

## Experiment #0

### PC Hardware and Operating Systems

#### Objective:

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The objective of this experiment is to introduce the operating systems and different hardware components of a microcomputer.

#### Equipment: Microcomputer

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#### Introduction:

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Microcomputer (PC) operating systems are briefly discussed in this experiment. The two commonly used operating systems in PC are MS-DOS and Windows (95, 98, etc..). In the MS-DOS environment, command line is used to view, copy or interact with stored files. In Windows environment, clicking the mouse performs these operations in a user friendly manner. First part of this experiment introduces the file management in MS DOS mode. In the second part a 386 microcomputer is disassembled and its hardware components are identified. Finally the PC is reassembled in the laboratory.

#### Pre-lab:

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Use any computer with 'Windows', to do the following operations:

1. In Windows operating system, use 'Start' and 'Find' menu to locate the 'Debug' program. Note the address or path.
2. From 'Start' and 'Programs' menu, use 'Windows Explorer' to make a new directory in C drive and name it 'EE 390'.
3. Using 'Copy' and 'Paste' command of 'Windows Explorer' copy the 'Debug.exe' program in to the newly created directory of 'EE390'
4. Execute the 'Debug' program by clicking on it. (type 'q' to quit)
5. Also execute the 'Debug' program, from 'Start' and 'Run' menu.
6. From 'Start' and 'Programs' menu, click on 'MS-DOS prompt' to start the MS-DOS debugger. Type 'Debug' and press <enter> to execute the program. Type 'q' to quit the debug program.

## **Lab Work<sup>1</sup>:**

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1. Use the Lab microcomputer to perform the following operations;
  - a. In MS-DOS mode, 'C :>' means we are in the main directory. Go to this directory and use 'DIR' to check the contents of the directory.
  - b. Use 'CD' or change directory command to go to 'DOS' directory.
  - c. Use 'DIR' to find Debug program in this directory (type 'DIR D\*')
  - d. Execute the Debug program. (Type 'Debug' and press <enter>). To quite the debugger, type 'q' in the debug prompt '-' and press enter.
  
2. Use the computer hardware to locate the following components;
  - a. Hard disk: Find the storage capacity and manufacturer of the disk.
  - b. ROM: Find its manufacturer and storage capacity.
  - c. RAM: Try to find the total storage capacity of RAM and the capacity of individual RAM circuits.
  - d. CPU: Find its manufacturer and the operating speed.
  
3. What is a BUS.? Can you see any?
4. Find the power supply and what voltages are supplied by it.
5. Where is the Mother board? Locate the Clock in it.
6. Where are ISA and PCI sockets in the mother board? What do they do?
7. Is there any input/output cards attached to the mother board. If so, what external devices can you connect to them?
8. Name the ports at the back of the computer. Write the total number of pins in each port and what devices can be connect to them.

