

Pentium™ CPU Modules

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Pentium CPU Modules

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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 made 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:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and 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 user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402. Stock No. 004-00398-5.

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Pentium CPU Modules

Introduction to Pentium CPUs

This section contains an overview and how to identify the various type of Pentium CPUs that are currently available to upgrade the performance of your computer.

Contact your Digital sales representative for information on the CPU types that are available for your computer.

Overview

The purpose of this booklet is to help you identify the CPU, install the CPU in your system, set any jumpers that may be necessary, and give you a set of tables for Device Mapping.

Identification

There are basically two types of Pentium CPU modules, 60 or 66 MHz and 75, 90, 100, or 120 MHz. Each type uses a different processor card. The 560/566 (60 and 66 MHz CPUs) processor card has one CPU socket and uses a larger socket referred to as "Socket 4" type. The 575/590/5100/5120 (75, 90, 100, and 120 MHz CPUs) processor card has two CPU sockets and uses a slightly smaller socket referred to as "Socket 5" type.

Pentium 560/566 CPU Modules

This section describes how to:

- Upgrade your computer with a higher performance CPU
- Change CPU module jumper

CPU Module Features

Your computer might be equipped with a 60 or 66 MHz Intel Pentium™ CPU. The Pentium CPU and related high-performance caching circuitry are located on a CPU module connected to the main logic board inside your computer.

Features of the CPU module include:

- Pentium processor operating at 60 or 66 MHz
- Standard 256 KB of secondary cache memory
- A ZIF socket for CPU upgrades

Upgrading the CPU

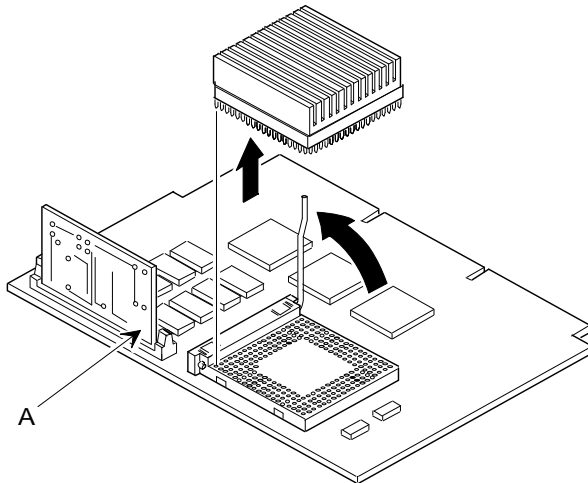
Your 560/566 CPU module is equipped with a ZIF socket (Socket 4 type) capable of supporting Intel OverDrive CPUs. Contact your Digital sales representative for CPU availability and ordering information for your computer.

To install a higher performance CPU:

1. Remove the CPU module.
2. Place the CPU module on an anti-static surface.

3. Lift up on the release lever to release the CPU.
Remove the CPU, noting its pin 1 orientation.

NOTE: Earlier versions of the CPU module did not have a voltage regulator card (66 MHz version) as shown in A, Figure 1 or a jumper card (60 MHz version). Also, the heat sinks on the CPU may vary from this figure.



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Figure 1. Releasing the CPU

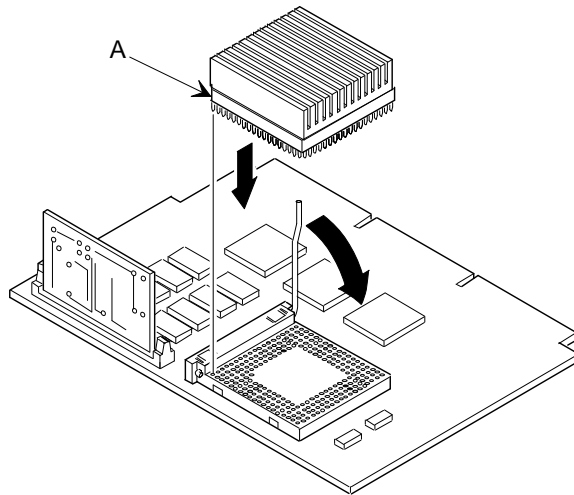


CAUTION: Static electricity can cause damage to components. Before handling any cache module, make sure you discharge all static electricity from your body by touching an exposed metal surface of your computer's chassis.

