Compaq StorageWorks™

REPLACING DIMMS IN AN HSX80 CACHE MODULE

Open Card Completely Before Beginning Installation Procedures

European Union Notice

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- EN 55022 (CISPR 22) *Electromagnetic Interference*
- EN 50082-1 (IEC 801-2, IEC 801-3, IEC 801-4) *Electromagnetic Immunity*
- EN 60950 (IEC 950) *Product Safety*

NOTICE

REPLACING DIMMS IN AN HSx80 CACHE MODULE

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Compaq Computer Corporation

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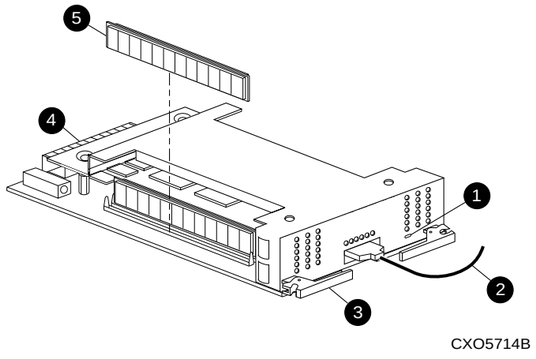
About This Card

This document contains instructions to replace or upgrade dual inline memory modules (DIMMs) in a cache module for an HSG60, HSG80, HSJ80, or HSZ80 subsystem.

NOTE: For instructions on upgrading a single-controller configuration to a dual-redundant controller configuration, see the appropriate array controller user guide or maintenance and service guide.

General Information

Figure 1, Figure 2, and Figure 3 provide general information about the cache module.



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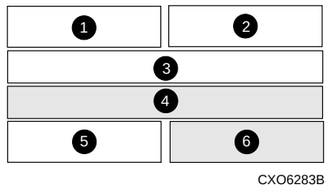
❶ Cache memory power LED
❷ ECB Y-cable (not used on the Model 2100 and 2200 enclosure)
❸ Retaining lever
❹ Backplane connector
❺ DIMM

Figure 1. Cache module

NOTE: In Figure 2, the environmental monitoring unit (EMU) ❷ and power verfication assembly (PVA) ❸ modules only exist in BA370 enclosures. The controller and cache module locations (❸ through ❻) are consistent with other Compaq StorageWorks™ controller enclosures.



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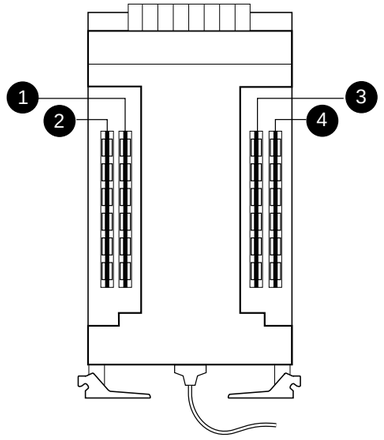
❶ EMU (BA370 enclosure only)
❷ PVA (BA370 enclosure only)
❸ Controller A
❹ Controller B
❺ Cache A
❻ Cache B

Figure 2. Cache module locations



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Memory	DIMMs	Quantity	Location
64 MB	32 MB	2	❶ ❸
128 MB	32 MB	4	❶ ❷ ❸ ❹
256 MB	128 MB	2	❶ ❸
512 MB	128 MB	4	❶ ❷ ❸ ❹

Figure 3. Cache module memory configurations

IMPORTANT: Regardless of the array controller software (ACS) version, in dual-redundant configurations, both cache modules *must* contain the same memory configuration.

HSJ80 controllers and some HSG80 controller configurations *require* a 512 MB cache memory configuration. Make sure the cache memory configuration meets or exceeds the ACS requirement.

If subsystem downtime is not crucial, Compaq recommends using the following section to replace DIMMs for all ACS versions. Otherwise, follow the ACS-specific procedure for the current controller configuration.

Replacing DIMMs in a Single-Controller Configuration or Upgrading Cache Memory

Use the steps in "Removing DIMMs" and "Installing DIMMs" to replace DIMMs in a cache module. To upgrade cache memory, use step 2 through step 8 in the "Removing DIMMs" section and all of the "Installing DIMMs" section.

