COMPAQ

Software
Product
Description

PRODUCT NAME: **HSZ50 Array Controller**   **SPD: 61.36.05**
                     Operating Software HSOF Version 5.7

Description

The HSZ50 StorageWorks™ Solutions Software provides storage controller software and storage management capability for products that incorporate the use of HSZ50 Array Controller from Compaq™ Computer Corporation. This array controller is an intelligent mass storage controller that interfaces between host computer systems and SCSI-attached mass storage devices using a SCSI-2 bus. The HSOF software executes in the HSZ50 array controller processing SCSI I/O requests from hosts and performing the device-level operations required to satisfy the requests.

HSZ50 Controller Software HSOF V5.7 Software Functions

HSOF V5.7 software includes the following capabilities:

* Testing and Diagnosis of the HSZ50 Array Controller

* Host Interconnect and Protocol Services

* SCSI Device Control

* HSOF Storage System Management Services

* Local Program Support

* Mirrored Write-Back Cache Capability

* Disk Striping (RAID 0)

* RAID 3/5 Support

* Disk Mirroring Capability (RAID 1)

* Partitioning

The following sections describe these capabilities:

Testing and Diagnosis of the HSZ50 Array Controller

HSOF software internal diagnostics execute automatically whenever:

- Controller power is turned on

- The array controller is reset

- The HSOF determines it (periodically during use)

LEDs on the controller front bezel provide diagnostic information upon controller failure. A local serial connection asynchronous I/O port is provided for configuration and diagnosis.

Host Interconnect and Protocol Services

The HSZ50 Array Controller attaches to host computer systems using a fast, wide, differential (FWD) SCSI-2 bus. Up to four SCSI target addresses can be set for either a single or a dual-redundant controller configuration. This allows support for up to 32 SCSI logical units (LUNs) per controller enclosure.

SCSI Device Control

HSOF software converts host I/O requests into device-specific SCSI commands. HSOF software supports concurrent commands and data transfers on multiple SCSI device buses for each supported device type. The HSOF SCSI device control functions include the following:

- Error Detection and Recovery
  HSOF software recovers from device errors, including bad block replacement for supported disk drives that do not perform this function for themselves.

- SCSI host interface errors are handled by the cooperation of the HSZ50 Array Controller hardware and HSOF software providing the following:
    - Automatic retransmission of data detected as being in error
    - Automatic detection of internal data path errors
    - Automatic failover of attached devices between identically configured HSZ50 controllers installed in the same controller enclosure (refer to product-specific documentation for any configuration restrictions).

- Device Integrity Testing
  HSOF software executes Device Integrity Test programs upon system manager command. These tests perform the following functions:
    - Verify correct operation of individual disk devices and units.
    - Place the HSZ50 Array Controller under load to verify correct system operation.

- Error Logging
  HSOF software uses SCSI protocol messages to report faulty or failing devices and controller faults to all connected hosts that have error logging enabled.

- Save Configuration on Disk
  HSOF software can save device information, HSZ50 controller configuration information, and HSOF software patches on to a disk. This improves availability (for single controller implementations), in the event of a controller replacement. This functionality is specific to HSZ50 to HSZ50 controller replacements in non-redundant configurations.

- Set SCSI Speed for Host and Devices
  In configurations that must use a long SCSI cable between the HSZ50 controller and the host system, it is possible for the initiator and target to negotiate a faster data rate than is supported by the cable length.

  Set SCSI Speed for Devices allows the controller to force a slower data rate when negotiating with the target device. This allows for a longer cable length than that supported by the speed that the controller and target device would normally negotiate. This CLI command can set the maximum data transfer rate between the controller and any device to 10MHz or 5MHz.

- Asynchronous Disk Swap (Hot Swap)
  HSOF V5.7 software supports asynchronous disk swaps. This is also known as Disk Hot Swap. It is defined as disk removal and insertion without regard to a quiescent device bus. Disks can be removed or inserted at any time with some restrictions. Restrictions are noted in the User documentation.

