# Chapter 6: Light-Sensitive Navigation with Phototransistors

*Vocabulary words used in this lesson.*

- ***Autonomously*** the freedom to act independently.
- ***Capacitor*** a device used to store an electric charge, consisting of one or more pairs of conductors separated by an insulator.
- ***Charge Transfer Circuit*** is an electronic amplifier *circuit.*
- ***Constant Declaration*** A constant holds a value that does not change. A constant declaration specifies the name, data type, and value of the constant and allocates storage for it.
- ***Detect*** discover or identify the presence or existence of.
- ***Fluorescent Light*** usually tubular electric lamp having a coating of fluorescent material on its inner surface and containing mercury vapor whose bombardment by electrons from the cathode provides ultraviolet light which causes the material to emit visible light.
- ***High*** is a status of a sensor. When an electronic sensor is set to high, it is a binary 1. When set to low, it is a binary 0.
- ***Incandescent Lamp*** is an electric light with a wire filament heated to such a high temperature that it glows with visible light
- ***Input Register*** a temporary storage for data received from memory before being transferred to an I/O device or for data from an I/O device
- ***Luminance in Light*** the intensity of light emitted from a surface per unit area in a given direction. The quantitative measure of brightness of a *light* source or an illuminated surface, equal to luminous flux per unit solid angle emitted per unit projected area of the source or surface.
- ***Oscilloscope*** a type of electronic test instrument that allows observation of constantly varying signal voltages, usually as a two-dimensional plot of one or more signals as a function of time. Other signals (such as sound or vibration) can be converted to voltages and displayed.
- ***Ohms Law*** A law relating the voltage difference between two points, the electric current flowing between them, and the resistance of the path of the current. Mathematically, the law states that V = IR, where V is the voltage difference, I is the current in amperes, and R is the resistance in ohms.
- ***Parallel Circuit*** For two components to be connected in parallel, each of their leads must be connected to common terminals (also called nodes). Components of an electronic circuit can be connected in many different ways. The two simplest of these are called series and parallel. Components connected in series are connected along a single path, so the same current flows

through all of the components. Components connected in parallel are connected along multiple paths, so the same voltage is applied to each component.

- ***Phototransistor*** a light-sensitive transistor. A transistor that responds to light striking it by generating and amplifying an electric current. A common type of phototransistor, called a photobipolar transistor, is in essence a bipolar transistor encased in a transparent case so that light can reach the base–collector junction. A photodiode is a semiconductor device that converts light into an electrical current. The current is generated when photons are absorbed in the photodiode. A small amount of current is also produced when no light is present.

- ***PULSOUT command*** generates a pulse of length time.

- ***PWM*** (Pulse-width modulation) is a modulation technique used to encode a message into a pulsing signal.

- ***PWM command*** This *command* is different than most other BASIC *commands* in that the *pwmout* runs continuously (in the background) until another *pwmout command* is sent.

- ***RAM memory -* RAM** (random access memory) is the most common type of memory found in computers and other devices, such as printers.

- ***RCTIME command*** function duplicates the Basic Stamp's function of the same name. It can be used to read resistive sensors of any type. The RC in RCTIME stands for resistor-capacitor, and the RCTIME command's most common use is with sensors that vary with either resistance or capacitance.

- ***Resistor*** a device having a designed resistance to the passage of an electric current.

- ***Series Circuit*** Components of an electronic circuit can be connected in many different ways. The two simplest of these are called series and parallel. Components connected in series are connected along a single path, so the same current flows through all of the components.

- ***Terminals*** Connection points in a circuit. For two components to be connected in parallel, each of their leads must be connected to common terminals (also called nodes).

- ***Threshold Voltage*** is the minimum gate-to-source voltage differential that is needed to create a conducting path between the source and drain terminals.

- ***Transistor*** a semiconductor device with three connections, capable of amplification in addition to rectification.

- ***Voltage*** an electromotive force or potential difference expressed in volts.

- ***Wavelength*** the distance between successive crests of a wave, especially points in a sound wave or electromagnetic wave.