CPU Upgrade/Overclocking

OBJECTIVES

1. Install a CPU.
2. Employ different clock frequencies.
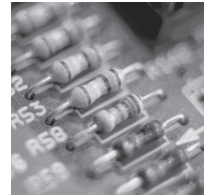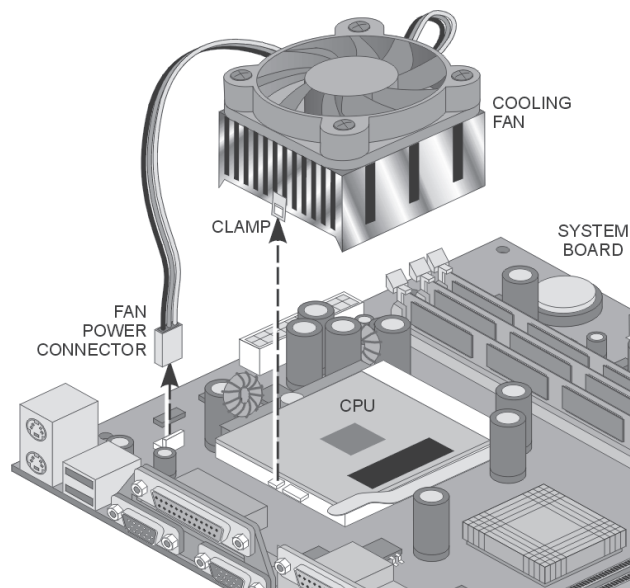
Hardware

RESOURCES

1. Marcraft 8000 Trainer

DISCUSSION

This lab will familiarize you with upgrading a CPU on a Socket370 motherboard. The process is fairly simple with today's auto-detecting motherboards. When you are upgrading a CPU you need to be concerned with CPU voltage, internal frequency, and FSB (Front Side Bus). The internal frequency is determined by multiplying the system bus by a particular number. The frequency specifications are usually written on the box the processor came in or on the processor itself. You will physically remove a CPU and reinstall it as if it were a new processor. Your motherboard may have physical jumper settings for clock frequencies, or software-controllable settings in the BIOS. Overclocking can be dangerous to your system and may cause system failures. It is recommended not to overclock more than 20% above the recommended frequencies. It is also important to have a good heat sink and fan on the processor.

Hardware

PROCEDURE

1. **Remove CPU**
   ____a. Shut down the computer if it is in any operating system.
   ____b. Turn off the power supply.
   ____c. Open the side panel of the computer and lay the case horizontally.
   ____d. Unplug the CPU cooling fan's power connector.
   ____e. Unclamp the cooling fan and heat sink from the CPU and set it aside, as shown in Figure 9-1.

Figure 9-1: CPU, Fan, and Clamp

____f.   Release the CPU by gently sliding the lever slightly away from the socket and then rotating the lever to vertical.

____g.   Gently remove the CPU being careful not to touch the pins on the bottom of the CPU. If you bend the pins the CPU will be useless. Make sure to use the grounding strap to remove any possible electrostatic discharges.

2.   Reinstall CPU

____a.   Refer to the CPU's documentation to determine the voltage, FSB, and internal frequency. The processor may have the internal frequency printed on it. Record these values in Table 9-1.

____b.   Reinsert the CPU into the socket, as illustrated in Figure 9-2. Be careful to insert it correctly. Usually two of the corner pins are missing in order to prevent improper connection.
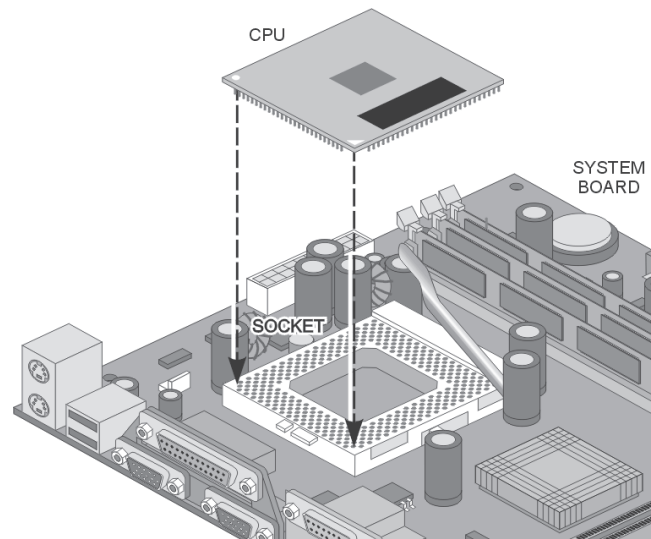

Figure 9-2:
CPU in Socket

____c.   Close the clamping mechanism.

____d.   Clamp the cooling fan and heat sink on the processor and plug in its power connector.

3.   CPU settings

____a.   Verify that everything is properly connected and turn on the computer.

____b.   Press the PAUSE key and record the values in Table 9-2.

4.   CPU overclocking

____a.   Enter the BIOS setup by pressing DELETE.

____b.   Depending on the processor you can change its clock frequency or multiplier to attain higher performance from the processor. Select "Frequency Control" and press ENTER.

____c.   Select "CPU Host Closk" and press ENTER.

____d.   Increase the frequency to its next highest setting (75 MHz for Celeron).

____e.   Press ESC, F10, Y, and ENTER to save chages.

____f.   Restart the computer and record the results in Table 9-3. If the computer does not start you will need to reset the CMOS.

____g.   If the CPU does not generate a higher frequency turn the multiplier back to its last working setting.

___h.   Restore all settings to their original state.
___i.   Put the case back on the computer and set it back to its original position.

TABLES

Table 9-1

Documented CPU Parameters	
Voltage:	
FSB:	
Internal Frequency:	

Table 9-2

CPU Parameters in Chipset Features Setup	
CPU Name:	
CPU Speed:	
CPU Clock Frequency:	
CPU Clock Ratio:	

Table 9-3

Increasing BUS Speed – Results:	
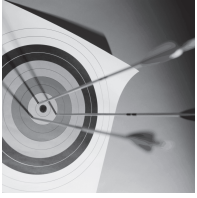
Feedback

LAB QUESTIONS

1. What are two methods of setting frequencies on various motherboards? Which one is yours?

2. How many pins are missing to prevent improper installation?

3. What was the smallest increment used to overclock the CPU?

4. What was the name of the menu for CPU settings in your particular BIOS (if available)?

5. Is it possible to underclock a CPU?