

POWERLEAP™ PL-54C/MMX

Pentium® CPU Upgrade Kit Installation Guide

--for--

- Intel Pentium (P54C)
- Intel Pentium w/MMX Technology (P55C)

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Introduction

Your PowerLeap™ PL-54C/MMX CPU upgrade board allows Intel Pentium™-60/66MHz (Socket 4) computers to take advantage of the latest MMX CPU technology. PowerLeap typically runs 150% to 550% times faster than your computer's original CPU speed.

The CPU upgrade board employs *patent pending* technology to adapt existing systems to the voltage and pinout requirements of this new generation of processors. It provides an upgrade solution that would otherwise require the replacement of the motherboard.

About MMX™ Technology

Intel's MMX technology extends the performance of Pentium processors with 57 new instructions, a 32K L1 cache, four new 64-bit data types, and more. For multimedia and communications applications, MMX can significantly enhance audio/video playback and image processing. MMX technology is compatible with a wide range of existing operating systems (including MS-DOS, Windows, OS/2, and UNIX) and 16/32-bit applications.

Some Commonly Used Abbreviations

This manual uses the following abbreviations and acronyms.

- MMX:** Multimedia Extension
- P54C:** Intel Pentium CPU
- P55C:** Intel Pentium with MMX CPU

Special Features

PowerLeap PL-54C/MMX offers the following advanced features:

- Flexible frequency multiplier increases CPU speed from 1.5 to 5.5 times
- Supports Intel Pentium and Pentium w/MMX CPUs
- Employs patented IPS (Independent Power Source) technology, which provides pure, durable, and abundant power to the V/Core of split-voltage type CPUs
- Switching VRM (Voltage Regulating Module) circuitry
- Large On-Chip 64KB L1 Cache (AMD-K6, Cyrix/IBM 6x86MX, & IDT-C6) or 32KB L1 Cache (Intel Pentium w/MMX) for high-performance implementation
- Chip-for-chip replacement, with no software drivers to install
- Includes the Landmark System Speed Test for testing the performance of your computer before and after PowerLeap PL-54C/MMX installation

What You Have

Your PowerLeap™ PL-54C/MMX CPU upgrade board includes the following items:

- The PowerLeap™ PL-54C/MMX upgrade board
- Power connector cord
- PowerLeap™ Utility Diskette (including the Landmark System Speed Test)
- CPU cooling fan & heatsink

What You Need

In addition to your PowerLeap™ PL-54C/MMX CPU upgrade board, you need a replacement CPU. For maximum compatibility, we recommend using only an Intel Pentium or Pentium w/MMX CPU. If you purchased your PL-54C/MMX with the CPU included, then you are ready to upgrade right now!

The PowerLeap™ PL-54C/MMX

This chapter describes setting the external clock frequency, clock multiplier, and voltage for your PowerLeap PL-54C/MMX CPU upgrade board.



Quick Start: Clock Multiplier and Voltage Settings

This section shows how to use the JP3 DIP switch to choose the correct clock multiplier and voltage for your new Intel Pentium processor.

Intel CPU	JP3 Setting
Pentium-166	
Pentium-200	
Pentium w/MMX-166	
Pentium w/MMX-200	
Pentium w/MMX-233	

JP2 Settings: External Clock Frequency

To assure optimum performance of your PowerLeap upgrade, the JP2 setting should match the external frequency of your computer's original CPU.

JP2 Setting		External Clock Frequency (Original CPU)
1		60MHz
1		66MHz (default)

JP3 Settings: Clock Multiplier and Voltage

This section shows the clock multiplier and voltage settings for Intel Pentium CPUs. To reduce power consumption, dual-voltage CPUs use two separate supply voltages: an I/O interface voltage and a lower core voltage for the processor.

Pins 1-6: Clock Multiplier Selection

	5.5x	5x	4.5x	4x	3.5x	3x	2.5x	2x
Pins 1-2	Open	Open	Closed	Closed	Open	Open	Closed	Closed
Pins 3-4	Open	Closed	Closed	Open	Open	Closed	Closed	Open
Pins: 5-6	Closed	Closed	Closed	Closed	Open	Open	Open	Open

Pins 7-12: Core Voltage Selection

Use pins 7-12 to set the core voltage for Single-voltage and Dual-voltage CPUs.