CAUTION: Static electricity can easily damage a cache module or a DIMM. Wear a snug-fitting, grounded electrostatic discharge (ESD) wrist strap.

Removing DIMMs

Use the following steps to remove DIMMs from a cache module:

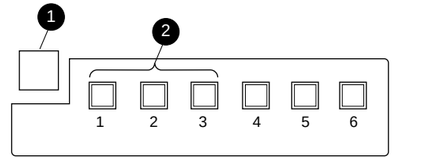
1. If the controller is operating, connect a PC or terminal to the controller maintenance port.

   If the controller is not operating, go to step 6.
2. From the host console, stop all host activity to the controllers and dismount the logical units in the subsystem.
3. If using a Microsoft Windows NT or Windows 2000 platform, shut down the server.
4. Run the fault management utility (FMU) to obtain the last failure codes, if desired.
5. Shut down "this controller" with the following command:

   SHUTDOWN THIS_CONTROLLER

   NOTE: After the controller shuts down, the reset button ❶ and the first three light emitting diodes (LEDs) ❷ turn ON (see Figure 4). This might take several minutes to happen, depending on the amount of data that needs to be flushed from the cache module.

   Proceed only after the reset button stops FLASHING and remains ON.



CXO6991A

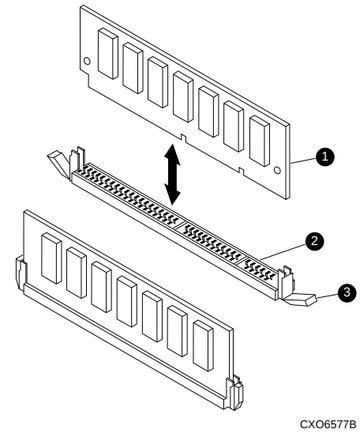
Figure 4. Controller reset button and first three LEDs

IMPORTANT: For Model 2100 and 2200 enclosures, omit step 6 and step 7. The ECB does not contain switches or use ECB Y-cables.

CAUTION: The ECB must be disabled—the status LED is OFF—before disconnecting the ECB Y-cable from the cache module. Failure to disable the ECB might damage the cache module.

6. Disable the ECB by pressing the battery disable switch until the status LED stops FLASHING—approximately five seconds.
7. Disconnect the ECB Y-cable from the cache module.
8. Disengage both retaining levers, remove the cache module, and place the cache module on an antistatic bag or a grounded antistatic mat.
9. Press down on the DIMM retaining clips (see Figure 5, ❸) at both ends of the DIMM ❶ being removed.

   NOTE: To make pressing down on the DIMM retaining clips easier, consider using the eraser end of a pencil or a small screwdriver.



❶ DIMM
❷ DIMM slot
❸ DIMM retaining clip

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Figure 5. Removing or installing a DIMM

10. Gently remove the DIMM from the DIMM slot ❷ and place the DIMM in an antistatic bag or on a grounded antistatic mat.
11. Repeat step 9 and step 10 for each DIMM.

See other side

Installing DIMMs

Use the following steps to install DIMMs in a cache module:

IMPORTANT: New cache modules arrive without DIMMs installed—the DIMMs are packaged separately. Unpack the DIMMs and install them into the cache module as required.

Both cache modules *must* contain the same memory configuration for the ACS version. Use Figure 3 for valid cache module memory configurations.

HSJ80 controllers and some HSG80 controller configurations *require* a 512 MB cache memory configuration. Make sure the cache memory configuration meets or exceeds the ACS requirement.

1. Insert each DIMM (see Figure 5, ❶) straight into the appropriate slot ❷ of the cache module (see Figure 3), ensuring that the notches in the DIMM align with the tabs in the slot.
2. Press the DIMM gently into the slot until seated at both ends.
3. Engage the two retaining clips ❸ for the DIMM.
4. Make sure both ends of the DIMM are firmly seated in the slot and both retaining clips engage the DIMM.
5. Repeat step 1 through step 4 for each DIMM.

CAUTION: Carefully align the cache module in the appropriate guide rails. Misalignment might damage the backplane.

6. Insert the cache module into the appropriate bay and engage the retaining levers.

IMPORTANT: For Model 2100 and 2200 enclosures, omit step 7 and step 8. The ECB does not contain switches or use ECB Y-cables.

