	An overview of the StorageWorks product line to include SBBs, shelves, controllers, and enclosures.
Chapter 2 StorageWorks Storage Devices	Describes the StorageWorks storage devices, to include disks, tapes, CD–ROMs, solid state disks, and magazine tape subsystems.
Chapter 3 StorageWorks Shelves	Describes the StorageWorks shelves, their functions, and use.
Chapter 4 StorageWorks Controllers	Describes the StorageWorks controllers and the devices they support.
Chapter 5 StorageWorks Enclosures	Describes the StorageWorks enclosures, including the SW800, SW500, SW300, deskside, and desktop enclosures.
Chapter 6 StorageWorks Cables	A comprehensive description of the StorageWorks cables to include lengths, connectors, special cables, and use.
Chapter 7 StorageWorks Accessories	Describes the various StorageWorks components such as shelves, upgrage kits, and so forth.
Chapter 8 StorageWorks Configured Subsystems	Describes configure-to-order and factory-configured subsustems to include storage capacity, controllers, devices, shelves, and so forth.
Index	A cross-reference to major topics.

Document Conventions

The following convention is used in this manual:

italic type	Italic type indicates complete manual titles.

1
Introduction

The *StorageWorks Solutions Product Catalog* introduces the StorageWorks family of products. The StorageWorks family of products is a low-cost, extremely flexible mass storage solution that permits you to design a StorageWorks subsystem to meet system-specific needs. This chapter is an introduction to the StorageWorks product line. It includes a general description of the product features, certification, and of each of the primary StorageWorks product categories:

- StorageWorks Building Blocks (SBBs)
- StorageWorks Shelves
- StorageWorks Controllers
- StorageWorks Enclosures

NOTE

The configurations defined in this manual are for guidance only. They are current and correct as of the date of publication, but are subject to change without notice.

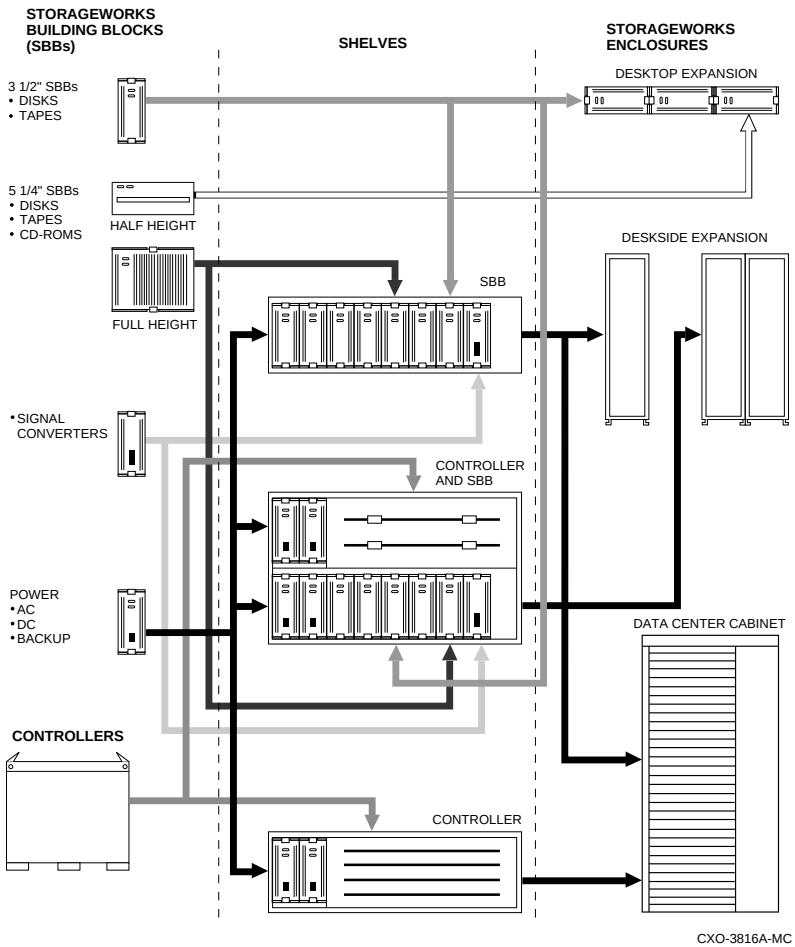
The catalog is meant to be used with other documents, including the *StorageWorks Configuration Guide*, to assist you in selecting the StorageWorks products that best provide a solution for your storage needs.

1.1 Product Features

The StorageWorks subsystem shown in Figure 1–1 has the following features:

- Low-cost SCSI device storage subsystems
- Snap-in devices for instant installation and removal
- The ability to mix 3½-inch and 5¼-inch storage devices
- The freedom to design your own system
- A redundant power option
- Redundant cooling
- Vertical or horizontal shelf orientation
- Locking cabinets for security of high-dollar value, portable storage devices
- Visual indication of shelf status, power supply status, storage device activity, and storage device status
- Automatic reporting of shelf status to host
- The capability to swap power supplies and storage devices without powering down the system

Figure 1–1 StorageWorks Subsystem components



1.2 StorageWorks Building Blocks

The StorageWorks building blocks (SBBs), shown in Figures 1–2 and 1–3, are the basic building blocks of the StorageWorks subsystem. They are available for both 3½-inch and 5¼-inch form factor devices. You can order SBBs with storage devices installed, or you can install third-party devices in a StorageWorks modular carrier to create an SBB. SCSI bus converters, adapters, and power supplies also can be mounted in SBBs.

Figure 1–2 Typical 3½-Inch SBB

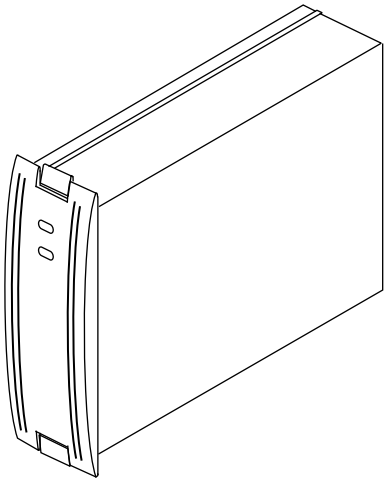


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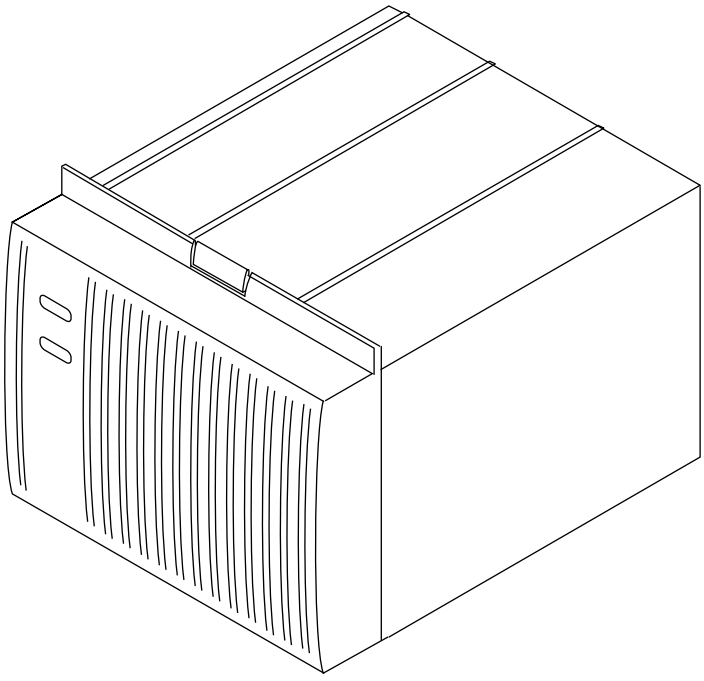
Figure 1–3 Typical 5¼-Inch SBB



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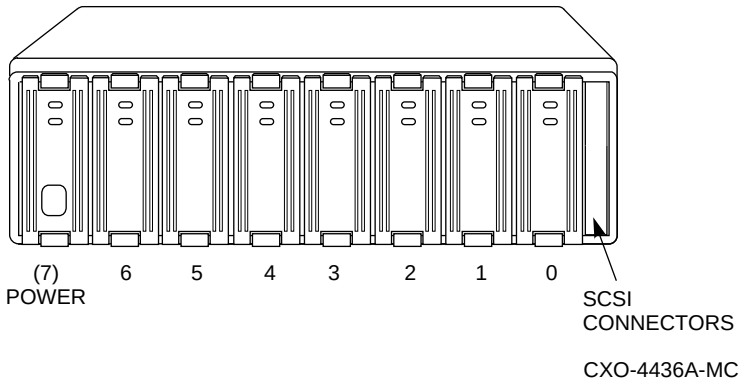
1.3 StorageWorks Shelves

The StorageWorks shelves, shown in Figure 1–4, fit into any enclosure that can accommodate a 445 millimeter (17.5 inch) device in either the horizontal or vertical position. The mounting bracket kits permit installing a shelf in either a data center cabinet with a metric mounting hole pattern, or an HSC™ controller cabinet with a Radio-Electronics-Television Manufacturer's Association (RETMA) mounting hole pattern. The shelf types include the following:

- The basic SBB shelf, shown in Figure 1–4, contains SBBs and power supplies
- The controller shelf, shown in Figure 1–5, contains SCSI bus controllers, cache memories, and power supplies.
- A controller and SBB shelf contains SCSI bus controllers, SBBs, and power supplies.

Figure 1–4 Typical SBB Shelf



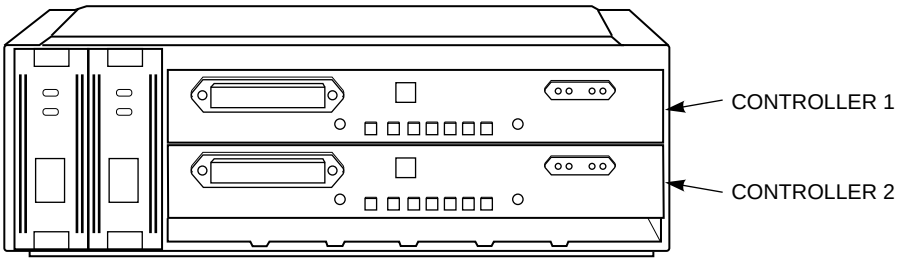
All of these shelves require either an ac or dc input power supply mounted in an SBB. The BA350–JA SBB shelf kit includes an ac power supply and the mounting hardware. See the individual shelf user's guide for a detailed description of a particular shelf.

1.4 StorageWorks Controllers

The controllers, shown in Figure 1–5, are the interface between the host computer and the SCSI devices. These controllers are not interchangeable and can be used only with a specific type host.

The function and purpose of the StorageWorks controllers are model specific. The controllers are mounted in special shelves such as the one shown in Figure 1–5.

Figure 1–5 Typical Controller Shelf



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1.5 StorageWorks Enclosures

StorageWorks enclosures are used for mounting SBBs or SBB shelves. The following enclosures can be used for StorageWorks products:

- 2–device 8/16-bit desktop box expansion unit for mounting two SBBs. The 2-device unit (BA362) holds up to two 3½-inch SBBs.
- 3–device, 8–bit desktop expansion unit (BA353–Ax series) for mounting SBBs for use with workstations and PCs as shown in Figure 1–6. The desktop storage expansion unit includes an internal power supply and does not require an SBB power supply.
- 5–device 8/16-bit desktop expansion unit, as shown in Figure 1–7, for mounting four SBBs. The 4-device unit (BA364) holds up to four 3½-inch SBBs and one fixed CD–ROM, or one 3½-inch SBB, one 5¼-inch SBB, and one fixed CD–ROM.
- Deskside expansion unit for mounting shelves such as the BA350–K*x* series similar to the one shown in Figure 1–8.
- Cabinets for mounting multiple SBB shelves and controller SBB shelves such as the 10-shelf departmental servers and the 24-shelf data center cabinets, shown in Figure 1–9. Each enclosure has a switch-controlled ac or dc power distribution unit. Cabinet shelf mounting brackets are available in either the RETMA or the metric mounting hole pattern.

Figure 1–6 3–Device, 8–Bit Desktop Expansion Unit

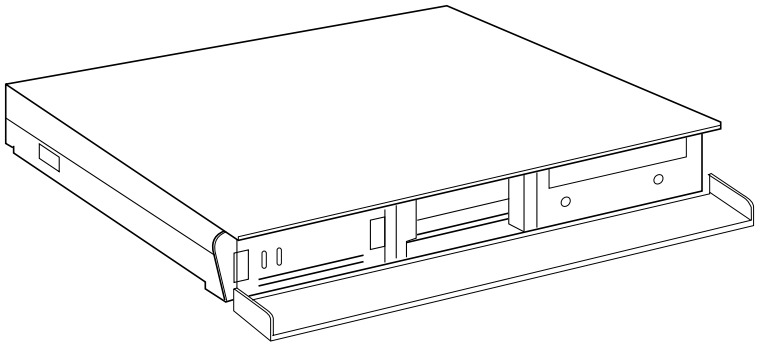

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Figure 1–7 2– and 5–Device, 8/16–Bit Desktop Expansion Units

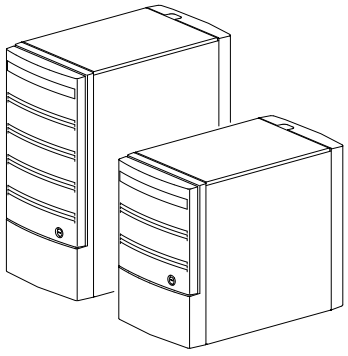

Figure 1–8 Typical Deskside Expansion Unit

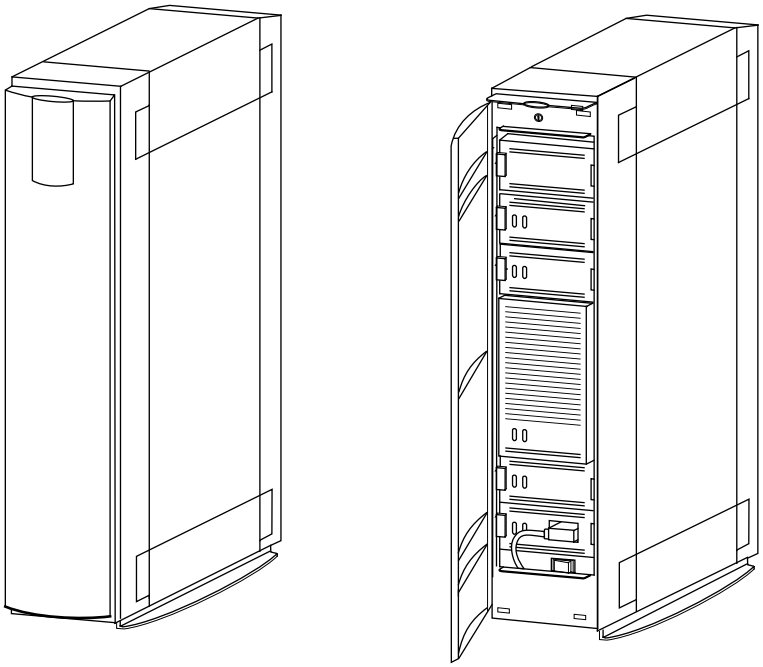

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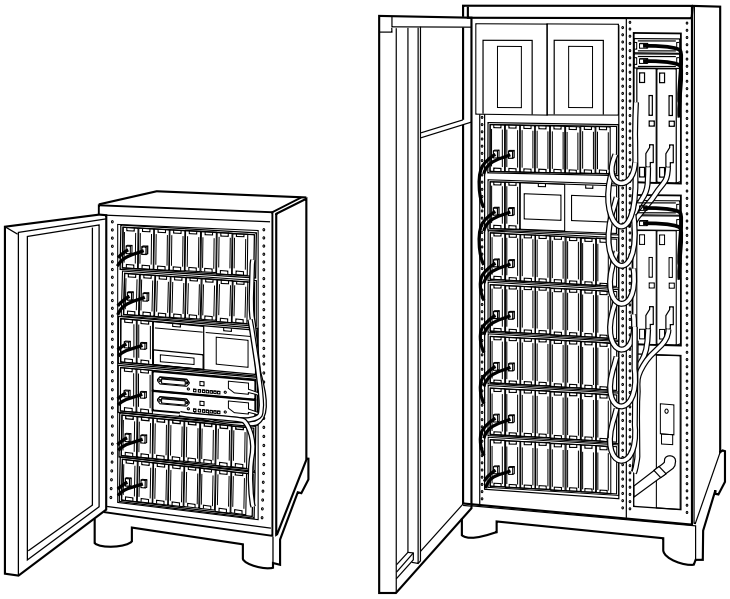
Figure 1–9 Typical 10–Shelf Departmental Server and 24–Shelf Data Center Cabinet



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1.6 Environmental Specifications

Table 1–1 lists the StorageWorks environmental specifications with which all StorageWorks products comply.

