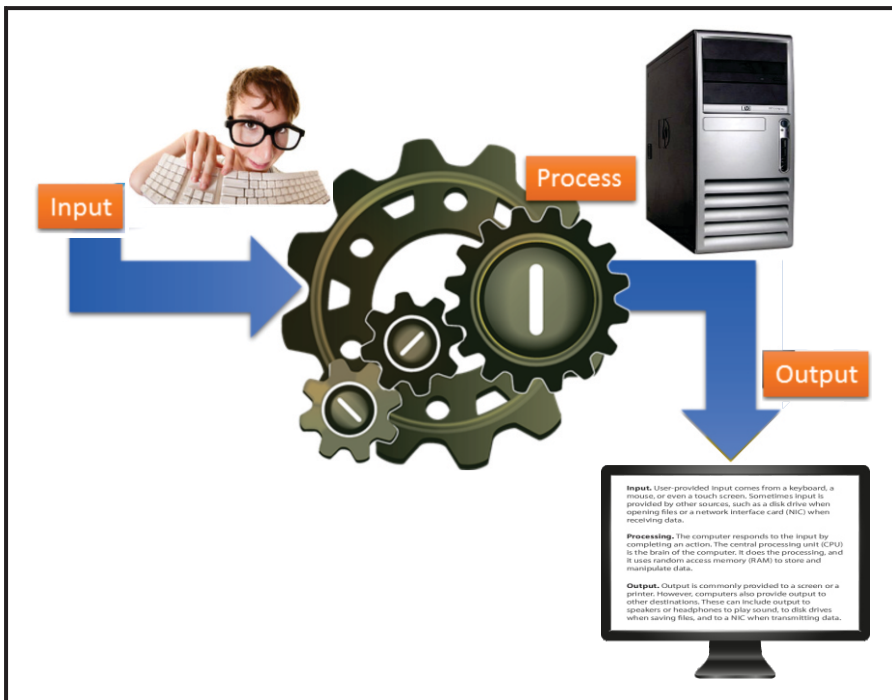


Computer Basics and its Peripherals

2



In this chapter, you will learn how to :

- Discuss the basics of computing
- Describe how the PC works
- Identify all the connectors and devices on a typical PC system unit
- Discuss the major internal components of a PC

Mastering the craft of a PC technician requires you to learn a lot of details about the many pieces of hardware in the typical PC. Even the most basic PC contains hundreds of discrete hardware components, each with its own set of characteristics, shapes, sizes, colors, connections, and so on. By the end of this book, you will be able to discuss all of these components in detail. This chapter takes you on a tour of a typical PC, starting with an overview of how computers work, and then examining both external connectors and internal components.

The Basics of Computing

Lesson 1

A personal computer (PC) is a computing device made up of many distinct electronic components that all function together in order to accomplish some useful task. At the most basic level, a PC has three functions: input, processing, and output. It accepts input, performs some processing, and provides an output, as shown below. This is often shortened to just input/output (I/O).

- **Input.** User-provided input comes from a keyboard, a mouse, or even a touch screen. Sometimes input is provided by other sources, such as a disk drive when opening files or a network interface card (NIC) when receiving data.
- **Processing.** The computer responds to the input by completing an action. The central processing unit (CPU) is the brain of the computer. It does the processing, and it uses random access memory (RAM) to store and manipulate data.
- **Output.** Output is commonly provided to a screen or a printer. However, computers also provide output to other destinations. These can include output to speakers or headphones to play sound, to disk drives when saving files, and to a NIC when transmitting data.



Computers are unable to work with data or programs until the information is in memory. Disk drives provide long-term storage, but information must be moved to the memory before the CPU can work with it. This is often transparent to the user.

For example, imagine you wanted to open up a Microsoft Word document that has your subject study notes. You would start by double-clicking the document, using the mouse as your input.

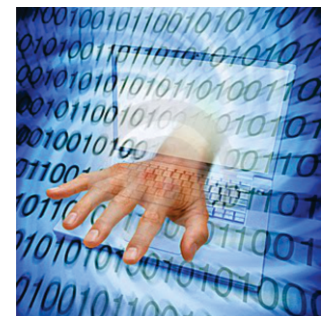
The computer processes your double-click with several actions:

1. It identifies the extension of the Microsoft Word file (.doc or .docx). It recognizes that this extension is associated with Microsoft Word.
2. It locates and retrieves the Microsoft Word program from the disk drive and begins moving the program from the disk drive to memory.
3. When the program is in memory, the computer can actually run it.
4. The computer begins sending results to the graphics card, showing the process of Microsoft Word starting.
5. When Microsoft Word is in memory and started, the computer locates the Word Study Notes file and moves it from the hard drive to memory.
6. When the file is in memory, the computer begins sending results to the graphics card then to the monitor.

The preceding IPO process is constantly repeated. Consider typing your subject notes about fans or power supplies into your study file. Each key press is another input that is processed and generates an output. The computer identifies what key you pressed, stores its value in memory, and displays it on the screen. When you save the file, it writes everything in its memory to the file on the drive.

