**COMPAQ**

# Software
# Product
# Description

**PRODUCT NAME:** **HSZ40 StorageWorks™ Solutions Software** **SPD: 53.54.13**
**HSOF Version 3.7**

**Description**

The HSZ40 Array Controller Operating Software (HSOF) is the software component of the HSZ40-Bx/Cx array controller. This array controller is an intelligent mass storage server that interfaces between host computer systems and SCSI-attached mass storage devices using a SCSI-2 bus. HSOF software executes in the HSZ40 array controller; it processes SCSI I/O requests from hosts, performing the device-level operations required to satisfy the requests.

**HSOF Software Functions**

HSOF software performs the following functions:

- Testing and diagnosis of the HSZ40 Array Controller

- Host interconnect and protocol services

- SCSI device control

- Subsystem management services

- Local program support

- Disk partitioning functions

The following sections describe these functions.

***Testing and Diagnosis of the HSZ40 Array Controller***

HSOF software internal diagnostics execute automatically when controller power is turned on, whenever the array controller is reset, and periodically during use. LEDs on the controller's front bezel provide diagnostic information upon controller failure.

An asynchronous I/O port is also provided for configuration and diagnosis.

**Host Interconnect and Protocol Services**

The HSZ40 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 shelf.

**SCSI Device Control**

HSOF software converts host I/O requests into device-specific SCSI commands. It supports concurrent commands and data transfers on multiple SCSI device buses for each supported device type.

HSOF software 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. For errors on the SCSI host interface, HSZ40 Array Controller hardware and HSOF software cooperate to provide 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 HSZ40-Bx/Cx controllers installed in the same controller shelf with Compaq™ Tru64™ UNIX Version 3.2 operating systems as well as Compaq OpenVMS™ Version 6.2 and higher.

- Device Integrity Testing - HSOF software executes Device Integrity Test programs on system manager command. These tests perform the following:
  - Verify correct operation of individual devices

  - Place the HSZ40 Array Controller under load to verify correct subsystem operation

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

- Partitioning - HSOF software allows partitioning of disk drives for improved device management. A partitioned disk appears to the OpenVMS operating system as separately addressable multiple unit numbers. Up to 4 partitions may be created per disk.

- 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 - Saves device, controller configuration information, and HSOF software patches on a disk. This improves availability in the event of a controller replacement. This functionality is specific to HSZ40 controller replacements for non-redundant configurations.

- Set SCSI Speed for Host and Devices - In configurations that must use a long SCSI cable between the HSZ40 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 switch can set the maximum data transfer rate between the controller and any device to10MHz or 5MHz.

- Asynchronous Device Swap - HSOF software Version 3.7 supports asynchronous device swaps-device removal and insertion without first quiescing the device bus. Devices can be removed or inserted at any time with some restrictions.

- Simultaneous Multiple Operating System Support - HSOF Software V3.7 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 V3.7 Software supports any two of the five host modes at one time. Refer to *CLI Reference Manual*,EK-CLI40-RM, B01) for further detail. Operating system support is required for Simultaneous Multiple Operating System Support. Check the Operating Systems SPD for support information.

- Optional Functionalities - RAID, disk mirroring, and write-back cache are available as options. Refer to the HS Family of Array Controllers Optional Operating Software for HSOF Software Version 2.7, V3.0, V3.1, V3.2, V3.4, and V3.7, Software Product Description, SPD 54.38.03, for further option information.

**Subsystem Management Services**

HSOF software provides the following subsystem management service:

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

- Dynamic Status Display - The HSOF VTDPY utility allows a system manager to view the HSZ40-based subsystem's state dynamically. This utility can use VT200-, VT300-, and VT400-series video terminals. Terminal port connections are supported at 4800, 9600, and 19200 BPS only.

- HSUTIL - The HSUTIL utility provides two functions: device format and device code load. Device format enables the system manager to perform a basic format operation on a disk device. Device code load provides the functionality to download device firmware onto supported disk and tape drives via the controller. Device code load is supported for some tape devices (check user documentation for support information).

