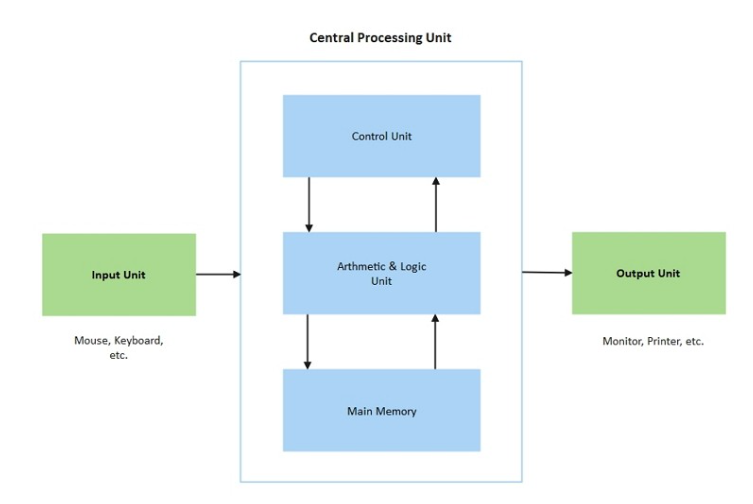
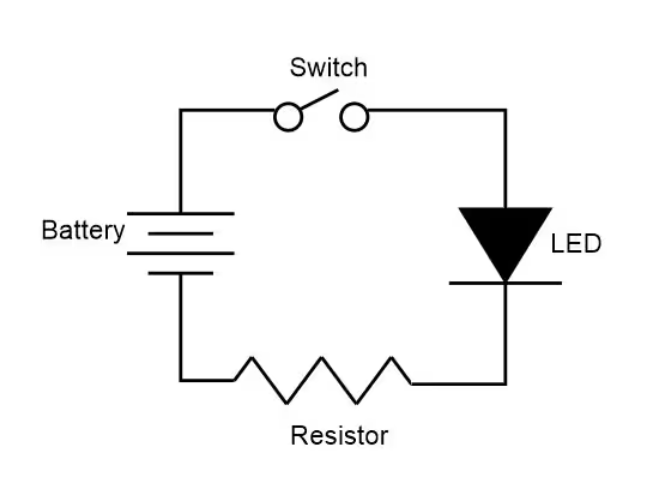
**Schematic Reading Notes:**

You’ll encounter three types of diagrams in electricity and electronics: block, schematic, and pictorial.

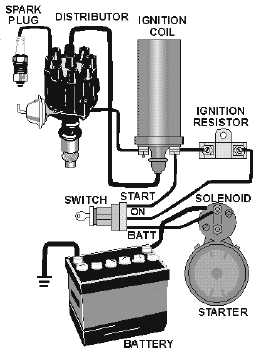
A block diagram gives you an overview of how the discrete circuits within a device or system interact.



Schematic diagram: a simplified drawing showing how components are connected in a system, using symbols and lines to help design, build, and troubleshoot.



A pictorial diagram, sometimes called a layout diagram, shows the actual physical arrangement of the circuit elements on the circuit board or chassis, so that you can quickly find and identify components to test or replace.



When you troubleshoot an unfamiliar electronic circuit, you’ll usually start with the block diagram to find where the trouble originates. Then you’ll refer to the schematic diagram (or part of it) to find the faulty component in relation to other components in the circuit. A pictorial diagram can then tell you where the faulty component physically resides, so that you can test it and, if necessary, replace it.

In a block diagram, each block represents all of the schematic symbols related to that part of the circuit. In addition, each block has a label that describes or names the circuit it represents. However, the block does nothing to explain the actual makeup of the circuit it represents.

A block diagram can provide a clear understanding of how each part operates in conjunction with the others.

A schematic diagram acts, in effect, as a map of an electronic circuit, showing all of the individual components and how they interconnect with one another.

A schematic drawing must indicate not only all components necessary to make a specific scheme, but also how these components interrelate to one another.

A schematic diagram reveals the scheme of a system by means of symbology. Symbology in schematic diagrams refers to the use of standardized symbols, icons, and graphics to represent components, devices, and concepts in a clear, consistent, and efficient visual representation of a system or process.

