

DIGITAL

FCO CATEGORY

Write Back Cache Batteries [S]

FCO HSWBC-S-0002

FIELD CHANGE ORDER

NUMBER: HSWBC-S-0002

APPLICABILITY: HS1CP-AF, HSD30-YX, HSJ30-YC, HSJ40-YA, YB, YC  
HSZ40-YX, HSZ40-BF, HSZ40-Cx SWXRA-YA, YB, YD, YJ, YX, YY  
SWXRC-04, SWXRC-05, SWXNA

PROBLEM & SYMPTOM:

Batteries manufactured during calendar year 1996 and shipped on write back cache modules or as replacement spares are at risk from a manufacturing defect that results in an early life 'open' failure condition.

1. High Risk Situation - can result in Data Loss  
The battery could open when the subsystem is operational. If a controller loss of power occurs before periodic tests discover the failure, data stored in the write back cache will be lost during the period of power loss. The result is a data loss.
2. Low Risk Situation - down time on write-back cache.

SOLUTION:

Replace identified batteries with production units from 1997 or later.

QUICK CHECK: (UTILIZE ATTACHED PROCEDURES BEFORE TAKING HSJ30/40, HSD30/HS1CP SWXRC / HSZ40 Controller out of service)

Remove Cache module in HSx30/40 Controller. Remove battery cover. On the flat side stamped in black ink will be a 'Month' 'Year' indication of the manufacture time of the battery. If that stamp indicates the battery was manufactured in 1996, it is a candidate for FCO replacement.

PRE/CO-REQUISITE FCO:

NONE

MFIT HRS

0.4 HRS

TOOL/TEST EQUIPMENT:

NONE

FCO PARTS INFORMATION

FCO KIT NO.	DESCRIPTION OF CONTENTS
EQ-tbd-01	including: 70-32162-01 WBC Battery Kit FA-tbd-01 FCO Installation Document

FCO CHARGING INFORMATION

NON-DIGITAL SERVICE PROVIDERS

Authorization, Ordering and Claims directions will be sent to you from the Digital AWSP office.

All request should be directed to 1-800-298-2977 (AWSP) #2.

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ESD SAFETY PROCEDURES:

When removing / handling any of the modules during execution of this FCO, follow carefully the safety procedures as follows:

Use ALL ESD safety precautions to prevent DOA's on material in kit. (Include the following caution statements and instructions for setting up the Velostat Kit or using an ESD module box, depending on the FCO)

\*\*\*\*\*
\* C A U T I O N \*
\* The module, as with all modules, contain electrostatic \*
\* discharge sensitive devices (ESDS). The use of the Velostat \*
\* Kit or ESD module box is essential to prevent damage which \*
\* may not be noticed immediately. \*
\*\*\*\*\*

Setting up Velostat Kit \_\_\_\_\_

- a. Unfold the Velostat mat to full size (24" x 24")
b. Attach the 15 foot ground cord to the Velostat snap fastener on the mat.
c. Attach the alligator clip end of the ground cord to a good ground on the cabinet.
d. Attach the wrist strap to either wrist and the alligator clip to a convenient portion of the mat.
e. Remove the module from it's CPU option slot and place it on the mat.

Or:

- e. Remove the module from the spares kit and lay it on the velostat mat.

\*\*\*\*\*
\* C A U T I O N \*
\* If using a module in an ESD box, insure wrist strap is \*
\* connected to the box and the box is connected to chassis of \*
\* the device being upgraded. \*
\*\*\*\*\*

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CONGIGURATION INFORMATION:

\*\*\*\*\* NOTE \*\*\*\*\*

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\* \*\*\*\*\* BATTERY AND BATTERY COVER MUST BE RETURNED \*\*\*\*\* \*  
\* TO DIGITAL EQUIPMENT CORPORATION FOR REWORK OR PROPER DISPOSAL \*  
\* \*  
\*\*\*\*\*

There are two distinct procedures for battery replacement depending upon the controller configuration.

Configuration 1) Either (A) redundant configuration WITH RAID sets and/or Mirror sets or (B) non-redundant configuration. This procedure requires system downtime.

Configuration 2) Redundant configuration WITHOUT RAID sets or Mirror sets configured. Downtime may be scheduled or C\_SWAP may be run to avoid downtime.

In either case, replacement of the Write Back Cache batteries requires a clean rundown of the controller, allowing all unwritten cache data to be flushed to media. This is accomplished through the CLI console SHUTDOWN command, which performs the rundown and halts the controller.