Table 1–1 StorageWorks Environmental Specifications

Condition	Specification
Optimum Operating Environment	
Temperature **Rate of Change**	+18° to +24° C (+65° to +75°F) 11°C (20°F) per hour
Relative Humidity	40% to 60% (noncondensing) with a step change of 10% or less (noncondensing)
Altitude	From sea level to 2400 m (8000 ft)
Air Quality	Maximum particle count .5 micron or larger, not to exceed 500,000 particles per cubic feet of air
Maximum Operating Environment Range	
Temperature	+10° to +40°C (+50° to +104°F) Derate 1.8°C for each 1000 m (1.0°F for each 1000 ft) of altitude Maximum temperature gradient 11°C/hr (52°F/hr) ± 2°C (4°F)
Inlet Air Volume	0.026 cubic m per second (50 cubic ft per minute)
Relative Humidity	10% to 90% (noncondensing) Maximum wet bulb temperature: 28°C (82°F) Minimum dew point: 2°C (36°F)
Maximum Non-operating Environmental Range	
Temperature	–40° to +66°C (–40° to +151°F) (During transportation and associated short-term storage)
Relative Humidity	8% to 95% in original shipping container (noncondensing) Otherwise, 50% (noncondensing)
Altitude	From –300 m (–1000 ft) to +3600 m (+12,000 ft) MSL

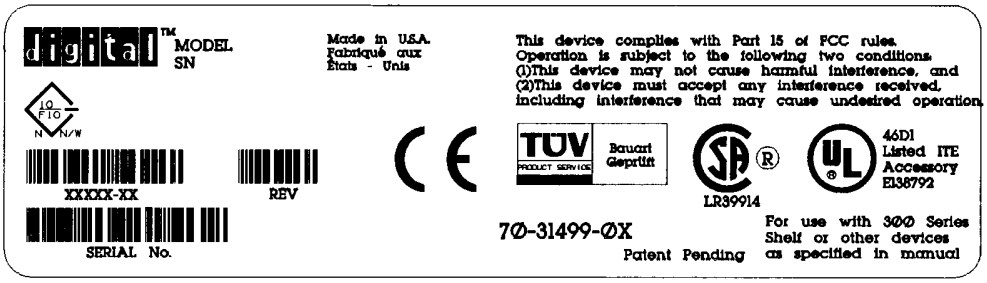
1.7 Device Certification and Qualification

Digital tests each storage device in an *approved* StorageWorks subsystem configuration (that is, controller, power supply, shelves, enclosure, cabling, and so forth) to determine compliance with country specific standards (for example, UL, FCC, CD Mark, CSA, and so forth) and with Digital environmental and acoustical standards.

It is how the device performs as part of the storage subsystem that determines the certification level. For example, a device installed in a deskside expansion unit (pedestal) may be in complete compliance with FCC Class B standards. However, installing the same device in a subsystem with any Class A component, such as either a data center cabinet (SW800-series) or a departmental server (SW500-series), makes it part of an FCC Class A subsystem.

To determine the qualifications of an SBB device, check the label shown in Figure 1–10.

Figure 1–10 Typical SBB Certification Label



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2

StorageWorks Storage Devices

This chapter contains descriptions of the StorageWorks storage devices. Check with your Digital account representative for availability of additional devices.

Note

No attempt has been made to define StorageWorks compatible third-party disk devices. Devices that meet the basic criteria defined in Table 2–1 may be installed in a modular carrier to create an SBB (StorageWorks building block).

Table 2–1 lists the general specifications for all StorageWorks devices.

Table 2–1 StorageWorks Storage Devices — General Description

Criteria	Description
Interface	The StorageWorks SCSI bus is SCSI–3 compliant. However, the shelves only support single-ended SCSI–2 devices.
Device size (form factor)	3½-inch full-height or low-profile, fixed or removable media devices. 5¼-inch half-height or full-height, fixed or removable media devices.
Power	The total power requirements for the devices in one shelf cannot exceed 150 watts. To make sure this requirement is met, devices must start-up sequentially at 4-second intervals.
Heat dissipation	The SBB shelf blowers provide sufficient air flow to cool devices mounted in an SBB.
SBB qualification	All Digital devices have been tested in an approved StorageWorks configuration (that is, shelf, enclosure, power supply, cabling, sequential device start-up at 4-second intervals, and so forth) and are in complete compliance with country-specific standards (for example, FCC, TÜV, CSA, and so forth) and with Digital standards. Customers are responsible for testing third-party devices for compliance with country-specific standards.

Information is presented in a tabular form and is organized by form factor, either 3½-inch or 5¼-inch, with their basic specifications (for example, capacity, media, transfer rate, rotational speed, and so forth). Detailed specifications are listed in the *Digital Systems and Options Catalog*. Typical 3½-inch and 5¼-inch devices are shown in Figures 2–1 and 2–2.

Figure 2–1 Typical 3½–Inch Device

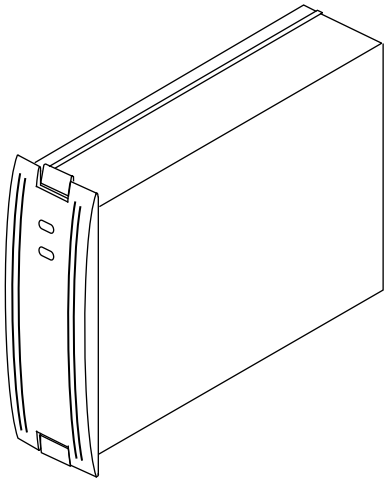

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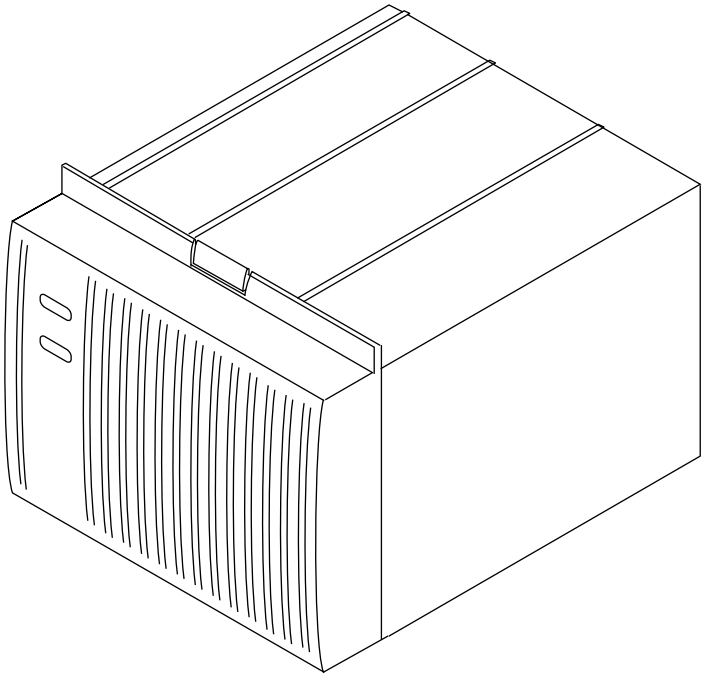
Figure 2–2 Typical 5¼–Inch Device



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2.1 Disk Drives

Tables 2–2 through 2–4 provide quick comparison charts of the available disk drives.

Table 2–2 8–Bit, 3½-Inch SCSI Disk Drives (–VA)

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
4412 RPM			
0.426 GB	RZ25	3.125	4
5400 RPM			
0.535 GB	RZ25L	2.6 - 4.4	10
1.05 GB	RZ26	3.3	10
1.05 GB	RZ26L	2.7 - 5.5	10
1.05 GB	RZ26N	4.2 - 7.1	10
2.10 GB	RZ28	2.7 - 5.5	10
2.10 GB	RZ28B	3.3 - 5.3	10
2.10 GB	RZ28M	4.5 - 7.8	10
7200 RPM			
2.10 GB	RZ28D	6.2 - 9.0	10
4.2 GB	RZ29B	.3 - 8.9	10

LEGEND

This can no longer be ordered.

Table 2–3 16–Bit, 3½-Inch SCSI Disk Drives (–VW)

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
5400 RPM			
1.05 GB	RZ26L	2.7 - 5.5	20
1.05 GB	RZ26N	4.2 - 7.1	20
2.10 GB	RZ28	2.7 - 5.5	20
2.10 GB	RZ28M	4.5 - 7.8	20
7200 RPM			
2.10 GB	RZ28D	6.2 - 9.0	20
4.2 GB	RZ29B	5.3 - 8.9	20

Table 2–4 8–Bit, 5¼-Inch SCSI Disk Drives (–VA)

		Transfer Rate (MB/s)	
Description	**Order No.**	**Media**	**SCSI Bus**
5400 RPM			
2.00 GB	RZ73	2.7	10
3.50 GB	RZ74	3.5- 5.5	10

LEGEND

This can no longer be ordered.

Caution

Do not operate 5¼-inch disk drives in the inverted position or the media may be damaged.

2.2 Optical Disk Drives

Table 2–5 provides a quick comparison chart of the available optical disk drives. All optical disk drives are mounted in 5¼-inch SBBs.

Table 2–5 StorageWorks Optical Disk Drives

		Transfer Rate (MB/s)	
Description	**Order No.**	**Media**	**SCSI Bus**
1.3 GB SCSI	RWZ52	Read: 1.6 Write: 0.8	5

2.3 Solid-State Disks

Table 2–6 provides a quick comparison chart of the available solid state disks. All solid State disks are half-height devices mounted in 5¼-inch SBBs.

Table 2–6 StorageWorks Solid State Disks (SSDs)

		Transfer Rate (MB/s)	
Description	**Order No.**	**Media**	**SCSI Bus**
107 MB SCSI	EZ51R–VA	2.2 to 2.5	10
428 MB SCSI	EZ54R–VA	2.2 to 2.5	10
856 MB SCSI	EZ58R–VA	2.2 to 2.5	10

2.4 Cartridge Tape Drives

Table 2–7 provides a quick comparison chart of the available StorageWorks cartridge tape drives.

Caution

Do not operate cartridge tape drives in the inverted position or the media may be damaged.

Table 2–7 StorageWorks Cartridge Tape Drives

		Transfer Rate	
Description	**Order No.**	**Media (KB/s)**	**SCSI Bus (MB/s)**
3½-Inch SBB			
4 GB 4 mm DAT SCSI	TLZ06–VA	366	4
4/8 GB 4 mm DAT SCSI	TLZ07–VA	405/810	4
5¼-Inch SBB-Full-Height Devices			
5 GB helical-scan SCSI	TKZ09–VA	500	4
6 GB DLT SCSI	TZ86–VA	800	5
20 GB DLT SCSI	TZ87–VA	800	5
20 GB DLT SCSI	TZ87N–VA	800	5
5¼-Inch SBB-Full-Height Tape Loaders			
46 GB RDAT SCSI (Capacity of 1 to 12 tape cartridges.)	TLZ6L–VA	500	4
32/96 GB 4 mm DAT SCSI (Capacity of 1 to 12 tape cartridges.)	TLZ7L–VA	366	4
5¼-Inch SBB-Half-Height Devices			
525 MB QIC SCSI	TKZ10–VA	200	3
525 MB QIC SCSI	TKZ10–VU	200	3
5/10 GB helical-scan SCSI	TKZ15–VA	500/1000	5

Table 2–7 (Cont'd) StorageWorks Cartridge Tape Drives

Description	Order No.	Transfer Rate	
		Media (KB/s)	SCSI Bus (MB/s)
5¼-Inch SBB-Half-Height Devices (Cont'd)			
5/10 GB helical-scan SCSI	TKZ15–VU	500/1000	5
2.5 GB QIC SCSI	TZK11–VA	300	3
2.5 GB QIC (Used only with desktop expansion unit.)	TZK11–VE	300	3
2.5 GB QIC SCSI (Second device for installation in an existing SBB.)	TZK11–VU	300	3

LEGEND
Capacity and transfer rates shown with a "/" mean noncompressed/compressed.

2.5 CD–ROMs

Table 2–8 provides a quick comparison chart of the available StorageWorks CD–ROM drives. All CD–ROM drives are 5¼-inch half-height or third-height devices and use the CD-ROM standard format.

Caution

Do not operate CD–ROM drives in the inverted position or the media may be damaged.

Table 2–8 StorageWorks CD–ROM Drives

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
600 MB	RRD42–VB	0.150	1.5
600 MB	RRD42–VE	0.150	1.5
600 MB	RRD42–VU	0.150	1.5
600 MB	RRD43–VA	0.300	4.2
600 MB (Three devices in a single SBB. Only available as a factory-configured device. CANNOT be installed in the field.)	RRD43–VC	0.300	4.2
600 MB	RRD43–VE	0.300	4.2
600 MB (Second device for installation in an existing SBB.)	RRD43–VU	0.300	4.2
600 MB	RRD44–VA	0.330	4.2
600 MB	RRD44–VE	0.330	4.2
600 MB (Second device for installation in an existing SBB.)	RRD44–VU	0.330	4.2

2.6 Magazine Tape Subsystems

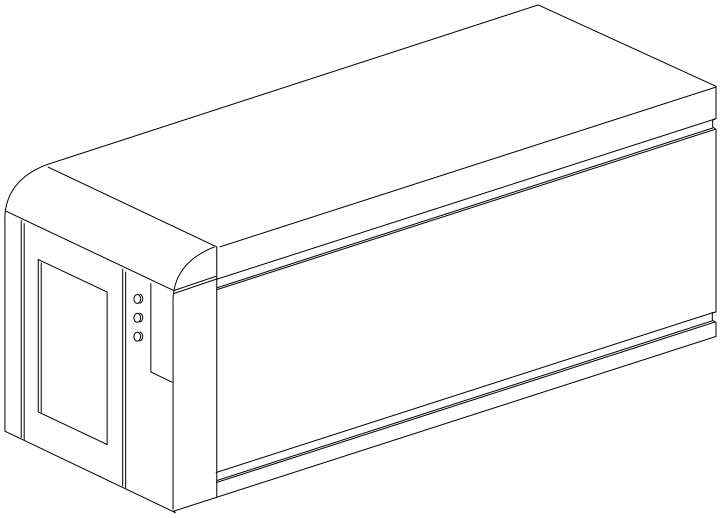
Both DIGITAL Linear Tape (DLT) magazine tape subsystems and StorageWorks devices can be installed in either a StorageWorks SW500-series or a SW800-series cabinet. The DLT magazine tape subsystems consist of the TZ8x7 tape loaders and the TZ875 mini-libraries. The TZ8x7 tape loaders are half-rack, full depth devices. The TZ875 mini-libraries are full-rack, half-depth devices. Table 2–9 lists the DLT magazine tape subsystems.

Table 2–9 StorageWorks DLT Magazine Tape Subsystems

		Transfer Rate (MB/s)	
Description	**Order No.**	**Media**	**SCSI Bus**
42 GB SCSI 7-cartridge	TZ867–AE	0.800	5
42 GB SCSI 7-cartridge	TZ867–AF	0.800	5
100 GB SCSI 10-cartridge	TZ875–AE	2.5	5
100 GB SCSI 10-cartridge	TZ875–NE	2.5	5
140 GB SCSI 7-cartridge	TZ877–AE	2.5	5
140 GB SCSI 7-cartridge	TZ877–AF	2.5	5

The TZ8x7 tape loaders, shown in Figure 2–3, are *always* installed in the top of the cabinet and extend the full depth of the cabinet. Installing one of these devices reduces the cabinet SBB shelf capacity by four shelves (two front; two rear). When the first device is installed, you must also modify the cabinet door for access to tapes by ordering and installing a tape loader door bezel (order number CK–SF400–TE).

Figure 2–3 Typical Tape Loader



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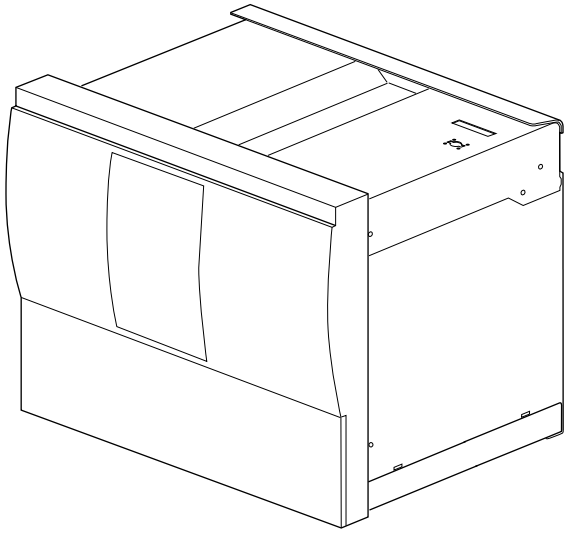
The TZ875 mini-libraries, shown in Figure 2–4, are *always* installed in the top of an SW500 cabinet; but, may be installed in any horizontal position in an SW800 cabinet. Installing a TZ875 mini-library reduces the cabinet SBB horizontal shelf capacity by two shelves. When each device is installed, you must also modify the cabinet door for access to tapes by installing a mini-library door bezel.

Figure 2–4 Typical Tape Mini–Library



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3

StorageWorks Shelves

StorageWorks provides five shelf models in three categories as follows:

- Storage device shelves (BA350–SB and BA356–SB)
- RAID shelves (BA355 and BA350–EA)
- Dual controller shelf (BA350–MB)

The storage device shelves and the RAID shelves each have one or more single-ended SCSI buses. The dual controller shelf has a special backplane for housing StorageWorks controllers. The differences between the storage device and the RAID shelves are the bus width, the number of storage devices supported, and the enclosures with which the shelves are compatible. These differences provide each shelf with characteristics that make it most suitable for a given configuration. Each shelf and the category to which it belongs is described in the following sections.

3.1 Storage Device Shelves

Storage device shelves contain a single ended SCSI bus that supports up to seven 3½-inch devices or two 5¼-inch devices. The bus can be split into two buses with one supporting up to four 3½-inch devices or one 5¼-inch device and the other bus supporting up to three 3½-inch devices or one 5¼-inch device. The storage device shelves are the following:

- 7-device 8-bit shelf (BA350–SB)
- 7-device 16-bit shelf (BA356–SB)

Figure 3–1 shows the BA350 shelf. It supports 8-bit transfers and a maximum SCSI data transfer rate of either 5 megabytes/second or 10 megabytes/second, depending on the total SCSI bus length.

