DIGITAL Personal Workstation
a/au-Series

Cache Memory Installation Guide

Order Number: EK-ALUNX-CU. A01

April 1997

Information - Class B

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any changes or modifications to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna

- Increase the separation between the equipment and the receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

The keyboard and video ports should be connected only with shielded datacables with an external ferrite bead over the cable. When either of these ports is connected with cables without such a ferrite bead, the additional ferrite beads shall be clamped over these cables next to the cable connector.

Contents

Preface

Purpose of the Guide

The DIGITAL *Personal Workstation* a/au-Series *Cache Memory Installation Guide* provides the information you need to successfully upgrade your system's cache memory.

Specifically, the guide describes the following steps in the upgrade (refer to the table of contents for a detailed listing of material covered):

1. Preparing for the cache memory installation.

2. Installing the HAL (hardware abstraction layer); applies only to systems running Microsoft Windows NT.

3. Updating the system using APU firmware.

4. Installing the new cache module.

5. Rebooting the operating system.

NOTE: You must complete all of the steps covered in the guide to properly perform the upgrade.

Intended Audience

If you are performing a cache memory installation on a DIGITAL Personal Workstation *a/au-Series* system, this information is relevant for you.

Special Notices

Three kinds of notices emphasize specific information in this guide:

- A **WARNING** indicates the presence of a hazard that can cause personal injury.

- A **CAUTION** indicates the presence of a hazard that can cause damage to hardware or that might corrupt software.

- A *NOTE* gives general information, such as compatibility with other products or pointers to other resources.

Additional Information Resources

You may wish to consult the following information resources relating to your DIGITAL Personal Workstation:

- DIGITAL *Personal Workstation User Information* (order number EK-ALMIA-UI). This guide explains how to start, use, upgrade, troubleshoot, and configure your system using the Microsoft Windows NT operating system.

- DIGITAL *Personal Workstation User Information* (order number EK-ALUNX-UI). This guide explains how to start, use, upgrade, troubleshoot, and configure your system using the DIGITAL UNIX operating system.

- *DIGITAL Quick Setup Guide* (order number ER-B30WW-IM). This graphical guide leads you through the initial installation of the DIGITAL Personal Workstation.

Contact your DIGITAL representative for other available product-related information.

Feedback

Our readers' opinions about this or any other DIGITAL manual are important to us. If you have any comments, we'd appreciate hearing from you.

- Internet electronic mail to:
  reader_comments@eng.pko.dec.com

- Mail to:

  Digital Equipment Corporation
  Shared Engineering Services
  PKO3-2/21J
  129 Parker Street
  Maynard, MA 01754-2199

Please reference order number EK-ALUNX-CU. A01 in your correspondence about this guide.

Preparing for the Installation

Prerequisite Hardware

Confirm that you have the correct hardware before you begin. If your system is an *a-Series,* it will be running Microsoft Windows NT 4.0 or greater; if your system is an *au-Series,* it will be running the DIGITAL UNIX operating system. Both systems should have the following minimal hardware:

- 32-MB memory.

- Floppy diskette drive.

- 200-MB or greater SCSI hard disk.

CAUTION: Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system unit chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Cache Memory Kit Contents

Ensure that you have the following items, shown in Figure 1:

① 2-MB cache memory module (54-24825-03)

② Three floppy diskettes. (AK-R4R5B-CA [disk 1 of 2], which contains the APU firmware update; AK-R5K9A-CA [disk 2 of 2], which contains the HAL copy utility; and AK-R1SHE-CA, which contains the HAL update.)

③ Documentation (EK-ALUNX-CU)
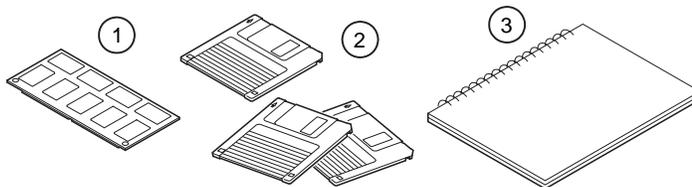
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Figure 1: Cache Memory Kit

Shutting Down the Microsoft Windows NT Operating System

Before proceeding with the update, perform the following steps to shut down the Microsoft Windows NT operating system:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.

