DIGITAL	FCO Write Back Cache Batteries	CATEGORY [O]	PAGE 1 OF 14

FIELD CHANGE ORDER	NUMBER: HSWBC-O001

APPLICABILITY: HS1CP-AF, HSD30-YX, HSJ30-YC, HSJ40-YA,YB,YC
                  HSZ40-YX, HSZ40-BF, SWXRA-YA,YB,YD,YJ,YX,YY
                  SWXRC-04, HS111-AA,AB, HS121-AA,AB

PROBLEM & SYMPTOM:
 Batteries shipped on write back cache modules between April 1 and
July 15, 1995 are at risk for not making reliable connections to the
     cache module.

 1. High Risk situation - can result in Data Loss:

   The battery connection may fail when the subsystem is operational.
        Because there is nothing that will indicate this, should a
   controller lose power, data stored in the write back cache will
        be lost during the period of power loss and cannot be flushed to
        the disk drive(s) after power is restored. The result is a
     data loss.

2. Low Risk Situation - down time on write-back cache.

SOLUTION:
   Disable usage of Write Back Cache on applicable controllers until such
   time that the suspect batteries are replaced.

QUICK CHECK: (ONLY UTILIZE ATTACHED PROCEDURES BEFORE TAKING HSJ/HSD/
         HSZ/HS1CP Controller out of service)
   Remove Cache module in HSxxx Controller. Remove battery cover. On the
   bottom edge of the battery, if a single label is on the battery and the
   label indicates April 1995, May 1995, June 1995, or July 1995 then the
   battery(s) is/are suspect and should be replaced. If the battery has
   markings not in this month/year range it is NOT covered by the FCO.
   If battery has 2 labels on it (i.e. Tested, and July 1995), then it
   is NOT suspect and should be left in service.

PRE/CO-REQUISITE FCO:	MFIT HRS
NONE	0.4 HRS

TOOL/TEST EQUIPMENT:
     NONE

FCO PARTS INFORMATION	

FCO KIT NO.	DESCRIPTION OF CONTENTS
EQ-01735-01	including: 70-32162-01 WBC Battery Kit FA-05070-01 FCO Installation Document

```
            FCO CHARGING INFORMATION "See last page of FA document"   |
|_____|
| Digital Employees should use the attached information to complete their LARS |
| report.                                                               |
|                                                                       |
| 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   **********************************
     *                                                                  *
     *    ******* 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 can 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.

****

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

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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-O001

12)   Digital field engineers should report this FCO activity on
        their LARS from per the attached instructions.

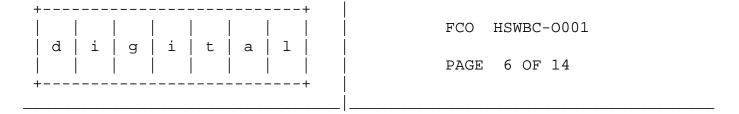   FIELD APPLICATION DOCUMENT (FA), Continuation Page

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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)

    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

replacement 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
    HSD30,HS1CP: V25D-4
    HSZ40      : V25Z-4
```

```
    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. 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

HSJ30/40 patch_v25j-1 Fixes for repetitive mirrorset
     recoveries and CLONE bugcheck
  patch_v25j-2 Fix SET NOFAILOVER to ignore ONLINE
     status

HSZ40 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

NOTE: HSZ-AX and HSZ-BX have different scripts in the
 following directory.

NOTE: Procedures and scripts for installation of these
 patches can be found at:

 CSC32::ISG$COMMON:[ISGVAX.HSJ40.HSJ_PATCHES]

 The following entries can be found in that account:

       FIB-SCRIPT_AXP.EXE;1   FIB-SCRIPT_VAX.EXE;1
HSD30_PATCHES.TXT;1   HSJ40_PATCHES.TXT;1
HSZ40_PATCHES.TXT;1   PATCH_V25D-1.SCRIPT;1
PATCH_V25D-2.SCRIPT;1   PATCH_V25D-3.SCRIPT;1
PATCH_V25D-4.SCRIPT;1   PATCH_V25J-1.SCRIPT;1
PATCH_V25J-2.SCRIPT;1   PATCH_V25ZA-1.SCRIPT;1
PATCH_V25ZA-2.SCRIPT;1   PATCH_V25ZA-3.SCRIPT;1
PATCH_V25ZA-4.SCRIPT;1   PATCH_V25ZB-1.SCRIPT;1
PATCH_V25ZB-2.SCRIPT;1   PATCH_V25ZB-3.SCRIPT;1
PATCH_V25ZB-4.SCRIPT;1

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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.
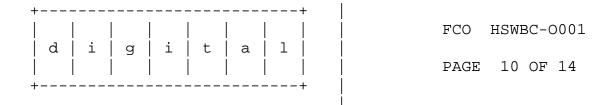   Port 1 restarted.
          Port 2 restarted.
          Port 3 restarted.
          Port 4 restarted.
          Port 5 restarted.
          Port 6 restarted. "

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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 contollers.
    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 battries
 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.

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-O001

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   K   U
        Non Contract/Non Warranty   F   F
     (c)RTD/Off-site Agreement   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:
 NOTE: The Write Back Cache is identified by both 70-CLASS and
  Digital standard model numbers. Therefore, in the DEC
  Option section of the LARS use the name of the option you're
  installing the FCO on, such as,

 If installing FCO on: On LARS use DEC Option:
  HSZ40B   HSZ40-BF
  HSZ40   HSZ40-YX
  HS1CP   HS1CP-AF
  HSD30   HSD30-YX
  SWXRC-04   HSZ40-YX
  HSJ40   HSJ40-YA
      HSJ40-YB (16MB CACHE)
      HSJ40-YC (32MB CACHE)
  HSJ30   HSJ30-YC

                   USA   APA   EUROPE

```
     -------------------------------------
     Option ID                    X     N/A     N/A
     Type of Call                 M     M
     Request Type                                             I
     Action Taken                 D     D     Y
     Quality Codes                                    M,L,J,R,X,A,Y,Z
     Fail Area-Module       HSWBC-O001 HSWBC-O001 HSWBC-O001
          FCO-Comments

     Material Used  EQ-01735-01 EQ-01735-01 EQ-01735-01
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Material Used continued...

   (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