- Simultaneous Multiple Operating System Support
  HSOF software provides support for a different host function mode for each controller target ID, thus allowing the controllers to work with different host operating systems on the same SCSI bus. HSOF software supports any two of the five host modes at one time. Operating system support is required to utilize this controller software feature.

  > **NOTE:** Check documentation to verify support for this functionality with your specific operating system.

HSOF Storage System Management Services

HSOF software provides the following subsystem management services:

- Alteration of Storage System Parameters
  HSOF software includes a command language interpreter (CLI) that allows a system manager to display and manipulate controller parameters and device configuration information as required. The CLI utility provides type ahead, recall and editing features. Any of the last four commands entered may be recalled and edited.

- HSOF Dynamic Status Display
  The HSOF software VTDPY utility allows a system manager to view the HSZ50-based storage system's state dynamically. This utility can use VT200-, VT300-, and VT400-series compatible video terminals. Terminal port connections are supported at 9600 and 19200 bps.

- HSUTIL
  - The HSUTIL utility provides the functions of device format and device code load: Device format enables the system manager to perform a basic format operation on a single or multiple storage device(s).

  - Device code load provides the functionality to download device firmware onto supported devices via the controller (check user documentation for support information).

- Environmental Monitor Unit (EMU)
  HSOF V5.7 software monitors data on the state of the HSZ50 controller and storage system. This data can be reported via Command Console and CLI and is reported in Environmental Monitor Unit (EMU) LEDs and in some cases activates an audible alarm. This functionality is supported in SW300-series cabinets for HSZ50 products only.

Local Program Support

HSOF software supports the following local utilities and commands:

- AUTOSPARE aids in the replacement of failed disk drives.

- CFMENU supports the configuring of controller-attached storage devices.

- CHVSN supports the ability to change volume serial numbers for disk drive devices.

- CLONE supports the making of a physical copy of data in concert with Disk Mirroring software (cannot be used with partitioned units).

- CLCP (Code Load/Code Patch) supports controller software changes.

- CONFIG supports the adding of new devices to the configuration.

- C_SWAP supports the controller and/or cache module warm swap (dual-redundant configurations only).

- DILX is the disk inline exerciser.

- FMU supports the displaying of controller last failure and memory system failure information as well as control of spontaneous event logging and last failure logging displays.

- VTDPY presents a user display of current controller state and performance data for attached disk drive devices.

Mirrored Write-Back Cache Capability

In dual-redundant configurations, the write-back cache capability provides the following functions:

- Stores data to be written temporarily in the controller's write-back cache and if the mirrored option is set, the write-back data is mirrored in the redundant controllers cache for fault tolerance. The controller then informs the host that the write request is complete. This allows the host to continue working without waiting for data to be written to disk media

- Writes the data stored in cache to the disk media based on a least-recently-used cache flushing policy or when a device has been inactive for a defined period of time

- Consolidates contiguously-located data blocks from multiple host write requests into a single device request to reduce average latency

- On recovery from a controller failure (for example, a power outage), detects that unwritten data still exists in cache and writes it to disk media before enabling normal controller operations

Disk Striping (RAID 0)

HSOF software treats sets of disk drives as stripesets (from 2 to 14 members) for improved I/O performance through load balancing. A stripeset appears to the operating system as a single virtual disk drive.

RAID 3/5 Support

The RAID capability provides the following functions:

- Manages up to 14sets of disk drives (from 3 to 14 members) as RAIDsets. A RAIDset can have a maximum size of 256 GB A RAIDset appears to the operating system as a single virtual disk drive. RAIDsets have the ability to tolerate the failure of a single member disk without loss of ability to deliver data to hosts.

- Dynamically adjusts between RAID Level 3 and RAID Level 5-like data protection algorithms depending on instantaneous workload.

- Maintains consistency of data and parity across all member disks in a RAIDset. This includes recovery from media errors.

- Detects the failure of a single member disk of a RAIDset and invokes data regeneration algorithms to provide continued data availability to hosts.

- Captures a designated spare (if one exists) in the event of a member disk failure and reconstructs the data and parity of the failed member disk onto it.
  For information regarding default chunksize, refer to *Configuring Your StorageWorks Subsystem HSZ50 Array Controllers HSOF Version 5.1*, EK-HSZ50-CG.