- Environmental Monitor Unit - HSOF Software Version 2.5 and higher support EMU functionality in SW300-series cabinets for HSZ40-Bx/Cx products only.

**Local Program Support**

HSOF Software Version 2.5 and higher support EMU functionality in SW300-series cabinets for HSZ40-Bx/Cx products only.

- AUTOSPARE as an option to aid in the replacement of failed disk drives

- CFMENU for configuring controller-attached storage devices

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

- CLONE utility for obtaining physical copies of data in concert with Disk Mirroring optional software

- Code Load/Code Patch (CLCP) for controller software changes

- CONFIG for automatically adding new devices to the configuration

- C_SWAP for controller and/or cache module warm swap (for dual-redundant configurations)

- DILX disk inline exerciser

- FLS for enabling and disabling optional licensed features

- FMU for displaying 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

> **NOTE:** The CLONE utility cannot be used with partitioned units.

**Hardware Requirements**

HSOF software requires an HSZ40-Bx or Cx Array Controller module on which to execute. The FWD SCSI bus must be properly terminated. The HSZ40 array controller includes six SCSI device ports. The specific devices supported by HSOF Software Version 3.7 are listed in the Device Tables. Up to 42 (in a non-redundant configuration) or up to 36 (in a dual-redundant configuration) SCSI-2 and SSD devices may be attached to the HSZ40 array controller via 32 SCSI LUNs.

The HSZ40-Bx/Cx Array Controller supported configurations are listed in Table 1.

**Table 1  Supported Configurations**

| Part Number | Description |
| --- | --- |
| HSZ40-BA/CA | StorageWorks Array Controller for 36 (dual-redundant) or 42 (single controller) SCSI-2 and SSD devices; no read cache |
| HSZ40-BD/CD | StorageWorks Array Controller for 36 (dual-redundant) or 42 (single controller) SCSI-2 and SSD disk devices; includes 16 MB of read cache |
| HSZ40-BF/CF | StorageWorks Array Controller for 36 (dual-redundant) or 42 (single controller) SCSI-2 and SSD disk devices; includes 32 MB of write-back cache, disk mirroring, and RAID options |
| HSZ40-TL | Two StorageWorks Array Controllers (HSZ40-BX/CX) for 36 dual-redundant SCSI-2 and SSD disk devices; both  with 32 MB of write-back cache, disk mirroring, and RAID options, and a 20M cable |

**Configuration Restrictions**

The following configuration restrictions apply:

- HSZ40-Ax is not supported by the this release.

- Two controllers in the same BA350-Mx controller shelf must be configured as a dual-redundant configuration.

- HSZ40-Bx and HSZ40-Cx controllers may be used in a dual-redundant pair with HSOF Software V2.7 and higher. The HSZ40-Cx is not supported on V2.5 and lower.

- The HSOF software must be at identical revision levels for dual redundant pairs.

- HSZ40-Cx minimum supported revision level is V3.1.

- For dual-redundant configurations, HSZ40-Ax and HSZ40-Bx/Cx controller modules are NOT supported in the same controller shelf.

- For HSZ40-Bx/Cx dual-redundant configuration failover, Compaq Tru64 UNIX Version 3.2g, 4.0d or OpenVMS Version 6.2-1H3, (or higher) operating system versions are required.

- A maximum of six devices may be attached to a single SCSI device bus on dual-redundant HSZ40 array controller configurations.

- A maximum of seven devices may be attached to a single SCSI device bus on nonredundant HSZ40 array controller configurations.

- A maximum combined total of 30 storagesets (mirrorsets, RAIDsets, and stripesets) are supported with HSOF Software Version 2.5 or higher.

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

- Maximum LUN capacity is 256GB.

**Host Node Hardware and Software Required**

A valid Compaq Tru64 UNIX or OpenVMS Alpha configuration with a supported FWD SCSI interface, as referred to in the following section, is required to run HSOF software.

