Digital Alpha XL

CPU Guide

Order Number: EK-ALXLA-CG. C01

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

1 233-MHz CPU Module

2 266-MHz CPU Module

3 300-MHz CPU Module

Contents

Figures

Tables

Preface

Welcome

This guide describes how to:

- Remove and install the 233-MHz Alpha CPU module.

- Configure the 233-MHz Alpha CPU module jumpers.

- Remove and install the 266-MHz Alpha CPU module.

- Install the air deflector.

- Configure the 266-MHz Alpha CPU module jumpers.

- Configure the 300-MHz Alpha CPU module jumpers.

Audience

If you will be removing, configuring, or installing an Alpha CPU module in your Alpha XL system, you will find the information included here helpful.

Organization of the Information

This information in this booklet covers the following topics:

- Chapter 1, Removing, installing, and configuring the 233-MHz Alpha CPU module.

- Chapter 2, Removing, installing, and configuring the 266-MHz Alpha CPU module.

- Chapter 3, Configuring the 300-MHz Alpha CPU module.

As future CPU modules become available, this guide will be revised to include appropriate new topics.

Special Notices

Two kinds of notices emphasize specific information:

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

- A **HINT** includes suggestions to make your computing tasks easier.

Additional Information Resources

You may wish to consult the following information resources relating to your Digital Alpha XL system:

- *Digital Quick Setup Guide* (order number ER-A03WW-IM) presents a graphical overview of the Digital Alpha XL installation.

- *Digital Alpha XL User's Guide* (order number EK-ALXLA-UG). This guide introduces the Digital Alpha XL system. The information is used to start, use, upgrade, troubleshoot, and configure your Digital Alpha XL system. The guide also contains general system information, including console commands and system care.

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

1

233-MHz CPU Module

Introduction

This chapter describes the features, removal, installation, and jumper configurations of the 233-MHz Alpha CPU module.

Features

The 233-MHz Alpha CPU module has the following features:

- **CPU Chip.** 233-MHz DECchip 21064A (EV45) with 16 KB (kilobytes) of instruction cache and 16 KB of data cache.

- **Core Logic.** DECchip 21071-AA chipset provides memory and cache control and a bridge to the PCI bus.

- **Secondary Cache.** 512 KB organized as direct-mapped and writeback.

- **Console Firmware.** 512 KB (kilobyte) of flashROM containing the ARC console firmware and PALcode.

- **DROM.** The diagnostic ROM contains 64 KB of power-on self test code.

- **NVRAM.** 8 KB of nonvolatile memory used for the storage of setup and configuration information.

- **Indicators.** 8-bit diagnostic LED display.

Removing and Installing the 233-MHz Alpha CPU

Removing the CPU

To remove the CPU module, refer to Figure 1-1 and follow these steps:

_____**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.

1.   Power off the system and disconnect the power cord.

2.   Unlock and remove the left side cover.

_____**HINT** _____

You may find it easier to access the CPU module by laying the system
down on its right side.