CAUTION: The ECB must be disabled—the status LED is OFF—before disconnecting the ECB Y-cable from the cache module. Failure to disable the ECB might damage the cache module.

7. If not already done, disable the ECB by pressing the battery disable switch until the status LED stops FLASHING—approximately five seconds.
8. Connect the ECB Y-cable to the cache module.
9. If not already connected, connect a PC or terminal to the controller maintenance port.
10. Restart the controller by pressing the reset button.

    NOTE: A controller restart can take as long as 60 sec, indicated by the temporary cycling of the port LEDs and a FLASHING reset button.

IMPORTANT: If the controller did not restart, use the following steps:
1. Press and hold the controller reset button.
2. Reseat the controller program card.
3. Release the reset button.

11. From the CLI prompt, display details about the configured controller using the following command:

    SHOW THIS_CONTROLLER FULL

    NOTE: Step 12 is optional for HSJ80 controllers.

12. [HSG60, HSG80 and HSZ80 only] Set the date and time using the following command:

    SET THIS_CONTROLLER TIME=*dd-mmm-yyyy:hh:mm:ss*

13. Mount the logical units on the host.
14. If using a Windows NT or Windows 2000 platform, restart the server.
15. Disconnect the PC or terminal from the controller maintenance port.

Replacing DIMMs in Dual-Redundant Controller Configurations

Use the steps in "Removing DIMMs" and "Installing DIMMs" to replace DIMMS in a cache module.

CAUTION: Static electricity can easily damage a cache module or a DIMM. Wear a snug-fitting, grounded ESD wrist strap.

NOTE: Both cache modules *must* contain the same memory configuration for the ACS version. Use Figure 3 for valid cache module memory configurations.

Removing DIMMs

Use the following steps to remove DIMMs from a cache module:

1. Connect a PC or terminal to the maintenance port of the operational controller.

   The controller connected to the PC or terminal becomes "this controller"; the controller for the cache module being removed becomes the "other controller."

2. For HSJ80 controllers:

   a. Prefer all units to "this controller" with the following command:

      SET *unit-number* PREFERRED_PATH=THIS_CONTROLLER

   b. Disable the computer interconnect (CI) bus paths with the following commands:

      SET OTHER_CONTROLLER NOPORT_1_PATH_A
      SET OTHER_CONTROLLER NOPORT_1_PATH_B
      SET OTHER_CONTROLLER NOPORT_2_PATH_A
      SET OTHER_CONTROLLER NOPORT_2_PATH_B

   NOTE: The display of an error message, indicating that the subsystem was unable to run down certain units on the "other controller," is a timing issue. If this occurs, repeat these SET commands.

3. Disable failover and take the controllers out of the dual-redundant configuration with one of the following commands:

   SET NOFAILOVER
   or
   SET NOMULTIBUS_FAILOVER

4. Start the field replacement utility (FRUTIL) with the following command:

   RUN FRUTIL

5. Enter **N**(o) to the question about replacing the cache battery.
6. Enter **1**, *Replace or remove a controller or cache module*, from the FRUTIL Main menu.
7. Enter **3**, *Other cache module*, from the Replace or Remove Options menu to remove the "other controller" cache module.
8. Enter **Y**(es) to confirm the intent to remove the "other controller" cache module.

CAUTION: Wait for FRUTIL to quiesce the device ports—indicated by an "All device ports quiesced" message. Failure to allow the ports to quiesce might result in data loss. Quiescing might take several minutes.

The ECB must be disabled—the status LED is OFF—before disconnecting the ECB cable from the cache module. Failure to disable the ECB might result in cache module damage.

IMPORTANT: A countdown timer allows a total of two minutes to remove the cache module. After two minutes, "this controller" will exit FRUTIL and resume operations. If this happens, return to step 4 and proceed.

9. For Model 2100 and 2200 enclosures, disengage both retaining levers and remove the "other controller" cache module.
10. For other enclosures:

    a. Disengage both retaining levers and partially remove the "other controller" cache module—about halfway.

CAUTION: The ECB must be disabled—the ECB status light is OFF—before connecting the ECB Y-cable to the cache module. Failure to disable the ECB might result in cache module damage.

    b. Disable the ECB by pressing the battery disable switch until the status light stops blinking—approximately 5 seconds.

    c. Remove the cache module:

       1) Disconnect the ECB cable from the "other controller" cache module.

