

Internal Computer Hardware

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WHAT'S COVERED

The physical parts of computing devices — those that you can actually touch — are referred to as hardware. Devices contain hardware that exist both inside and outside of the device itself. In this tutorial, we will take a look at computer hardware inside the computer, and learn a little bit about how they work.

Our discussion breaks down as follows:

1. The CPU

Most computing devices have a similar architecture. The core of this architecture is the **central processing unit (CPU)**. The CPU can be thought of as the “brains” of the device. The CPU carries out the commands sent to it by the software, and returns results to be acted upon.



An Intel CPU

The earliest CPUs were large circuit boards with limited functionality. Today, a CPU is generally on one chip and can perform a large variety of functions. There are two primary manufacturers of CPUs for personal computers: Intel and Advanced Micro Devices (AMD).



DID YOU KNOW

The speed ("clock time") of a CPU is measured in hertz. A hertz is defined as one cycle per second. The CPU's processing power is increasing at an amazing rate. Besides a faster clock time, many CPU chips now contain multiple processors per chip. These chips, known as dual-core (two processors) or quad-core (four processors), increase the processing power of a computer by providing the capability of multiple CPUs.



TERM TO KNOW

Central Processing Unit (CPU)

The "brains" of the device; it performs computations and logic operations sent to it by application software, and returns results to be acted upon.

2. Motherboard

The **motherboard** is the main circuit board on the computer. The CPU, RAM, hard disk, integrated graphics card, and sound card (if not embedded into the motherboard), among other things, all connect into the motherboard. Motherboards come in different shapes and sizes, depending upon how compact or expandable the computer is designed to be. Most modern motherboards have many integrated components, such as video and sound processing, which used to require separate components.



Motherboard

The motherboard provides much of the bus of the computer (the term bus refers to the electrical connection between different computer components). The bus is an important determiner of the computer's speed: the combination of how fast the bus can transfer data and the number of data bits that can be moved at one time determine the speed.



TERM TO KNOW

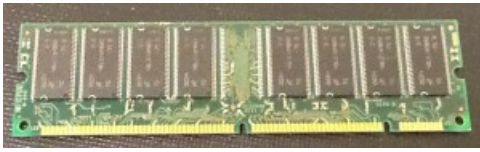
Motherboard

The main circuit board on the computer, to which the CPU, memory, and storage connect.

3. Memory

When a computer starts up, it begins to load information from the hard disk into its working memory. This working memory, called **random-access memory (RAM)**, can transfer data much faster than the hard disk. Any program that you are running on the computer is loaded into RAM for processing. In order for a computer to work effectively, some minimal amount of RAM must be installed. In most cases, adding more RAM will allow the computer to run faster. RAM can store data as long as it is receiving power; when the computer is turned off, any data stored in RAM is lost.

Read-only memory (ROM) is a form of memory in which the data stored on it can only be read. Typically, the data stored on ROM is meant to only be read. The boot sequence of personal computers requires ROM to initialize the operating system.



Memory DIMM



TERMS TO KNOW

Random-Access Memory (RAM)

The working memory of a computer that transfers data from the hard disk upon starting the device.

Read-Only Memory (ROM)

A form of memory in which the data stored can only be read; it cannot be changed.

4. Hard Disk

While the RAM is used as working memory, the computer also needs a place to store data for the longer term. Most of today's personal computers use a hard disk for long-term data storage. A **hard disk** is where data is stored when the computer is turned off, and where it is retrieved from when the computer is turned on. Why is it called a hard disk? A hard disk consists of a stack of disks inside a hard metal case. A floppy disk was a removable disk that, in some cases at least, was flexible, or “floppy.”



Hard disk



WATCH

Check out the components of a hard drive in the video below.



TERM TO KNOW

Hard Disk

The location for long-term data storage when the computer is turned off, and where data is retrieved from when the computer is turned on.



SUMMARY

Computing devices consist of physical components you can touch, known as hardware. In this tutorial, we reviewed important hardware components that exist inside a computer as well as their function, including the **CPU**, **motherboard**, **RAM**, **ROM**, and **hard disk**.

Source: DERIVED FROM CHAPTER 2 OF “INFORMATION SYSTEMS FOR BUSINESS AND BEYOND” BY DAVID T. BOURGEOIS. SOME SECTIONS REMOVED FOR BREVITY.

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