3.   Remove the screw holding the CPU module retaining bar.

4.   Gently pull the back of the retaining bar outward and rearward until the tab in
      the fan housing comes out.

5.   Remove the CPU module and place it in an ESD-protected bag.
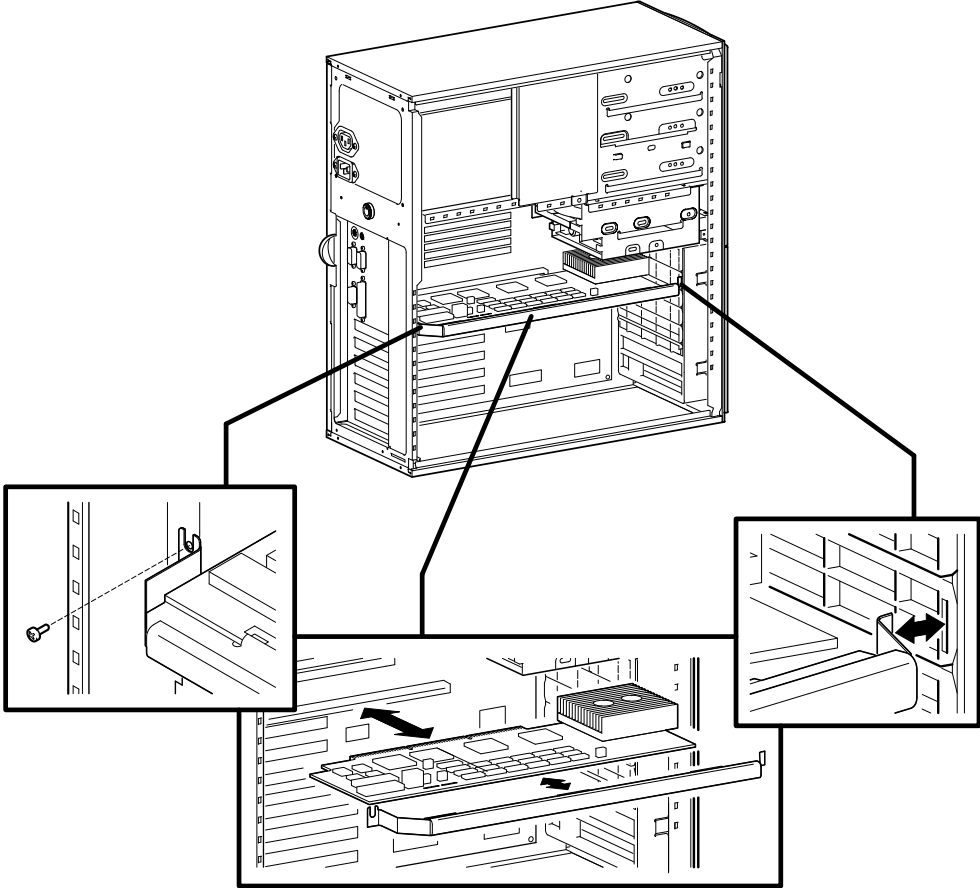
233-MHz CPU Module

Figure 1-1. Removing the 233-MHz CPU Module

Installing the CPU

To install the CPU module, refer to Figure 1-1 and follow these steps:

_____**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.

1.   Remove the 233-MHz CPU module from its ESD-protected bag and check that
       the configuration jumpers are properly set. (See the next section, Configuring
       the 233-MHz CPU Module Jumpers.)

2.   Gently insert the CPU module into the CPU slot in the motherboard.

3.   Replace the retaining bar by inserting the tabbed end into the slot in the fan
       housing.

4.   Carefully swing the retaining bar downward while catching the edge of the CPU
       module in the clips.

5.   Fasten the retaining bar in place with the screw.

6.   Replace and lock the side cover.

7.   Connect the power cable and power on the system.

Configuring the 233-MHz CPU Module Jumpers

Jumper pins allow you to set specific system parameters. Set them by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper block from its current location with your fingers or small needle-nosed pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

LED indicators are provided for additional diagnostic use. The side cover must be removed to view the indicators. Refer to the Chapter 5 of the *Digital Alpha XL User's Guide* for the indicator code meanings.

Figure 1-2 shows the locations of the CPU module jumper pins and the LED indicators. Table 1-1 lists the CPU module jumpers and factory-default settings. Note that the square pin of each jumper block is pin 1.

_____ **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.
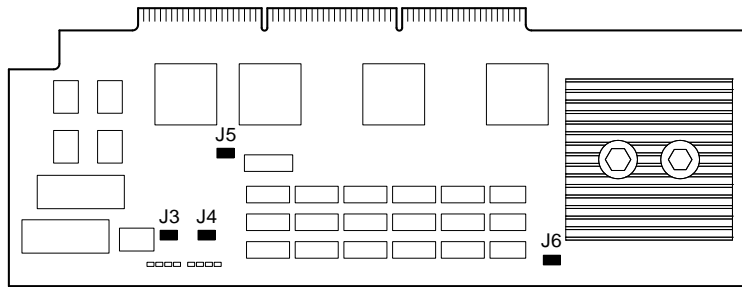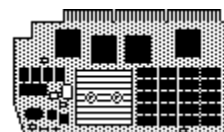
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233-MHz CPU Module