       2) Remove the cache module from the enclosure.

11. Place the cache module on an antistatic bag or a grounded antistatic mat.
12. Enter **N**(o) to the question for a replacement cache module.

    FRUTIL will exit.

13. Press down on the DIMM retaining clips (see Figure 5, ❸) at both ends of the DIMM ❶ being removed.

    NOTE: To make pressing down on the DIMM retaining clips easier, consider using the eraser end of a pencil or a small screwdriver.

14. Gently remove the DIMM from the DIMM slot ❷ and place the DIMM in an antistatic bag or on a grounded antistatic mat.
15. Repeat step 13 and step 14 for each DIMM.

Installing DIMMs

Use the following steps to install DIMMs in a cache module.

IMPORTANT: New cache modules arrive without DIMMs installed—the DIMMs are packaged separately. Unpack the DIMMs and install them into the cache module as required.

Both cache modules *must* contain the same memory configuration for the ACS version. Use Figure 3 for valid cache module memory configurations.

HSJ80 controllers and some HSG80 controller configurations *require* a 512 MB cache memory configuration. Make sure the cache memory configuration meets or exceeds the ACS requirement.

1. Insert each DIMM (see Figure 5, ❶) straight into the appropriate slot ❷ of the cache module (see Figure 3), ensuring that the notches in the DIMM align with the tabs in the slot.
2. Press the DIMM gently into the slot until seated at both ends.
3. Engage the two retaining clips ❸ for the DIMM.
4. Make sure both ends of the DIMM are firmly seated in the slot and both retaining clips engage the DIMM.
5. Repeat step 1 through step 4 for each DIMM.
6. If not already connected, connect a PC or terminal to the operational controller.

   The controller connected to the PC or terminal becomes "this controller"; the controller for the cache module being installed becomes the "other controller."

7. Start FRUTIL with the following command:

   RUN FRUTIL

8. Enter **N**(o) to the question about replacing the cache battery.
9. Enter **2**, *Install a controller or cache module*, from the FRUTIL Main menu.
10. Enter **3**, *Other cache module*, from the Install Options menu to install the "other controller" cache module.
11. Enter **Y**(es) to confirm the intent to install the "other controller" cache module.

CAUTION: Wait for FRUTIL to quiesce the device ports—indicated by an "All device ports quiesced" message. Failure to allow the ports to quiesce might result in data loss. Quiescing might take several minutes.

The ECB must be disabled—the status LED is OFF—before disconnecting the ECB cable from the cache module. Failure to disable the ECB might damage the cache module.

Carefully align the cache module in the appropriate guide rails. Misalignment might damage the backplane.

IMPORTANT: A countdown timer allows a total of two minutes to install the cache module. After two minutes, "this controller" will exit FRUTIL and resume operations. If this happens, return to step 7 and proceed.

12. Follow on-screen instructions to install the cache module and to restart the "other controller."

    NOTE: A controller restart can take as long as 60 sec, indicated by the temporary cycling of the port LEDs and a FLASHING reset button.

IMPORTANT: If the "other controller" did not restart, use the following steps:
1. Press and hold the "other controller" reset button.
2. Reseat the "other controller" program card.
3. Release the reset button.

13. Enable failover and reestablish the dual-redundant configuration with the following command:

    SET FAILOVER COPY=THIS_CONTROLLER
    or
    SET MULTIBUS_FAILOVER COPY=THIS_CONTROLLER

    This command copies the subsystem configuration from "this controller" to the "other controller."

14. If desired, verify the failover configuration with the following command:

    SHOW THIS_CONTROLLER FULL

15. For HSJ80 controllers:

    a. Enable CI bus paths with the following commands:

       SET THIS_CONTROLLER PORT_1_PATH_A
       SET THIS_CONTROLLER PORT_1_PATH_B
       SET THIS_CONTROLLER PORT_2_PATH_A
       SET THIS_CONTROLLER PORT_2_PATH_B

    b. Remove the preferred path on all units with the following command:

       SET *unit-number* NOPREFERRED_PATH

16. Disconnect the PC or terminal from the controller maintenance port.

This completes the hardware installation.