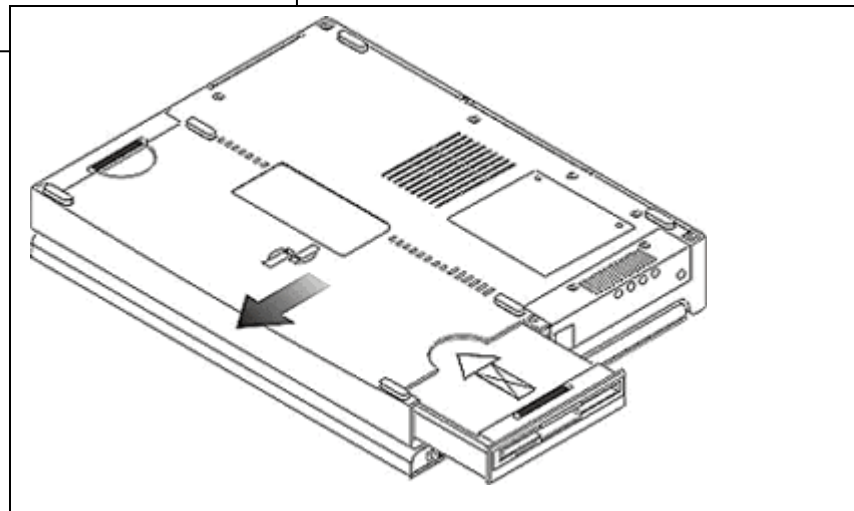
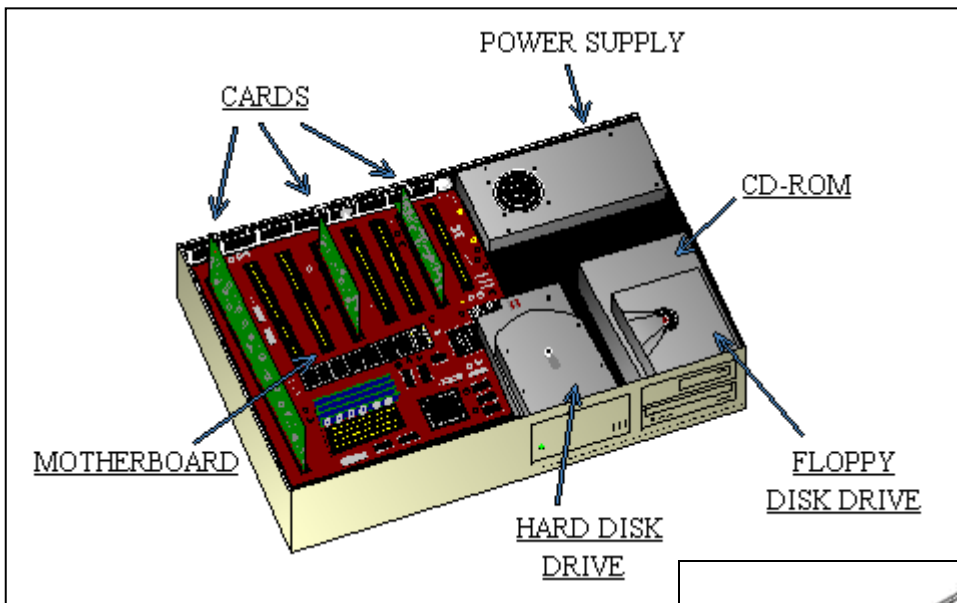
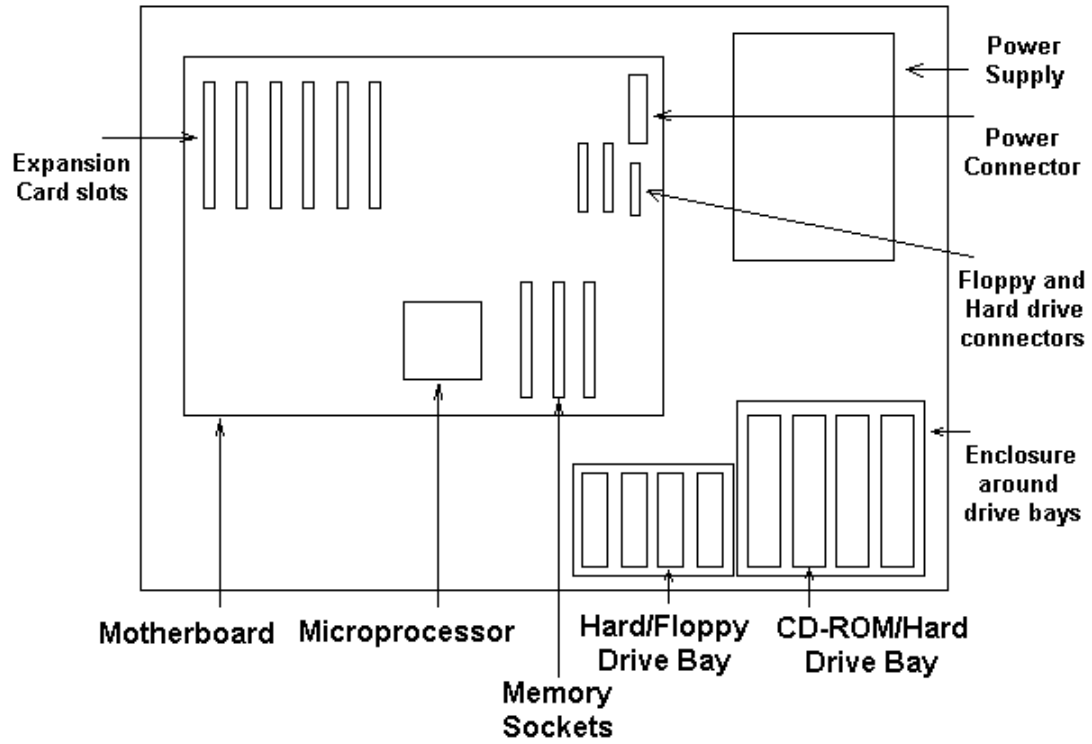
## **Lab Report:**