2. Shut down the operating system as Table 1 outlines.

Table 1: Windows NT Operating System Shutdown

Step	Action
1	Click the `Start` button.
2	Click `Shut Down...`
3	Select `Shut down` the Computer?
4	Click the `Yes` button.

3. Wait for the operating system to complete the shutdown process. The Microsoft Windows NT operating system displays a window indicating it is safe to turn off or restart the system.

4. Proceed to the section on Loading the HAL.

Shutting Down the DIGITAL UNIX Operating System

Before proceeding with the update, perform the following steps to shut down the DIGITAL UNIX operating system:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.

2. Shut down the operating system as Table 2 outlines.

Table 2: DIGITAL UNIX Operating System Shutdown

Step	Action
1	Open a terminal window.

2	Type `Shutdown -h now.` The following message displays quickly:
	`Final System Shutdown`
	`Message`
	`System going down`
	`immediately.`
	…
	`System Shutdown time has`
	`arrived`

3	System returns to the SRM console.

3. Wait for the operating system to complete the shutdown process.

4. Turn off the machine.

5. Proceed to the section on Installing the Cache Memory Module.

Loading the HAL

a-Series **Systems Only**

NOTES: 1. This section applies only to a-Series *systems, which are running the Microsoft Windows NT operating system. You will need both the HAL copy utility diskette (AK-R5K9A-CA) and the HAL update diskette (AK-R1SHE-CA) to load the HAL successfully.*

Before installing the cache memory, ensure that the HAL (hardware abstraction layer) is properly loaded onto your system. This update procedure is applicable for customers whose systems have Microsoft Windows NT preloaded. In addition, customers whose systems do not have Windows NT preloaded (that is, systems for which the end user agreement [EULA] has not been completed) also should follow this procedure.

Use the following procedure to load the HAL:

1. Insert the floppy diskette labeled "DIGITAL Personal Workstation 'a/au'-Series Cache Module Support Diskette, Disk 2 of 2, HAL Copy Utility" into the floppy diskette drive.

2. Power on the system.

3. Press [F2] to get to the AlphaBIOS main menu.

4. From the AlphaBIOS main menu, use the arrow keys to select `Utilities Run` →
   `Maintenance Program.` Press [Enter].

5. In the Run Maintenance Program dialog box, fill in the fields as follows:
   Program Name: halcopy
   Location: A:

6. Press [Enter].

NOTE: If you see a File Open Error warning box, make sure that you typed "halcopy" correctly and that you have inserted the correct diskette. Then retry.

7. The following message displays:
   `Halcopy utility starting...`

8. Insert the disk labeled "Hardware Support Disk for Microsoft® Windows NT™ 4.0" (AK-R1SHE-CA).

3

9. The following messages display:
   ```
   Do you wish to complete the HAL upgrade?
   Y to complete upgrade, anything else to quit…>
   ```

10. Press Y to complete the upgrade.

11. The following message displays:
    ```
    Reading new HAL…
    Updating HAL…
    Update completed.
    Hit any key to return to AlphaBIOS.
    ```

    NOTE: If you see any messages that include the <Error> string, contact your Digital Field Service or VAR support staff for assistance.

12. Press any key.

13. Your HAL update is now complete. When you restart your DIGITAL Personal Workstation, you will be using the updated HAL.

14. Proceed to the section on Updating System Firmware from APU.

Copying the HAL over the Internet

NOTE: This section applies only to a-Series *systems running the Microsoft Windows NT operating system.*

If you prefer to copy the HAL over the Internet, follow the next steps:

1. Open the URL http://www.windows.digital.com/support/sysoft.asp.

2. You will be at the Windows Enterprise Computing screen.

3. Scroll down to the DIGITAL Personal Workstation heading and choose 433a or 500a.

4. You will now be at the DIGITAL Personal Workstation 433a and 500a Support Files screen.

5. Choose the latest HAL for WNT 4.0.

6. Save the files on your system.

7. Unzip the archive and copy the files (HAL filename is `halmiata.dll`) to a floppy diskette. Label it "DIGITAL Personal Workstation 'a/au'-Series, Cache Module Support Diskette, HAL Update."]

Updating System Firmware from APU

a-Series **Systems Only**

You must reflash your system through APU. The next section outlines the steps required to accomplish this.

NOTE: This procedure updates both SRM and AlphaBIOS.