NOTE: The IGNORE\_ERRORS and IMMEDIATE\_SHUTDOWN (non-default) qualifiers to the SHUTDOWN command are "NOT" to be set. OVERIRIDE\_ONLINE (HSJ/HSD) is acceptable because it will rundown the cache.

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\* CONFIGURATION # 1 \*

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The following procedure is to be used for Configuration 1 (non-redundant configuration or redundant configuration WITH RAIDsets or Mirroring sets);

- 1) Schedule controller downtime
- 2) Connect to controller through the CLI  
CLI SHUTDOWN THIS\_CONTROLLER  
  
NOTE: If dual redundant configuration, SHUTDOWN both controllers before proceeding.
- 3) Wait for SHUTDOWN to complete - May take up to 5 minutes
- 4) Remove controller module (See HS family of Array Controllers Service Manual,REV D.01, Page 7-7)
- 5) Remove cache module (See HS Family of Array Controllers Service Manual, Page 7-25)
- 6) Inspect battery per quick check on page 1. If battery needs to be replaced, replace batteries per the instructions included with the replacement kit (EK-HSFAM-RI) or HS Family of Array Controller Service Manual, Page 7-33, Revision D.

- 7) Reinsert cache Module
- 8) Reinsert Controller module (Do not over tighten the screws on the bezel! A snug connection is all that is required.)

NOTE: If dual redundant configuration, complete both controllers before proceeding.

- 9) Restart Controller
- 10) A fully charged battery should show status "good" in a few minutes.

NOTE: A fully discharged battery may take 5 hours to re-charge.

- 11) Report this FCO activity on the LARS form in the "Fail Area/Module/FCO/Comments" column as follows: FCO HSWBC-S-0002
- 12) Digital field engineers should report this FCO activity on their LARS from per the attached instructions.

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\* CONFIGURATION #2 \*  
 \*\*\*\*\*

For Configuration 2 (redundant configurations WITHOUT RAID sets or Mirroring sets), either follow the above procedures for Configuration 1 or:

- a. Connect to controller through the CLI  
 CLI SET <unit name NOWRITEBACK  
  
 for all WRITEBACK enabled units configured on this pair controller
- b. Run C\_SWAP to avoid downtime (see attachment, page 6)
- c. Connect to controller through the CLI CLI SET <unit name WRITEBACK  
 for all previous WRITEBACK enabled units

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\*\*\*\*\*  
 \* Attachment: C\_SWAP procedures \*  
 \*\*\*\*\*

- A. If the controller is running a version of HSOF previous to V2.5x, Follow the C\_Swap procedures in the HS Family of Array Controllers Service Manual, Revision D.01, Page 7-59.

When the cache module is removed, follow the battery procedures on page 7-33 of the same manual or utilize the instruction sheet EK-HSFAM-RI included with the battery kit.

Complete the C\_Swap procedures for the first controller, then proceed with the second controller/cache.

- B. If the controller is running HSOF V2.5x or greater, new C\_Swap procedures, listed below, must be followed.

NOTE: In order for the process identified below to work properly, both controllers must, at a minimum, be at the patch revision identified in STEP # 2 below.

Additionally, in order for this C\_Swap process to work, two (2) controller power supplies must be installed. If you have only one controller power supply, either

temporarily install a second power supply, or take down both controllers at the same time.

1. At the console of the controller whose batteries are to be replaced, type  
"SHOW THIS\_CONTROLLER".

2. Check the output text for one of the following two messages:

If you see:

"Not configured for dual-redundancy"

Proceed to non-redundant configuration procedures above (Configuration 1).

If you see:

"Configured for dual-redundancy with ZG...."

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Check the firmware version that was reported in the previous line of text. The following versions are the minimum necessary to proceed:

HSJ40,HSJ30: V25J-2 ; V27J-x  
HSD30,HS1CP: V25D-4 ; V27D-x  
HSZ40 : V25Z-4 ; V27Z-x ; V30Z-2

Examples of insufficient versions are:

for the HSJ30/HSJ40: V25J-0  
for the HSD30/HS1CP: V25D-0  
for the HSZ40 : V25Z-0

If the firmware of either the controller is below the required revision, the appropriate patches must be installed. See Revision Table below for details. Once done, proceed with step # 3.

NOTE: Patches must be installed sequentially, i.e., if ----- patch 3 is required, patches 1 and 2 are required to be installed prior to installation of patch 3.