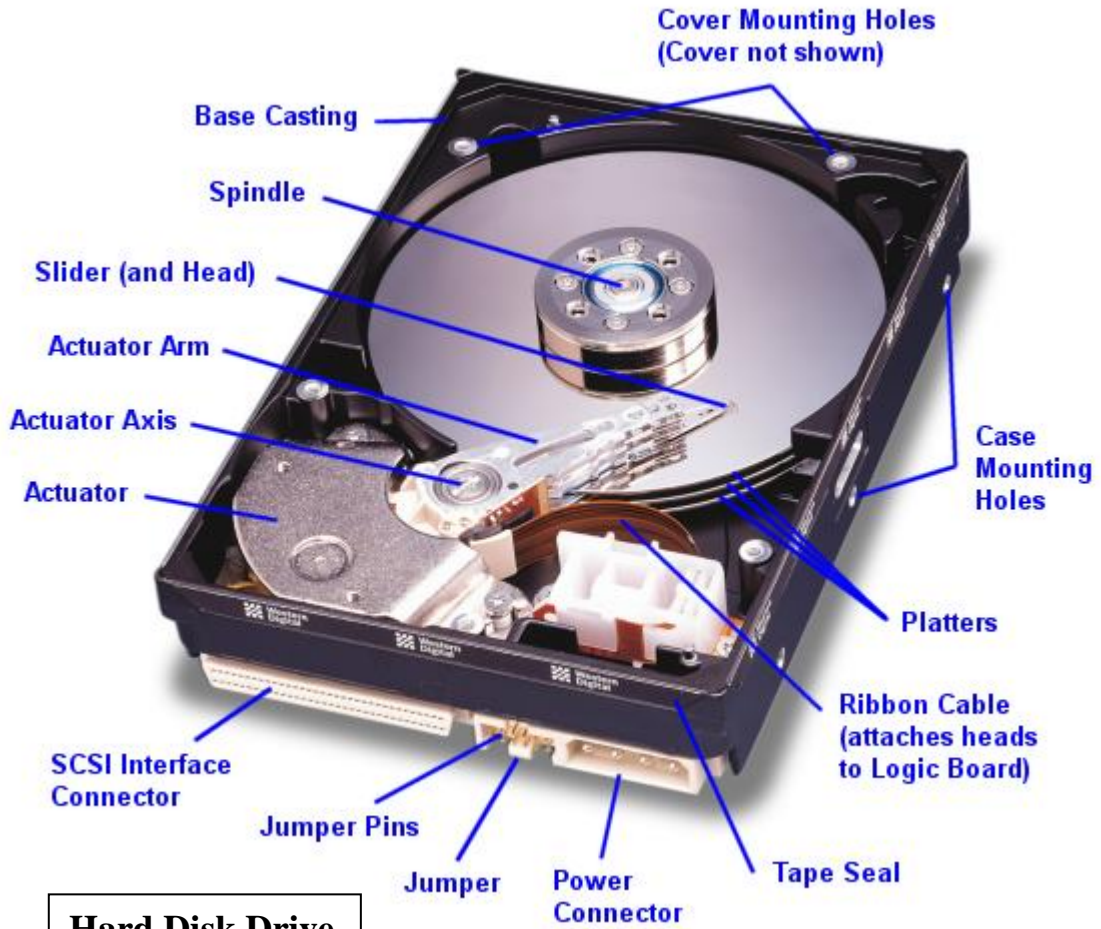
The lab report should contain: 1.OBJECTIVE, 2.INTRODUCTION, 3.RESULTS (observed in the pre-lab and in the experiment) and 4.CONCLUSION.