Figure 3–1 BA350 SBB Shelf

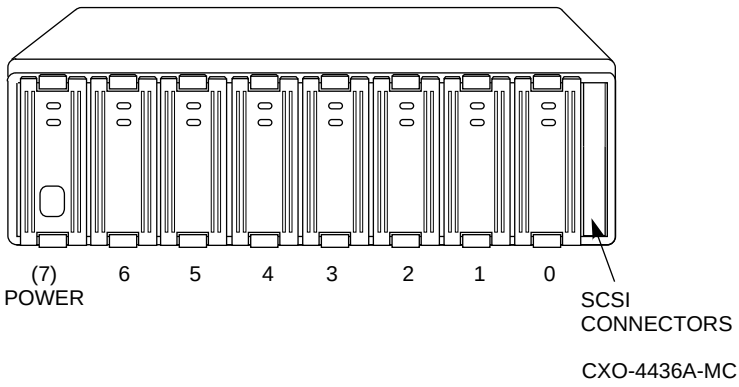
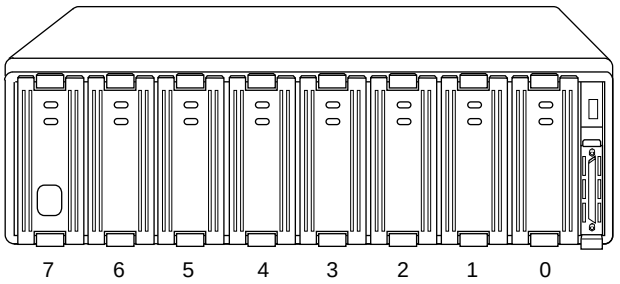


Figure 3–2 shows the BA356 shelf. It supports 16-bit transfers and a maximum SCSI data transfer rate of either 10 megabytes/second or 20 megabytes/second, depending on the total SCSI bus length.

Figure 3–2 BA356 SBB Shelf



Both models of the storage device shelf can be used in the following enclosures:

- SW500 Departmental Server Cabinet
- SW800 Data Center Cabinet
- Deskside Expansion Units

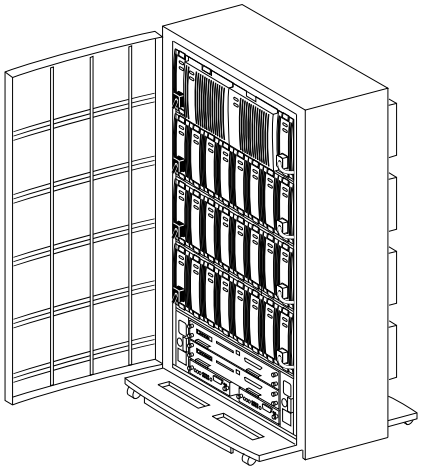
Each 8-bit shelf easily connects to an adjacent shelf with BN21H cables.

3.2 24–Device Raid Shelf

The 24-device RAID shelf (BA355) is shown mounted in a RAID Subsystem Deskside Enclosure in Figure 3–3. The shelf eliminates the need for device cables. All interconnections among devices are made via the shelf backplane. The shelf consists of four shelf rows, each providing mounting slots for up to six 3½-inch devices or two 5¼-inch devices. Located at the bottom of the BA355 shelf is an integrated controller shelf with six SCSI bus connections to the device shelves. Refer to the *StorageWorks Solutions SW300-Series RAID Enclosure Installation and User's Guide* for additional information.

This shelf is supported in the RAID enclosure (SW300) and the Data Center Cabinet (SW800).

Figure 3–3 BA355 Shelf



CXO-4268A-MC_R

3.3 Controller Shelves

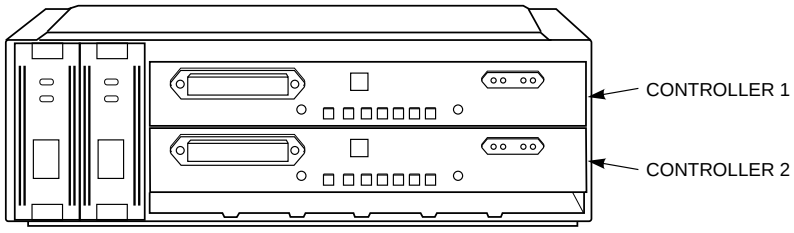
StorageWorks provides one controller shelf, the BA350-MA, which permits configuring of controllers and associated cache modules in either an independent controller or a dual redundant controller configuration. The BA350-MA supports the following StorageWorks controllers:

- HSJ
- HSD (except HSD05 and HSD10, which mount in SBB shelves)
- HSZ

Figure 3–4 shows the BA350-MA controller shelf with two controllers and two power supplies. It can be used in the following StorageWorks enclosures:

- SW500 Departmental Server Cabinet
- SW800 Data Center Cabinet

Figure 3–4 BA350–MA Controller Shelf



CXO-4964A-MC

3.4 Power Supplies

Table 3–10 lists the specifications for the StorageWorks power supplies. The StorageWorks power supplies are mounted in 3½-inch SBBs. The StorageWorks power supply is located in slot seven of a shelf as shown in Figure 3–1. A second StorageWorks power supply can be mounted in slot six if redundant shelf power is required. These power supplies also can be used in the 24–device RAID shelf.

Table 3–10 StorageWorks Power Supply Specifications

Specifications	BA35X–HF	BA35X–HB	BA35X–HG	BA35X–HC
Power Supply Type	ac input	dc input	dc input	Battery backup
Input ac voltage range	100–240 V ac	N/A	N/A	N/A
Input dc voltage range	N/A	36–72 V dc	36–72 V dc	12 V dc (Charging power from shelf power bus.)
ac input frequency range	50/60 Hz	N/A	N/A	N/A
Nominal dc voltage input	N/A	48 V dc	48 V dc	N/A
Autoranging feature	Yes	Yes	Yes	N/A
Output Voltages	12 V dc 5 V dc	12 V dc 5 V dc	12 V dc 5 V dc	12 V dc 5 V dc
Output power	150 W	131 W	150 W	200 W peak for 16, 32, or 64 seconds (user selectable)

4

StorageWorks Controllers and Servers

StorageWorks storage devices require connections to a SCSI–2 (Small Computer System Interface–2) bus for proper operation. Since host systems use different I/O buses or interconnects, StorageWorks provides a variety of controllers and servers to connect the SCSI bus to the I/O bus or interconnect of the host system. The controllers provide interfaces to the following host buses or interconnects:

- Computer Interconnect (CI™)
- Digital Storage Systems Interconnect (DSSI™)
- Differential Small Computer Systems Interconnect (SCSI)
- Fiber Distributed Data Interconnect (FDDI)

4.1 Computer Interconnect Interfaces

Interfaces to the CI are provided by the HSJ family of array controllers and by the HSC SCSI controller, commonly referred to as the K.scsi controller. The HSJ controllers are intelligent storage servers that integrate storage devices based on the SCSI-2 standard with the CI.

4.1.1 CI-to-SCSI Controller

Each CI-to-SCSI (HSJ) array controller:

- Complies with DSA (Digital Storage Architecture), to ensure reliable transmission of data in a cluster environment
- Includes support for up to 7 storage devices per SCSI port (6 storage devices if dual redundant power supplies are used in the device shelf)
- Comes standard with controller based RAID 0 (disk striping)
- Is compatible with host based RAID 1 and 5
- Supports 16 or 32 MB of read cache
- Is easily upgraded to new firmware revisions
- Meets the following regulatory approvals: FCC-A, UL, CSA, VDE, TÜV

HSJ array controllers must be installed in StorageWorks controller shelves. The controllers can be configured as follows:

- Independent—Each controller is installed in its own controller shelf.
- Dual redundant—Two controllers are installed in the same controller shelf. The controllers are connected to one another through the backplane and both have access to all storage devices. The HSJ42 and HSJ44 models are dual redundant controller configurations.

Table 4–1 lists the specifications for the HSJ controller models. Table 4–2 lists the storage devices supported by the HSJ family of array controllers.

Table 4–1 HSJ Controller Models—Specifications

Characteristic	Description
General Specifications	
Host interface	CI
Drive interface	Fast single-ended SCSI–2
Peak controller bandwidth (MB/s)	4.0
Operating system support (See software product description for latest operating system support.)	VAX VMS V5.5–1 or higher OpenVMS VAX 5.5–2 or higher OpenVMS Alpha 1.5
Supported Adapters	CIXCD–AB, AC (used with XMI-based systems) CIBCA–B*x* (used with BI-based systems) CI780 (used with SBI-based systems)
Compatible Shelves	BA355 BA350–M series
RAID levels supported	
Controller Based	Standard: RAID 0 (disk striping) Optional: RAID 1, 0 and 1, and RAID 5
Host Based	RAID 1 or RAID 5
HSJ30 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1
Device SCSI buses supported	3
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	18
Peak I/O request/s	>700
Upgradeable functionality (firmware)	Yes
Standard cache (MB)	16
Maximum cache (MB)	32
Controller shelves required	1
Device SCSI buses Supported	6
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	36
Peak I/O request/s	1100
Upgradeable firmware	Yes

.

Table 4–2 HSJ Family of Array Controllers—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
8-Bit Disk Drives (–VA)			
0.426 GB SCSI in 3½-inch SBB	RZ25	3.125	4
1.05 GB SCSI in 3½-inch SBB	RZ26	3.3	10
1.05 GB SCSI in 3½-inch SBB	RZ26L	2.7 - 5.5	10
2.10 GB SCSI drive in 3½-inch SBB	RZ28	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28B	3.3 - 5.3	10
4.2 GB SCSI in 3½-inch SBB	RZ29B	5.3 - 8.9	10
3.57 GB SCSI in 5¼-inch SBB	RZ74	6.2 - 9.0	10
Cartridge Tape Drives			
4 GB 4 mm DAT SCSI in 3½-inch SBB	TLZ06–VA	0.366	4
46 GB RDAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ6L–VA	0.500	4
4/8 GB SCSI 4mm DAT tape drive in 3½-inch SBB	TLZ07–VA	0.405/0.810	4
6 GB DLT SCSI half-height in 5¼-inch SBB	TZ86–VA	0.800	5
20 GB DLT SCSI half-height in 5¼-inch SBB	TZ87–VA	0.800	5
20 GB DLT SCSI half-height in 5¼-inch SBB	TZ87N–VA	0.800	5
20 GB DLT SCSI desk top	TZ87–TC	0.800	5
Magazine Tape Drives			
2 GB SCSI cartridge tape drive	TKZ60	10	5
42 GB SCSI half-rack, full-depth tape loader	TZ867	0.800	5
100 GB SCSI full-rack, half-depth tape mini-library	TZ875	2.5	5
140 MB dual-density reel-to-reel magnetic tape drive	TSZ07	0.625	4
2.6 TB (terabytes) native/5.2 TB compressed SCSI automated tape library	TL820	1.25 native 2.5 Com-pressed	10
CD–ROMs (–VA)			
600 MB SCSI in 5¼-inch SBB	RRD42	0.150	1.5
600 MB SCSI 5¼-inch SBB	RRD43	0.300	4.2
600 MB SCSI 5¼-inch SBB	RRD44	0.330	4.2
Solid State Disks (–VA)			
107 MB SCSI in 5¼-inch SBB	EZ51R	2.2 - 2.5	10
428 MB SCSI in 5¼-inch SBB	EZ54R	2.2 - 2.5	10
856 MB SCSI in 5¼-inch SBB	EZ58R	2.2 - 2.5	10
Optical Disk Drives (–VA)			
1.3 GB SCSI in 5¼-inch SBB	RWZ52	Read: 1.6 Write: 0.8	5

LEGEND

This can no longer be ordered.

4.1.2 CI-to-SCSI (HSC) Controller

The CI-to-SCSI (HSC) controller mounts in the HSC controller cabinets and provides support for up to seven SCSI ports. Table 4–3 lists the storage devices supported by the HSC SCSI controller.

Table 4–3 HSC SCSI Controller—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
8-Bit Disk Drives (–VA)			
1.05 GB SCSI in 3½-inch SBB	RZ26	3.3	10
1.05 GB SCSI in 3½-inch SBB	RZ26L	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28B	3.3 - 5.3	10
3.57 GB SCSI in 5¼-inch SBB	RZ74	6.2 - 9.0	10
16-Bit Disk Drives (-VW)			
4.2 GB SCSI in 3½-inch SBB	RZ29B	5.3 - 8.9	20
Cartridge Tape Drives (–VA)			
4 GB 4 mm DAT SCSI in 3½-inch SBB	TLZ06	0.366	4
46 GB RDAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ6L	0.500	4
6 GB DLT SCSI full-height in 5¼-inch SBB	TZ86	0.800	5
20 GB DLT SCSI full-height in 5¼-inch SBB	TZ87	0.800	5
20 GB DLT SCSI full-height in 5¼-inch SBB	TZ87N	0.800	5
5 GB helical-scan SCSI half-height in 5¼-inch SBB	TKZ09	0.500	4
4/8 GB 4 mm DAT SCSI in 3½-inch SBB	TLZ07	405/810	4
32/96 GB 4 mm DAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ7L	0.366	4
5/10 GB helical-scan SCSI half-height in 5¼-inch SBB	TKZ15	0.500/0.1000	5
Magazine Tape Drives			
200 - 800 MB SCSI automated tape library	STK4220	2.982	5
2 GB SCSI cartridge tape drive	TKZ60	10	5
140 MB dual-density reel-to-reel magnetic tape drive	TSZ07	0.625	4
0.52 TB native/1.04 TB compressed SCSI automated tape library	TL810	1.25 native 2.5 compressed	10
2.6 TB native/5.2 TB compressed SCSI automated tape library	TL820	1.25 native 2.5 compressed	10
100 GB SCSI full-rack, half-depth tape mini-library	TZ875	2.5	5
42 GB SCSI half-rack full-depth 7-cartridge tape loader	TZ867	0.800	5
140 GB SCSI half-rack, full-depth 7-cartridge tape loader	TZ877	2.5	5

(Continued on next page.)

LEGEND

This can no longer be ordered.

Table 4–3 (Cont'd) HSC SCSI Controller—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
Magazine Tape Drives			
200 - 800 MB SCSI automated tape library	STK4220	2.982	5
2 GB SCSI cartridge tape drive	TKZ60	10	5
140 MB dual-density reel-to-reel magnetic tape drive	TSZ07	0.625	4
0.52 TB native/1.04 TB compressed SCSI automated tape library	TL810	1.25 native 2.5 compressed	10
2.6 TB native/5.2 TB compressed SCSI automated tape library	TL820	1.25 native 2.5 compressed	10
100 GB SCSI full-rack, half-depth tape mini-library	TZ875	2.5	5
42 GB SCSI half-rack full-depth 7-cartridge tape loader	TZ867	0.800	5
140 GB SCSI half-rack, full-depth 7-cartridge tape loader	TZ877	2.5	5
Solid State Disks (–VA)			
107 MB SCSI in 5¼-inch SBB	EZ51R	2.2 to 2.5	10
428 MB SCSI in 5¼-inch SBB	EZ54R	2.2 to 2.5	10
856 MB SCSI in 5¼-inch SBB	EZ58R	2.2 to 2.5	10
CD ROM (–VA)			
600 MB in 5¼-inch SBB	RRD42	0.150	1.5
600 MB in 5¼-inch SBB	RRD43	0.300	4.2
600 MB in 5¼-inch SBB	RRD44	0.330	4.2
Optical (–VA)			
19 GB (formatted) single-drive optical library	RW524	Read: 1.0-1.6 Write: 0.33-0.53	5
38 GB (formatted) dual-drive optical library	RW530	Read: 1.0-1.6 Write: 0.33-0.53	5
104 GB (formatted) four-drive optical library	RW534	Read: 1.0-1.6 Write: 0.33-0.53	5
170 GB (formatted) four-drive optical library	RW536	Read: 1.0-1.6 Write: 0.33-0.53	5

4.2 Digital Standard Storage Interconnect Interfaces

Interfaces to the Digital Standard Storage Interconnect (DSSI) are provided by the HSD family of array controllers. HSD array controllers allow you to match the level of connectivity, performance and availability you need to connect to a host system that uses the DSSI. Table 4–4 lists the specifications for the HSD controller models. Table 4–5 provides a list of the storage devices supported by the HSD05 and HSD10 Array Controllers. Table 4–6 provides a list of the storage devices supported by the HSD30 Array Controller.

Table 4–4 HSD Controller Models—General Specifications

Characteristic	Description
General Specifications	
Host interface	DSSI
Drive interface	Fast single-ended SCSI–2
Upgradeability	HSD05: None HSD10: read cache HSD30: read or write-back cache
HSD05 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	0
Controller shelves required	Mounts in BA350-SB device shelf
SCSI buses	1
Maximum attached devices	7
Peak I/O request/s	500
Peak bandwidth (MB/s)	1.6
RAID levels supported	
Controller based	None
Host based	RAID level 0 RAID level 1 RAID level 5
Upgradeable functionality (firmware)	No
Operating system support	OpenVMS VAX V5.5–2 or higher OpenVMS Alpha V 1.5 or higher
Supported adapters	KFQSA KFMSZ KFESA KFDDA KFDDB Embedded (VAX/DEC 4000 Systems)
Compatible shelves	BA350–S series

(Continued on next page.)