Pentium 560/566 CPU Modules

4. Install the new CPU.

Make sure pin 1 on the CPU is aligned with pin 1 on the ZIF socket. Pin 1 is located at the notched end of the CPU (A, Figure 2).



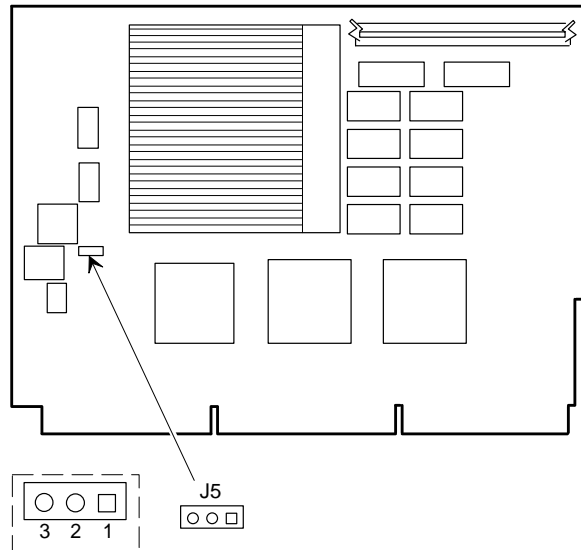
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Figure 2. Installing a New CPU

5. Return the release lever to its original position.
6. Set any appropriate jumpers. Refer to the following section entitled "Jumper Locations".
7. Install and secure the CPU module to the main logic board.

Jumper Locations

Figure 3 shows you the CPU module's jumper location. The following table lists the factory default settings. If necessary, refer to "Device Mapping" for memory mapping information.



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Figure 3. CPU Module Jumper Locations

560/566 CPU Module Jumper Settings

Feature	Description	Setting
CPU clock input (default depends on the CPU installed at the factory)	66 MHz	J5, pins 1 and 2 jumpered
	60 MHz	J5, pins 2 and 3 jumpered

NOTE: Pentium (60 MHz or 66 MHz) CPU modules that do not have jumper J5 (CPU clock input) have been factory set at the correct speed.

Pentium 575/590/5100/5120 CPU Modules

This section describes how to:

- Upgrade your computer with a higher performance CPU
- Upgrade your computer's secondary cache memory
- Change CPU module jumpers

CPU Module Features

Your computer might be equipped with a 75, 90, 100 or 120 MHz Pentium™ processor installed in a CPU ZIF socket (socket 5 type). A second CPU ZIF socket is available for future Pentium OverDrive processors. The Pentium processor(s) and related high-performance caching circuitry are located on a CPU module connected to the main logic board inside your computer. Features of the CPU module include:

- Pentium processor operating at 75, 90, 100, or 120 MHz internally
- Secondary cache memory module
- Optional secondary cache upgrades to boost secondary cache memory performance
- Secondary ZIF socket for future overdrive processor upgrades

NOTE: If your computer has a dual processor CPU module, both CPU ZIF sockets will be occupied by a Pentium processor.

Upgrading the CPU

Your 575/590/5100/5120 CPU module is equipped with a second upgradeable ZIF socket capable of supporting future higher performance Pentium processors. Installing a higher performance OverDrive processor enables your computer to operate with higher processing power. Contact your Digital sales representative for CPU availability and ordering information for your computer.

NOTE: CPU upgrades are not available for dual processor CPU modules.

To install a higher performance CPU:

1. Remove the CPU module.
2. Place the CPU module on an anti-static surface.
3. Lift up on the release lever for the empty ZIF socket..
4. Install the new CPU and return the release lever to its original position.