Disk Mirroring Capability (RAID 1)

Disk mirroring offers extremely high data reliability by providing following functions:

- Real-time maintenance of up to six identical copies of data on mirrorsets of separate disks attached to a single HSZ50 Array Controller

- Protects data against disk failure by replicating all data on each member of the mirrorset

- Striping of mirrorsets, for high-performance access to large amounts of highly available data

- Captures a designated spare (if one exists) in the event of a mirrorset member disk failure and copies the data of the failed member disk onto it

- The ability to increase or decrease the number of members in a mirrorset as requirements change

- Flexible policy options for determining both how read requests are satisfied and the speed of copying when a new member is being added

- HSOF software disk mirroring can utilize the UNMIRROR command to change devices back to single-disk units

Partitioning

HSOF software allows partitioning of disk drives or storage sets for improved device management. A partition appears to the operating system as a single virtual disk. Up to 4 partitions may be created per storage set or disk drive.

Limits on the Total Number of Storagesets

The following limits apply to storagesets configured on a single controller or dual-redundant controller configurations:

- A mirrorset can have a maximum of 6 members.

- There can be a maximum of 20 Mirrorsets and/or RAIDsets.

- There can be a maximum of 30 storagesets (RAIDsets, mirrorsets, and /stripesets.

- There can be a maximum of 32 physical device members total for a unit.

HSOF Hardware Requirements

HSOF software requires an HSZ50 Array Controller on which to execute. The FWD SCSI bus must be properly terminated.

The HSZ50 Array Controller includes six SCSI connecting storage device ports. The specific devices supported by HSOF Software Version 5.7 are listed in the tables that follow. Up to 42 (non-redundant configurations only) or up to 36 (dual-redundant configurations) SCSI-2 and SSD devices may be attached to the HSZ50 Array Controller via 32 SCSI LUNs.

The HSZ50 Array Controller supported configurations are shown in Table 1.

Table 1 Supported Configurations

Part Number	Description
HSZ50-AF	StorageWorks Array Controller for 36 (dual-redundant) or 42 (non-redundant) SCSI-2 disk/tape /optical devices
	32 MB Read/Write-back Cache, RAID, Disk Mirroring and one single External Cache Battery unit (ECB)
	Prerequisite: One HSOF Software kit ordered separately, (1) QB-5CJAA-SA
HSZ50-AH	StorageWorks Array Controller for 36 (dual-redundant) or 42 (non-redundant) SCSI-2 disk/tape /optical devices
	64 MB Read/Write-back Cache, RAID, Disk Mirroring and one single External Cache Battery unit (ECB)
	Prerequisite: One HSOF Software kit ordered separately, (1) QB-5CJAA-SA
HSZ50-AJ	StorageWorks Array Controller for 36 (dual-redundant) or 42 (non-redundant) SCSI-2 disk/tape/optical devices
	128 MB Read/Write-back Cache, RAID, Disk Mirroring and one single External Cache Battery unit (ECB)
	Prerequisite: One HSOF Software kit ordered separately, (1) QB-5CJAA-SA
HSZ52-AF	One set (two HSZ50-AF controllers) of dual-redundant StorageWorks Array Controllers for 72 SCSI-2 disk/tape/optical devices; 64MB Read/Write-back Cache, RAID Disk Mirroring and one dual External Cache Battery units (ECB)
	Prerequisite: Two HSOF Software kits ordered separately, (2) QB-5CJAA-SA
HSZ52-AH	One set (two HSZ50-AJ controllers) of dual-redundant StorageWorks Array Controllers for 72 SCSI-2 disk/tape/optical devices
	128MB Read/Write-back Cache, RAID Disk Mirroring and one dual External Cache Battery units (ECB)
	Prerequisite: Two HSOF Software kits ordered separately, (2) QB-5CJAA-SA

