BUSES:

The electrically conducting path along which data is transmitted inside any digital electronic device. A Computer **bus** consists of a set of parallel conductors, which may be conventional wires, copper tracks on a PRINTED CIRCUIT BOARD, or microscopic aluminum trails on the surface of a silicon chip. Each wire carries just one bit, so the number of wires determines the largest data WORD the bus can transmit: a bus with eight wires can carry only 8-bit data words, and hence defines the device as an 8-bit device.

A computer bus normally has a single word memory **circuit called a LATCH** attached to either end, which briefly stores the word being transmitted and ensures that each bit has settled to its intended state before its value is transmitted.

The Computer bus helps the various parts of the PC communicate. If there was no bus, you would have an unwieldy number of wires connecting every part to every other part. It would be like having separate wiring for every light bulb and socket in your house.

Types of Computer Bus

There are a variety of buses found inside the computer.

Data Bus: The data bus allows data to travel back and forth between the microprocessor (CPU) and memory (RAM).

Address Bus: The address bus carries information about the location of data in memory.

Control Bus: The control bus carries the control signals that make sure everything is flowing smoothly from place to place.

Expansion Bus: If your computer has expansion slots, there's an **expansion bus.** Messages and information pass between your computer and the add-in boards you plug in over the expansion bus.

Although this is a bit confusing, these different buses are sometimes together called simply "the bus." A user can think of the computer's "bus" as one unit made up of three parts: data, address, and control, even though the three electrical pathways do not run along each other (and therefore don't really form a single "unit") within the computer.

There are different sizes, or widths of data buses found in computers today. A data bus' width is measured by the number of bits that can travel on it at once. The speed at which its bus can transmit words, that is, its bus BANDWIDTH, crucially determines the speed of any digital device. One way to make a bus faster is to increase its width;

An 8-bit bus carries data along 8 parallel lines. A 16-bit bus, also called ISA (Industry Standard Architecture), carries data along 16 lines. A 32-bit bus, classified as EISA (Enhanced Industry Standard Architecture) or MCA (Micro Channel Architecture), can carry data along 32 lines

The speed at which buses conduct signals is measured in megahertz (Mhz). Typical PCs today run at speeds between 20 and 65Mhz. Also see CPU, Expansion Card, Memory, Motherboard, RAM, ROM, and System Unit.

How Does Computer Bus Work?

A bus transfers electrical signals from one place to another. An actual bus appears as an endless amount of etched copper circuits on the motherboard's surface. The bus is connected to the CPU through the Bus Interface Unit.

Data travels between the CPU and memory along the data bus. The location (address) of that data is carried along the address bus. A clock signal which keeps everything in synch travels along the control bus.

The clock acts like a traffic light for all the PC's components; the "green light" goes on with each clock tick. A PC's clock can "tick" anywhere from 20 to 65 million times per second, which makes it seem like a computer is really fast. But since each task (such as saving a file) is made up of several programmed instructions, and each of those instructions takes several clock cycles to carry out, a person sometimes has to sit and wait for the computer to catch up.