Table 4–4 (Cont'd) HSD Controller Models—General Specifications

Characteristic	Description
HSD10 Specifications	
Standard cache (MB)	0 (HSD10–AA)
Maximum cache (MB)	32 (HSD10–AF)
Other cache available (MB)	16 (HSD10–AD)
Controller shelves required	Mounts in BA350-SB device shelf
SCSI buses	1
Maximum attached devices	7
Peak I/O request/s	1000
Peak bandwidth (MB/s)	3.0
RAID levels supported	
Controller based	RAID level 0
Host based	RAID level 0 RAID level 1 RAID level 5
Upgradeable firmware	Yes
Operating system support	OpenVMS VAX V5.5–2 or higher OpenVMS Alpha V 1.5 or higher
Supported adapters	KFQSA Embedded (VAX/DEC 4000 Systems) KFDDA KFDDB KFMSA KFESA
Compatible shelves	BA350–S series
HSD30 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
SCSI buses	3
Maximum attached devices	21
Peak I/O request/s	1000
Peak bandwidth (MB/s)	3.2
RAID levels supported	
Controller based	RAID level 0
Host based	RAID Level 1
Upgradeable firmware	Yes
Operating system support (See software product description for latest operating system support.)	OpenVMS VAX V5.5–2 or higher OpenVMS Alpha V1.5 or higher
Supported adapters	KFMSA KFESA SHAC-based embedded/native for various VAX and DEC systems Embedded/native adapter for DEC 4000™ systems
Compatible shelves	BA355 BA350–M series

Table 4–4 (Cont'd) HSD Controller Models—General Specifications

Characteristic	Description
HS1CP Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
SCSI buses	6
Maximum attached devices	42
Peak I/O request/s	1000
Peak bandwidth (MB/s)	3.2
RAID levels supported	All raid levels supported by V2.5
Upgradeable firmware	Yes
Operating system support (See software product description for latest operating system support.)	OpenVMS Alpha 6.2 or higher
Supported adapters	KFESA KFESB
Compatible shelves	BA350–M series

Table 4–5 HSD05 and HSD10 Array Controllers—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
8-Bit Disk Drives (–VA)			
1.05 GB SCSI in 3½-inch SBB	RZ26	3.3	10
1.05 GB SCSI in 3½-inch SBB	RZ26L	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28B	3.3 - 5.3	10
4.2 GB SCSI in 3½-inch SBB	RZ29B	5.3 - 8.9	10
2.00 GB SCSI in 5¼-inch SBB	RZ73	2.7	10
3.57 GB SCSI in 5¼-inch SBB	RZ74	3.5- 5.5	10
Cartridge Tape Drives (–VA)			
4 GB 4 mm DAT SCSI in 3½-inch SBB	TLZ06	0.366	4
46 GB RDAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ6L	0.500	4
4/8 GB SCSI 4mm DAT in 3½-inch SBB	TLZ07	0.405/0.810	4
32/96 GB 4 mm DAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ7L	0.366	4
6 GB DLT SCSI full-height in 5¼-inch SBB	TZ86	0.800	5
20 GB DLT SCSI half-height in 5¼-inch SBB	TZ87	0.800	5
CD–ROMs (–VA)			
600 MB SCSI in 5¼-inch SBB	RRD43	0.300	4.2
600 MB SCSI in 5¼-inch SBB	RRD44	0.330	4.2
Solid State Disks (–VA)			
107 MB SCSI in 5¼-inch SBB	EZ51R	2.2 - 2.5	10
428 MB SCSI in 5¼-inch SBB	EZ54R	2.2 - 2.5	10
Optical Disk Drives (–VA)			
1.3 GB SCSI in 5¼-inch SBB	RWZ52	Read: 1.6 Write: 0.8	5

LEGEND

This can no longer be ordered.

Table 4–6 HSD30 Array Controller—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
8-Bit Disk Drives (–VA)			
1.05 GB SCSI in 3½-inch SBB	RZ26	3.3	10
1.05 GB SCSI in 3½-inch SBB	RZ26L	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28B	3.3 - 5.3	10
4.2 GB SCSI in 3½-inch SBB	RZ29B	5.3 - 8.9	10
3.57 GB SCSI in 5¼-inch SBB	RZ74	6.2 - 9.0	10
Cartridge Tape Drives			
4 GB 4 mm DAT SCSI in 3½-inch SBB	TLZ06–VA	0.366	4
46 GB RDAT SCSI full-height loader in 5¼-inch SBB (Capacity of 1 to 12 tape cartridges.)	TLZ6L–VA	0.500	4
4/8 GB SCSI 4mm DAT in 3½-inch SBB	TLZ07–VA	0.405/0.810	4
140 MB dual-density reel-to-reel magnetic tape drive	TSZ07–VA	0.625	4
6 GB DLT SCSI full-height in 5.¼-inch SBB	TZ86–VA	0.800	5
20 GB SCSI DLT half-height in 5¼-inch SBB	TZ87–VA	0.800	5
20 GB SCSI DLT half-height in 5¼-inch SBB	TZ87N–VA	0.800	5
20 GB SCSI DLT desk top	TZ87-TC	0.800	5
Magazine Tape Drives			
2 GB SCSI cartridge tape drive	TKZ60	10	5
42 GB SCSI half-rack, full-depth tape loader	TZ867	0.800	5
100 GB SCSI full-rack, half-depth tape mini-library	TZ875	2.5	5
2.6 TB native/5.2 TB compressed SCSI automated tape library	TL820	1.25 native 2.5 Compressed	10
CD–ROMs (–VA)			
600 MB SCSI in 5¼-inch SBB	RRD42	0.150	1.5
600 MB SCSI in 5¼-inch SBB	RRD43	0.300	4.2
600 MB SCSI in 5¼-inch SBB	RRD44	0.330	4.2
Solid State Disks (–VA)			
107 MB SCSI in 5¼-inch SBB	EZ51R	2.2 - 2.5	10
428 MB SCSI in 5¼-inch SBB	EZ54R	2.2 - 2.5	10
856 MB SCSI in 5¼-inch SBB	EZ58R	2.2 - 2.5	10
Optical Disk Drives (–VA)			
1.3 GB SCSI in 5¼-inch SBB	RWZ52	Read: 1.6 Write: 0.8	5

LEGEND

This can no longer be ordered.

4.3 Differential Small Computer System Interconnect Interfaces

Interfaces to the Differential SCSI are provided by the HSZ family of array controllers. The HSZ family of array controllers connect a 20 MB/s Fast Wide Differential SCSI bus to StorageWorks devices attached to up to six independent 10 MB/s single ended fast SCSI buses. Table 4–7 lists the specifications for the HSZ array controllers. Table 4–8 provides a list of the industry standard disks and solid state disk devices supported by the HSZ40.

Table 4–7 HSZ Array Controllers—General Specifications

Characteristic	Description
General Specifications	
Host interface	SCSI (20 MB fast wide differential)
Drive interface	Fast single-ended SCSI–2
Operating system support	DEC OSF/1 for Alpha V3.2 or higher
Supported adapters	KZTSA KZMSA PMAZC KZPSA KZPAA
Compatible shelves	BA355 BA350–M series
HSZ40 Specifications	
Standard cache (MB)	None
Maximum cache (MB)	Read Cache — 16 or 32 MB optional Write-back Cache — Requires read cache as a prerequisite.
Controller shelves required	BA350-MA/MB shelf for SW500 and SW800 series enclosures.
SCSI buses	6
Maximum attached devices	42 (36 if configured with redundant controllers)
Peak I/O request/s	Read –Up to 1300 Write–Up to 900
Peak bandwidth	9 MB/s
RAID levels supported	RAID Level 0 standard. Digital's optional RAID implementation dynamically adapts to changes in I/O workload, offering enhanced performance with a wide variety of I/O loads.
Upgradeable firmware	Yes

(Continued on next page.)

Figure 4–7 (Cont'd) HSZ Array Controllers—General Specifications

Characteristic	Description
HSZ40B Specifications	
Standard cache (MB)	None
Maximum cache (MB)	Read Cache — 16 or 32 MB optional Write-back Cache — Requires read cache as a prerequisite.
Controller shelves required	BA350-MA/MB shelf for SW500 and SW800 series enclosures: Mounts directly into the SW300 RAID Expansion Cabinet
SCSI buses	6
Maximum attached devices	42 (36 if configured with redundant controllers)
Peak I/O request/s	Read –Up to 1300 Write–Up to 900
Peak bandwidth	9 MB/s
RAID levels supported	RAID Level 0 standard. Digital's optional RAID implementation dynamically adapts to changes in I/O workload, offering enhanced performance with a wide variety of I/O loads
Upgradeable firmware	Yes

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Table 4–8 HSZ40 Array Controller—Supported Storage Devices

Description	Order No.	Transfer Rate (MB/s)	
		Media	SCSI Bus
8-Bit Disk Drives (–VA)			
0.426 GB SCSI in 3½-inch SBB	RZ25	3.125	4
1.05 GB SCSI in 3½-inch SBB	RZ26	3.3	10
1.05 GB SCSI in 3½-inch SBB	RZ26L	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28	2.7 - 5.5	10
2.10 GB SCSI in 3½-inch SBB	RZ28B	3.3 - 5.3	10
4.2 GB SCSI in 3½-inch SBB	RZ29B	5.3 - 8.9	10
3.573½ GB SCSI in 5¼-inch SBB	RZ74	6.2 - 9.0	10
Solid State Disks (–VA)			
107 MB SCSI in 5¼-inch SBB	EZ51R	2.2 - 2.5	10
428 MB SCSI in 5¼-inch SBB	EZ54R	2.2 - 2.5	10
856 MB SCSI in 5¼-inch SBB	EZ58R	2.2 - 2.5	10

LEGEND

This can no longer be ordered.

4.4 Fiber Distributed Data Interconnect Interfaces

Interfaces to the fiber distributed data interconnect (FDDI) are provided by the FDDI servers. The FDDI servers connect Digital's Alpha technology with the StorageWorks family of storage devices. Table 4–9 lists the specifications for the HS servers.

Table 4–9 FDDI Server Specifications

Characteristic	Description
General Specifications	
Host interface	FDDI
Drive interface	Fast single-ended SCSI–2
Peak sever bandwidth (MB/s)	12
Compatible shelves	BA350–S series
RAID levels supported	
Controller based	RAID 0, RAID 1, RAID 0+1, RAID 5
Host based	RAID 1, RAID 1, RAID 5
HS111 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
Device SCSI buses supported	6
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	36
Peak I/O request/s	800
Operating system support	Open VMS Alpha V6.1 or higher (See software product description.)
Supported adapters	DEFEA, DEFPA, KFESA, KFESB
Upgradeable firmware	Yes
HS121 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
Device SCSI buses Supported	6
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	72
Peak I/O request/s	2100
Operating system support	Open VMS Alpha V6.1 or higher (See software product description.)
Supported adapters	DEFEA, DEFPA, KFESA, KFESB
Upgradeable firmware	Yes

Table 4–9 (Cont'd) FDDI Server Specifications

Characteristic	Description
HS211 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
Device SCSI buses Supported	6
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	36
Peak I/O request/s	800
Operating system support	Open VMS Alpha V6.2 (See software product description.)
Supported adapters	DEFPA, KFESB
Upgradeable firmware	Yes
HS221 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	1 (BA350–MA/MB)
Device SCSI buses Supported	6
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	36
Peak I/O request/s	2100
Operating system support	Open VMS Alpha V6.2 (See software product description.)
Supported adapters	DEFPA, KFESB
Upgradeable firmware	Yes
HS241 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	32
Controller shelves required	2 (BA350–MA/MB)
Device SCSI buses Supported	12
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	72
Peak I/O request/s	4300
Operating system support	Open VMS Alpha V6.2 (See software product description.)
Supported adapters	DEFPA, KFESB
Upgradeable firmware	Yes

Table 4–9 (Cont'd) FDDI Server Specifications

Characteristic	Description
HS280 Specifications	
Standard cache (MB)	0
Maximum cache (MB)	0
Controller shelves required	2 (BA350–MA/MB)
Device SCSI buses Supported	12
Maximum attached devices (Maximum recommended by Digital, allowing for upgrade to dual redundant power supplies.)	72
Peak I/O request/s	N/A
Operating system support	N/A (See software product description.)
Supported adapters	N/A
Upgradeable firmware	Yes

5

StorageWorks Enclosures

This chapter provides information on each of the following enclosures used with StorageWorks products:

- 2–device desktop expansion units (BA362-A*x*)
- 3–device, 8–bit desktop expansion unit (BA353-A*x*)
- 5–device desktop expansion units (BA364-A*x*)
- 7–device, 8–bit deskside expansion unit (BA350-K Series)
- 7–device, 16–bit deskside expansion unit (BA356-K Series)
- 9–device, 16–bit deskside expansion unit (BA346-K Series)
- 24–device, 8–bit RAID subsystem enclosure (SW300)
- 10–shelf departmental servers (SW500)
- 24–shelf data center cabinet (SW800)
- HSC server cabinet

5.1 3–Device, 8–Bit Desktop Expansion Unit

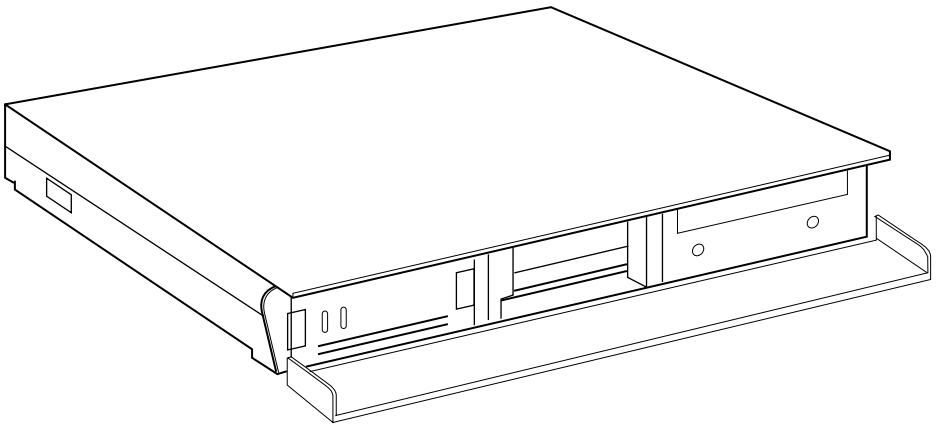
The 3–device, 8–bit desktop expansion unit (BA353–Ax), shown in Figure 5–1, adds storage capacity to high-end PCs, workstations, and desktop server applications. The desktop expansion unit's size, construction and lack of service area requirements allow it to be placed under a workstation. Because the desktop expansion unit is less than 6 cm (2.4-inches) high, the workstation's screen height and tilt angle remain virtually unchanged.

The desktop expansion unit has its own power and cooling system; a SCSI-2 host interface that connects to a personal computer, a workstation, or a server; a power switch; and a power outlet that can supply power to a second desktop expansion unit.

The desktop expansion unit accommodates three devices and supports the following maximum device configurations:

- One 5¼-inch SBB containing a TZK11, RRD42, RRD43, or RRD44, and two 3½-inch SBBs containing TLZ06-VA, TLZ07-VA, RX26-VA, or RZx–VA devices
- Three 3½-inch SBBs containing TLZ06-VA, TLZ07-VA, RX26-VA, or RZx–VA devices

Figure 5–1 3–Device, 8–Bit Desktop Expansion Unit



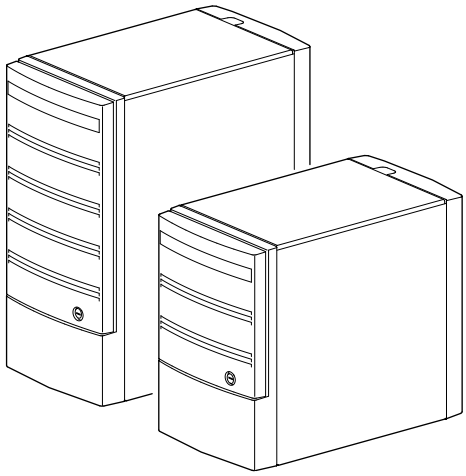
CXO-4963A-MC

5.2 2– and 5–Device 8/16–Bit Desktop Expansion Units

The 2– and 5–device desktop expansion units, BA362 and BA364, respectively, are shown in Figure 5–2. These units have the following characteristics, which are common to both units unless otherwise stated:

- The 2–device unit holds up to two, 3½-inch SBBs.
- The 5–device unit holds up to four, 3½-inch SBBs and one fixed CD–ROM; or one 3½-inch SBB, one 5¼-inch SBB, and one fixed CD–ROM.
- 16-bit SCSI data bus that accommodates either 8- or 16-bit devices.
- Address selection switch for each port.
- Internal cooling fan.
- Internal power supply.
- 120 V ac or 240 V ac power.
- Stackable, using BA36X-AA stacking kit.