To update the firmware from APU, follow these steps:

1. From the Main menu, use the arrow keys to select CMOS Setup. Press [Return] (on some keyboards, [Enter]).

2. Insert the floppy diskette labeled "DIGITAL Personal Workstation 'a'-Series Cache Module Support Diskette, Disk 1 of 2, APU Firmware Update" (AK-R4R5B-CA) into the appropriate drive (drive A:).

3. Press [F6] to go to Advanced Setup.

4. Tab down to Console Selection, and use the up arrow [↑] to select `Digital UNIX Console SRM`.

5. Press [F10] twice. Press [Return] (on some keyboards, [Enter]) to save the changes.

6. Power cycle the machine.

NOTE: Wait at least 45 seconds before restarting the machine.

7. The system should come back up the SRM >>> prompt.

8. At the SRM >>> prompt, the DIGITAL Personal Workstation xxxau Console X6.2-x will display across the top of the screen.

9. Type `>>>b dva0`. Press [Return] (on some keyboards, [Enter]).

10. The display now reads:
    ```
    Boot dva0.0.0.0.1 -flags 0
    block 0 of dva0.0.0.0.1 is a valid boot block
    ```

After the system is finished reading the floppy diskette, the SRM >>> prompt changes to the APU → prompt. At this point, you can proceed to perform the update outlined next.

1. At the APU → prompt, type `update`. Press [Return] (on some keyboards, [Enter]).

2. The following displays:
    ```
    APU-I ARE YOU READY TO PROGRAM (SRM) ROM DEVICE? (Y/N)
    ```

3. Type `y`. Press [Return] (on some keyboards, [Enter]).

4. You will see the following display:
    ```
    APU-I ERASING (SRM) ROM DEVICE
    ```

Installing Cache Memory

```
APU-I PROGRAMMING (SRM) ROM DEVICE
APU-I VERIFY LOADED (SRM) ROM IMAGE
APU-I VERIFY LOADED (SRM) ROM IMAGE DONE
APU-I PROGRAMMING (SRM) ROM COMPLETED
APU-I ERASING (ARC/AlphaBIOS) ROM DEVICE
APU-I PROGRAMMING (ARC/AlphaBIOS) ROM DEVICE
APU-I VERIFY LOADED (ARC/AlphaBIOS) ROM IMAGE
APU-I VERIFY LOADED (ARC/AlphaBIOS) ROM IMAGE DONE
APU-I PROGRAMMING (ARC/AlphaBIOS) ROM COMPLETED
```

To upgrade POST at the APU → prompt, follow these steps:

1. To upgrade the POST (power on self test) code, type `update srom` at the APU → prompt. Press [Return] (on some keyboards, [Enter]).

2. The following displays:
   `APU-I ARE YOU READY TO PROGRAM (SROM) ROM DEVICE? (Y/N)`

3. Type `y` . Press [Return] (on some keyboards, [Enter]).

4. You will see the following display:
   ```
   APU-I ERASING (SROM) ROM DEVICE
   APU-I PROGRAMMING (SROM) ROM DEVICE
   APU-I VERIFY LOADED (SROM) ROM IMAGE
   APU-I VERIFY LOADED (SROM) ROM IMAGE DONE
   APU-I PROGRAMMING (SROM) ROM COMPLETED
   ```

5. You return to the APU → prompt.

6. Power cycle the machine.

NOTE: Wait at least 45 seconds before turning the machine on again.

7. The system will come back to the SRM >>> prompt.

8. At the SRM >>> prompt, type:
   `set os_type nt` [Return] (on some keyboards, [Enter])
   `show os*` [Return] (on some keyboards, [Enter])

9. The display should be as follows:
   `os_type NT`

10. Power cycle the machine.

NOTE: Wait at least 45 seconds before turning the machine on again.

11. The APU upgrade is now completed.

12. Your system will now come up to the AlphaBIOS screen.

Installing the Cache Memory Module for *a/au-Series* Systems

Prior to performing the next steps, ensure that:

1. *If your system is running Microsoft Windows NT,* the HAL has been copied to the appropriate location in the system partition on your system disk.

2. AlphaBIOS and POST have been updated (for *a-Series* systems running Windows NT only).

3. The operating system has been shut down. (See earlier instructions.)

4. The system has been powered off.

Powering Off the System

CAUTION: Do not turn off power to your system or peripherals until the shutdown sequence has completed.

Once you have safely shut down the operating system as described earlier, turn off the system power before proceeding.