JP3 Pins 7-12	Single-Voltage CPUs (P54C/C6)	Dual-Voltage CPUs			
		3.2V	2.9V	2.8V	2.2V
Pins 7-8	Closed	Open	Closed	Open	Open
Pins 9-10	Closed	Open	Open	Open	Closed
Pins 11-12	Closed	Closed	Open	Open	Open

Installing the CPU Upgrade Board

This chapter describes installing your PowerLeap™ PL-54C/MMX CPU upgrade board.

Before Installation

Prior to starting installation, take your CPU upgrade board from its packing and remove the protective foam pad, taking care not to damage the pins. If the package includes a CPU cooling fan & heatsink, remove it too.

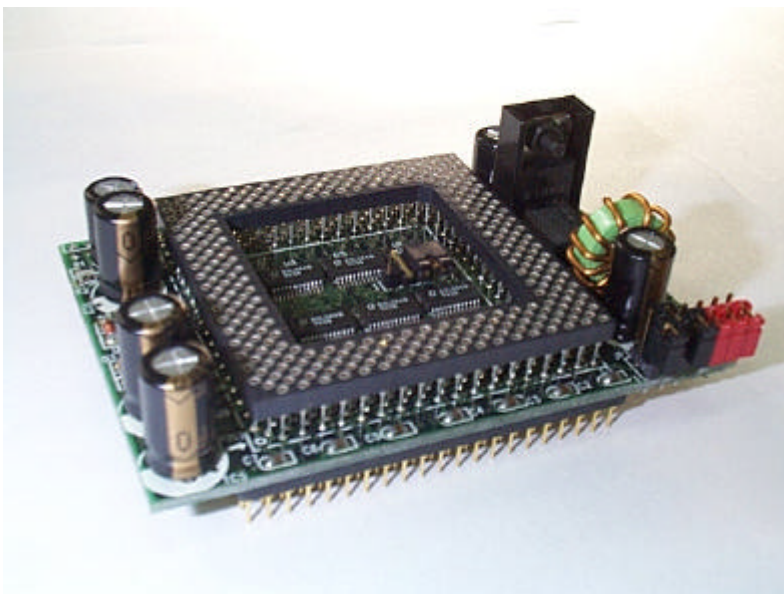


Figure 1. PL-54C/MMX (SVRM)

To compare the performance increase provided by the PL-54C/MMX CPU upgrade board, we suggest running the Landmark System Speed Test both before and after installation. If you are uncertain about the speed of your existing CPU, you can determine the speed by running the Landmark System Speed Test. For details, see “Running the Landmark System Speed Test” later in this guide.

Installation

Install the CPU upgrade board as follows.

- ☞ To install the CPU upgrade board:
1. Place your computer where you will have plenty of space to work.
 2. **Turn the computer off and disconnect all power cords and cables from the rear of the computer.**
 3. Remove the cover from the computer (as described in the computer documentation).
 4. Locate your existing CPU on the computer’s motherboard. The CPU will be clearly labeled with the manufacturer’s name (such as “Intel”), and markings identifying the CPU model and speed (such as Pentium-66).
 5. Remove the existing CPU cooling fan.