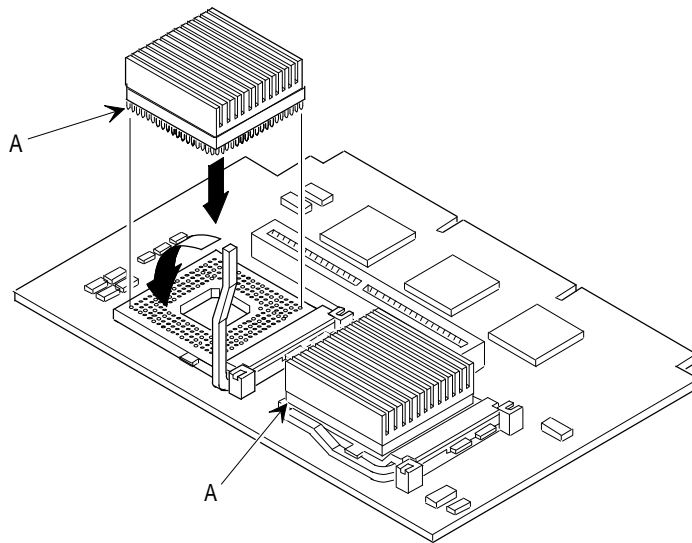
Make sure pin 1 on the CPU is aligned with pin 1 on the ZIF socket (A, Figure 4). Pin 1 is located at the notched corner of the CPU (You can see the notched corner by looking at the CPU from the pin side).

Also, the CPU is keyed so it cannot be installed incorrectly.



CAUTION: Static electricity can cause damage to components. Before handling any cache module, make sure you discharge all static electricity from your body by touching an exposed metal surface of your computer's chassis.

Pentium 575/590/5100/5120 CPU Modules



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Figure 4. Installing a New CPU

5. Set any appropriate jumpers. Refer to the following section titled "Secondary Cache Memory Upgrade Socket and Jumper Locations."
6. Install and secure the CPU module to the main logic board.

Secondary Cache Memory Upgrade Socket and Jumper Locations

Figure 5 shows the location of the CPU module's secondary cache memory upgrade socket (A, Figure 5) as well as jumper pin locations. The following table lists the factory default settings. If necessary, refer to "Device Mapping" for memory mapping information.

575/590/5100/5120 CPU Module Jumper Settings

Feature	Description	Setting
CPU core/bus	2/1 speed bus	J4, jumpered ⁽²⁾
frequency ratio	3/2 speed bus	J4, open ⁽¹⁾
Reserved	Factory use only	J8, jumpered ⁽¹⁾ J8, open

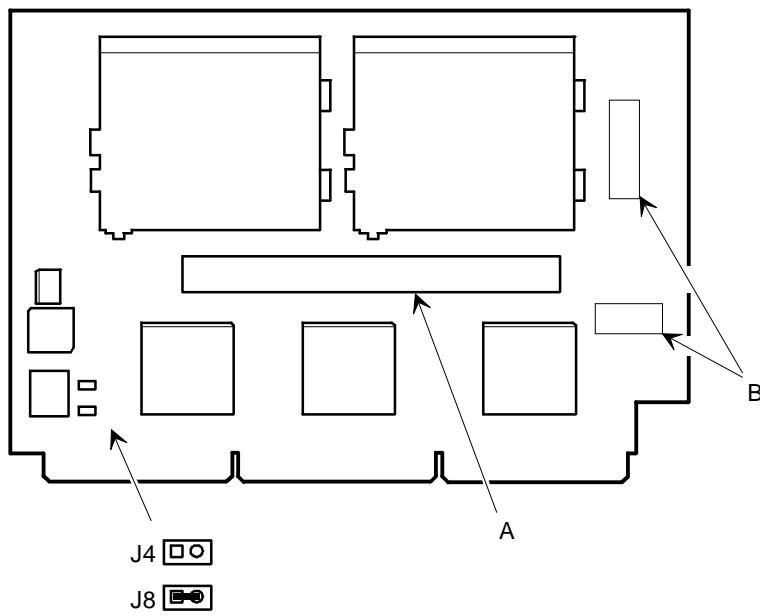
1. Factory default setting

2. For Celebris XL 5120, J4 will be jumpered.

NOTE: Digital recommends that you do not change the factory default jumper settings.

