

SECTION 1.2 QUESTIONS

1. Name an item other than one mentioned in this chapter that includes a specific-purpose computer.
2. What are the four tasks in which hardware is involved?
3. List two devices used for input in a general-purpose computer.
4. List three devices involved in output from a general-purpose computer.
5. List two devices involved in either processing or storage in a general-purpose computer.

CHAPTER 1, SECTION 3

Computer Architecture

Computer architecture is a term used to describe the way the many devices that make up a computer are put together. The devices that programmers need to understand the most are the microprocessor, RAM, ROM, and the “bus” that connects them together.

Figure 1-8 shows a diagram of how the RAM, ROM, and microprocessor work together by way of the bus. Let’s examine each part of the diagram, beginning with RAM.

RAM, which is an acronym for Random Access Memory, is your computer’s primary storage. RAM is where currently running programs and active data are stored. Some RAM is also used to store items that support your program and its input and output. For example, when you are using your word processor, the word processor program is stored in RAM along with the document upon which you are working. Later in this chapter, you will read about data stored on disk that is waiting to be used.

Think of RAM like the top of your desk. RAM holds the programs and data you are working on, and space is limited. When you buy a computer, one of the important specifications is the amount of RAM installed. You must have enough RAM to hold the items your system requires to operate, along with the program you want to run and its data. Optional features like screen savers also use RAM.

The subject of RAM will come up several times in this book. Because there is so much to understand about your computer’s memory, we will cover the information as you need it.

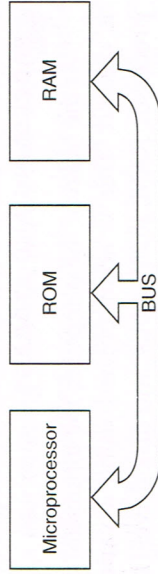


FIGURE 1 - 8
The microprocessor is connected to the RAM and ROM by a system called the bus.

ROM

ROM is an acronym for Read-Only Memory. Your computer’s ROM is a set of memory chips that have data permanently stored upon them. Typically, ROM chips store data and programs necessary to get the computer started.

However, ROM can contain much more than startup procedures. Many of the first personal computers included the BASIC programming language on ROM chips. IBM-compatible computers have a whole set of programs in ROM, called the **BIOS** (Basic Input/Output System), used to interact with the screen, keyboard, and disks. Macintosh computers have an extensive set of programs, called the **Toolbox**, stored on ROM chips.

MICROPROCESSOR

Entire books have been written about microprocessors. But as a programmer, you need only a basic understanding of what goes on inside a microprocessor.

The microprocessor does the computing and controls everything else that is going on in the computer. All of the other parts of the computer support the microprocessor. As soon as you turn on your computer, the microprocessor begins processing millions of commands every second.

THE INSTRUCTION SET

A microprocessor is designed to “understand” a set of commands called an *instruction set*. Although there are similar instructions among different microprocessors, each model (i.e., 80486, Pentium, PowerPC, etc.) has its own instruction set. Microprocessors can accept and carry out operations that are written in the format of their own unique instruction set only. This is one reason that software written for one kind of computer does not automatically work on another kind of computer.

THE PARTS OF A MICROPROCESSOR

There are many kinds of microprocessors and several manufacturers that make them. Most microprocessors, however, contain some of the same basic parts. Figure 1-9 illustrates the most common and important parts of a microprocessor.

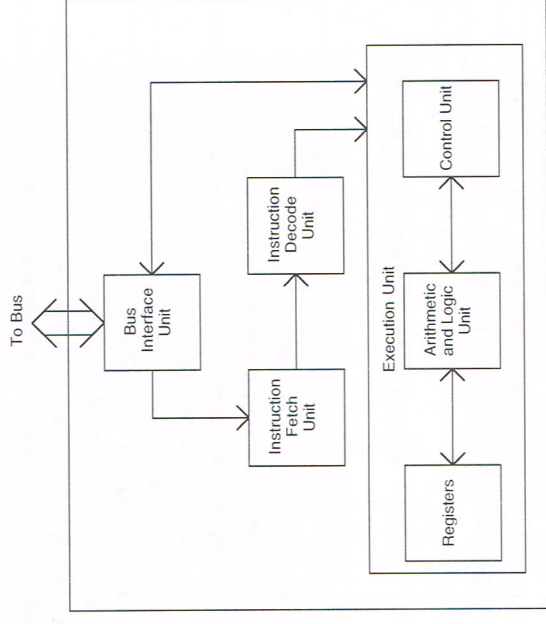


FIGURE 1 - 9
While microprocessors from different manufacturers vary in their design, most microprocessors contain parts similar to these.