Table 2 Supported Configurations - continued

Part Number	Description
HSZ52-AJ	One set (two HSZ50-AJ controllers) of dual-redundant StorageWorks Array Controllers for 72 SCSI-2 disk/tape/optical devices
	256MB Read/Write-back Cache, RAID Disk Mirroring and one dual External Cache Battery units (ECB)
	Prerequisite: Two HSOF Software kits ordered separately, (2) QB-5CJAA-SA
HSZ54-AJ	Two sets (four HSZ50-AJ controllers) of dual-redundant StorageWorks Array Controllers for 144 SCSI-2 disk/tape/optical devices
	512MB Read/Write-back Cache, RAID Disk Mirroring and two dual External Cache Battery units (ECB)
	Prerequisite: Four HSOF Software kits ordered separately, (2) QB-5CJAA-SA
DS-SWXRA-W0	StorageWorks RAID Array 450 with 24 System Building Block (SBB Pedestal Cabinet Storage Subsystem)
	HSZ50 6 channel controller, tri-link with terminator, 32MB write back cache expandable to 64MB or 128MB, single cache battery in SBB, 24 SBB slot Wide (16-bit) SCSI cabinet, 5 power supplies, redundant cooling, EMU, host to controller cable BN21K-05 (68 Pin SCSI to 68 Pin 90 degree). Serial line assembly with adapters (9 pin and 25 Pin)
	Requires RA450 platform kit, host adapter, and disks ordered separately
DS-SWXRA-W4	StorageWorks RAID Array 450 with 24 System Building Block (SBB) (Rackmount Storage Subsystem)
	HSZ50 6 channel controller, tri-link with terminator, 32MB write back cache expandable to 64 or 128MB, single cache battery in SBB, 24 SBB slot Wide (16-bit) SCSI rack, 5 power supplies, redundant cooling, and host to controller cable BN21K-10 (68 Pin SCSI to 68 Pin 90 degree). Serial line assembly with adapters (9 pin and 25 Pin). Metric Mounting kit for Data Center Cabinet (SW800/SWXSC-Dx)
	Requires RA450 Platform kit, host adapter, and disks ordered separately. Mounting in 19" RETMA cabinet requires BA35X-RB option

Configuration Restrictions

The following configuration restrictions apply:

- Two controllers in the same controller enclosure must be configured as a dual-redundant configuration.

- HSZ40 or SWXRC-04/05 controllers may not be used in a dual-redundant pair with the HSZ50.

- HSZ50 minimum supported revision level is HSOF V5.1 software. A maximum of six devices may be attached to a single SCSI device bus on dual-redundant HSZ50 array controller configurations.

- In dual-redundant pairs, HSOF Software must be at identical revision levels (including patch revisions).

- A maximum of seven devices may be attached to a single SCSI device bus on non-redundant HSZ50 array controller configurations.

- A maximum combined total of 20 disk mirrorsets and RAIDsets are supported with HSOF Software Version 5.7.

- A maximum combined total of 30 storagesets (mirrorsets, RAIDsets, and stripesets) are supported with HSOF Software Version 5.7.

- There can be a maximum of 4 partitions per disk or storagesets.

- Maximum LUN capacity is 256GB.

HSOF Host Node Software and Hardware Required

A valid operating system configuration with a supported FWD SCSI interface, as referenced in the following section, is required to operate an HSZ50 controller with HSOF software:

- Table 2 contains the Compaq TRU64™ UNIX host bus adapters for operating system versions 4.0d, 4.0e, 4.0f, 5.0, and 5.0a.

- Table 3 contains the Compaq OpenVMS™ Alpha host bus adapters for operating system versions OpenVMS Alpha:V6.2-1H3, V7.1-1H1/2/3, V7.1-2, V7.2, and V7.2-1 and OpenVMS VAX: V6.2, V7.1, and V7.2

- Table 4 contains the *Windows NT* Alpha host bus adapters for operating system versions 3.51 and 4.0.

- Table 5 contains the *Windows NT* x86 -Compatible host bus adapters for operating system versions 3.51 and 4.0.