**Other Hardware**

The RAID and disk mirroring options for HSZ40-Bx/Cx require a write-back cache module. The Write-Back Cache option requires the HSZ40-YX cache option or the Write-Back Cache license and the HSx30/40 Write-Back cache battery, along with the appropriate cache module option. RAID, Disk Mirroring and Write-back Cache are standard with HSZ40-BF and HSZ40-CF options.

> **NOTE:** Hardware configuration guidelines for HSZ40 Array Controllers are provided in the *Configuring Your StorageWorks HSZ40 Array Controller,* EK-HSZ40-CG. B01.

### *Compaq TRU64 UNIX Host Bus Adapters*

The following Host Bus Adapters are supported by the Compaq Tru64 UNIX operating systems 3.2g, and 4.0d for HSZ40-Bx/Cx controllers:

- KZMSA (for DEC 7000 DEC 10000  and AlphaServers 8200 /8400 systems, requires a DWZZ-series signal converter)

- KZPSA (for Compaq AlphaServers 1000/2000/2100/4100/8200/8400)

- KZTSA (for DEC 3000[TM] systems)

- PMAZC (for DEC 3000 systems, requires a DWZZ-series signal converter)

### *Compaq OpenVMS Host Bus Adapters*

The following Host Bus Adapters are supported by the Compaq OpenVMS Alpha operating system Version 6.2 and V7.1 for HSZ40 controllers:

- KZMSA (for DEC 7000, DEC 10000, and requires a DWZZ-series signal converter)

- KZPAA (for Compaq AlphaServers 1000/2000/2100 systems)

- KZPSA (for Compaq AlphaServers 1000/2000/2100/4100/8200/8400)

- KZTSA (for DEC 3000 systems)

- PMAZC (for DEC 3000 systems, requires a DWZZ-series signal converter)

- KFTIA (for TurboLaser 8200 embedded SCSI)

*Windows NT x86-Compatible Host Bus Adapters*

The following host adapters are supported by the Windows NT x86-Compatible operating system Version 3.51 and 4.0 for HSZ50 controllers:

- SWXA3-BC (for PCI based systems)
- SWXA3-BD (for PCI based systems)
- SWIA3-BB (for EISA based systems)

*Windows Alpha Host Bus Adapters*

The following host adapters are supported by the Windows Alpha operating system Version 3.51 and 4.0 for HSZ40 controllers:

- KZPSA (for Compaq AlphaServers 400/1000/2000/2100/4100)

HSOF software supports the following optional software:

- QL-4DTA9-AA HSZ Disk Mirroring Software License
- QL-3J0A9-AA HSZ RAID Software License
- QL-3HXA9-AA HSZ Write-Back Cache Software License

> **Note:** Use of the Write Back Cache Software License requires that HSZ40 cache module and HSx30/40 cache batteries be installed. To purchase batteries contact you local Compaq Customer Service representative.

*HSZ40-Bx/Cx Packaging*

HSZ40-Bx/Cx Array Controllers, mounted in a BA350-MA controller shelf, support the following packaging components:

- BA350-Sx 8-bit SCSI shelf for devices and up to two single-ended buses
- BA356-Sx 16-bit SCSI shelf for devices and up to two single-ended buses with BA-35X-MG 8-bit I/O module
- BA35x-HF 150 Watt, 48 Volt Power Supply in System Building Block (SBB), 3½ inch form factor
- BA35X-MG 8-Bit I/O Module
- BA35X-MH 16-Bit I/O Module

**Supported Disk Devices**

Tables 2 through 7 contains a list of the supported disk devices for the HSZ40 running HSOF V3.7.