Figure 5–2 2– and 5–Device Desktop Expansion Units

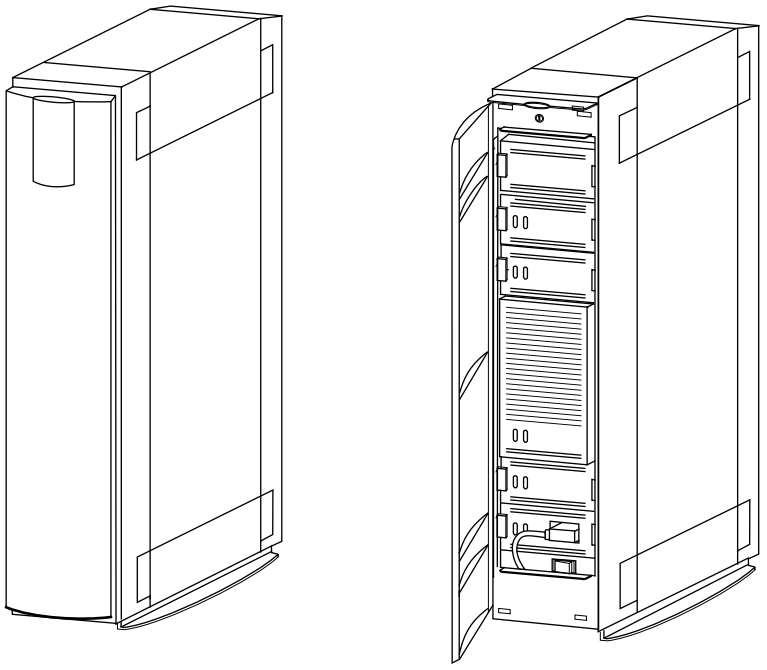


5.3 7–Device Deskside Expansion Unit

The deskside expansion unit, shown in Figure 1–8, has the following characteristics:

- The unit has an ac distribution unit that provides switch-controlled input voltages to the shelf power supplies.
- The unit has a switched ac outlet for connecting to a second expansion unit (Note: no more than two units should be powered from the same wall receptacle).
- The unit is portable and can be installed without a front or rear service area.
- Slot 6 is normally reserved for either a redundant power supply or a BBU.
- The unit holds either a BA350–SB device shelf or a BA356–SB device shelf.
- The unit includes the BA35X–VA pedestal mounting kit.

Figure 5–3 Deskside Expansion Unit



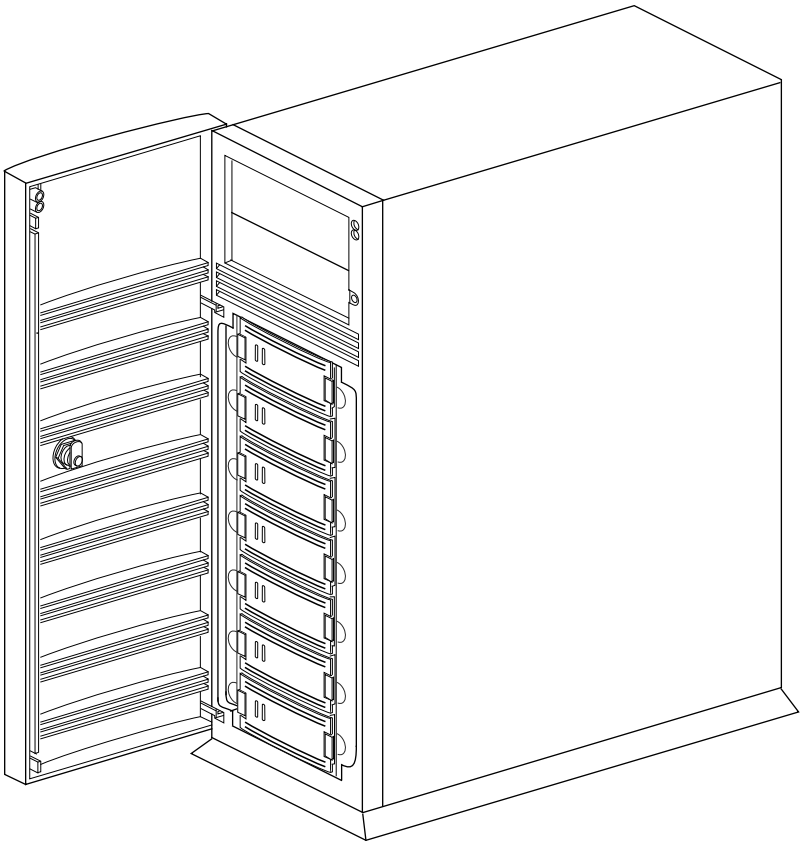
CXO-4371A-MC

5.4 9–Device, 16–Bit Deskside Expansion Unit

The 9–device, 16–bit deskside expansion unit, shown in Figure 5–4, has the following characteristics:

- Single-ended, 8-bit or 16-bit, SCSI–2 bus
- Capacity of seven, 3½-inch SBBs, plus two, 5¼-inch, half-height SBBs.
- 68-pin, high-density input and output connectors
- ac power supply (switch selectable input 50 to 60 Hz, 115 to 240 V ac
- Cooling fan
- Jumper selectable SCSI address configurations
- Active SCSI bus termination

Figure 5–4 9–Device, 16–Bit Deskside Expansion Unit



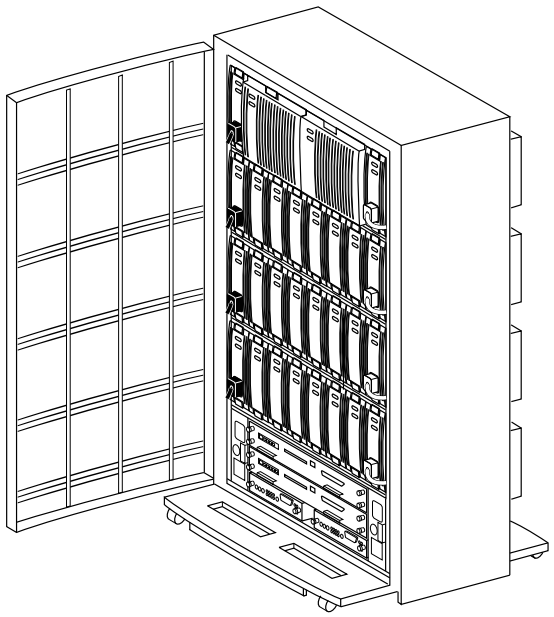
CXO-4552A-MC

5.5 24–Device, 8–Bit RAID Subsystem Enclosure (SW300)

The 24–device, 8–bit RAID subsystem enclosure (SW300 RAID enclosure), shown in Figure 5–5, houses devices and controllers in a 24-device, 8-bit RAID shelf. The SW300 RAID enclosure requires 120 V ac, 60 Hz, or 240 V ac, 50 Hz, single-phase power. The SW300 RAID enclosure has the following features:

- Environmental monitor
- AC Power entry box
- N+1 power redundancy using only 5 power supplies
- Full power redundancy using 8 power supplies
- Eight dual-speed blowers
- Mounting for 24, 3½-inch SBBs or 8, 5¼-inch SBBs.
- Mounting for two HSJ family, HSZ family, or HSD family array controllers and cache modules. The HSD05 and HSD10 are not included as they mount in SBB shelves.

Figure 5–5 24–Device, 8–Bit RAID Subsystem Enclosure (SW300)



CXO-4268A-MC_R

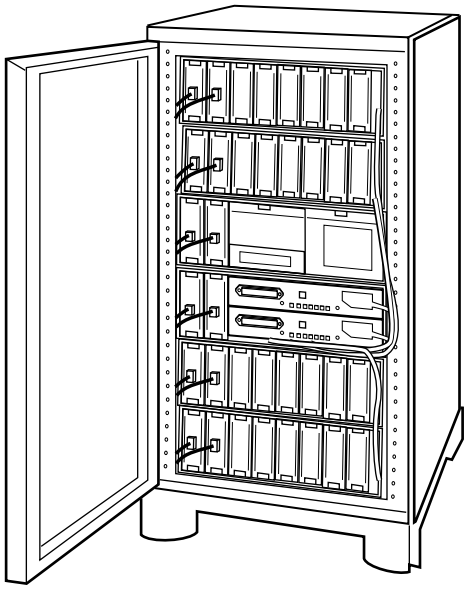
5.6 10–Shelf Departmental Servers (SW500)

The 10–shelf departmental servers (SW500 cabinet), shown in Figure 5–6, requires 120 V ac, 60 Hz, or 240 V ac, 50 Hz, single-phase power and is capable of holding the following shelves or tape subsystems:

- Ten device shelves: BA350-SB or BA356-SB
- Nine device shelves and one controller shelf (BA350-MB)
- Eight device shelves and two controller shelves
- Five device shelves, one controller shelf, and two TZ8*xx* magazine tape subsystems.

The actual number of devices supported in the SW500 cabinet is a function of the number of hosts accessing the SW500 cabinet, and the number of SCSI channels supported by each host or controller.

Figure 5–6 10–Shelf Departmental Servers (SW500)



CXO-4965A-MC

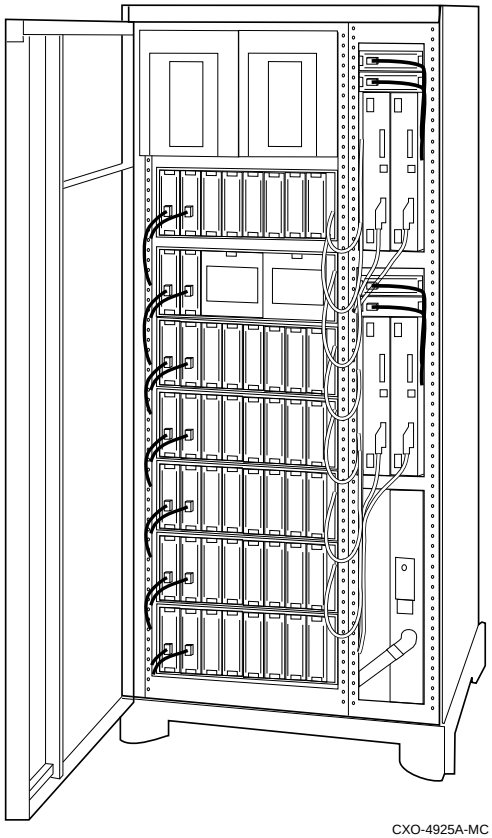
5.7 24–Shelf Data Center Cabinet (SW800)

The 24–Shelf Data Center Cabinet (SW800 cabinet), shown in Figure 5–7, requires 120/208 V ac, 60 Hz, or 240/416 V ac, 50 Hz, three-phase power and is capable of holding the following shelves or tape subsystems:

- Twenty-four device shelves (BA350-SB)
- Twenty-two device shelves and two controller shelves (BA350-MB)
- Twenty device shelves and four controller shelves
- Sixteen device shelves, two controller shelves, and two TZ8*xx* magazine tape subsystems
- Twelve device shelves, two controller shelves, and four TZ8*xx* magazine tape subsystems
- Twelve device shelves, four controller shelves, and four TZ8*xx* magazine tape subsystems
- Each TZ875 mini-library reduces the cabinet horizontal SBB shelf capacity by two shelves
- A fan tray reduces the cabinet horizontal SBB shelf capacity by one shelf

The actual number of devices supported in the SW800 cabinet is a function of the number of hosts accessing the SW800 cabinet, and the number of SCSI channels supported by each host or controller.

Figure 5–7 24–Shelf Data Center Cabinet (SW800)



CXO-4925A-MC

5.8 HSC Server Cabinet

The HSC server cabinets used with the HSC40, 60, 65, 70, 90, or 95 can be updated with up to four storage device shelves (BA350–SB). The HSC must have a SCSI Data Channel Card installed to support the devices mounted in the shelves.

6

StorageWorks Cables

The process for selecting SCSI cables is basically the same whether or not the host system is a Digital system. All you have to do is determine the cable length.

For a non-Digital system, you must refer to the host system and controller documentation and determine the following:

- The SCSI adapter or controller type
- The SCSI connector pin configuration (50-pin or 68-pin)
- The connector configuration (straight, right-angle) and latching mechanism (thumb latches, thumb screws, bale locks, and so forth)
- The controller bus speed (fast [10 MB/s or 20 MB/s] or slow [5 MB /s])

For all host systems you must then calculate the maximum SCSI bus cable length. This is the difference between the maximum SCSI bus length, which is determined by the bus speed, and the total of the following:

- The SCSI bus length between the controller terminator and the controller cable connector
- The SCSI bus length between the shelf input connector and either the shelf terminator or shelf output connector
- The special cables
- The cables connecting the SBB shelves

The *maximum* length of the fast and slow buses, including all cables and shelf buses, is shown in Table 6–1. All bus lengths are rounded off to the nearest tenth of a unit.

It is recommended that you select the shortest cable possible to connect the host to the StorageWorks subsystem.

Table 6–1 SCSI Bus Parameters

Bus Type	Transfer Rate	Meters	Feet
8-bit, single-ended	5 MB/s	6.0	19.7
8-bit, single-ended	10 MB/s	3.0	9.8
8-bit, differential	10 MB/s	25.0	9.8
16-bit, single-ended	20 MB/s	3.0	9.8
16-bit, differential	20 MB/s	25.0	82.0

6.1 SCSI Cable Connectors

All 8-bit BA35x SBB shelves have two SCSI, 50-pin, high-density, female connectors. Only cables, such as the BN21H-series, with a SCSI 50-pin, high-density, male, straight connector can be attached to the SBB shelves. The BN-series StorageWorks SCSI cables are built to SCSI–3 specifications and operate reliably as part of either a fast or slow bus.

The 16-bit shelf (BA356) has two SCSI, 68-pin, high-density, female connectors. Only cables, such as the BN21K and BN21L, with SCSI, 68-pin, high-density, male connectors can be attached to the BA356 shelf. The BN-series StorageWorks SCSI cables are built to SCSI–3 specifications and operate reliably as part of either a fast or slow bus.

Controllers can have both 50-pin, high-density, female connectors and 68-pin, high density, female connectors. Only connectors with a 50-pin, high-density, male, straight connector or a 68-pin, high-density, right-angle connector can be attached to the StorageWorks controller shelves.

Other controllers, converters, or adapters not listed in this manual may require different cables.

6.2 StorageWorks Shelf SCSI Cables

All the StorageWorks shelves and expansion units, such as the BA350–KB deskside expansion unit and the BA353–Ax desktop expansion unit, have SCSI single-ended, 50-pin, highdensity, female, straight connectors. Only cables with a 50-pin, high-density, male, straight connectors, such as found on the BN21H-series cables, can be used.

The following sections contain detailed descriptions of the compatible SCSI cables, to include connectors, typical use, and lengths:

- SCSI–2, 50-conductor, single-ended cables—Section 6.3
- SCSI–3, 68-conductor, differential cables—Section 6.4
- SCSI–2 and SCSI–3 special purpose cables, such as "Y" cables, trilink connectors, and terminator blocks—Section 6.5

6.3 SCSI 8–Bit Single–Ended Cables

The BA350 SBB shelf SCSI bus is an 8-bit wide, single-ended bus with two 50-pin, high-density, female connectors (JA1 and JB1). The compatible cable for these connectors is a 50-conductor cable with a 50-pin, high-density, shielded male, straight connector with thumb latches (also known as squeeze-to-release latches). This combination of conductors and connectors is a SCSI single-ended cable.

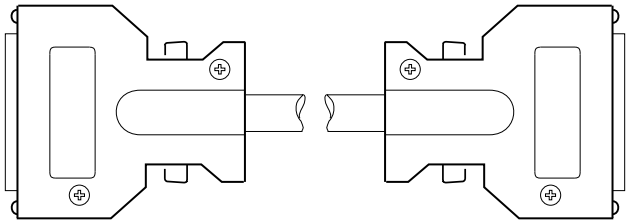
The primary difference between the single-ended cables is the connectors. The following sections describe the different types of SCSI single-ended cables that are compatible with the SBB shelves.

6.3.1 BN21H-Series SCSI Single-Ended Cables

The BN21H-series cables are shown and described in Table 6–2. These cables are typically used to connect SBB shelves to the following:

- Other SBB shelves
- SCSI adapters, such as the following:
  - KZMSA, an XMI to SCSI adapter
  - PMAZ–AA and PMAZ–AB
  - K.scsi

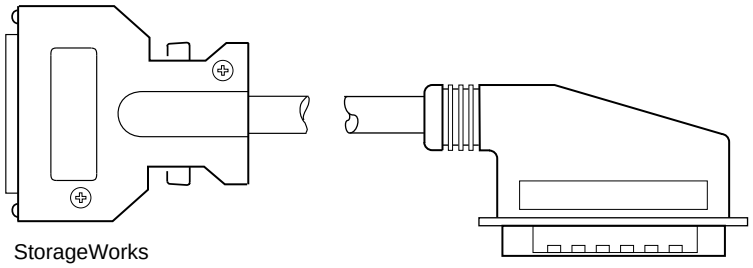
Table 6–2 BN21H Series Cables

Cable Description	Meters	Feet	Order No
			
Standard cable, 50-conductor	0.3	1.0	BN21H–0C
Two 50-pin, high-density, male, straight connectors	0.5	1.6	BN21H–0E
with thumb latches	1.0	3.3	BN21H–01
	1.5	4.8	BN21H–1E
	2.0	6.5	BN21H–02
	3.0	9.8	BN21H–03
	5.0	16.4	BN21H–05

6.3.2 BN21R-Series SCSI Single-Ended Cables

The BN21R-series single-ended cables are shown and described in Table 6–3. These cables are typically used to connect a StorageWorks shelf to a 50-pin, low-density receptacle, such as that used by the DEC 4000 model 610 Alpha distributed/departmental server.

