

REPLACING AN HSG60 OR HSx80 ARRAY CONTROLLER

About This Card

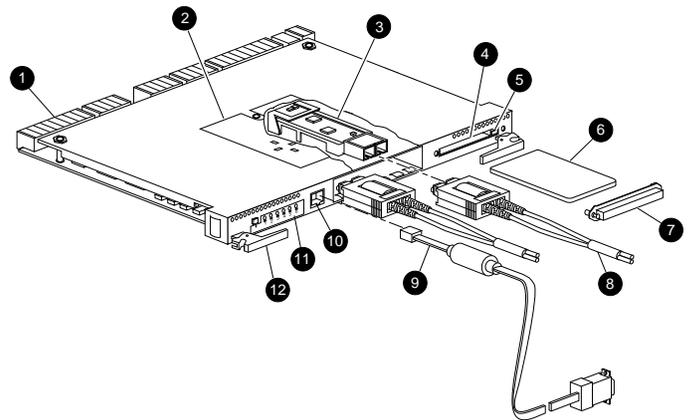
This document contains instructions for replacing an HSG60, HSG80, HSJ80, or HSZ80 array controller.

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, Figure 3, and Figure 4 provide general information about the specific host cable connection for each array controller.

NOTE: The maintenance port cable shipped with the array controller has a 9-pin connector for a PC connection only. If using a terminal instead of a PC, order the optional maintenance port cable from the local field service office.



CX07198A

- 1 Backplane connectors
- 2 Access door
- 3 Optical gigabit link module (GLM)
- 4 Program card slot
- 5 Program card ejection button
- 6 Program card
- 7 Program card electrostatic discharge (ESD) cover
- 8 Fibre Channel optical host bus cables
- 9 Maintenance port cable for a PC connection
- 10 Maintenance port
- 11 Operator control panel (OCP)
- 12 Release lever

Optional adapters for a terminal connection (9-pin D-sub to 25-pin D-sub, not shown):

- Male to female (null modem), part numbers: 173407-001 / 12-45238-01
- Male to male (null modem), part numbers: 173407-002 / 12-45238-02
- Male to male (modem), part numbers: 173407-003 / 12-45238-03

Figure 1. HSG60 or HSG80 array controller with optical GLM

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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*

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REPLACING AN HSG60 OR HSx80 ARRAY CONTROLLER

Third Edition (December 2000)

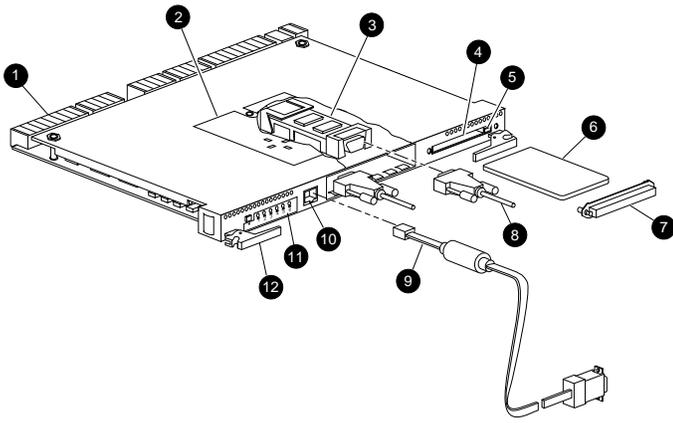
Part Number: 196743-023

EK-80CTL-IM. C01

Compaq Computer Corporation



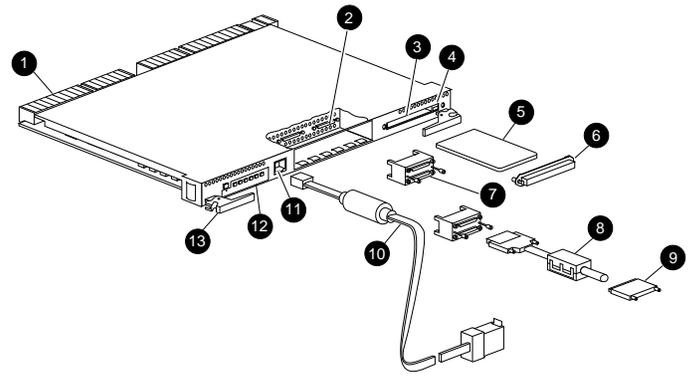
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CXO7199A