Patch 1 and 2 are pre-requisites to 3.

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Patch Revision Table

Controller	Patch Number	Patch Name
HSD30/HS1CP	patch_v25d-1	Work Around for 710/720 NMIs during loopback\test 2 & LCRC tests
	patch_v25d-2	Fixes for repetitive mirrorset recoveries and CLONE bugcheck
	patch_v25d-3	DSSI Port 240ns sync transfer period change
	patch_v25d-4	Fix SET NOFAILOVER to ignore ONLINE status
	patch_v25d-5	Re-enable RAID5 write-back when cache battery low to good CACHE_POLICY=B
	patch_v25d-6	Fix for metadata race condition
	patch_v27d-1	Fix for Battery Test failures
HSJ30/40	patch_v25j-1	Fixes for repetitive mirrorset recoveries and CLONE bugcheck
	patch_v25j-2	Fix SET NOFAILOVER to ignore ONLINE status
	patch_v27j-1	
	patch_v27j-2	
HSZ40-Bx/CX	patch_v25z-1	Work Around for 710/720 NMIs during loopback test 2 & LCRC tests
	patch_v25z-2	SCSI VT Flow Control Correction
	patch_v25z-3	Fixes for repetitive mirrorset recoveries and CLONE bugcheck
	patch_v25z-4	Fix SET NOFAILOVER to ignore ONLINE status
	patch_v25z-5	Re-enable RAID5 write-back when cache battery low to good CACHE_POLICY=B
	patch_v25z-6	Fix for metadata race condition
	patch_v27z-1	Patch to permit HSZ40-BX and HSZ40-CX modules to be intermixed in dual configurations
patch_v27z-2	Fix for Battery Test failures	

patch_v30z-1	Fix for medium/forced errors on a RAID 1 (mirrorset)
patch_v30z-2	Fix for Battery Test failures
patch_v30z-3	Fix for Mirrorset Repair/Fast Buffer problem

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NOTE: Patch Script files may be found at:

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CSC32::ISG\$COMMON:[HSJ40.HSJ\_PATCHES]

CSC32::ISG\$COMMON:[HSD30.HSD\_PATCHES]

CSC32::ISG\$COMMON:[HSZ40.HSZ\_PATCHES]

NOTE: HSZxx-AX and HSZxx-BX have different  
----- scripts in this directory.

NOTE: Procedures and script engine for installation of these  
----- patches can be found at:

Located on CSC32::ISG\$COMMON:[HSJ40].

HSDSA-SCRIPT-ALPHA.EXE ; For HSD/HSJ patches  
; from ALPHA machine  
HSDSA-SCRIPT-VAX.EXE ; For HSD/HSJ patches  
; from VAX machine

Located on CSC32::ISG\$COMMON:[HSZ40.ALPHA\_HSZTERM].  
;For HSZTERM from ALPHA/OpenVMS machine

Located on CSC32::ISG\$COMMON:[HSZ40.HSZTERM\_UNIX].  
;For HSZTERM from DIGITAL UNIX machine

Located on CSC32::ISG\$COMMON:[HSZ40.HSZTERM\_VMS].  
;For HSZTERM from VAX/VMS machine

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3. Cleanly SHUTDOWN the controller whose battery is to be replaced. Be certain that all online units are online to the OTHER controller.
4. On the console of the OTHER controller, type "SET NOFAILOVER".



5. At the console of the OTHER controller, type "RUN C\_SWAP".
6. Answer the question  
" Do you wish to REMOVE the other HSJ40 Y/N [N] ?"  
RESPOND by typing: "YES".
7. Answer the question  
" Will its cache module also be removed Y/N [N] ?"  
RESPOND by typing "YES".
8. Wait for the following text to appear at the console:  
" Killing other controller. Attempting to quiese all ports.  
Port 1 quiesced. Port 2 quiesced. Port 3 quiesced.  
Port 4 quiesced. Port 5 quiesced. Port 6 quiesced.  
All ports quiesced.  
  
Remove the other HSJ40 (the one WITHOUT a blinking green LED)  
within 5 minutes. "
9. Remove the console cable, port connector, trilink (leaving cables  
connected to the trilink for HSD30 and HSZ40) and  
program card from the controller whose battery is being  
replaced.
10. Remove the controller whose battery is being replaced..
11. Wait for the following text to appear on the surviving controller's  
console:  
" Restarting ALL ports.  
Port 1 restarted.  
Port 2 restarted.  
Port 3 restarted.  
Port 4 restarted.  
Port 5 restarted.  
Port 6 restarted. "

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12. Remove the now-exposed cache module.