Figure 1-2. 233-MHz CPU Module Jumpers

Table 1-1. 233-MHz CPU Module Jumper Descriptions

Jumper	Pins	Function	Description
J3	1 to 2	Mini-console	The position of J3 determines whether the SROM code goes to the SROM mini-console (for manufacturing use only) or passes control to the next stage of initialization, the DROM code.
	2 to 3 (D)	Jump to main console	
J4	1 to 2 (D)	Enables flashROM writes	The J4 jumper can be used to prevent writes to the flashROMs. Typically, writes are enabled.
	2 to 3	Disables writes	
J5	1 to 2	Boot floppy	The DROM code uses J5 to determine whether an image from a floppy disk or the flashROM containing the console firmware should be loaded into the memory and started.
	2 to 3 (D)	Normal (flashROM load)	
J6	1 to 2 (D)	Reset	The front-panel push button is set to cause a Reset when pressed.
	2 to 3	Not supported	

(D) = Default position

2

266-MHz CPU Module

Introduction

This topic describes the features, removal, configuring, and installation of the 266- MHz CPU module.

Features

The 266-MHz Alpha CPU module has the following features:

- **CPU.** 266-MHz DECchip 21064A (EV45) with 16 KB (kilobytes) of instruction and 16 KB of data cache.

- **Core Logic.** DEChip21071-AA chipset provides memory and cache control and a bridge to the PCI bus.

- **Secondary Cache.** 2 MB (megabytes) organized as direct-mapped and writeback.

- **Console Firmware.** 512 KB of flashROM containing the ARC console firmware and PALcode.

- **DROM.** The diagnostic ROM contains 64KB of power-on self test code.

- **NVRAM.** 8 KB of nonvolatile memory used for the storage of setup and configuration information.

- **Indicators.** 8-bit diagnostic LED display.

Removing and Installing the 266-MHz CPU Module

Removing the CPU Module

To remove the CPU module, refer to Figure 2-1 and follow these steps:

_____**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.

1. Power off the system and disconnect the power cord.

2. Unlock and remove the left side cover.

_____**HINT** _____

You may find it easier to access the CPU module by laying the system down on its right side.

3. Remove the screw holding the CPU module retaining bar.

4. Gently pull the back of the retaining bar outward and rearward until the tab in the fan housing comes out.

5. Remove the CPU module and place it in an ESD-protected bag.
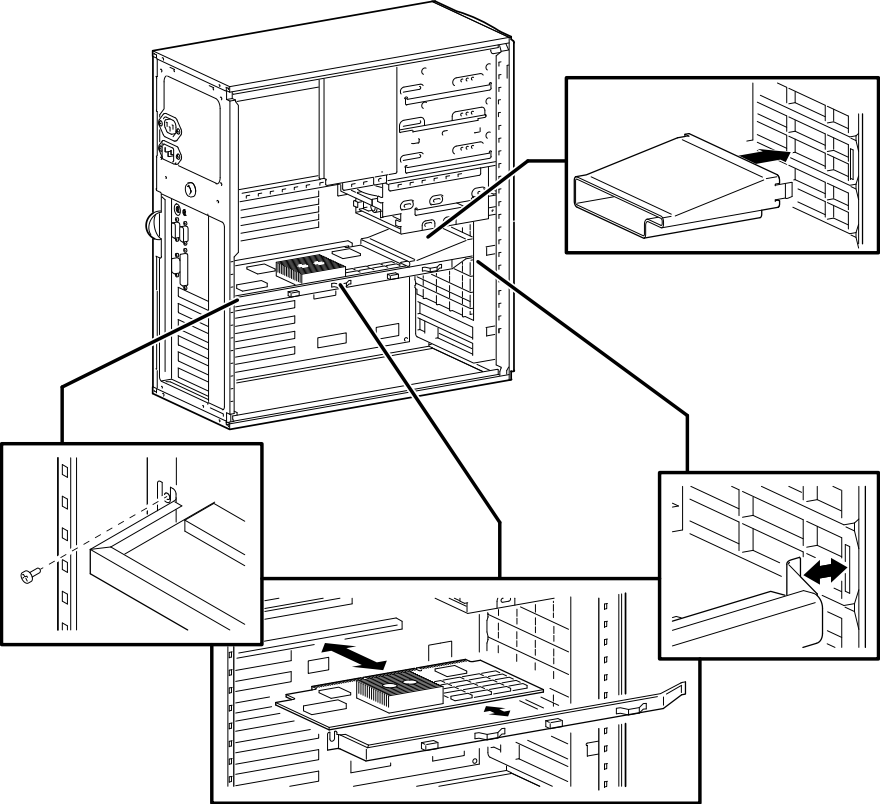
266-MHz CPU Module