- ❶ Backplane connectors
 - ❷ Access door
 - ❸ Copper GLM
 - ❹ Program card slot
 - ❺ Program card ejection button
 - ❻ Program card
 - ❼ Program card ESD cover
 - ❽ Fibre Channel copper host bus cables
 - ❾ Maintenance port cable for a PC connection
 - ❿ Maintenance port
 - ⓫ OCP
 - ⓬ Release lever
- Optional adapters for a terminal connection (9-pin D-sub to 25-pin D-sub, not shown):
- Male to female (null modem), part numbers: 173407-001 / 12-45238-01
 - Male to male (null modem), part numbers: 173407-002 / 12-45238-02
 - Male to male (modem), part numbers: 173407-003 / 12-45238-03

Figure 2. HSG60 or HSG80 array controller with copper GLM



CXO7200A

- ❶ Backplane connectors
 - ❷ Host ports
 - ❸ Program card slot
 - ❹ Program card ejection button
 - ❺ Program card
 - ❻ Program card ESD cover
 - ❼ Trilink connector
 - ❽ Host bus cable with ferrite bead
 - ❾ SCSI terminator
 - ❿ Maintenance port cable for a PC connection
 - ⓫ Maintenance port
 - ⓬ OCP
 - ⓭ Release lever
- Optional adapters for a terminal connection (9-pin D-sub to 25-pin D-sub, not shown):
- Male to female (null modem), part numbers: 173407-001 / 12-45238-01
 - Male to male (null modem), part numbers: 173407-002 / 12-45238-02
 - Male to male (modem), part numbers: 173407-003 / 12-45238-03

Figure 4. HSZ80 array controller with trilink connector

Single-Controller Configurations

Use the steps in “Removing a Controller” and “Installing a Controller” to replace a controller. See the applicable array controller figure (Figure 1, 2, 3, or 4) for clarification during the procedure.

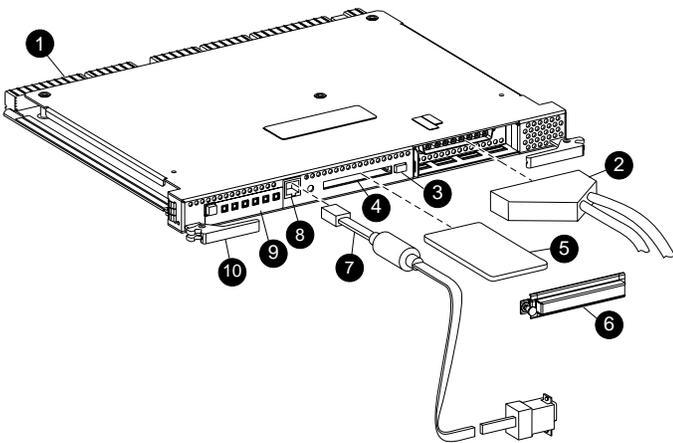
CAUTION: Static electricity can easily damage an array controller. Wear a snug-fitting, grounded ESD wrist strap.

Removing a Controller

Use the following steps to remove a controller:

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 7.
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. Is a disk initialized with the SAVE_CONFIGURATION switch?
 - No. Locate existing information that will support the manual configuration of the subsystem. The new controller must be manually configured as described using the appropriate array controller user guide or CLI reference guide.
 - Yes. Use the following command to save the current device configuration for “this controller:”

CONFIGURATION SAVE



CXO7276A

- ❶ Backplane connectors
 - ❷ Computer interconnect (CI) host bus cable
 - ❸ Program card ejection button
 - ❹ Program card slot
 - ❺ Program card
 - ❻ Program card ESD cover
 - ❼ Maintenance port cable for a PC connection
 - ❽ Maintenance port
 - ❾ OCP
 - ⓫ Release lever
- Optional adapters for a terminal connection (9-pin D-sub to 25-pin D-sub, not shown):
- Male to female (null modem), part numbers: 173407-001 / 12-45238-01
 - Male to male (null modem), part numbers: 173407-002 / 12-45238-02
 - Male to male (modem), part numbers: 173407-003 / 12-45238-03

Figure 3. HSJ80 array controller with CI connector

- 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 5). 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.