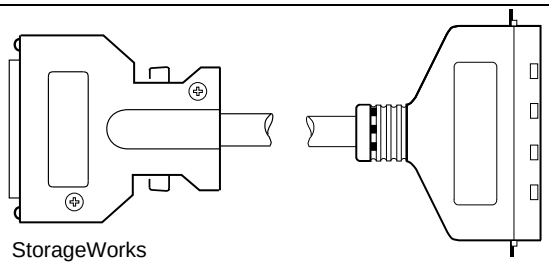
Table 6–3 BN21R-Series Cables

Cable Description	Meters	Feet	Order No
			
Adapter cable, 50-conductor	0.5	1.6	BN21R–0E
• One 50-pin, high-density, male, straight connector with thumb latches	1.0	3.3	BN21R–01
	2.0	6.5	BN21R–02
• One 50-pin, low-density, male, right-angle connector	3.0	9.8	BN21R–03
	5.0	16.4	BN21R–05

6.3.3 BN23G-Series Cables SCSI Single-Ended Cables

The BN23G-series cables are shown and described in Table 6–4. These cables allow you to connect SCSI devices that have different density, 50-pin connectors. The BN23G-series cables are typically used to connect SBB shelves to SCSI adapter cards in personal computers and workstations.

Table 6–4 BN23G-Series Cables

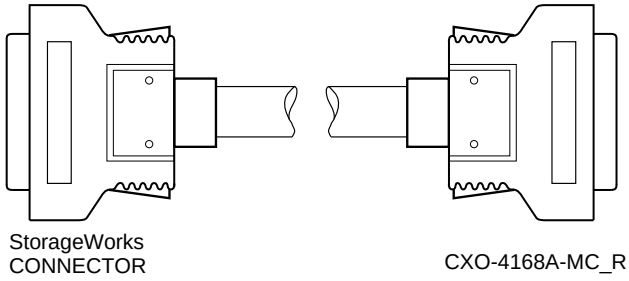
Cable Description	Meters	Feet	Order No
			
Adapter cable, 50-conductor	0.5	1.7	BN23G–0E
• One 50-pin, high-density, straight connector with thumb latches	1	3.3	BN23G–01
	2	6.6	BN23G–02
• One 50-pin, low-density, straight connector with bail locks	3	9.9	BN23G–03
	5	15.5	BN23G–05

6.3.4 BC10U-Series SCSI Single-Ended Cables

The BC10U-series single-ended cables are shown and described in Table 6–5. The BC10U-series cables are used *only* with Alpha systems with the BA655 SCSI plug-in unit (PIU). *Do not* use this SCSI cable in any other configuration. These cables are typically used to connect SBB shelves to the following:

- Other SBB shelves
- KZMSA, an XMI to SCSI adapter

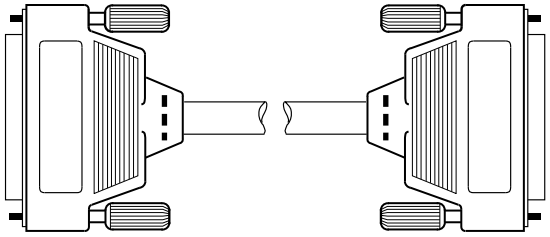
Table 6–5 BC10U-Series Cables

Cable Description	Meters	Feet	Order No
			
Alpha DEC 7000 and DEC 1000 SCSI cable, 50-conductor Two 50-pin, high-density, male, straight connectors with thumb latches	2.0 3.0 5.0	6.5 9.8 16.4	BC10U–02 BC10U–03 BC10U–05

6.3.5 BN31A-Series HSC Controller Single-Ended Cable

The BN31A-series HSC controller single-ended cable is shown and described in Table 6–6. This cable is used only with the HSR95 model HSC controllers.

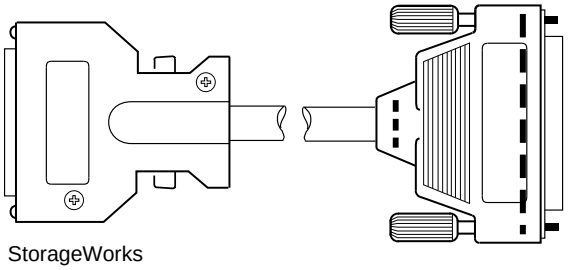
Table 6–6 BN31A-Series Cable

Cable Description	Meters	Feet	Order No
			
HSC controller to HSC controller cable, 50-conductor Two 50-pin, high-density, male, straight connectors with thumbscrews	2.0	6.5	BN31A–02

6.3.6 BN31B Series HSC Controller single-ended Cables

The BN31B-series HSC controller single-ended cable is shown and described in Table 6–7.

Table 6–7 BN31B-Series Cables

Cable Description	Meters	Feet	Order No
			
HSC controller to StorageWorks shelf cable, 50-conductor • One 50-pin, high-density, male, straight connector with thumb latches • One 50-pin, high-density, male, straight connector with thumb screws	2.0 3.0	6.5 9.8	BN31B–02 BN31B–03

6.4 SCSI Differential Cables/16–Bit Single–Ended

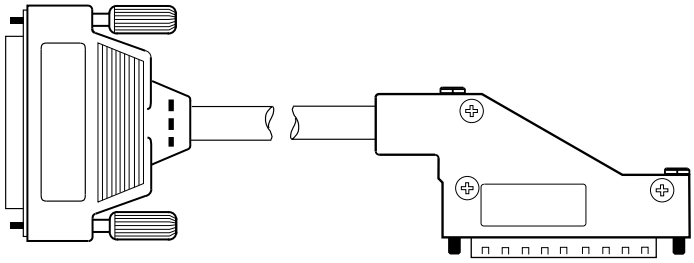
Many host computers use the differential SCSI bus. The controller or SCSI signal converters use a 68-conductor, differential cable. The same cable is used for 16–bit single–ended buses. A 16-bit BA356 shelf will use one of these cables.

The primary difference between the cables is the connectors. The following sections describe the different types of SCSI differential/16–bit single–ended cables.

6.4.1 BN21K-Series SCSI Cables

The BN21K-series SCSI cables are shown and described in Table 6–8. These cables are typically used to connect a StorageWorks controller shelf to a host SCSI adapter, such as the KZTSA or a K.scsi.

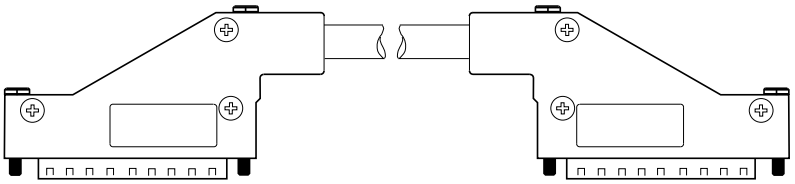
Table 6–8 BN21K-Series Cables

Cable Description	Meters	Feet	Order No
 CXO-4171A-MC_R			
Standard cable, 68-conductor with the following connectors:	1.0	3.3	BN21K–01
	1.5	4.9	BN21K–1E
• One 68-pin, high-density, male, straight connector with jackscrew (thumbscrew) fasteners	2.0	6.5	BN21K–02
	3.0	9.8	BN21K–03
• One 68-pin, high-density, male, right-angle connector with screw fasteners	5.0	16.4	BN21K–05
	8.0	26.2	BN21K–08
	10.0	32.8	BN21K–10
	15.0	49.2	BN21K–15
	20.0	65.6	BN21K–20
	23.0	75.5	BN21K–23

6.4.2 BN21L-Series SCSI Cables

The BN21L-series SCSI cables are shown and described in Table 6–9. The BN21L-series cables are typically used to connect a StorageWorks controller to another controller, or a controller to a SCSI converter when there is not enough clearance to use a straight connector.

Table 6–9 SCSI 16-Bit Cable Specifications

Cable Description	Meters	Feet	Order No
 CXO-4172A-MC_R			
Standard cable, 68-conductor with two 68-pin, high - density, right-angle connectors with screw fasteners.	0.3	0.5	BN21L–0B
	0.5	1.6	BN21L–0E
	1.0	3.3	BN21L–01
	2.0	6.5	BN21L–02
	3.0	9.8	BN21L–03
	5.0	16.4	BN21L–05
	10.0	32.8	BN21L–10
	15.0	49.2	BN21L–15
	20.0	65.6	BN21L–20

6.5 Special SCSI Cables

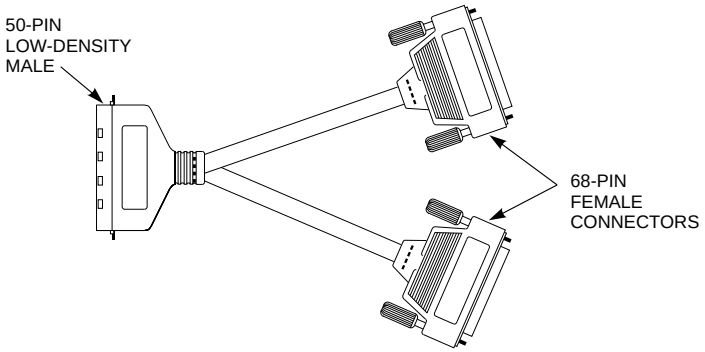
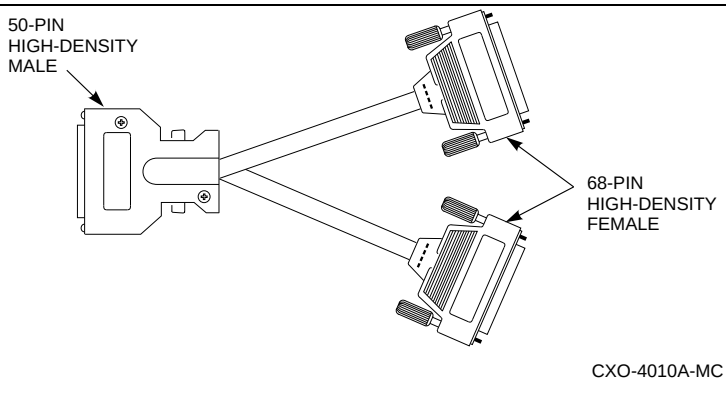
There are many compatible SCSI devices that cannot be connected together using the standard SCSI single-ended or differential cables. In some special cases there is a requirement to connect a SCSI adapter to multiple controllers, place a device in the middle of the bus, or other special configurations. Most of these cases can be handled using a trilink connector block (a "Y" connector) or a "Y" cable.

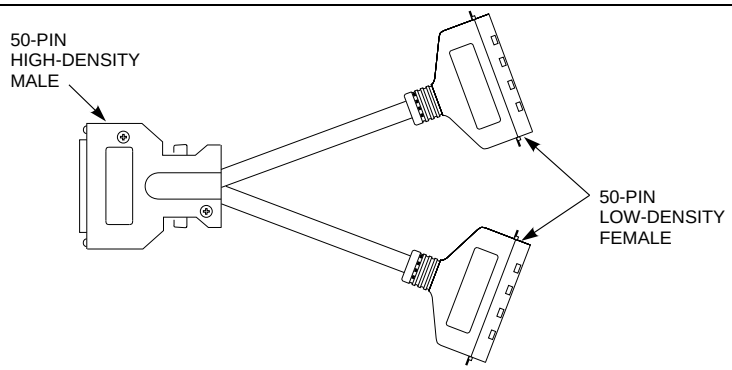
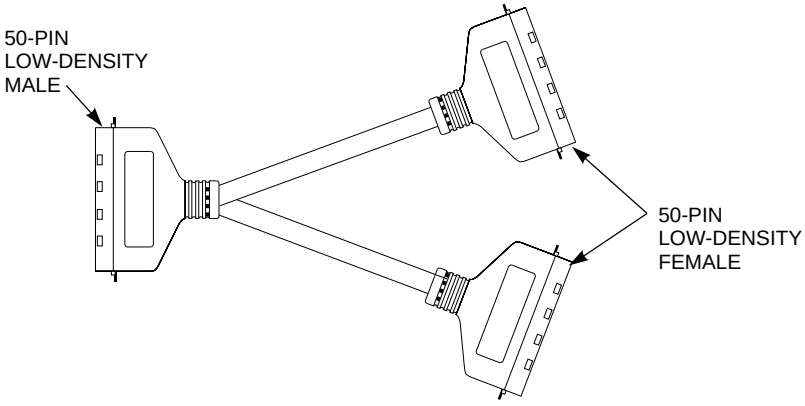
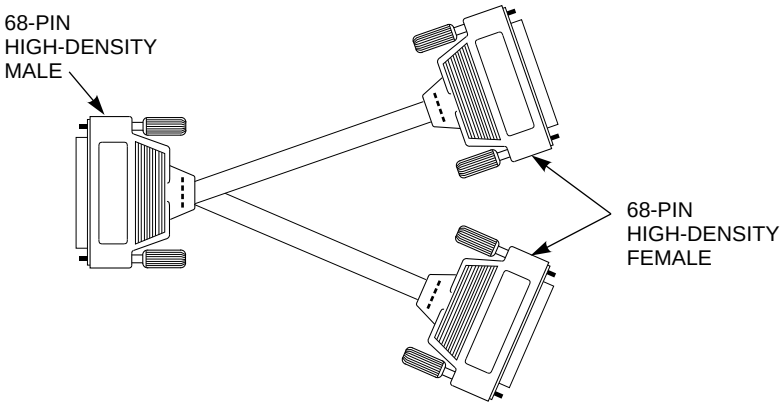
Table 6–10 lists the StorageWorks-compatible adapter SCSI cables by *function* (listed alphabetically).

Note

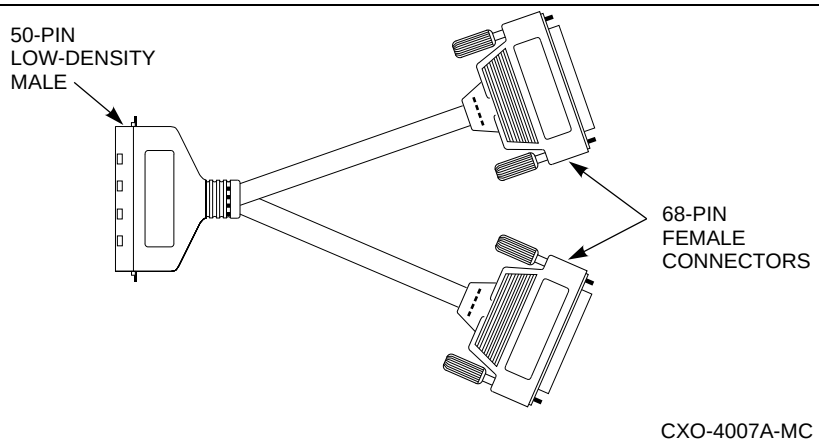
The length of all "–0B" "Y" adapter cables is 0.15 meters (6 inches).

Table 6–10 Selecting a "Y" SCSI Cable

To do this	Order Number
Connect a 68-pin, high-density (operating in the 8-bit mode) cable to a 50-pin low-density connector.	BN21P–0B
	
Connect a 68-pin, high-density (operating in the 8-bit mode) cable connector to a 50-pin, high-density connector, such as an HSZ-series) single-ended controller connector. Use with Sun Microsystems® or Hewlett-Packard® systems.	BN21X–0B
	

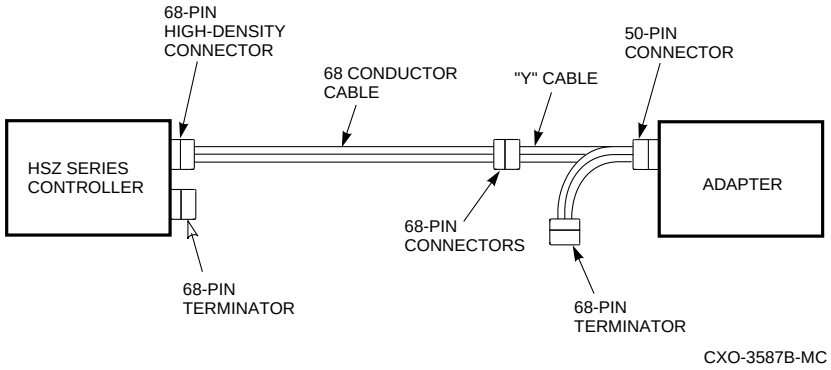
To do this	Order Number
Connect a *high-availability* OSF™ configuration host cables, such as an ULTRIX™ system, to a StorageWorks shelf.	BN21V–0B .
 CXO-4008A-MC	
Connect an OSF configuration host cable to a StorageWorks shelf.	BN21Y–0B
 CXO-4011A-MC	
Connect a second host cable to a KZTSA SCSI host adapter.	BN21W–0B
 CXO-4009A-MC	

To do this	Order Number
Remove an HSZ-series controller from the end-bus position without interrupting the bus. You *also must* use a 68-pin, differential, terminator block (H879–AA).	BN21P–0B .



As shown in Figure 6–8, you can adapt a 68-pin, differential cable to a 50-pin, single-ended connector simply by connecting a "Y" cable, 68-pin, female connector to the male cable connector. By installing the differential terminator block in the other 68-pin "Y" cable connector, you now could disconnect the "Y" cable to the adapter without interrupting the SCSI bus because the differential terminal block in the "Y" cable now terminates the bus.

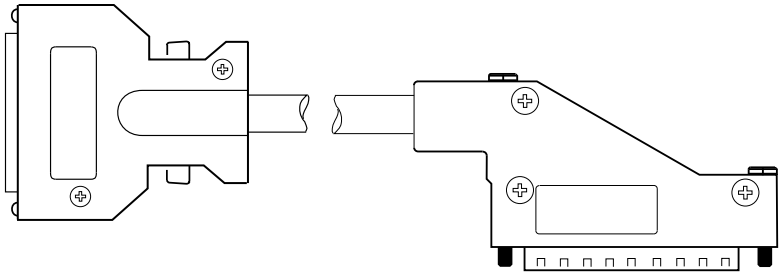
Figure 6–8 Typical “Y” Cable Connection



6.6. BN21N-Series SCSI Transition Cables

The BN21N-series SCSI transition cables are shown and described in Table 6–11.