Table 2 Compaq TRU64 UNIX Host Bus Adapters

Adapter	Adapter Description
KZMSA	For DEC 7000™, DEC 10000™, and AlphaServers™ 8200/8400 systems (requires a DWZZ-series signal converter)
KZPSA	For Compaq AlphaServers 1000/2000/2100/4000/4100/8200/8400
KZTSA	For DEC 3000™ systems
KZPSA-BB	PCI bus-to-Fast Wide Differential SCSI for Compaq AlphaServer systems For DEC 3000 systems (requires a DWZZ-series signal converter)

Table 3 Compaq OpenVMS Alpha Host Bus Adapters

Adapter	Adapter Description
KZMSA	For DEC 7000, DEC 10000 (requires a DWZZ-series signal converter)
KZPAA	For Compaq AlphaServers 1000/2000/2100 systems
KZPSA	For Compaq AlphaServers 1000/2000/2100/4000/4100/8200/8400
KZTSA	For DEC 3000 systems
PMAZC	For DEC 3000 systems (requires a DWZZ-series signal converter)
KFTIA	For TurboLaser 8200 embedded SCSI

Table 4 Windows NT Alpha Host Bus Adapters

Adapter	Adapter Description
KZPSA	For Compaq AlphaServers 400/1000/2000/2100/4000/4100 systems

Table 5 Windows NT x86-Compatible Host Bus Adapters

Adapter	Adapter Description
SWZA3-BC	For PCI-based systems
SWXA3-BD	For PCI-based systems
SWXA3-BB	For EISA-based systems

Other Hardware

The HSOF V5.7 software supports the following optional hardware:

- HSSIM-AA 32MB SIMM Pack for HSx50 controllers (add additional 32MB SIMMs to upgrade HSZ50 controllers to the supported 64MB and 128MB configurations)

- HS35X-BA Single External Cache Battery (ECB) Replacement

- HS35X-BB Dual External Cache Battery (ECB) Replacement

> **NOTE:** Hardware configuration guidelines for HSZ50 array controllers are provided in the Configuring your StorageWorks HSZ50 Array Controller, EK-HSZ50-CG**.**

Supported Storage Devices

Tables 6 through 11contain the supported device tables for HSOF V5.7. These tables list the only storage devices that are supported by the HSZ50 Array Controller running HSOF V5.7. Compaq Computer Corporation neither supports nor recommends any device not listed for use with the HSZ50 Array Controller running HSOF V5.7, regardless of the supplier or stated conformance to ANSI SCSI standards. Compaq Computer Corporation will not assure correct operation of any unqualified device nor assure that such devices will not have an impact on other supported devices, or on the HSZ50 Array Controller itself, or on a Compaq Computer Corporation system configuration.

Table 6 Supported Ultra SCSI Wide Disks

Device	Capacity GB	Minimum Microcode Version [1]	Minimum H/W Revision[2]	Controller Enclosures	
				DS-BA370-AA[3]	DS-SWXM1-xA DS-BA356-MD
DS-RZ1BB-VW	2.1	LYJ0/0656	A01	YES	YES
DS-RZ1CB-VW	4.3	LYJ0/0656	A01	YES	YES
DS-RZ1CD-VW	4.3	0306	A01	YES	YES
DS-RZ1DB-VA/VW	9.1	LYJ0/0307	A01	NO	YES
DS-RZ1CF-VA/VW	4.3	0370/0371	A01	NO	YES
DS-RZ1DF-VA/VW	9.1	0372/1614	A01	NO	YES
DS-RZ1EF-VA/VW	18.2	N1H1/0372	A01	NO	YES
DS-RZ1DD-VA/VW	9.1	0305/3B07	A01	YES-VW	YES
DS-RZ1ED-VW	18.2	0306/0305/ 3B07	A01	YES-VW	YES
DS-RZ1EA-VW	18.2	3B05/ B016	A01	YES-VW	YES
DS-RZ1DA-VW	9.1	3B06/B016	A01	YES-VW	YES
DS-RZ1FC-VW	36.4	3B07	A01	YES-VW	YES

Table 6 Notes:
[1]   Minimum Microcode Version
[2]   Minimum Hardware Revision supported
[3]   Only Ultra SCSI Wide drives supported and installed in a DS-BA370-AA run in Ultra Mode