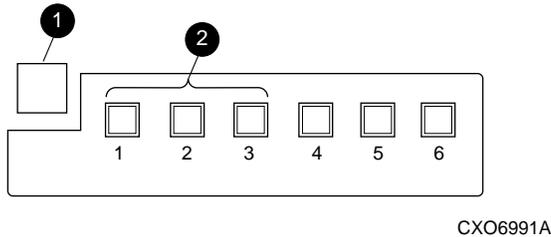


Figure 5. Controller reset button and first three LEDs

CAUTION: The cache module might contain unwritten data if the controller crashes and the controller cannot be shut down with the SHUTDOWN THIS_CONTROLLER command. Loss of data might occur.

- Remove the program card ESD cover and the program card and save them in an antistatic bag or on a grounded antistatic mat for the replacement controller.
- Disconnect all host bus cables or terminators from the controller:
 - [HSG60 or HSG80] Disconnect the optical or copper cables.

NOTE: If extender clips are not installed on the optical cables, use thin needle nose pliers to disconnect the cables (see inset on Figure 6).

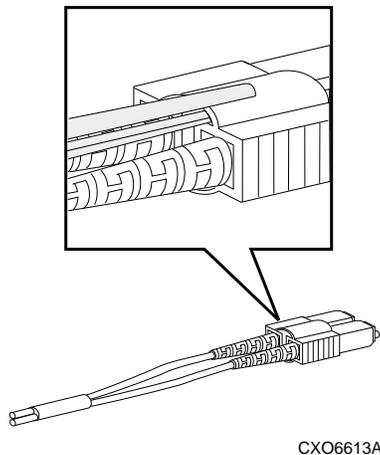


Figure 6. Using thin needle nose pliers to disconnect a fiber optic cable

- [HSJ80] Disconnect the internal CI cables from the controller (see Figure 3).
 - [HSZ80] Disconnect the tralink connector from the controller (the tralink connectors are reused, see Figure 4).
- If connected to the operational controller, disconnect the PC or terminal from the controller maintenance port.
 - Disengage both retaining levers and remove the controller, then place the controller in an antistatic bag or on a grounded antistatic mat.

Installing a Controller

Use the following steps to install a controller:

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

IMPORTANT: Ensure the program card is not installed in the replacement controller.

NOTE: If the controller being installed was previously used in another subsystem, purge the controller of the old configuration (refer to the CONFIGURATION RESET command description in the appropriate array controller user guide or CLI reference guide).

- Insert the replacement controller into Controller A bay and engage the retaining levers.
- Connect a PC or terminal to the replacement controller maintenance port.
- Press and hold the reset button while inserting the program card into the replacement controller.
- Release the reset button.
The controller restarts.

IMPORTANT: If the controller did not restart, use the following steps:

- Press and hold the controller reset button.
 - Reseat the controller program card.
 - Release the reset button.
- From the CLI prompt, display details about the configured controller using the following command:
SHOW THIS_CONTROLLER FULL
 - Configure the controller as described using the appropriate array controller user guide or CLI reference guide.
 - Is the current device configuration saved on a disk drive?
 - No. Manually restore the current device configuration using existing information and the appropriate array controller user guide or CLI reference guide.
 - Yes. Automatically restore the configuration as follows:

IMPORTANT: In the following step, if all port buttons *do not* begin FLASHING when the program card is inserted, continue holding the Port #6 button and then eject and reinsert the program card.

- Press and hold the Port #6 button (see Figure 7, ❷) and then insert the program card.
The reset button begins FLASHING.

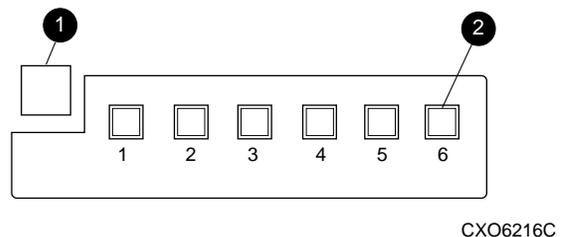


Figure 7. Location of array controller reset and port #6 buttons on the OCP

- Release the Port #6 button to initiate the configuration restore.

- Using the code-load/code-patch utility (CLCP), install any patches that were installed on the previous controller as described in the appropriate array controller user guide or CLI reference guide.

NOTE: Step 9 is optional for HSJ80 controllers.