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<sup>1</sup> Make sure you know the hardware components as there will be a quiz in this topic.

## Inside the Case



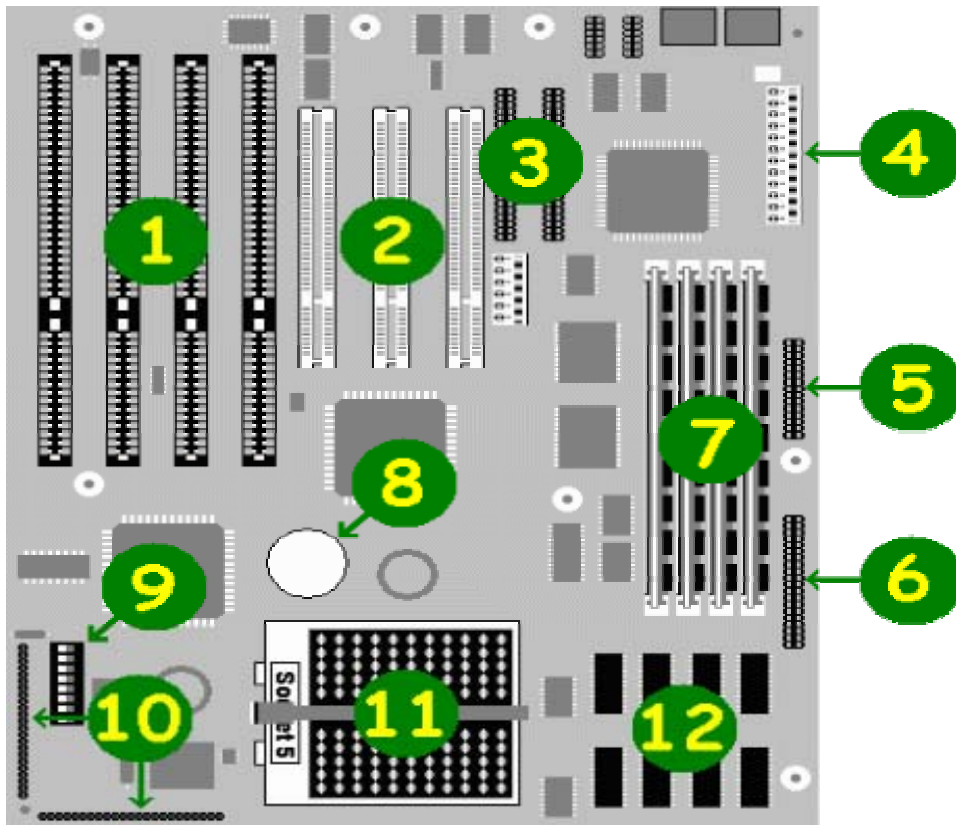


**Hard Disk Drive**



**CD-ROM Drive**

## Basic Components on a Motherboard



- 1 ISA (Industry Standard Architecture) bus slots for plugging in older 8 and 16-bit adapter cards.
- 2 PCI (Peripheral Component Interconnect) bus slots for plugging in newer 32-bit adapter cards.
- 3 Hard drive controller connectors.
- 4 Power connector.
- 5 Parallel port connector.
- 6 Floppy disk controller connector.
- 7 SIMM (Single In-line Memory Module) sockets for adding memory.
- 8 Lithium backup battery for the CMOS.
- 9 Configuration jumper block for changing the ISA bus clock, clearing a CMOS password, resetting the CMOS to the default settings, etc.
- 10 Front panel connectors for the internal speaker, keyboard and hard drive lights, +12v fan, etc.
- 11 Pentium processor in a Socket 5 connector.
- 12 256K cache (those systems with an external cache only).