Table 7 Supported SCSI-2 Disks

Device	Capacity GB	Minimum Microcode Version[2]	Minimum H/W Revision[2]	Controller Enclosures	
				DS-BA370-AA[4]	DS-SWXM1-xA DS-BA356-MD
RZ25–VA	0.426	0900	B01	NO	YES
RZ26–VA	1.05	T392	D02	NO	YES
RZ26L–VA/VW [3]	1.05	440C	A01	YES-VW	YES
RZ26N–VA/VW[3]	1.05	446	A01	YES-VW	YES
SWXD3-SF/WF[3]	1.05	446	A01	YES-WG	YES
DS-RZ26N-VZ [3]	1.05	1003	A01	YES	YES
RZ28–VA/VW [3]	2.1	435E	B03	YES-VW	YES
RZ28B–VA	2.1	0003	A01	NO	YES
RZ28D–VA/VW [3]	2.1	0008	A01	YES-VW	YES
SWXD3-SG/WG [3]	2.1	0008	A01	YES-WF	YES
RZ28M–VA/VW [3]	2.1	466	A01	YES-VW	YES
DS-RZ28M–VZ [3]	2.1	1003	A01	YES	YES
SWXD3-SH/WH [3]	2.1	466	A01	YES-WH	YES
RZ29B–VA/VW [3]	4.3	0007	B01	YES-VW	YES
SWXD3-SE/WE [3]	4.3	0007	C02/A01	YES-WE	YES
DS–RZ40–VA	9.1	LYJO/0656	A01	NO	YES

Table 7 Notes:
[2]   Minimum Microcode Version and Hardware Revision supported
[3]   Wide disks require BA356 wide device shelves and 8-bit or 16-bit I/O modules
[4]   Only Ultra SCSI Wide drives supported and installed in a DS-BA370-AA run in Ultra Mode

Table 8   Supported Solid State Disks

Device	Capacity GB	Minimum Microcode Version	Minimum H/W Revision	Controller Shelves	
				DS-BA370-AA	DS-SWXM1-xA DS-BA356-MD
EZ31-VW	0.134	V064	A01	YES	YES
EZ32-VW [2,3]	0.268	V064	A01	YES	YES
EZ51R-VA [2,3]	0.10	V096	D01	YES	YES
EZ54R-VA [2,3]	0.42	V109	C02	YES	YES
EZ58R-VA [1,2,3]	0.85	V110	D01	NO	YES
EZ64-VA [2,3]	0.475	V064	A01	NO	YES
EZ64-VW [2,3]	0.475	V070	A01	NO	YES
EZ69-VA [2,3]	0.950	V064	A01	NO	YES
EZ69-VW [2,3]	0.950	V070	A01	NO	YES
EZ454 [2,3]	.536	Y018	A01	NO	YES
EZ832 [2,3]	3.2	Y018	A01	NO	YES
EZ41 [2,3]	0.134	V012	A01	NO	YES
EZ42 [2,3]	0.268	V012	A01	NO	YES
EZ51 [2,3]	.107	V109	C02	NO	YES
EZ54 [2,3]	.428	V109	C02	NO	YES
EZ705 [2,3]	0.536	V012	A01	NO	YES
EZ711 [2,3]	1.1	V012	A01	NO	YES
EZ716 [2,3]	1.6	V012	A01	NO	YES

Table 8 Notes:
[1]   Code load is not supported for these drives
[2]   Formatting supported for these drives
[3]   Do not warm-swap solid-state disk drives. Make sure power to the device shelf is turned off before removing or inserting this device

Table 9 Supported Tape Libraries

Device	Capacity GB	Minimum Microcode Version [2]	Minimum H/W Revision [2]	Controller Shelves	
				DS-BA370-AA	DS-SWXM1-xA DS-BA356-MD
TL812 [3,4,7]	960/1920 [5]	1.2 robot/ CC33 drive	A01	YES [11]	YES
TL820, Rev A01 [3,4]	2640/5280 [5]	1d3M robot/ v40 drive	L1	YES [3]	YES
TL822 [3,4,7]	5280/10560 [5]	1g4F robot/ CC33drive	A01	YES [3]	YES
TL826 [3,4,7]	3520/7040 [5]	1g4F robot/ CC33drive	A01	YES [3]	YES
DS-TL893 [3,4,7,8]	9.24/18.48T [5]	V2A/5A	A01	YES [3]	YES
DS-TL894 [3,4,7,8]	1.69/3.36T [5]	V1.24	A01	YES [3]	YES
DS-TL895 [3,4,7,8]	3.1/6.2 [5]	230	A01	YES [3]	YES
DS-TL896 [3,4,7,8]	6.1/12.32T [5]	V2A/5A	A01	YES [3]	YES