6. Remove the existing CPU from the ZIF socket.

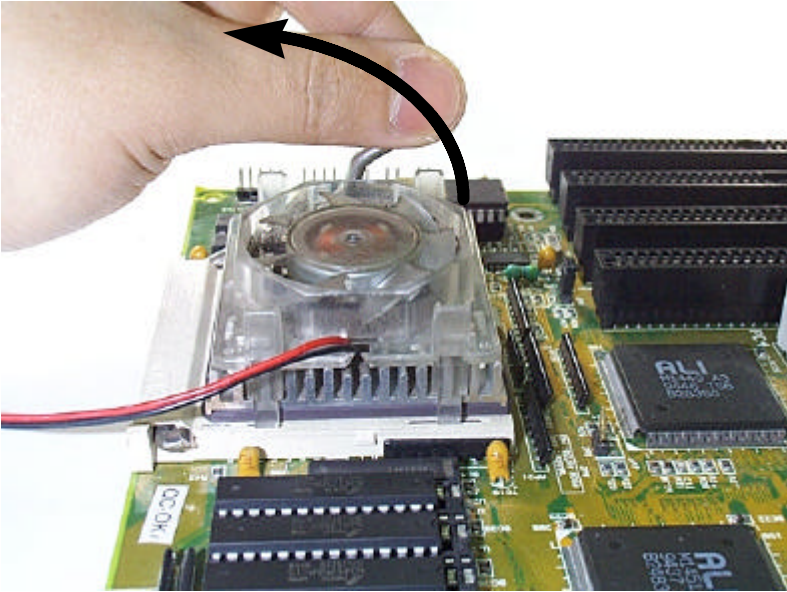


Figure 2. Removing the existing CPU and CPU cooling fan

7. Make sure that the upgrade board's JP2 and JP3 jumper settings are correct (refer to the previous chapter). These jumper switches let you set the correct external clock frequency, clock multiplier, and voltage for the upgrade board.