13. Inspect batteries per quick check on page 1. If necessary, replace the batteries on this cache module. (See enclosure EK-HSFAM-RI or HS Family of Array Controllers Service Manual Page 7-33)

14. Answer the question

"Do you have a replacement HSJ40 readily available [N] ?"

RESPOND by typing "YES".

15. Answer the question

\*\*\*\* Sequence to INSERT other HSJ40 has begun. \*\*\*\*

Do you wish to INSERT the other HSJ40 [N] ?"

RESPOND by typing "YES".

16. Wait for the following text to appear on the surviving controller's console:

"Attempting to quiese all ports. Port 1 quiesced.  
Port 2 quiesced.  
Port 3 quiesced.  
Port 4 quiesced.  
Port 5 quiesced.  
Port 6 quiesced.  
All ports quiesced.

Insert the cache module, then insert the other HSJ40, WITHOUT its program card, and press Return ?"

17. Insert the cache module that was removed in STEP 10. Then insert the controller module WITHOUT the program card. Attach the console cable. (Do not overtighten the screws in the bezel! A snug connection is all that is required.)

18. Press the 'RETURN' key on the surviving controller's console.

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19. Wait for the following text to appear on the surviving controller's console:

"Restarting ALL ports. Port 1 restarted.  
Port 2 restarted.

Port 3 restarted.  
Port 4 restarted.  
Port 5 restarted.  
Port 6 restarted.  
Controller Warm Swap program terminated.

The configuration has two controllers.  
To restart the other HSxxx:

- 1) Enter the command RESTART OTHER.
- 2) Press and hold in the Reset (//) button while inserting the program card.
- 3) Release Reset (//); the controller will initialize.
- 4) Configure new controller by referring to the controller's user guide

20. At the surviving controller's console, type "RESTART OTHER".

21. Insert the PCMCIA program card while depressing the green reset button on the bezel of the controller whose batteries were replaced. After the PCMCIA card is seated, release the green reset switch.

22. On the console of the controller whose batteries were replaced type, "SET NOFAILOVER".

23. (HSJ,HSD,HS1CP only) On the same controller console, type  
"RESTART THIS".

24. On the same controller console, type  
"SET FAILOVER COPY=OTHER".

(NOTE) On HSZ40, replacement controller will restart automatically after issuing this command.

25. Attach the port cable to the controller whose batteries were just replaced.

26. A fully charged battery should show status "good" in a few minutes.

Note: A fully discharged battery may take 5 hours to re-charge.

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27. Proceed to the beginning of this process to replace the batteries in the OTHER cache module.
28. Report this FCO activity on the LARS form in the "Fail Area/Module/FCO/Comments" column as follows: FCO HSWBC-S-0002
29. Digital field engineers should report this FCO activity on their LARS from per the attached instructions.

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LARS

CATEGORY	F	USA	APA	EUROPE
Activity - Coverage Code				
(a)Contract	W		U	K
Warranty	W		U	W
Inhouse		A		
Invoiced per Call	F			
(b)IN-DEC Contract				
Non Contract/Non Warranty		K	F	U
(c)RTD/Off-site Agreement		F	F	U
Mkt/FS/Seg Code				
Code for W,K,		111		111
Code for F	031		031	
BBC Code for K,W,A				111
BBC Code for F				031
DEC Option				
Option ID	X		N/A	N/A
Type of Call		M		M
Request Type		I		
Action Taken		D		D
Quality Codes		M,L,J,R,X,A,Y,Z		Y
Fail Area-Module		*****	*****	*****
FCO-Comments				

Material Used

(a) Warranty Optimum, Warranty Standard and Warranty Basic (on-site) Agreements; \* Note material (only) free of charge for all customers.

(b) Applies to IN-DEC Area Only

(c) RTD=Return to Digital or Off-site Agreements; If Field Engineer On-site, use Activity Code "F".

FCO CHARGING INFORMATION									
WARRANTY/CONTRACT				NONWARRANTY/NONCONTRACT					
ON-SITE		OFF-SITE		ON-SITE		OFF-SITE		MATERIAL ONLY	
TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	ORDER-ADMIN, HANDLING PKG, SHIPPING & EQ KIT	
DEC	DEC	DEC	DEC	CUS	CUS	CUS	CUS	CUS	

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