Table 9 Notes:

[2]   Minimum microcode version and hardware revision supported

[3]   Requires 0.2 meter SCSI–1 to SCSI–2 transition cable, Compaq Computer Corporation internal part number 17–03831–01 for DWZZA-AA, and part number 17-04367-01 for SBB DWZZA-VA and DWZZB-VW

[4]   Requires DWZZA/DWZZB single-ended to differential SCSI signal converter

[5]   Values represent compressed data. The compression factor is device dependent based on individual device algorithms.-

[7]   Cannot read TK50, TK70 or TZ30 format tapes

[8]   Do not warm swap this device. Make sure that the device shelf power is off when inserting or removing this device.

[9]   Wide Tape Devices require BA356 with 8-bit I/O module.

[10]   Tape Device Code load is supported.

[11]   May be connected via cable to the SA370

Table 10 Tape Loader Support

Device	Capacity GB	Minimum Microcode Version [2]	Minimum H/W Revision [2]	Controller Shelves	
				DS-BA370-AA	DS-SWXM1-xA DS-BA356-MD
TZ875-NT/TA [3,10]	50/100 [5]	930A	A01	YES [3]	YES
TZ877–AE/AF [3,10]	70/140 [5]	930A	A01	YES [3]	YES
TZ885–TA [3,7,10]	100/200 [5]	CC33	A01	YES [3]	YES
TZ885–NE [3,7,10]	100/200 [5]	CC33	A01	YES [3]	NO
TZ887–AE/AF [3,7,10]	140/280 [5]	CC33	A01	YES [3]	YES
TZ887–NE/NT [3,7,10]	140/280 [5]	CC33	A01	NO	YES

Table 10 Notes:

[2]   Minimum microcode version and hardware revision supported

[3]   Requires 0.2 meter SCSI–1 to SCSI–2 transition cable, Compaq Computer Corporation internal part number
         17–03831–01 for DWZZA-AA, and part number 17-04367-01 for SBB DWZZA-VA and DWZZB-VW

[4]   Requires DWZZA/DWZZB single-ended to differential SCSI signal converter

[5]   Values represent compressed data. The compression factor is device dependent based on individual device algorithms.

[7]   Cannot read TK50, TK70 or TZ30 format tapes

[8]   Do not warm swap this device. Make sure that the device shelf power is off when inserting or removing this device.

[9]   Wide Tape Devices require BA356 with 8-bit I/O module.

[10]   Tape Device Code load is supported.

[11]   May be connected via cable to the SA370

Table 11 Tape Drive Support

Device	Capacity GB	Minimum Microcode Version [2]	Minimum H/W Revision [2]	Controller Shelves	
				DS-BA370-AA	DS-SWXM1-xA DS-BA356-MD
TZ87–VA [10]	10/20 [5]	930A	A01	NO	YES
TZ87N–VA [7,10]	10/20 [5]	930A	A01	NO	YES
TZ87–TA [3,4,10]	10/20 [5]	9514	B02	YES [3]	YES
TZ87N–TA [3,4,10]	10/20 [5]	930A	A01	YES [3]	YES
TZ88N-VA/TA/TA [7,10]	20/40 [5]	CC33	A01	NO	YES
DS-TZ89N-VW [7,9,10,12]	35/70 [5]	V80	A01	NO	YES
DS-TZ89N–TA [3,7,10]	35/70 [5]	141F	A01	YES [3]	YES
DS-TZS20-VW	25/50 [5]	01aj	A01	YES	YES
DS-AIT35-VW [9,10]	35/70	4.03	A01	YES	YES