Figure 2-1. Removing the 266-MHz CPU Module

Installing the 266-MHz CPU Module and Air Deflector.

To install the CPU module, refer to Figure 2-1 and follow these steps:

_____ **CAUTIONS**_____

The air deflector must be installed for proper operation of 266-MHz CPU Module. If you are upgrading the from another CPU to the 266-MHz CPU module, make sure you install the air deflector first.

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.

1. If an air deflector is not present, locate the deflector and insert the its tabbed end into the fan housing and swing the deflector back to snap it in place.

2. Remove the 266-MHz CPU Module from its ESD-protected bag and check that the configuration jumpers are properly set. (See the next section, Configuring the 266-MHz CPU Module Jumpers.)

3. Gently insert the CPU module into the CPU slot in the motherboard.

4. Replace the retaining bar by inserting the tabbed end into the slot in the fan housing.

5. Carefully swing the retaining bar closed while catching the edge of the CPU module in the clips.

6. Fasten the retaining bar in place with the screw.

7. Replace and lock the side cover.

8. Connect the power cable and power on the system.

Configuring the 266-MHz CPU Module Jumpers

Jumper pins allow you to set specific system parameters. Set them by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location with your fingers or small needle-nosed pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

LED indicators are provided for diagnostic use. The side cover must be removed to view the indicators. Refer to the Chapter 5 of the *Digital Alpha XL User's Guide* for the indicator code meanings.

Figure 2-2 shows the locations of the CPU module jumper pins and the LED indicators. Table 2-1 lists the CPU module jumpers and factory-default settings. Note that the square pin of each jumper block is pin 1.

_____**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.

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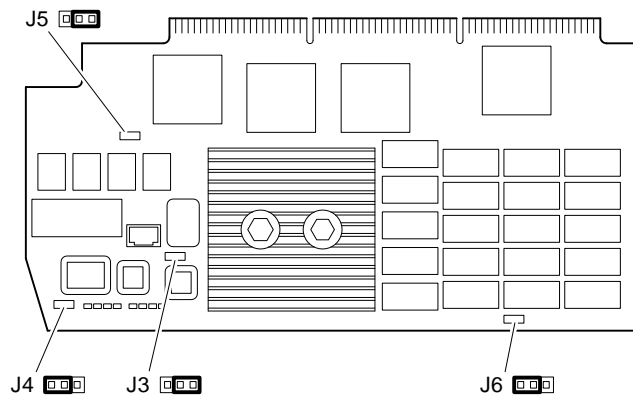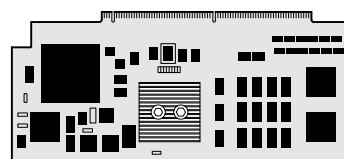**Figure 2-2. 266-MHz CPU Module Jumpers**