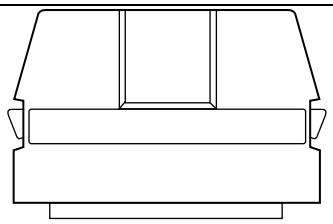
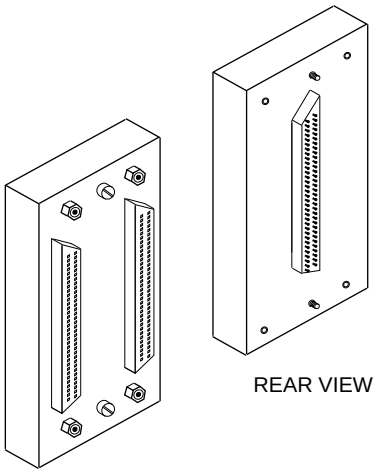
Table 6–11 BN21N-Series Cables

Cable Description	Meters	Feet	Order No
 8-BIT CONTROLLER PEDESTAL CXO-4859A-MC			
Standard cable, 50-conductor with the following connectors: • One 50-pin, high-density, male, straight connector with thumb latches • One 68-pin, high-density, male, right-angle connector with jackscrews	2.0 3.0 10.0 15.0 20.0	6.5 9.8 32.8 49.2 65.6	BN21N–02 BN21N–03 BN21N–10 BN21N–15 BN21N–20

6.7 H885–AA Trilink Connector Block

Table 6–12 lists the StorageWorks-compatible trilink connectors and terminators and their uses.

Table 6–12 StorageWorks Trilink Connectors and SCSI Terminator Blocks

Order No.	Function
H879–AA	68-pin, SCSI, differential, terminator block for terminating SCSI "Y" cables, trilink connector blocks, and SCSI differential buses. Used to enable the hot-swap method for replacing a controller without interrupting the bus.
	 CXO-4957A-MC
H885–AA	Trilink connector block used with the differential terminator block to enable the hot-swap method for replacing an HSZ-series controller in either the mid-bus or end-bus position.
	 REAR VIEW FRONT VIEW CXO-3851A-MC

A trilink connector can be used in conjunction with an H879–AA differential terminal block to permit replacing an HSZ-series controller without disabling the bus.

The trilink connector has three 68-pin connectors: two female and one male. The male connector is attached to the controller, and the differential cables, or a 68-pin, differential, terminator block, is attached to the female connectors.

See Figure 6–9 for a typical end-bus installation using a trilink connector. See Figure 6–10 for a typical mid-bus installation.

Figure 6–9 HSZ–Series Controller — End-Bus Position

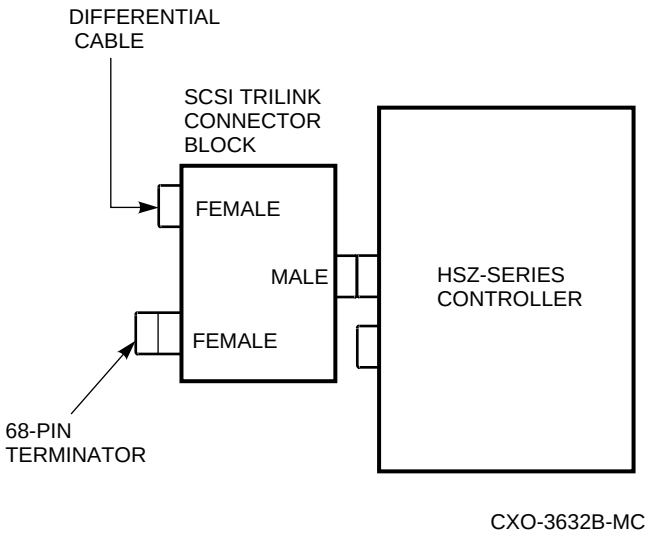
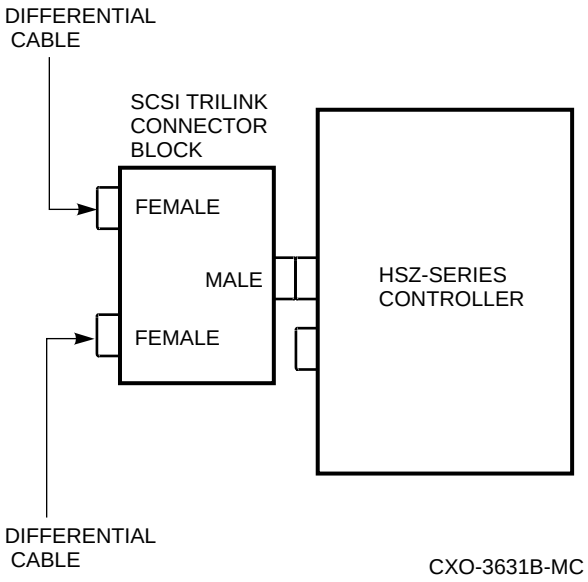


Figure 6–10 HSZ–Series Controller — Mid-Bus Position



6.8 DSSI Cables

The process for selecting DSSI (DIGITAL standard system interface) cables is basically the same whether or not the host system is a Digital system. You must refer to the host system and controller documentation and determine the following:

- The DSSI adapter or controller type
- The connector configuration (straight or right-angle)

For all host systems you must then calculate the maximum DSSI bus cable length. This is the difference between the maximum DSSI bus length and the total of the following:

- The DSSI bus length between the host controller terminator and the host controller cable connector
- The DSSI bus length between the HSD-series controller cable and the HSD-series controller DSSI terminator

Digital recommends that you select the shortest cable possible to connect the host to the StorageWorks subsystem.

The HSD05 and HSD10 storage array controller SBBs connect to the host with one of the DSSI cables listed in Table 6–13. The SBB 96-pin connector connects the controller to the 8-bit wide, single-ended DSSI bus through the use of a DSSI trilink connector (included with each HSD05 and HSD10 unit).

Table 6–13 Host System to StorageWorks DSSI Cables

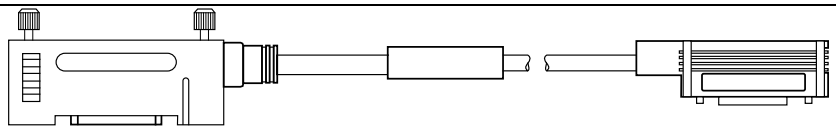
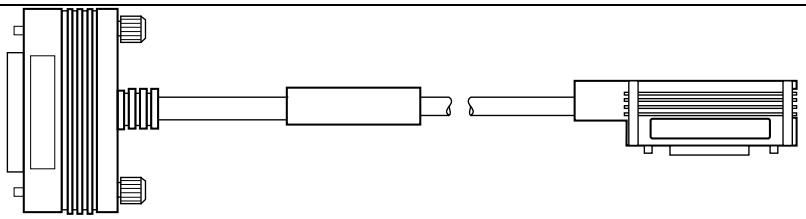
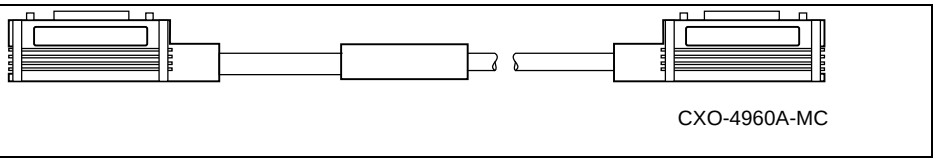
Cable Description	Feet	Meters	Order No
Use one of the following cables to connect an HSD05/HSD10 storage array controller to VAX 3000/4000™ or DEC 4000™.			
 CXO-4959A-MC			
A cable with:	6	1.8	BC29R–06
One right-angle 50-pin tab connector	9	2.7	BC29R–09
	16	4.9	BC29R–16
One right-angle 50-pin micro-ribbon connector	30	9.1	BC29R–30
Use one of the following cables to connect an HSD05/HSD10 storage array controller to VAX 6000/7000/10000™ or AlphaServer 2000/2100™.			
 CXO-4958A-MC			
A cable with:	6	1.8	BC29S–06
One right-angle 50-pin micro-ribbon connector	9	2.7	BC29S–09
	16	4.9	BC29S–16
One straight 50-pin TAB connector	30	9.1	BC29S–30

Table 6–14 lists the DSSI cables approved for interconnecting ("daisy chaining") HSD05 controllers, including the connectors, length, and order number. Interconnecting HSD05 controllers requires a trilink connector and a terminator block.

Table 6–14 HSD05/HSD10 DSSI Cables

Cable Description	Feet	Meters	Order No.
Use the following cable to connect the HSD05/HSD10 controllers to an adjacent DSSI node (horizontal shelf to vertical shelf, shelves on the same side of the cabinet).			
 CXO-4960A-MC			
A cable with:			
Two right-angle connectors	3	1.0	BC29T—03
	9	3.0	BC29T—09
Use the following cable, shown above, to connect the HSD05/HSD10 controllers to an adjacent DSSI node (horizontal shelf to vertical shelf, shelves on opposite side of the cabinet).			
A cable with:			
Two right-angle 50-pin micro ribbon connectors mounted with cable attached to opposite ends of connectors	2	0.7	BC29U—02
Use the following cable, shown above, to connect HSD05/HSD10 controllers to HSD05/HSD10 controllers in adjacent shelf slots in a split-shelf configuration.			
A cable with:			
Right-angle 50-pin micro-ribbon connector to a right-angle 50-pin micro-ribbon connector	1	0.3	BC29V—01
Use the following cable, shown above, to connect HSD05/HSD10 controllers in a pedestal to an adjacent cabinet/pedestal DSSI node.			
A cable with:			
Right-angle 50-pin micro-ribbon connector to a right-angle 50-pin micro-ribbon connector	6	1.8	BC29V—06
Use the following cable, shown above, to connect HSD05/HSD10 controllers in a pedestal to an adjacent cabinet/pedestal DSSI node requiring a longer connection.			
A cable with:			
Right-angle 50-pin micro-ribbon connector to a right-angle 50-pin micro-ribbon connector	16	9.1	BC29V—16
Use the following cable, shown above, as a DSSI bus extension.			
A cable with:			
Straight 50-pin micro-ribbon connector (female) to a straight 50-pin micro-ribbon connector (male)	5	1.5	BC21R—5L

7

StorageWorks Accessories

StorageWorks accessories, when installed, expand the capabilities of a StorageWorks system. The classes of StorageWorks accessories and the tables that describe each accessory in more detail are as follows:

- Shelf accessories (see Table 7–1)
- Cabinet accessories (see Table 7–2)
- Storage Device Accessories and Kits (see Table 7–3)
- Modular carrier kits (see Table 7–4)
- SCSI Bus accessories (see Table 7–5)

Most of the accessories are included in the basic StorageWorks subsystems.

Table 7–1 Shelf Accessories

Order No.	Description
BA35X–PA	Filler panel kit consisting of six 3½-inch bezels for covering blank slots.
BA35X–MA	Blower assembly for StorageWorks shelf.
BA35X–MB	An active terminator board for two 8-bit single-ended SCSI–2 buses.
BA35X–MC	A jumper board for two 8-bit single-ended SCSI–2 buses.
BA35X–MD	Dual-speed blower assembly for StorageWorks shelf.
BA35X–RA	Metric mounting kit for mounting BA355 into SW500/SW800 cabinets.
BA35X–RB	Radio-Electronics-Television Manufacturer's Association (RETMA) rack mounting kit for mounting StorageWorks shelves in cabinets with the RETMA mounting pattern, such as HSC controller cabinets. One kit is required for each StorageWorks shelf ordered separately.
BA35X–RD	Metric rack mounting kit for mounting StorageWorks shelves in an SW500-series or SW800-series cabinet. One kit is required for each StorageWorks shelf ordered separately. These brackets are part of the BA350–JA SBB shelf upgrade kit.
BA35X–RJ	RETMA mounting kit for mounting BA355 into RETMA cabinets.
BA35X–MG	8-bit I/O module for BA356.
BA35X–MH	16-bit I/O module for BA356.

Table 7–2 Cabinet Accessories

Order No.	Description
SW8*x*P–AA*	60 Hz, 120/208 V ac, three-phase cable distribution unit kit. Required to add dual power to SW800 cabinet without redundant power cords installed.
SW8*x*P–AB*	50 Hz, 240/416 V ac, three-phase cable distribution unit kit. Required to add dual power to SW800 cabinet without redundant power cords installed.
SW8*x*P–BA*	60 Hz, 120/208 V ac, three-phase cable distribution unit kit. Required to add dual power to SW800 cabinets with redundant power cords installed.
SW8*x*P–BB*	50 Hz, 240/416 V ac, three-phase cable distribution unit kit. Required to add dual power to SW800 cabinets with redundant power cords installed.
SWX01–AA	This external SCSI storage kit for DEC 7000 Alpha or DEC 10000 Alpha systems is mounted in an SW800 cabinet. This kit contains the following items: 1 BA350–JA SW500/SW800 data cabinet SBB shelf kit 1 DWZZA–VA SBB SCSI signal converter 1 DWZZA–AA desktop SCSI signal converter 1 BN21H–02 SCSI single-ended cable 1 BN21K–10 SCSI differential cable
HSS9X–RA	This HSC-compatible external SCSI storage kit is mounted in an SW800 cabinet. This kit contains the following items: 1 HSC9X–SX SCSI data channel card 1 BA350–JA SW500/SW800 data cabinet SBB shelf kit 1 DWZZA–VA SBB SCSI signal converter 1 BN21K–10 SCSI differential cable
SW500- and SW800-Series Cabinet Magazine Tape Door Bezel	
CK–SF400–TE	TZ8*x*7–VA Tape Loader Door Bezel This door bezel is required to provide clearance for two TZ8*xx*–VA tape drive subsystems. Order one kit for every two tape drive subsystems.

* Cable distribution units are installed by Digital Multivendor Customer Services engineers

Table 7–3 Storage Device Accessories and Kits

Order No.	Description
SWDDB–BA	Twelve 1.05 GB RZ26–VA 3½-inch disk drives in a single shipping container.

LEGEND

This can no longer be ordered.

Table 7–4 Modular Carrier Kits

Order No.	Description
BA35X–CE	3½-Inch Fixed Media 8-bit SBB Kit A device carrier kit for mounting customer-supplied 3½-inch form factor fixed media devices. This kit contains the following items: • Integrated EMI/RFI/ESD shield • Universal SCSI interface and power connector • SCSI device address selection switch • Bezel mounted green device status LED • Bezel mounted amber device activity LED • Mounting hardware • Installation guide
BA35X–CF	3½-Inch Removable Media 8-bit SBB Kit A device carrier kit for mounting customer-supplied 3½-inch form factor removable media devices. This kit contains the following items: • Integrated EMI/RFI/ESD shield • Universal SCSI interface and power connector • SCSI device address selection switch • Bezel • Mounting hardware • Installation guide
BA35X–CG	5¼-Inch Fixed or Removable Media 8-bit SBB Kit A device carrier kit for mounting either full-height or half-height customer-supplied 5¼-inch form factor fixed and removable media devices. This kit contains the following items: • Integrated EMI/RFI/ESD shield • Universal SCSI interface and power connector • SCSI device address selection switch • Bezels for both fixed and removable media devices • Bezel mounted green device status LED—fixed media device • Bezel mounted amber device activity LED—fixed media device • Half-height device bezel panel • Half-height device mounting bracket • Mounting hardware • Bezel extraction tool • Installation guide
BA35X–CH	3½-Inch Fixed Media 16-bit SBB Kit A device carrier kit for mounting customer-supplied 3½-inch form factor fixed media devices. This kit contains the following items: • Integrated EMI/RFI/ESD shield • Universal SCSI interface and power connector • SCSI device address selection switch • Bezel • Mounting hardware • Installation guide

Table 7–5 Differential SCSI Bus Accessories

Order No.	Description
H885–AA	A 68-pin, differential SCSI bus, trilink connector block used in conjunction with a differential terminator block to facilitate the following: • Removing a controller or bus converter without interrupting the bus • Placing a controller or bus converter in the mid-bus position
H879–AA	A 68-pin, differential SCSI, terminator block used in conjunction with the SCSI trilink connector block to permit removal of controller without interrupting the bus.

8

StorageWorks Configured Subsystems

You can order StorageWorks enclosures and subsystems in the following ways:

- **Configure-to-Order Systems:**
  The customer-specified options are installed at the factory.
- **Factory-Configured Systems:**
  These systems are configured at the factory and shipped to the customer "as is." Customer-specified options are shipped with the system for on-site installation.
- **Field Configured Systems:**
  Customer-specified options are installed on-site. The options can be ordered at any time for field upgrades.

As shown in Table 8–1, the system configuration category is model dependent. Unless specifically stated otherwise, all systems can be configured at the customer site providing the proposed upgrade does not create any configuration conflicts. For detailed information about compatible upgrades and possible conflicts, contact your Digital account representative.