Removing the System Cover

CAUTION: To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.
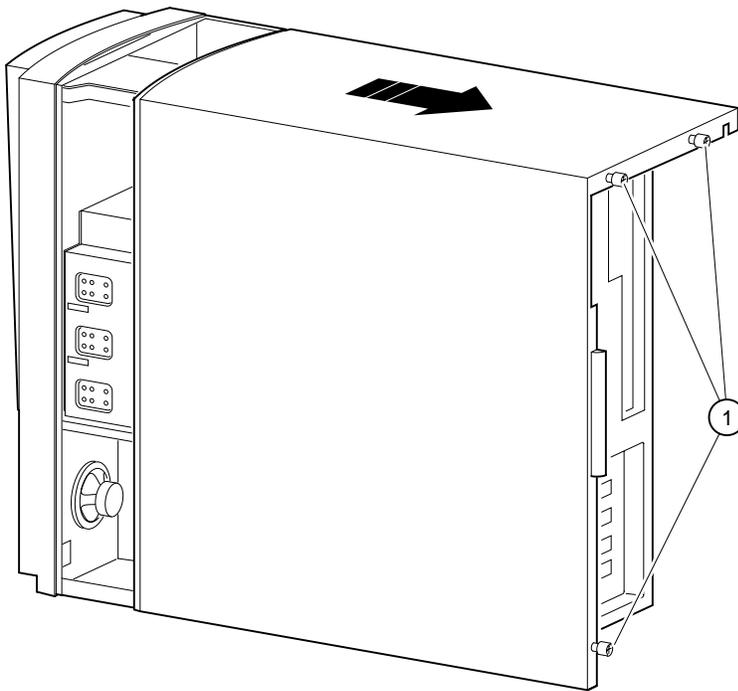
To remove the system cover, refer to Figure 2 and perform the following steps:

1. Shut down your system and all peripheral devices.

2. Unplug the power cord and all other cables.

WARNING: Allow at least 45 seconds for the power supply capacitors to discharge safely.

3. Remove the system lock, if necessary.

4. Locate and loosen the three thumb screws ① that fasten the system cover to the rear panel. Place your thumbs on the upper corners of the system cover, pull back on the cover, and slide the cover back and away from the system enclosure. Then lift the cover up and away from the system.

Installing Cache Memory

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Figure 2: Unlocking and Removing System Cover

Removing the MLB

NOTES: 1. Before beginning this section, confirm that you have removed all cables; this will facilitate the next steps. 2. Remove the MLB from the system to facilitate access to the cache memory connectors on the MLB.

CAUTION: To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.

Refer to Figure 3 and follow these steps to remove the MLB from your system:

1.   With the system cover off, release the two MLB-retaining clips on top of the MLB.

2.   Hold onto both ends of the MLB as you slide it up and out of the system chassis.

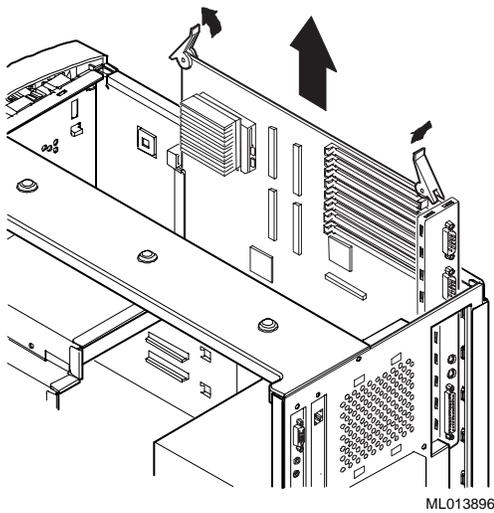3.   Carefully place the MLB onto a static-free, flat surface.

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Figure 3: Removing the MLB

Installing the Cache Memory

NOTE: Carefully remove the cache memory module from its ESD-protected bag.

