CONTROL UNIT AS A PART OF A COMPUTER SYSTEM

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Each computer is a system, parts of what work together as a whole. But the main part of this system is CPU (Central Processor Unit). And CPU is also a system that can be broken down into smaller subsystems. One of them is control system of the CPU represented by Control Unit.

A control unit is the part of a CPU (or other device) that directs its operation. The output of the unit control is activity of the rest of the device.

The control unit is the circuitry that controls the flow of data through the processor, and coordinates the activities of the other units within it. In a way, it is the "brain within the brain", as it controls what happens inside the processor, which in turn controls the rest of the PC.

The control unit (often called a control system or central controller) directs the various components of a computer. It reads and interprets (decodes) instructions in the program one by one. The control system decodes each instruction and turns it into a series of control signals that operate the other parts of the computer. Control systems in advanced computers may change the order of some instructions so as to improve performance.

A key component common to all CPUs is the program counter, a special memory cell (a register) that keeps track of which location in memory the next instruction is to be read from.

The control system's function is as follows — note that this is a simplified description and some steps may be performed concurrently or in a different order depending on the type of CPU.

Since the program counter is (conceptually) just another set of memory cells, it can be changed. Instructions that modify the program counter are often known as "jumps" and allow for loops (instructions that are repeated by the computer) and often conditional instruction execution (both examples of control flow).

It is noticeable that the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program and, indeed, in some more complex CPU designs.

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