Despite being able to do so much, it's worth pointing out that computers are absolutely dumb. They can work only with numbers. Specifically, they can work only with ones and zeros. Everything that is written to a disk drive or to memory is a series of ones and zeros.

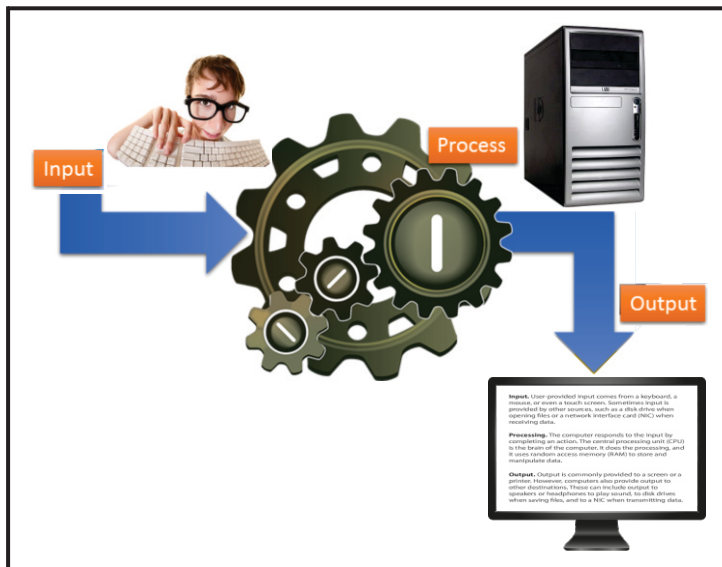
Admittedly, computers can work with these ones and zeros very quickly. Ask it to multiply two five-digit numbers, and a computer will do so in a flash. However, it must first translate any input you give it to a string of ones and zeros, process these strings, and then translate the result of ones and zeros into a usable display.



Chapter 2

Laboratory Manual

COMPUTER BASICS and ITS PERIPHERALS



Laboratory Activities

- 2.01 Exploring the Functions and Components of a PC
- 2.02 Examining User-Accessible Components
- 2.03 Recognizing External Connections
- 2.04 Identifying CPU Characteristics
- 2.05 Recognizing CPU Sockets
- 2.06 Cooling Your CPU
- 2.07 Exploring CPU Specifications with CPU-Z

Chapter 2.08 Analysis and Written Test

- 2.09 Determining the Amount of RAM in a PC
- 2.10 Identifying Types of RAM
- 2.11 Exploring RAM Specifications with CPU-Z

Chapter 2.12 Analysis and Written Test

- 2.13 Researching New Motherboards
- 2.14 Identifying Motherboard Features
- 2.15 Exploring Motherboard Features with CPU-Z
- 2.16 Identifying BIOS ROM
- 2.17 Accessing BIOS via the CMOS Setup Program

- 2.18 Configuring and Clearing CMOS Setup Program Passwords

- 2.19 Configuring BIOS Settings

Chapter 2.20 Analysis and Written Test

- 2.21 Electricity
- 2.22 Power Supply Output
- 2.23 Power Protection

Chapter 2.24 Analysis and Written Test

- 2.25 Installing Parallel ATA Hard Drives
- 2.26 Installing Serial ATA Hard Drives
- 2.27 Configuring CMOS Settings
- 2.28 Comparing Solid-State Drives and Magnetic Hard Drives

Chapter 2.29 Analysis and Written Test

Lab Activity 2.01 Exploring the Functions and Components of a PC

Everything a computer does falls into one of four categories: input, processing, output, and storage. To troubleshoot PC problems successfully, you need a good understanding of these four processes and the components that are involved with each one.

Learning Objectives

At the end of this lab, you'll be able to

- Define the four functions of computer systems
- Detail common components involved in each of these four functions

Lab Materials and Setup

The materials you need for this lab are :

- a notepad and pencil, to draw a four-column table
- optional: Access to a working computer with a word processing or spreadsheet application installed to aid in drawing the table
- work text for reference



Get used to taking notes and drawing pictures. Most tech experts use a notepad to keep track of what they see and they change. It is recommended that you save your drawings and notes, as you'll find them useful in subsequent labs.

Let's Get the Lab Started

In this activity, you'll review, list, and define the various components involved in the PC's vital functions.

Step 1 Reread the "The Basics of Computing" section in work text, paying particular attention to the sections on input, processing, and output.

Step 2 For each of the following functions, write a definition and give a brief example:

Input:

Processing:

Output:

Step 3 Using the following table, list the components that operate in each of the four functional categories. Try to include as many components as you can; you might take a peek at some of the later chapters in the work text to see if you can add any other components. Think about how each of the components contributes to the overall workings of the PC, and include as much detail about the component as possible.

Input	Processing	Output

Step 4 If you completed the table right here in the lab book, you can review it later while finishing the rest of the lessons. If you made a table in your notebook or created an electronic version, make sure you keep it nearby. As you work on later chapters, you'll want to update the table with additional components and extra details. The information in the table (and in your head) will expand as you develop a better understanding of how the components relate to the PC's "big picture."