To install the cache memory onto the MLB, refer to Figure 4 and follow these steps:
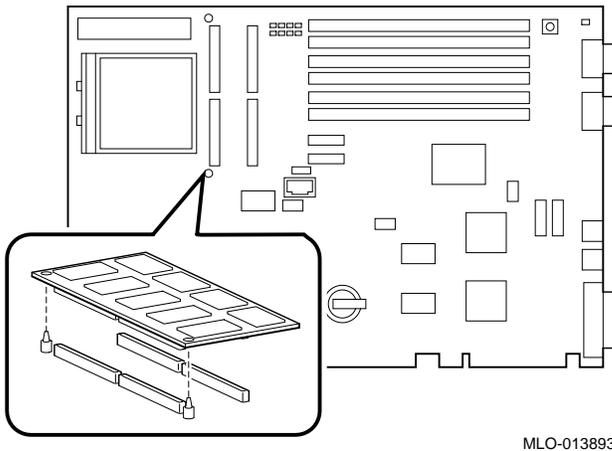

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Figure 4: Installing Cache Memory

1. Using the alignment pins on the MLB as a guide, carefully position the cache memory onto the MLB connectors.

2. Once the module is properly aligned, firmly press down on it to engage the connectors.

NOTE: Some systems shipped without the alignment pins in place. If you received a system without pins, use the corresponding holes in the cache memory and the MLB as a positioning guide.

CAUTION: Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system unit chassis. A static discharge from your fingers can result in permanent damage to electronic components.

Replacing the MLB

Refer to Figure 5 and follow these steps to replace the MLB into the system after you have installed the cache memory:

1. Hold onto both ends of the MLB as you slide it down into the system chassis.

2. Carefully seat the MLB onto the connectors inside the system chassis.

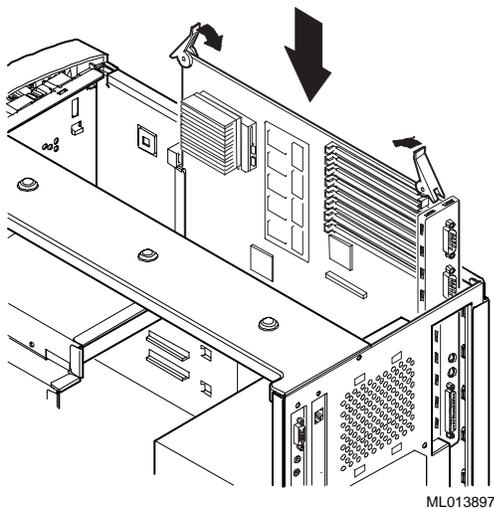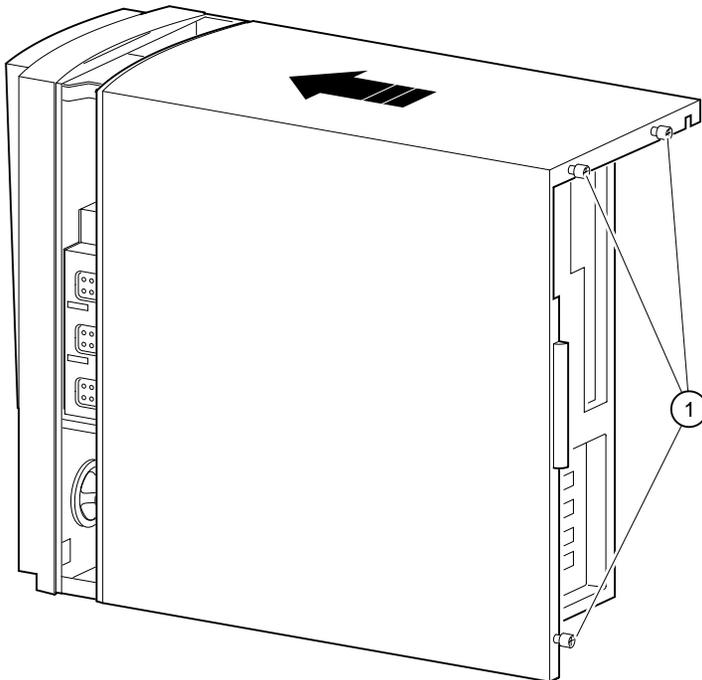3. Lock the MLB-retaining clips over the MLB to secure it.

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Figure 5: Replacing the MLB

Replacing the System Cover

To replace the system cover, refer to Figure 6 and follow the next procedure:

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Figure 6: Replacing System Cover

1. Line up the flanges on the inside of the bottom-left portion of the cover so that they overlap the edge of the chassis body.

2. Then slide the cover forward to secure it into place. Fasten the system cover with the three thumbscrews ① provided.

Powering On the System

Power on the system, and boot the operating system.