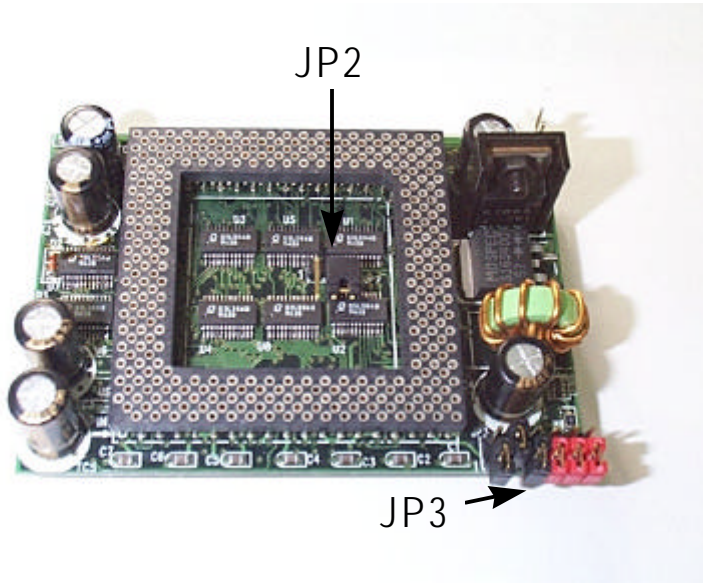


Figure 3. The JP2 and JP3 jumper switches

8. Install the new CPU into the upgrade board socket. Make sure it is firmly seated in the socket.

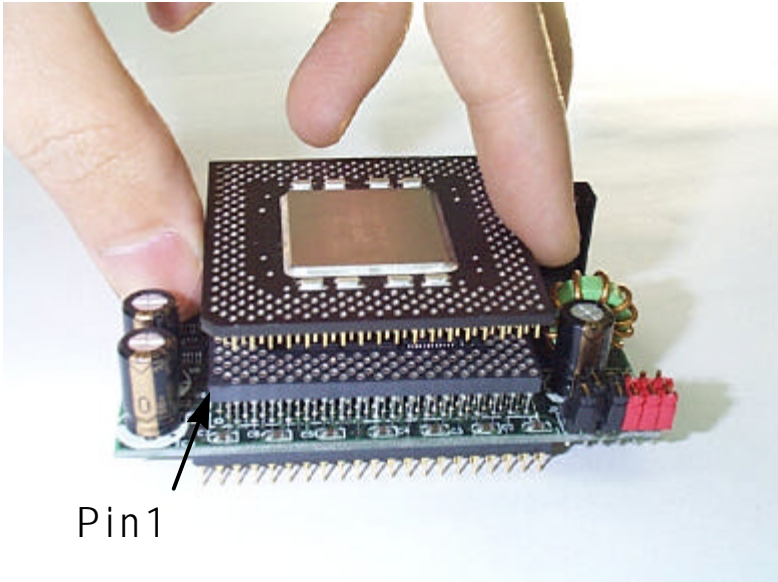


Figure 4. Installing the new CPU into the upgrade kit socket

9. Remove the protective film from the adhesive pad on the bottom of the heat sink.

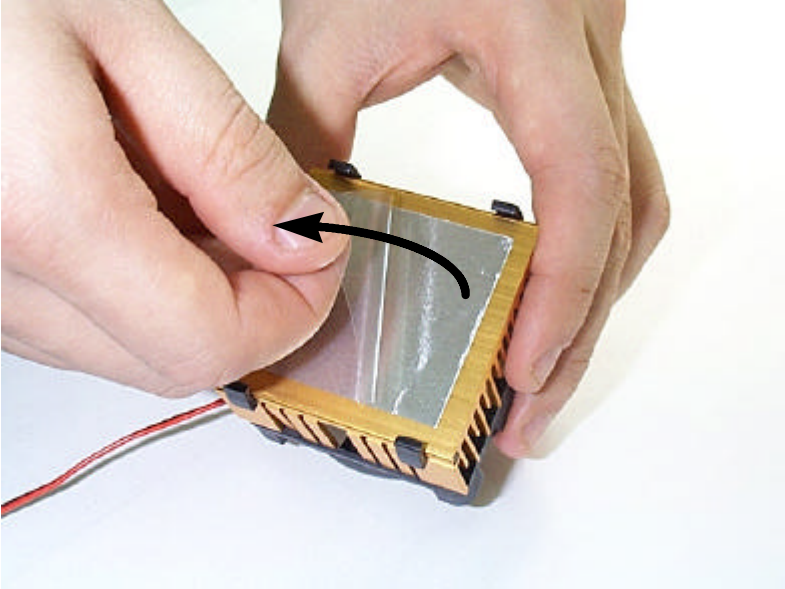


Figure 5. Removing the protective film

10. Press the cooling fan and heatsink onto the top of the CPU.

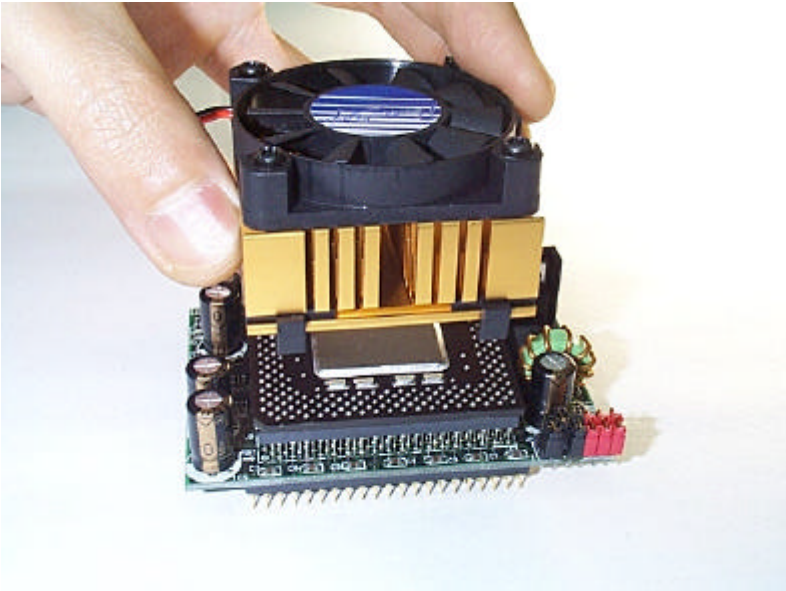


Figure 6. Pressing the cooling fan and heatsink onto the CPU

The adhesive pad creates a strong bond between the heatsink and CPU and ensures even heat dissipation from the CPU.

11. Install the CPU upgrade board into your computer's ZIF socket, **making sure that pin 1 of the upgrade board is installed in pin 1 of the ZIF socket.**