Earlier versions of the CPU Module did not have voltage regulator sockets as shown in B of Figure 5.

Pentium 575/590/5100/5120 CPU Modules



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Figure 5. Secondary Cache Upgrade Socket and Jumper Locations

Upgrading Secondary Cache Memory

Your 575/590/5100/5120 CPU module comes with standard or burst secondary cache memory in the form of a single in-line cache module. Secondary cache memory is designed to greatly improve the performance of the installed CPU(s). Note that “standard” cache refers to asynchronous cache and “burst” cache to synchronous (higher performance) cache.

You can upgrade your secondary cache memory by installing higher performance secondary cache memory upgrades. Contact your Digital sales representative for availability.

To install additional secondary cache memory:

1. Remove the CPU module.
2. Place the CPU module on an anti-static surface.
3. Locate the secondary cache memory socket on the CPU module and remove the currently installed cache memory module.

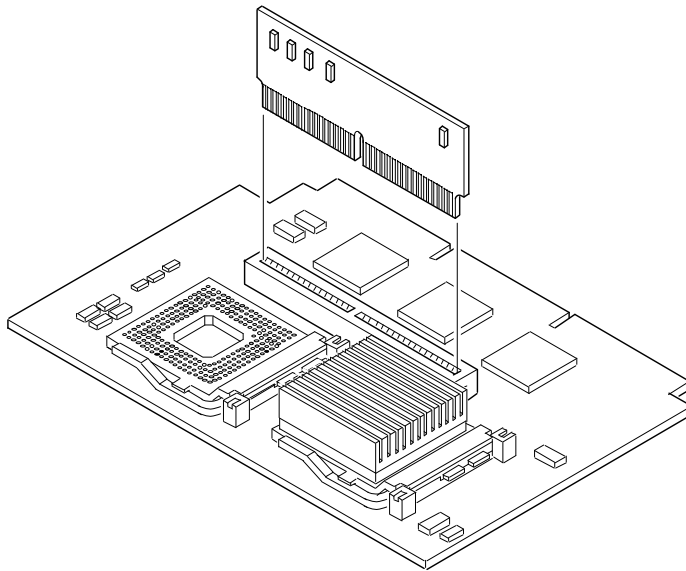


CAUTION: Static electricity can cause damage to components. Before handling any cache module, make sure you discharge all static electricity from your body by touching an exposed metal surface of your computer’s chassis.

4. Remove the new cache memory module from its anti-static packaging, handling it only by the edges.

Pentium 575/590/5100/5120 CPU Modules

5. Install the cache memory module into the socket (Figure 6).
Make sure it is firmly seated into the socket.



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Figure 6. Installing a Secondary Cache Memory Module

6. Install and secure the CPU module to the main logic board.

Device Mapping

This section provides a series of tables listing mapping and address information related to computer memory and various main logic board devices (keyboard controller, interrupt controller, DMA controller, etc.).

Your computer's memory and address locations are allocated at the factory to operate within a standard PC environment. However, due to the number of optional devices and/or expansion boards that are available, sometimes memory and address locations need to be changed. For example, some network expansion boards require a specific memory location. If that location is already allocated, a memory conflict results and the expansion board will not operate as expected. Note that some memory, I/O and interrupt locations can be changed using the BIOS Setup utility. Refer to your computer's User's Guide for additional information.



CAUTION: Before changing any memory or address location, refer to the documentation supplied with the optional device, expansion board, or software application and make sure adequate information is available. If not, contact the option or software manufacturer for further information.