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

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

- Connect all host bus cables or terminators to the controller:
 - [HSG60 or HSG80] Reconnect the optical or copper cables (see Figure 1 or Figure 2, respectively).
 - [HSJ80] Reconnect the internal CI cables (see Figure 3).
 - [HSZ80] Reconnect the tralink connectors (see Figure 4).
- Mount the logical units on the host.
- If using a Windows NT or Windows 2000 platform, restart the server.
- Disconnect the PC or terminal from the controller maintenance port.

Dual-Redundant Controller Configurations

Use the steps in “Removing a Controller” and “Installing a Controller” to replace a controller. See the applicable array controller figure (Figure 1, 2, 3, or 4) for clarification during the procedure.

 **CAUTION:** Static electricity can easily damage an array controller. Wear a snug-fitting, grounded ESD wrist strap.

Removing a Controller

Use the following steps to remove a controller:

- 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 being removed becomes the “other controller.”

- For HSJ80 controllers:
 - Prefer all units to “this controller” with the following command:
- Disable the CI bus paths with the following commands:

```
SET unit-number PREFERRED_PATH=THIS_CONTROLLER  
  
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.

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

```
SET NOFAILOVER  
or  
SET NOMULTIBUS_FAILOVER
```
- Remove the program card ESD cover and program card from the “other controller.” Save them in an antistatic bag or on a grounded antistatic mat for the replacement controller.

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

```
RUN FRUTIL
```
- Enter **N(o)** to the question about replacing the cache battery.
- Enter **1**, *Replace or remove a controller or cache module*, from the FRUTIL Main menu.
- Enter **2**, *Other controller module*, from the Replace or Remove Options menu to remove the “other controller.”
- Enter **Y(es)** to confirm the intent to remove the “other controller.”

 **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.

IMPORTANT: A countdown timer allows a total of two minutes to remove the controller. After two minutes, “this controller” will exit FRUTIL and resume operations. If this happens, return to step 5 and proceed.

- Remove the controller:
 - Disconnect all host bus cables or terminators from the controller:
 - [HSG60 or HSG80] Disconnect the optical or copper cables.
 - Disengage both retaining levers and remove the controller from the enclosure.
 - Place the controller in an antistatic bag or on a grounded antistatic mat.
- Is a replacement controller available now?
 - No. Enter **N(o)** and disconnect the PC or terminal from the controller maintenance port.
FRUTIL will exit.
 - Yes. Enter **Y(es)** and go to step 6 in the next section and proceed.

Installing a Controller

Use the following steps to install a controller.

- 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 being installed becomes the “other controller.”
- Start FRUTIL with the following command:

```
RUN FRUTIL
```
- Enter **N(o)** to the question about replacing the cache battery.
- Enter **2**, *Install a controller or cache module*, from the FRUTIL Main menu.
- Enter **2**, *Other controller module*, from the Replace or Remove Options menu.
- Enter **Y(es)** to confirm the intent to install the “other controller.”



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.

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

IMPORTANT: A countdown timer allows a total of two minutes to install the controller. After two minutes, “this controller” will exit FRUTIL and resume operations. If this happens, return to step 2 and proceed.

7. Install the replacement controller:
 - a. Make sure that the program card is seated in the controller.
 - b. Insert the controller into the appropriate bay, and engage the retaining levers.

NOTE: When fully seated, the controller starts automatically—the reset LED turns On.

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.

8. Press **Enter/Return** to continue.

FRUTIL exits.

9. Install the program card ESD cover on the “other controller.”

10. Configure the controller as described in the appropriate array controller user guide or CLI reference guide.

NOTE: If the controller being installed was previously used in another subsystem, purge the controller of the old configuration (refer to the CONFIGURATION RESET command description in the appropriate array controller user guide or CLI reference guide).

11. Enable failover and reestablish the dual-redundant configuration with one of the following commands:

```
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.”

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

```
SHOW THIS_CONTROLLER FULL
```

13. Wait for FRUTIL to terminate and then reconnect the host bus cables or terminators:

- [HSG60 or HSG80] Reconnect the optical or copper cables (see Figure 1 or Figure 2, respectively).
- [HSJ80] Reconnect the internal CI cables (see Figure 3).
- [HSZ80] Reconnect the tralink connectors (see Figure 4).

14. 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
```

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

This completes the hardware installation.