**Table 2  Supported Disk Drives**

| Device | Capacity in Gigabytes | Minimum Microcode Version | Minimum Hardware Version |
|---|---|---|---|
| RZ25-VA | 0.43 | 0900 | B01 |
| RZ26-VA | 1.05 | T392 | D02 |
| RZ26L-VA/VW[1] | 1.05 | 440C | A01 |
| RZ26N-VA/VW[1] | 1.05 | 446 | A01 |
| SWXD3-SF/WF[1] | 1.05 | 446 | A01 |
| DS-RZ26N-VZ[1] | 1.05 | 1003 | A01 |
| DS-RZ1BB-VW | 2.10 | LYJO/0656 | A01 |
| RZ28-VA/VW[1] | 2.10 | 435E | B03 |
| RZ28B-VA | 2.10 | 0003 | A01 |
| RZ28D-VA/VW[1] | 2.10 | 0008 | A01 |
| SWXD3-SG/WG[1] | 2.10 | 0008 | A01 |
| RZ28M-VA/VW[1] | 2.10 | 0466 | A01 |
| DS-RZ28M-VZ[1] | 2.10 | 1003 | A01 |
| SWXD3-SH/WH[1] | 2.10 | 0466 | A01 |
| RZ74-VA | 3.57 | T427B | B07 |
| DS-RZ1CB-VW | 4.1 | LYJO/0656 | A01 |
| RZ29B-VA/VW[1] | 4.3 | 0007 | B01 |
| SWXD3-SE/WE[1] | 4.3 | 0007 | C02/A01 |
| DS-RZ1CF-VA/VW | 4.3 | 0370/0371 | A01 |
| DS-RZ1DB-VW | 9.1 | LYJO/0307 | A01 |
| DS-RZ1DF-VA/VW | 9.1 | 0372/1614 | A01 |
| DS-RZ40-VA | 9.1 | LYGO | A01 |
| DS-RZ1DD-VA/VW | 9.1 | 0305/3B07 | A01 |
| DS-RZ1EF-VA/VW | 18.2 | 0372/N1H1 | A01 |

**Table 2  Supported Disk Drives – continued**

| Device | Capacity in Gigabytes | Minimum Microcode Version | Minimum Hardware Version |
|---|---|---|---|
| DS-RZ1ED-VW | 18.2 | 0306/0305/3B07 | A01 |
| DS-RZ1EA-VW | 18.2 | 3B05/ B016 | A01 |
| DS-RZ1DA-VW | 9.1 | 3B06/ B016 | A01 |
| DS-RZ1FC-VW | 36.4 | 3B07 | A01 |

Table 2 Notes:

[1]        Wide disk drives require a SWXSS–06 shelf.

All drive "VW" models require DS-SWXSS–06 wide device shelves.

**Table 3  Supported Solid State Devices**

| Device | Capacity in Gigabytes | Minimum Microcode Version | Minimum Hardware Version | Notes |
|---|---|---|---|---|
| EZ31-VW | 0.134 | V064 | A01 | 2, 3 |
| EZ32-VW | 0.268 | V064 | A01 | 2, 3 |
| EZ51R-VA | 0.10 | V096 | D01 | 2, 3 |
| EZ54R-VA | 0.42 | V109 | C02 | 2, 3 |
| EZ58R-VA | 0.85 | V110 | D01 | 1, 2, 3 |
| EZ64-VA | 0.475 | V064 | A01 | 2, 3 |
| EZ64-VW | 0.475 | V070 | A01 | 2, 3 |
| EZ69-VA | 0.950 | V064 | A01 | 2, 3 |
| EZ69-VW | 0.950 | V070 | A01 | 2, 3 |
| EZ454 | .536 | Y018 | A01 | 2, 3 |
| EZ832 | 3.2 | Y018 | A01 | 2, 3 |
| EZ41 | 0.134 | V012 | A01 | 2, 3 |
| EZ42 | 0.268 | V012 | A01 | 2, 3 |
| EZ51 | .107 | V109 | C02 | 2, 3 |

**Table 3  Supported Solid State Devices - continued**

| Device | Capacity in Gigabytes | Minimum Microcode Version | Minimum Hardware Version | Notes |
|---|---|---|---|---|
| EZ54 | .428 | V109 | C02 | 2, 3 |
| EZ705 | 0.536 | V012 | A01 | 2, 3 |
| EZ711 | 1.1 | V012 | A01 | 2, 3 |
| EZ716 | 1.6 | V012 | A01 | 2, 3 |