Inconsistencies arise in schematic symbology, and that’s a situation that makes electronics-related diagrams more sophisticated than road maps.

By knowing the type of component alone, you can’t tell what role it plays in a circuit until you have a good schematic diagram showing all the components in the circuit, and how they all interconnect. Rarely can you get all this information in easy-to-read form by examining the physical hardware.

Hard-wiring: the physical components and interconnections of a circuit.

A schematic diagram gives you an overall picture of a circuit and shows you how the various routes and components interact with other routes and components. When you can see how the overall circuit depends on each individual circuit leg and component, you can diagnose and repair the problem.

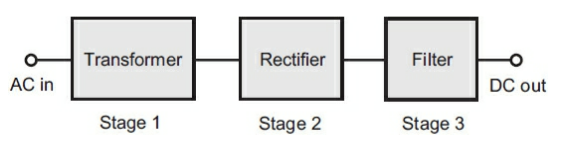
Our senses along with our central processor, the brain, render us less than proficient at mentally conceiving all of the workings of electronic circuits by dealing with them directly. Therefore, we have to accept data a small step at a time, compiling it in hardcopy form (through symbology) and providing hardcopy readout.

Schematic symbols and diagrams are designed for human beings, so human logic constitutes a prime factor in determining which symbols mean what.

Schematic diagrams are encoded representations of circuits, while pictorials show us the physical objects, often proportioned according to their relative size, and sometimes rendered so as to look three-dimensional by means of shading and perspective. Schematic diagrams depict circuit components as symbols only, without regard to their real-world size or shape, and in two dimensions, completely lacking depth or perspective.

A block diagram portrays the general construction of an electronic device or system. A block diagram can also provide a simplified version of a circuit by separating the main parts and showing you how they are interconnected.

In sequence going from left to right, the electricity passes through the transformer, the rectifier, and the filter before arriving at the output as DC. In this case, the lines that connect the blocks do not have arrows because readers will naturally assume that the flow goes from left to right. In more complicated block diagrams, the interconnecting lines may include arrows to show which block affects which, or to indicate the general direction of signal flow when it might not otherwise be clear.



Block diagrams can also be called functional diagrams because they reveal the basic functioning of the electronic circuit.

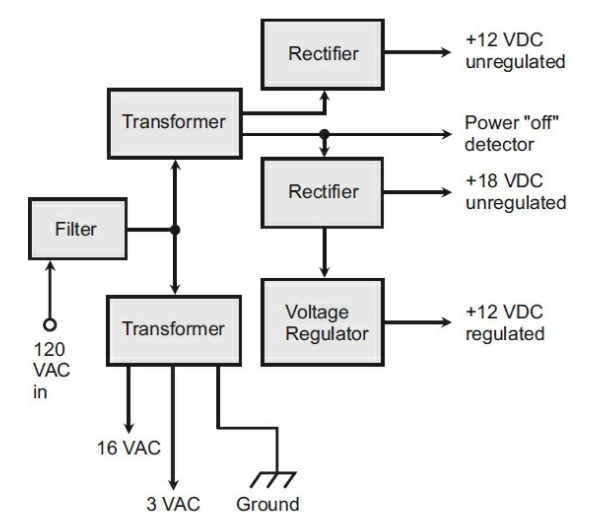
Block diagrams may constitute the beginning design for a circuit. The next step would be to develop it into a schematic diagram by putting in the circuits that fill in each block.

At the same time, a schematic diagram may mark the beginning of a circuit design. But in this case, you have the detail without knowing the overall flow of the design, so someone would have to work backward to come up with the block diagram demonstrating how operation happens.

If presented without accompanying schematics, a block diagram describes the basic functional operation of an electronic device or system. The block diagram can prove most useful when you don’t need to know the functions of individual components.

When we need to know, or portray, individual differences between circuits that do essentially the same things, then we need schematic diagrams.

In the below block diagram, the flow of electricity is shown using arrows. They also usually tell the user the sequence of events or direction of signal flow.



More sophisticated block diagrams also include triangles to represent circuit blocks built around specialized amplifiers constructed within integrated circuits (ICs), also known as chips.