Table 8–1 StorageWorks Enclosure System Configuration Categories

Configure-to-Order Systems				Factory-Configured Systems			
24-Shelf Data Center Cabinets							
SW800–AA	SW810–AA	SW811–AA	SW812–AA	SW810–BA	SW810–CA	SW812–BA	SW812–CA
SW800–AB	SW810–AB	SW811–AB	SW812–AB	SW810–BB	SW810–CB	SW812–BB	SW812–CB
SW800–FA							
SW800–FB							
10-Shelf Departmental Servers							
SW500–AC	SW510–AC	SW511–AC	SW512–AC	SW510–BC	SW510–CC	SW512–BC	SW512–CC
SW500–AD	SW510–AD	SW511–AD	SW512–AD	SW510–BD	SW510–CD	SW512–BD	SW512–CD
SW500–FC	SW500–FD						
7-Device, 8-Bit, Deskside Expansion Units							
BA350–KA		BA350–KB		BA350–KC		BA350–KE	
				BA350–KF			
3-Device, 8-Bit Desktop Expansion Units							
BA353–AA	BA353–AB			BA353–AD	BA353–AF	BA353–AJ	
				BA353–AE	BA353–AH	BA353–AP	

LEGEND

This can no longer be ordered.

8.1 24–Shelf Data Center Cabinet Subsystems (SW800–Series)

Tables 8–2 and 8–3 describe data center cabinets and subsystem configurations.

Table 8–2 24–Shelf Data Center Cabinets—Configure-to-Order Subsystems

Note

The second letter in the model-suffix denotes the cabinet input ac power as follows:
*x*A-60 Hz, 120/208 V ac, three-phase
*x*B-50 Hz, 240/416 V ac, three-phase

Description	Enclosure
SW800 Data Center Cabinet **No controller shelves or controllers** **No SBB shelves or storage devices** A 1700 mm (66.9 in) high, configure-to-order SW800 cabinet available in either 60 Hz, 120/208 V ac, three-phase configuration (-AA) or 50 Hz, 240/416 V ac, three-phase configuration (-AB). This cabinet includes the following components: • Outer panels • Blank doors • Power entry units • Internal power cords • Cooling systems It can accommodate a maximum of 24 StorageWorks shelves.	**SW800–AA** **SW800–AB**
SW800 Data Center Cabinet **No controller shelves or controllers** **No SBB shelves or storage devices** A 1700 mm (66.9 in) high, configure-to-order SW800 cabinet available in either 60 Hz, 120/208 V ac, three-phase configuration (-AA) or 50 Hz, 240/416 V ac, three-phase configuration (-AB). This cabinet includes the following components: • Outer panels • Blank doors • Power entry units • Internal power cords • Cooling systems It can accommodate a maximum of 23 StorageWorks shelves.	**SW800–FA** **SW800–FB**

(Continued on next page)

Table 8–2 (Cont.) 24–Shelf Data Center Cabinets—Configure-to-Order Subsystems

Description	Enclosure
SW810 Data Center Subsystem **Controller shelf without a controller** **6.3 GB disk storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 controller 1 ac power supply 3 8-bit SBB shelves with: 6 RZ26–VA 3½-inch disk drives (2 per shelf) 6 SCSI cables (2 per shelf) 3 ac power supplies (1 per shelf)	**SW810–AA** **SW810–AB**
SW811 Data Center Subsystem **Controller shelf without a controller** **21 GB disk storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 ac power supply 6 8-bit SBB shelves with: 6 RZ74–VA 5¼-inch disk drives (1 per shelf) 6 SCSI cables (1 per shelf) 6 ac power supplies (1 per shelf)	**SW811–AA** **SW811–AB**
SW812 Data Center Subsystem **Controller shelf without a controller** **12.6 GB disk storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 ac power supply 3 8-bit SBB shelves with: 6 RZ28–VA 3½-inch disk drives (2 per shelf) 6 SCSI cables (2 per shelf) 3 ac power supplies (1 per shelf)	**SW812–AA** **SW812–AB**

LEGEND

This can no longer be ordered.

Table 8–3 24–Shelf Data Center Cabinets—Factory-Configured Subsystems

Note

The second letter in the suffix denotes the cabinet or tape drive input ac power as follows:

*x*A-60 Hz, 120/208 V ac, three-phase
*x*B-50 Hz, 240/416 V ac, three-phase
*x*E-60 Hz, 120 V ac, single-phase
*x*F-50 Hz, 240 V ac, single-phase

Description	Enclosure
Data Center Subsystem **HSJ42–AD Controller** **18.9 GB Disk Storage** This factory-configured subsystem is shipped with the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 Controller 2 ac power supplies 6 8-bit SBB shelves with: 18 RZ26L–VA 3½-inch disk drives (3 per shelf) 6 SCSI cables (1 per shelf) 12 ac power supplies (2 per shelf) 2 cable distribution units	**SW810–BA** **SW810–BB**
SW810 Data Center Subsystem **HSJ42–AD Controller** **18.9 GB Disk Storage** **42 GB Tape Storage** This factory-configured subsystem is shipped with the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 Controller 2 ac power supplies 5 8-bit SBB shelves with: 18 RZ26L–VA 3½-inch disk drives (3 shelves: 4 drives each; 2 shelves: 3 drives each) 5 SCSI cables (1 per shelf) 10 ac power supplies (2 per shelf) 1 TZ867–AE/AF Tape Drive Loader with: 1 Tape Drive Door Bezel Kit 2 SCSI cables 2 cable distribution units	**SW810–CA** **SW810–CB**

(Continued on next page)

Table 8–3 (Cont.) 24–Shelf Data Center Cabinets—Factory-Configured Subsystems

Description	Enclosure
SW812 Data Center Subsystem **HSJ42–AD Controller** **37.8 GB Disk Storage** This factory-configured subsystem is shipped with the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 Controller 2 ac power supplies 6 8-bit SBB shelves with: 18 RZ28B–VA 3½-inch disk drives (3 per shelf) 6 SCSI cables (1 per shelf) 12 ac power supplies (2 per shelf) 2 cable distribution units	**SW812–BA** **SW812–BB**
SW812 Data Center Subsystem **HSJ42–AD Controller** **37.8 GB Disk Storage** **42 GB Tape Storage** This factory-configured subsystem is shipped with the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW800 subsystem contains the following components: 1 8-bit controller shelf with: 1 Controller 2 ac power supplies 5 8-bit SBB shelves with: 18 RZ28B–VA 3½-inch disk drives (3 shelves: 4 drives each; 2 shelves: 3 drives each) 5 SCSI cables (1 per shelf) 10 ac power supplies (2 per shelf) 1 TZ867–AE/AF Tape Drive Loader with: 1 Tape Drive Door Bezel Kit 1 ac power cord 2 SCSI cables 2 cable distribution units	**SW812–CA** **SW812–CB**

LEGEND

This can no longer be ordered.

8.2 10–Shelf Departmental Server Subsystems (SW500–Servers)

Tables 8–4 and 8–5 describe the departmental server subsystems cabinets and subsystems.

Table 8–4 10–Shelf Departmental Servers—Configure-to-Order Subsystems

Note

The second letter in the model-suffix denotes the cabinet input ac power as follows:
*x*A-60 Hz, 120 V ac, single-phase
*x*B-50 Hz, 240 V ac, single-phase

Description	Enclosure
SW500 Departmental Server Subsystem **No controller shelves or controllers** **No SBB shelves or storage devices** An 1100 mm (42.1 in) high, configure-to-order SW500 cabinet available in either 60 HZ, 120 V ac, single-phase configuration (-AC) or 50 Hz, 240 V ac, single-phase configuration (-AD). This cabinet includes the following components: • Outer panels • Blank doors • Power entry units • Internal power cords • Cooling systems It can accommodate a maximum of 10 StorageWorks shelves.	**SW500–AC** **SW500–AD**
SW500 Departmental Server Subsystem **No controller shelves or controllers** **No SBB shelves or storage devices** An 1100 mm (42.1 in) high, configure-to-order SW500 cabinet available in either 60 HZ, 120 V ac, single-phase configuration (-AC) or 50 Hz, 240 V ac, single-phase configuration (-AD). This cabinet includes the following components: • Outer panels • Blank doors • Power entry units • Internal power cords • Cooling systems It can accommodate a maximum of 10 StorageWorks shelves.	**SW500–FC** **SW500–FD**

(Continued on next page)

Table 8–4 (Cont.) 10–Shelf Departmental Servers—Configure-to-Order Subsystems

Description	Enclosure
SW500 Departmental Server Subsystem **No Controller** **6.3 GB Disk Storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW500 subsystem contains the following components: 1 8-bit controller shelf with: 1 ac power supply 3 8-bit SBB shelves with: 6 RZ26L–VA 3½-inch disk drives (2 per shelf) 6 SCSI cables (2 per shelf) 3 ac power supplies (1 per shelf)	**SW510–AC** **SW510–AD**
SW500 Departmental Server Subsystem **No Controller** **21 GB Disk Storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW500 subsystem contains the following components: 1 8-bit controller shelf with: 1 ac power supply 6 8-bit SBB shelves with: 6 RZ74–VA 5¼-inch disk drives (1 per shelf) 6 SCSI cables (1 per shelf) 6 ac power supplies (1 per shelf)	**SW511–AC** **SW511–AD**
SW500 Departmental Server Subsystem **No Controller** **12.6 GB Disk Storage** Customer-specified options can be installed at the factory or on site. This configure-to-order SW500 subsystem contains the following components: 1 8-bit controller shelf with: 1 ac power supply 3 8-bit SBB shelves with: 6 RZ28–VA 3½-inch disk drives (2 per shelf) 6 SCSI cables (2 per shelf) 3 ac power supplies (1 per shelf)	**SW512–AC** **SW512–AD**

LEGEND

This can no longer be ordered.

Table 8–5 10–Shelf Departmental Servers—Factory-Configured Subsystems

Note

The second letter in the model-suffix denotes the cabinet input ac power as follows:
*x*A-60 Hz, 120 V ac, single-phase
*x*B-50 Hz, 240 V ac, single-phase

Description	Enclosure
SW500 Departmental Server Subsystem **HSJ40–AD Controller** **6.3 GB Disk Storage** This factory-configured subsystem is shipped with only the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW500 subsystem containing the following components: 1 8-bit controller shelf with: 1 controller 1 ac power supply 3 8-bit SBB shelves with: 3 RZ26L–VA 3½-inch disk drives (2 per shelf) 3 SCSI cables (2 per shelf) 3 ac power supplies (1 per shelf) 1 cable distribution unit	**SW510–BC** **SW510–BD**
SW500 Departmental Server Subsystem **HSJ40–AD Controller** **6.3 GB Disk Storage** **42 GB Tape Storage** This factory-configured subsystem is shipped with only the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW500 subsystem containing the following components: 1 8-bit controller shelf with: 1 controller 1 ac power supply 3 8-bit SBB shelves with: 3 RZ26L–VA 3½-inch disk drives (1 per shelf) 3 SCSI cables (1 per shelf) 3 ac power supplies (1 per shelf) 1 TZ867–AE/AF Tape Drive Loader with: 1 Tape Drive Door Bezel Kit 1 SCSI cable 1 cable distribution unit	**SW510–CC** **SW510–CD**

(Continued on next page)

Table 8–5 (Cont.) 10–Shelf Departmental Servers—Factory-Configured Subsystems

Description	Enclosure
SW500 Departmental Server Subsystem **HSJ40–AD Controller** **12.6 GB Disk Storage** This factory-configured subsystem is shipped with only the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW500 subsystem containing the following components: 1 8-bit controller shelf with: 1 controller 1 ac power supply 3 8-bit SBB shelves with: 3 RZ26L–VA 3½-inch disk drives (1 per shelf) 3 SCSI cables (1 per shelf) 3 ac power supplies (1 per shelf) 1 cable distribution unit	**SW512–BC** **SW512–BD**
SW500 Departmental Server Subsystem **HSJ40–AD Controller** **12.6 GB Disk Storage** **42 GB Tape Storage** This factory-configured subsystem is shipped with only the listed components installed prior to shipment. Customer-specified options are installed on site. A factory-configured SW500 subsystem containing the following components: 1 8-bit controller shelf with: 1 controller 1 ac power supply 3 8-bit SBB shelves with: 3 RZ26L–VA 3½-inch disk drives (1 per shelf) 3 SCSI cables (1 per shelf) 3 ac power supplies (1 per shelf) 1 TZ867–AE/AF Tape Drive Loader with: 1 Tape Drive Door Bezel Kit 1 SCSI cable 1 cable distribution unit	**SW512–CC** **SW512–CD**

LEGEND

This can no longer be ordered.

8.3 7–Device, 8–Bit Deskside Expansion Units (BA350–Kx Series)

Tables 8–6 and 8–7 describe the deskside expansion units and subsystem configurations.

Table 8–6 7–Device, 8–Bit Deskside Expansion Units—Configure-to-Order Subsystems

Description	Enclosure
Deskside Expansion Unit **No controller** **No storage devices** This configure-to-order deskside expansion unit is certified for operation in an FCC Class B environment when all the installed storage devices are also Class B certified. It can also be used in an FCC Class A environment with any approved storage device installed. Customer-specified options can be installed either at the factory or on site. 1 Pedestal Mounting Kit with the following components: 1 ac distribution unit 2 ac power cords (internal) 1 8-bit SBB shelf with the following components: 1 ac input power supply 1 ac power cord	**BA350–KA**
Deskside Expansion Unit **No controller** **No storage devices** This configure-to-order deskside expansion unit is certified for operation in an FCC Class B environment when all the installed storage devices are also Class B certified. It can also be used in an FCC Class A environment with any approved storage device installed. Customer-specified options can be installed either at the factory or on site. 1 Pedestal Mounting Kit with the following components: 1 ac distribution unit 2 ac power cords (internal) 1 8-bit SBB shelf with the following components: 1 ac input power supply 1 ac power cord	**BA350–KB**

Table 8–7 7–Device, 8–Bit Deskside Expansion Units—Factory-Configured Subsystems

Description	Enclosure
BA350 Deskside Expansion Unit **HSD05 DSSI Controller** **3.15 GB Disk Storage** This factory-configured deskside expansion unit is certified for operation in an FCC Class B environment when all the installed storage devices are also Class B certified. It can also be used in an FCC Class A environment with any approved storage device installed. Customer-specified options are installed on site. 1 Pedestal Mounting Kit with the following components: 1 ac distribution unit 2 ac power cords (internal) 1 8-bit SBB shelf with the following components: 1 DSSI Controller 3 RZ26L–VA 3½-inch disk drives 1 ac input power supply 1 ac power cord	**BA350–KC**
BA350 Deskside Expansion Unit **HSD05 DSSI Controller** **6.3 GB Disk Storage** This factory-configured deskside expansion unit is certified for operation in an FCC Class B environment when all the installed storage devices are also Class B certified. It can also be used in an FCC Class A environment with any approved storage device installed. Customer-specified options are installed on site. 1 Pedestal Mounting Kit with the following components: 1 ac distribution unit 2 ac power cords (internal) 1 8-bit SBB shelf with the following components: 1 DSSI Controller 3 RZ28B–VA 3½-inch disk drives 1 ac input power supply 1 ac power cord	**BA350–KE**
BA350 Deskside Expansion Unit **HSD05 DSSI Controller** **6.3 GB Disk Storage** This factory-configured deskside expansion unit is certified for operation in an FCC Class B environment when all the installed storage devices are also Class B certified. It can also be used in an FCC Class A environment with any approved storage device installed. Customer-specified options are installed on site. 1 Pedestal Mounting Kit with the following components: 1 ac distribution unit 2 ac power cords (internal) 1 8-bit SBB shelf with the following components: 1 DSSI Controller 3 RZ28B–VA 3½-inch disk drives 1 ac input power supply 1 ac power cord	**BA350–KF**

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This can no longer be ordered.

8.4 3–Device, 8–Bit Desktop Expansion Unit (BA353–Ax Series)

Tables 8–8 and 8–9 describes the desktop expansion unit and subsystem configurations.

Table 8–8 3–Device, 8–Bit Desktop Expansion Units—Configure-to-Order Subsystems

Description	Enclosure
Desktop Expansion Unit **No storage devices** A configure-to-order desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 one 5¼-inch half-height or 3½-inch SBB slot—factory set for 3½-inch SBB 2 3½-inch SBB slots	**BA353–AA**
Desktop Expansion Unit **No storage devices** A configure-to-order desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 one 5¼-inch half-height or 3½-inch SBB slot—factory set for 5¼-inch SBB 2 3½-inch SBB slots	**BA353–AB**

Table 8–9 3–Device, 8–Bit Desktop Expansion Units—Factory-Configured Subsystems

Description	Enclosure
Desktop Expansion Unit **600 MB CD–ROM** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 RRD44-VE CD–ROM 2 3½-inch SBB slots	**BA353–AD**
Desktop Expansion Unit **600 MB CD–ROM** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 RRD43-VE CD–ROM 2 3½-inch SBB slots	**BA353–AE**

(Continued on next page)

Table 8-9 (Cont.) 3–Device, 8–Bit Desktop Expansion Unit—Factory-Configured Subsystems

Description	Enclosure
Desktop Expansion Unit **600 MB CD–ROM** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 RRD42–VE CD–ROM 2 3½-inch SBB slots	**BA353-AF**
Desktop Expansion Unit **95 MB Tape Drive** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 TZ30–VE cartridge tape drive 2 3½-inch SBB slots	**BA353–AH**
Desktop Expansion Unit **2 GB Tape Drive** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 TZK11–VE cartridge tape drive 2 3½-inch SBB slots	**BA353–AJ**
Desktop Expansion Unit **10 GB Tape Drive** A factory-configured desktop expansion unit with the following: 1 universal ac input power supply 1 internal blower 1 SWXTE–AC cartridge tape drive 2 3½-inch SBB slots	**BA353–AP**

LEGEND

This can no longer be ordered.

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