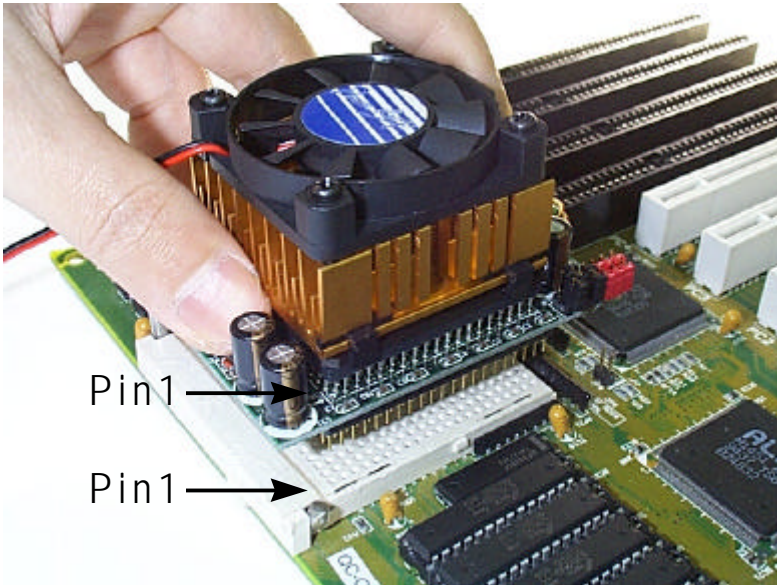


Figure 7. Installing the CPU upgrade board into the ZIF socket

Pin 1 of the CPU upgrade board must match the pin 1 hole of the ZIF socket. If the upgrade board is installed incorrectly, it may be damaged.

12. Plug one the fan's connectors (either the male or the female connector, depending on you computer), into one of your computer's power plugs.

13. **Plug the provided power connector into the upgrade board's JP1 connector, making sure that the pin marked "1" corresponds to the connector's red line.** Then plug one of the other connectors (either the male or female connector, depending on your computer) to a connector from your computer's power supply.

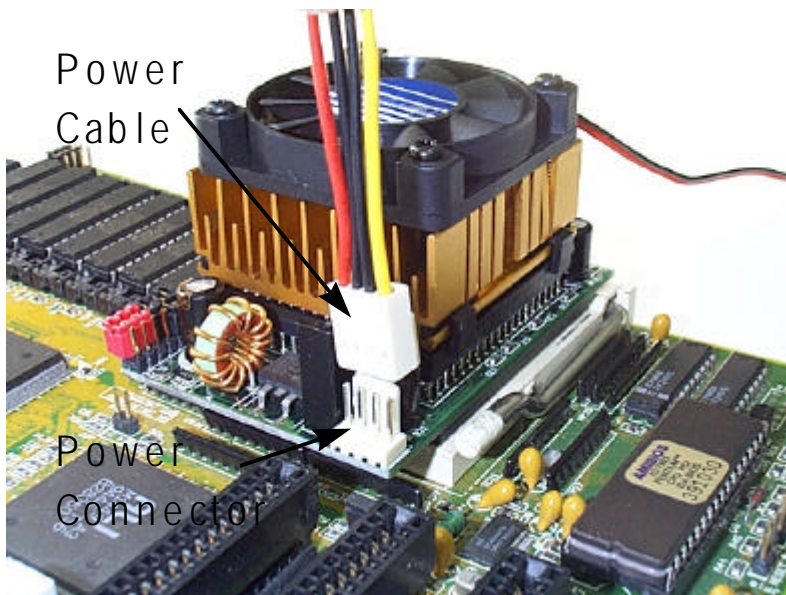


Figure 8. Installing the power connector

The CPU upgrade board must have an independent (external) power supply in order to operate. Without a connection to an external power supply, the CPU upgrade will not work.

For maximum reliability, do not use the unused connector on the power connector cord to supply power to a hard disk drive or other device. In other words, use the power connector cord to connect only the upgrade board to the computer's power supply.

Technical Reference

You can achieve the best CPU performance by adjusting the system board's external clock speed according to the tables below.

System Upgrade Speed = External Clock Speed x Upgrade Board Clock Multiplier

Intel CPU	External Clock Speed	Upgrade Board Clock Multiplier	Internal Clock Speed
Pentium - 60	60 MHz	1x	60 MHz
Pentium - 66	66 MHz	1x	66 MHz
Pentium - 75 (P54C)	50 MHz	1.5x	75 MHz
Pentium - 90 (P54C)	60 MHz	1.5x	90 MHz
Pentium - 100 (P54C)	66 MHz	1.5x	100 MHz
Pentium - 120 (P54C)	60 MHz	2x	120 MHz
Pentium - 133 (P54C)	66 MHz	2x	133 MHz
Pentium - 150 (P54C)	60 MHz	2.5x	150 MHz
Pentium -166 (P54C)	66 MHz	2.5x	166 MHz
Pentium - 200 (P54C)	66 MHz	3x	200 MHz
Pentium w/MMX-166 (P55C)	66 MHz	2.5x	166 MHz
Pentium w/MMX-200 (P55C)	66 MHz	3x	200 MHz
Pentium w/MMX-233 (P55C)	66 MHz	3.5x	233 MHz