Table 3 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 4  Tape Drive Loader Support**

| Device | Capacity GB | Minimum Microcode Version [2] | Minimum H/W Revision [2] |
|---|---|---|---|
| TZ875-NT/TA [3,10] | 50/100 [5] | 930A | A01 |
| TZ877–AE/AF [3,10] | 70/140 [5] | 930A | A01 |
| TZ885–TA [3,7,10] | 100/200 [5] | CC33 | A01 |
| TZ885–NE [3,7,10] | 100/200 [5] | CC33 | A01 |
| TZ887–AE/AF [3,7,10] | 140/280 [5] | CC33 | A01 |
| TZ887–NE/NT [3,7,10] | 140/280 [5] | CC33 | A01 |

Table 4 Notes:

[2]    Minimum microcode version and hardware revision is supported.

[3]    Requires 0.2 meter SCSI–1 to SCSI–2 transition cable, Compaq internal part number 17–03831–01 for DWZZA-AA, and Compaq 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.

## Table 5  Tape Libraries Support

| Device | Capacity GB | Minimum Microcode Version [2] | Minimum H/W Revision [2] |
|---|---|---|---|
| TL812 [3,4,7] | 960/1920 [5] | 1.2 robot/CC33drive | A01 |
| TL820, Rev A01 [3,4] | 2640/5280 [5] | 1d3M robot/v40 drive | L1 |
| TL822 [3,4,7] | 5280/10560 [5] | 1g4F robot/CC33drive | A01 |
| TL826 [3,4,7] | 3520/7040 [5] | 1g4F robot/CC33drive | A01 |
| DS-TL893 [3,4,7,8] | 9.24/18.48T [5] | V2A/5A | A01 |
| DS-TL894 [3,4,78] | 1.69/3.36T [5] | V1.24 | A01 |

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**Table 5   Tape Libraries Support - continued**

| Device | Capacity GB | Minimum Microcode Version [2] | Minimum H/W Revision [2] |
|---|---|---|---|
| DS-TL895 [3,4,7,8] | 3.1/6.2 [5] | 230 | A01 |
| DS-TL896 [3,4,7,8] | 6.1/12.32T [5] | V2A/5A | A01 |

Table 5 Notes:

[2]   Minimum microcode version and hardware revision supported

[3]   Requires 0.2 meter SCSI–1 to SCSI–2 transition cable, Compaq internal part number 17–03831–01 for DWZZA-AA, and Compaq 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

**Table 6  Tape Drives Support**

| Device | Capacity GB | Minimum Microcode Version [2] | Minimum H/W Revision [2] |
|--------|-------------|-------------------------------|--------------------------|
| TZ87–VA [10] | 10/20 [5] | 930A | A01 |
| TZ87N–VA [7,10] | 10/20 [5] | 930A | A01 |
| TZ87–TA [3,4,10] | 10/20 [5] | 9514 | B02 |
| TZ87N–TA [3,4,10] | 10/20 [5] | 930A | A01 |
| TZ88N-VA/TA [7,10] | 20/40 [5] | CC33 | A01 |
| DS-TZ89N–VW [7,9,10] | 35/70 [5] | V80 | A01 |
| DS-TZ89N–TA [3,7,10] | 35/70 [5] | 141F | A01 |
| DS-TZS20–VW | 25/50 [5] | 01Aj | A01 |
| DS-AIT35-VW [9,10] | 35/70 | 4.03 | A01 |

Table 6 Notes:

[2]    Minimum microcode version and hardware revision supported

[3]    Requires 0.2 meter SCSI–1 to SCSI–2 transition cable, Compaq internal part number 17–03831–01 for DWZZA-AA, and Compaq 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.