CPU Memory Address Map (Full Range, 560/566 CPUs)

Range	Function	Notes
0 KB to 512 KB	Main memory	PC compatibility range
512 KB to 1024 KB	Main memory	PC compatibility range (EISA/ISA memory lower limit)
1 MB to 16 MB	Main memory	EISA/ISA memory upper limit
	Memory space gap	PCI memory hole (16 MB max. size) ⁽²⁾
16 MB to 192 MB ⁽¹⁾	Main memory	Pentium processor upper limit
192 MB to 4 GB ⁽¹⁾	PCI memory	

⁽¹⁾ 128 MB max. for DECpc LPx 560/566

⁽¹⁾ 512 MB max. for Prioris HX (DP) Series

⁽²⁾ 4MB max. for Prioris XL Server

CPU Memory Address Map (Full Range, 575/590/5100/5120 CPUs)

Range	Function	Notes
0 KB to 512 KB	Main memory	PC compatibility range
512 KB to 1024 KB	Main memory	PC compatibility range (EISA/ISA memory lower limit)
1 MB to 16 MB	Main memory	ISA memory upper limit
	Memory space gap	
16 MB to 384 MB ⁽¹⁾	Main memory	Computer memory upper limit
384 MB to 4 GB ⁽¹⁾	PCI memory	

⁽¹⁾ 512 MB max. for Prioris XL Server

512 MB max. for Prioris HX (DP) Series

CPU Memory Address Map (PC Compatibility Range)

Address Range	Function	Size
00000 to 7FFFF	Main memory	512 KB
80000 to 9FFFF	Main/PCI/ISA memory	128 KB
A0000 to BFFFF	PCI/ISA video buffer memory	128 KB
C0000 to C7FFF	Video memory BIOS	32 KB
C8000 to DFFFF	PCI/ISA card BIOS and buffer memory	96 KB
E0000 to EBFFF	ISA/PCI adapter RAM after POST completes Used by BIOS Setup during POST	48 KB ⁽¹⁾
EC000 to EFFFF	SCSI BIOS (if enabled)	16 KB ⁽¹⁾
F0000 to FFFFF	System BIOS memory	64 KB

⁽¹⁾ 32 KB for Prioris XL Server

CPU I/O Address Map

Range (hexadecimal)	Function
0000 to 0CF7	PCI I/O space
0CF8	Configuration space enable register
0CF9	Turbo and reset control register
0CFA to BFFF	PCI I/O space
C000 to CFFF	PCI configuration space
D000 to FFFF	PCI I/O space

Device Mapping

I/O Address Map

Range (hexadecimal)	Function
060 to 064	Keyboard/mouse controller
0F0 to 0FF	Math co-processor
1F0 to 1F7	IDE controller (if enabled)
278 to 27F	LPT2 (if enabled)
2F8 to 2FF	COM2 (if enabled)
378 to 37F	LPT1 (if enabled)
3BC to 3BE	LPT3 (if enabled)
3F0 to 3F7	Diskette controller (if enabled)
3F8 to 3FF	COM1 (if enabled)

Computer Interrupt Levels

Interrupt Number	Interrupt Source
IRQ1	Keyboard controller
IRQ3	COM2 (if enabled)
IRQ4	COM1 (if enabled)
IRQ6	Diskette drive (if enabled)
IRQ7	LPT1, LPT2, LPT3 (if enabled)
IRQ12	Mouse interrupt
IRQ13	Math co-processor
IRQ14	Hard disk drive (if enabled)

DMA Channel Assignment

Channel	Controller	Function
0	1	Refresh
1	1	Not used
2	1	Diskette controller (if enabled)
3	1	Not used
4	2	Cascade DMA
5	2	Not used
6	2	Not used
7	2	Not used

PCI Configuration Space Address Map

Range (hexadecimal)	Function
C0xx	CPU bridge
C1xx ⁽¹⁾	Onboard PCI SCSI (if applicable) ⁽¹⁾
C2xx	PCI/ISA or PCI/EISA bridge
C6xx	PCI slot 1
C7xx	PCI slot 2
C8xx	PCI slot 3

⁽¹⁾ For Priors HX servers: PCI-to-PCI bridge (PCI slots 4, 5, 6)