AMD CPU	External Clock Speed	Upgrade Board Clock Multiplier	Internal Clock Speed
K6 MMX - 166	66 MHz	2.5x	166 MHz
K6 MMX - 200	66 MHz	3x	200 MHz
K6 MMX - 233	66 MHz	3.5x	233 MHz
K6 MMX - 266	66 MHz	4x	266 MHz
K6 MMX - 300	66 MHz	4.5x	300 MHz

IDT CPU	External Clock Speed	Upgrade Board Clock Multiplier	Internal Clock Speed
C6 MMX - 180	60 MHz	3x	180 MHz
C6 MMX - 200	66 MHz	3x	200 MHz
C6 MMX - 225	75 MHz	3.5x	225 MHz
C6 MMX - 240	60 MHz	4x	240 MHz

Running the Landmark System Speed Test

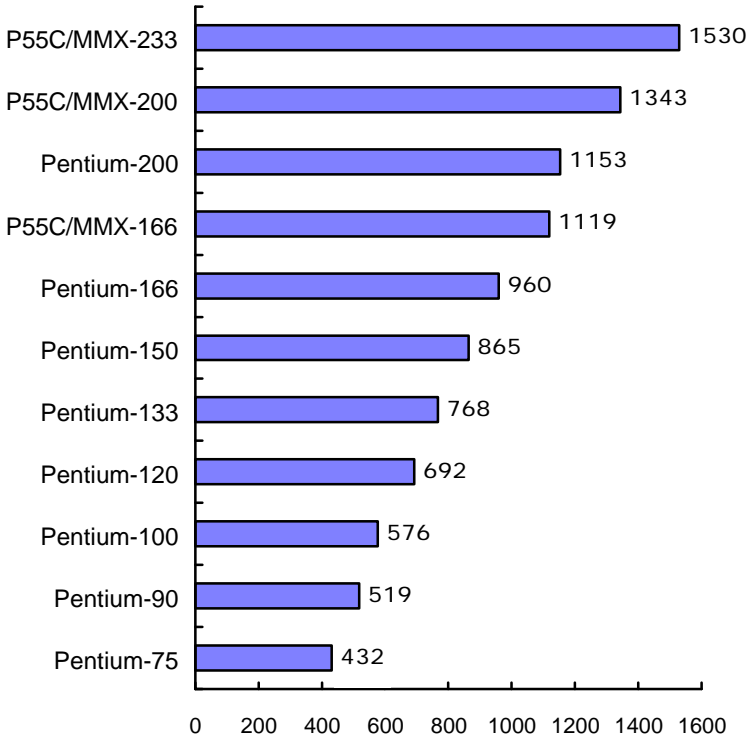
To verify the performance increase provided by the CPU upgrade board and your new CPU, we suggest running the Landmark System Speed Test® both before and after installation. The Landmark System Speed Test® is provided on the software distribution floppy disk.

The Landmark rating measures the speed of the processor at performing calculation tasks. Run the Landmark System Speed Test® as follows:

1. Insert the software distribution floppy disk into drive A.
2. At the DOS prompt, type *SPEED200 [switches]* and then press <Enter>.

Running the Landmark System Speed Test® from within Microsoft Windows or OS/2 may yield unreliable results. For best results, run the test program from the DOS prompt. Do not run the test program from a DOS task within Microsoft Windows or OS/2.

The following table shows the approximate Landmark System Speed Test® results for a variety of Pentium CPUs.



Downloading PowerLeap Software

The PowerLeap web site (<http://www.powerleap.com/download.htm>) contains links to files available for FTP download, including:

- PowerLeap CPU Control for Windows 95 and NT. This utility is also on the diskette that comes with the PL-54C/MMX (see the "SETUP.EXE" file). As newer versions are released, they are made available here as well.
- WinTune 97 Benchmark. *Windows Magazine's* latest version of the WinTune benchmark, which is handy for before-after comparisons. Requires Windows 95.