Table 11 Notes:

[2]	Minimum microcode version and hardware revision supported
[3]	Requires 0.2 meter SCSI–1 to SCSI-2 transition cable, Compaq Computer Corporation internal part number 17–03831–01 for DWZZA-AA, and part number 17-04367-01 for SBB DWZZA-VA and DWZZB-VW
[4]	Requires DWZZA/DWZZB single-ended to differential SCSI signal converter
[5]	Values represent compressed data. The compression factor is device dependent based on individual device algorithms.
[7]	Cannot read TK50, TK70 or TZ30 format tapes
[9]	Wide Tape Devices require BA356 with 8-bit I/O module.
[10]	Tape Device Code load is supported.
[11]	May be connected via cable to the SA370
[12]	Code Load is not supported on this device.

Tapes and Tape libraries listed in the tables are supported by HSOF with the HSZ50 controller on Compaq OpenVMS and Compaq Tru64 UNIX as specified in the specific operating system documentation. Direct attachment of these devices may be supported on other platforms as specified in the product literature.

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Table 12 CD-ROM Support

Device	Capacity GB	Minimum Microcode	Minimum H/W	Controller Shelves	
				DS-BA370-AA	DS-SWXM1-xA DS-BA356-MD
RRD42-VB/VU[1]	0.6	1.1A	A01	NO	YES
RRD43-VA[1]	0.6	0064	A02	NO	YES
RRD44-VA[1]	0.6	3493	A02	NO	YES
RRD45-VA/VU[1]	0.6	1645	A01	NO	YES
RRD46-VA[1]	0.6	1337	A01	NO	YES
RRD47-VA[1]	0.6	1206	A01	NO	YES

Table 12 Notes:

[1]   Do not warm swap this device. Ensure that the device shelf power is off when inserting or removing this device.

Software Requirements

The following lists the operating systems and versions that are approved for use by V5.7:

- Compaq Tru64 UNIX V4.0d, V4.0e, V4.0f, V5.0, and V5.0a

- OpenVMS Alpha: V6.2-1H3, V7.1-1H1/2/3, V7.1-2, V7.2, and V7.2-1

- OpenVMS VAX: V6.2, V7.1, and V7.2

Distribution Media

The HSOF software is shipped on PCMCIA program card media only.

Ordering Information

Customers wishing to purchase HSOF Software V5.7 Software Kits (or Services) may order them using the part numbers listed in Table 13. The HSOF Software is ordered and shipped separately from the HSZ50.

Customers wishing to purchase Platform Software Kits (including HSOF Software V5.7), StorageWorks Command Console (SWCC), documentation and any required platform-specific software, may order them using the part numbers listed in Table 14.

Table 13 Solutions Software Package Part Numbers

Part Number	Description
QB-5CJAA-SA	HSZ50/HSOF License, Media, and Documentation
QB-5CJAA-SC	HSZ50/HSOF License and Media
QA-5CJAA-GZ	HSZ50/HSOF Media and Documentation
QT-5CJ**-**	HSZ50/HSOF Software Product Services

Table 14 Platform Kits and Adapters

Host Platform	Platform S/W Kit
Tru64 UNIX	QB-5JCAB-SA
Compaq OpenVMS	QB-5JCAC-SA
Windows NT/Alpha	QB-5JCAD-SA
Windows NT/x86-Compatible	QB-5JCAE-SA

> **NOTE:** See the Host Node Software and Hardware Required sections for specific adapter support.

Software Product Services

A variety of service options are available from Compaq Computer Corporation. For more information, contact your local Compaq Computer Corporation office. Software service for the HSZ50 Solution Software is covered under the terms and conditions of the Integrated Hardware and Software Customer Service contracts. Multivendor Customer Services for the HSZ50 controller and HSZ50 Solutions Software are covered under the terms and conditions of the following:

- Hardware Customer Service contract

- Software Customer Service contract

- Media and Documentation Distribution Service (MDDS) contract

Software Warranty

HSZ50 Solutions Software is provided with 90 day Telephone Support and 90 days conformance to the Software Product Description (SPD).

Notice