

Lab Expectations

1. Each student should maintain a lab notebook which carefully documents the steps taken during lab and their results. Entries should be dated and written in ink.
2. Your lab grade is based entirely on your written lab reports. Another student who is attending lectures but not labs should be able to read your reports and perfectly reproduce your results.
3. Lab is intended to be a hands-on learning experience for all students. This means you should take turns which student does what, giving preference to students with the least prior experience. Lab reports should indicate who did what.
4. The lab manual is intended as a guide and does not always provide detailed instructions.
5. Have fun!

Lab 1

Build the PC

Objectives

In this lab, you will construct a PC from components. When you are finished, the PC should be able to boot from the CD drive and boot (or try to) from the hard drive.

1.0 Before you start

Each system is a little different. These instructions are a guide; you may need to vary some of the steps. Be sure to *use an anti-static wristband* for all steps. Obtain the PC components from the TA.

1.1 Opening the case

1. Remove both sides of the case via the 4 screws on the back of the case.
2. Remove the back fan (not the power supply). Make a note of which holes were used for the fan. It will be easier to access the inside of the case during assembly with the fan removed.

1.2 The Motherboard

We suggest to install the CPU, heat sink, and memory onto the motherboard before installing the motherboard into the case. Read the motherboard instructions, CPU installation instructions, and heat sink installation instructions carefully. Some tips:

1. Leave the motherboard on the pink foam while installing the CPU and heat sink.
2. Align the CPU onto the socket according to the instructions. Handle the CPU very carefully. Do not touch the center part or damage the pins. The CPU will fall into place when it is aligned correctly.
3. The heat sink will be attached to the processor using a strap. One end of the strap should have a slot for a standard screwdriver, while the other end does not. The ends will hook

under clips on the processor socket. Hook the screwdriver end last. This requires a good deal of force. Be very careful not to slip and damage the motherboard or CPU.

4. Attach the CPU fan power cable to the motherboard. Read the motherboard instructions to find the correct receptacle.
5. Install the memory DIMM into the slot closest to the processor.
6. Locate the Ethernet port, USB ports, sound plugs, etc. on the motherboard. These need to line up with a feed-through plate on the back of the case. If they do not, you need to remove the feed-through plate from the case and use a feed-through plate that came with the motherboard.
7. When installing the motherboard into the case, handle the motherboard by the edges and line it up with the feed-through plate. Once the feed-plate is properly aligned, affix the motherboard using the 6 screws that hold the motherboard to the case.

1.3 Drives

Install the floppy drive and CD drive. You will need to knock out the drive bay covers to do this.

This machine will use drive trays to allow easy switching between hard drives. Install one drive rack (according to the instructions) into a large bay. Install each hard drive into a drive tray. Make sure the hard drive jumpers are in *cable select* mode. Place one of the drive trays into the rack.

1.4 Video Card

1. Locate the AGP (long brown) slot. Remove the corresponding metal cover (and screw) from the back of the case.
2. Install the video card by pressing firmly until the latch snaps into place.
3. Screw the metal plate for the card into the case.

1.5 Cables

1. Connect the floppy drive to the motherboard. Use the narrowest ribbon cable. On the motherboard, the notch will align the plug correctly. On the floppy drive, align the red wire with the pin #1 side.
2. Connect the hard drive rack to the motherboard. The primary IDE port and connector are blue, and are aligned using the notches. Connect the far end of the cable to the hard drive, aligning the notch. The middle connector is unused (it would be for a slave disk).
3. Connect the CD drive to the secondary IDE port on the motherboard.
4. Locate “CD2” on the motherboard (using the instructions). Plug the 4-pin connector from the CD drive into the motherboard, matching the red wire to the right channel.

5. Attach the LEDs, speaker, reset switch, and power switch connectors to the motherboard. Use the motherboard instructions to determine the correct placement.
6. Connect the power cables to the motherboard, the 3 drives, and the front fan.

1.6 Closing the case

1. Be sure all drives have screws on both sides.
2. Re-install the rear fan to the case and connect the power.
3. Have the TA inspect your machine.
4. Put the sides back on the case.

1.7 External connections

Attach the monitor, keyboard, mouse, power, and Ethernet cable.

1.8 Check the machine

Turn the computer on and get into the BIOS.

1. Set the date and time.
2. Make sure the boot order is (CD-rom, Floppy, IDE-0).
3. Make sure caches L1 and L2 are enabled.
4. SDR/DDR CAS latency may need to be changed to 2.5T.

When the computer starts, verify:

- The CPU information is correct
- The memory is detected and working
- The drives are detected and working

When your machine is correctly trying to boot (or booting properly), you are finished!

1.9 Finishing up

1. Turn the machine off.
2. Save all packaging and instructions for the end of the semester, when the machine will be disassembled.