Table 2-1. 266-MHz CPU Module Jumper Descriptions

Jumper	Pins	Function	Description
J3	1 to 2	Mini-console	The position of J3 determines whether the SROM code goes to the SROM mini-console (for manufacturing use) or passes control to the next stage of initialization, the DROM code.
	2 to 3 (D)	Jump to main console	
J4	1 to 2 (D)	Enables flashROM writes	The J4 jumper can be used to prevent writes to the flashROMs. Typically, writes are enabled.
	2 to 3	Disables writes	
J5	1 to 2	Boot floppy	The DROM code uses J5 to determine whether an image from a floppy disk or the flashROM containing the console firmware should be loaded into the memory and started.
	2 to 3 (D)	Normal (flashROM load)	
J6	1 to 2 (D)	Reset	The front-panel push button is set to cause a Reset when pressed.
	2 to 3	Not supported	

(D) = Default position

3

300-MHz CPU Module

Introduction

This topic describes the features and configuration of the 300-MHz CPU module.

Features

The 300-MHz Alpha CPU module has the following features:

- **CPU.** 300-MHz DECchip 21164 (EV5) with 8 KB (kilobytes) of instruction, 8 KB of data cache, and 96 KB of on-chip three-way set associative secondary cache.

- **Core Logic.** DEChip 21171-AA chipset provides memory and cache control and a bridge to the PCI bus.

- **External Cache.** 2 MB (megabytes) organized as direct-mapped and writeback.

- **Console Firmware.** 512 KB of flashROM containing the AlphaBIOS firmware.

- **NVRAM.** 8 KB of nonvolatile memory used for the storage of setup and configuration information.

Configuring the 300-MHz CPU Module

Jumper pins allow you to set specific system parameters. Set them by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location with your fingers or small needle-nosed pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

Figure 3-1 shows the locations of the CPU module jumper pins. Table 3-1 lists the CPU module jumpers and factory-default settings. Note that the square pin of each jumper block is pin 1.

_____**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.
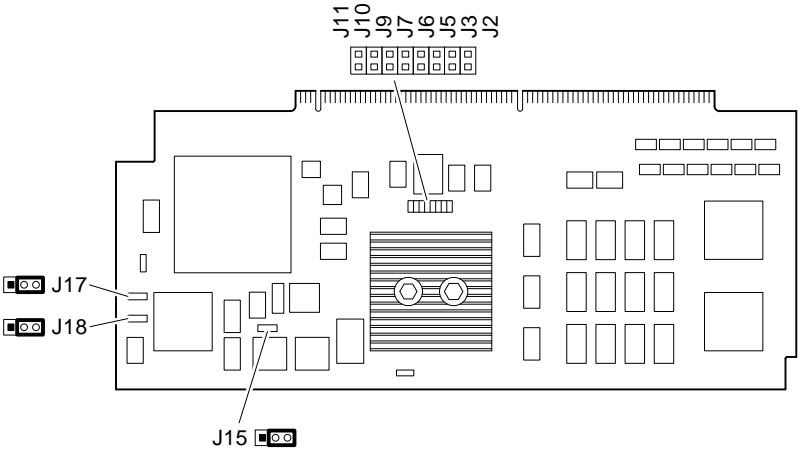
Figure 3-1. 300-MHz CPU Module Jumpers

Table 3-1. 300-MHz CPU Module Jumper Descriptions

Jumper	Pins	Function	Description
SROM Program Select Jumpers J2 J3 J5 J6 J7 J9 J10 J11	Installed (D)	 No Init mini-console MCHK mini-console Reserved Reserved MFG Memtest Failsafe floppy Mini-console Power up	Only one of the SROM Program Select Jumper pins can be installed at any one time.
J8*			For testing purposes only (ground).
J15	1 to 2 2 to 3 (D)	Write disabled Write enabled	FlashROM write enabled.
J16*			For testing purposes only (ground).
J17	1 to 2 2 to 3	Alternate console Primary (D)	Alternate console.
J18	1 to 2 2 to 3 (D)	Secure Not secure (D)	Secure console.

(D) = Default position. *These jumpers are not represented on the figure.