**Table 7  CD-ROM Support**

| Device | Capacity GB | Minimum Microcode Version [2] | Minimum H/W Revision [2] |
|---|---|---|---|
| RRD42-VB/VU [8] | 0.6 | 1.1A | A01 |
| RRD43-VA [8] | 0.6 | 0064 | A02 |
| RRD44-VA [8] | 0.6 | 3493 | A02 |
| RRD45-VA/VU [8] | 0.6 | 1645 | A01 |
| RRD46-VA [8] | 0.6 | 1337 | A01 |
| RRD47-VA [8] | 0.6 | 1206 | A01 |

Table 7 Notes:

[2]     Minimum microcode version and hardware revision supported

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

Tapes and Tape libraries listed in the tables are supported by HSOF with the HSZ40 controller on OpenVMS and Compaq Tru64 UNIX as specified in the specific operating system documentation. No other operating system support is provided.

Tables 2 through 7 represent the **only** devices that are supported by the HSZ40 Array Controller running HSOF V3.7. Compaq Computer Corporation neither supports nor recommends any device not listed for use with the HSZ40 regardless of the supplier or stated conformance to ANSI SCSI standards. Compaq will not assure correct operation of any unqualified device nor assure that such devices will not have impact on other supported devices, on the controller itself, or on a Compaq system configuration.

**Software Requirements**

The following listed operating systems are the only qualified to operate with the HSZ40 Array Controller running HSOF V3.7.

- Compaq Tru64 UNIX:  Versions 4.0d, 4.0e, 4.0f, 5.0, and 5.0a

- 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**

HSOF Software is shipped on PCMCIA program card media only.

**Ordering Information**

HSOF software kits and licenses for the HSZ* Array Controllers may be ordered or an MCS contract purchased using the order numbers listed in Table 8.

**Table 8  Distribution and Documentation Options**

| Part Number | Description |
| --- | --- |
| QL-2YJA9-AA | SWKS HSZ40 MSC TRAD LIC |
| QL-2YJA9-RA | SWKS HSZ40 MSC TRAD UPD LIC |
| QA-2YJAD-HS | SWKS HSZ40-B/C MSC PCRM KIT |
| QA-2YJAC-GZ | SWKS HSZ40-B/C MSC DOC KIT |
| QT-2YJ9A*-** | HSOF Software Product Services |

Refer to SPD 54.38.03 for optional RAID, write-back cache, and disk mirroring software license ordering information.

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**Optional Software**

Refer to the HS Family of Array Controllers Optional Operating System Software (HSOF), Version 2.7, 3.0, 3.1, 3.2, 3.4, and 3.7 SPD 54.38.03, for further information regarding the following optional software products:

- RAID (RAIDsets) – HSOF Software treats sets of disk drives as RAIDsets when the separately licensed RAID option is installed. RAIDsets may have from 3 to 14 members. Each RAIDset is presented to the hosts as a single large virtual disk.

- Disk Mirroring - HSOF Software treats sets of disk drives as mirrorsets when the separately licensed disk mirroring option is installed. Mirrorsets may have from 2 to 6 members. Each mirrorset is presented to the hosts as a single large virtual disk.

- Write-back Cache - When the separately licensed write-back cache option is installed, HSOF Software can provide improved I/O performance by supporting write-back cache for user-selected disks, stripesets, RAIDsets, and mirrorsets.

**Software Licensing**

An HSOF Software license is shipped with every hardware configuration that includes an HSZ40 Array Controller.

This software is furnished only under a license. For more information about Compaq's licensing terms and policies, contact your local Compaq office.

The RAID, write-back cache, and disk mirroring options require separate licenses and require that a license key be installed for correct operation. Refer to the *HSOF Array Controllers Optional Operating Software (HSOF), Versions 2.7, 3.0, 3.1, 3.2, 3.4, and 3.7 SPD 54.38.03*, for further licensing information.

**Software Product Licenses**

A variety of service options are available from Compaq. For more information, contact your local Compaq office or distributor.

Software service for HSOF software is covered under the terms and conditions of the integrated Hardware and Software Customer Service contracts.

Multivendor Customer Services for the HSZ40 Array Controller and HSOF 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**

Warranty for this software product as provided by Compaq, includes 90 days conformance to Software Product Description (SPD) and 90 days telephone support.

## Notice