

# Appendix C

## Glossary

**Actuator:** A device responsible for moving a mechanical device, such as one connected to a computer by a sensor link.

**Algorithm:** A finite set of step-by-step instructions that can be followed to perform a specific task, such as a mathematical formula or a set of instructions in a computer program.

**Ambient temperature:** The temperature of the air that surrounds operating equipment.

**Auto-route:** Auto-routing is a computer aided process of routing the PCB traces. The auto-route algorithm requires the schematic netlist to have the information about the component connections.

**Autonomous:** Not controlled by others or by outside forces; independent.

**AWG:** American Wire Gauge. A number in front of "AWG" specifies a thickness of the wire - the smaller the number, the thicker the wire.

**BASIC:** Beginners All-purpose Symbolic Instruction Code. Basic is a widely used, high-level programming language.

**CAD:** Computer Aided Design. CAD is a general term that includes any software that aids in the design of products.

**Capacitor:** An electric circuit element used to store charge temporarily, consisting in general of two metallic plates separated and insulated from each other by a dielectric.

**CD:** compact disc - A small optical disk on which data such as music, text, or graphic images is digitally encoded.

**Circuit:** A configuration of electrically or electromagnetically connected components or devices.

**Compiler:** A program that translates another program written in a high-level language into machine language so that it can be executed on a computer.

**Current:** The amount of electric charge flowing past a specified circuit point per unit time.

**DIP:** Dual In-line Package. An electronics chip or other component that has two rows of "legs" which are placed in a printed circuit board through holes in the board.

**Debug:** The process of detecting, locating, and correcting a problem in a software program or hardware.

**DIP switch:** Dual In-line Package switch. Printed circuit boards and peripheral devices are often equipped with a bank of DIP switches to control various aspects of the board's operation.

**Double-sided board:** A double-sided board is a PCB that has traces on both sides.

**DRC:** Design Rule Check. The DRC is a computer routine that checks against a design error list by the user. DRC's mostly check for spacing and sizing violations and check for unfinished connections.

**EEPROM:** Electrically Erasable Programmable Read-Only Memory. A memory chip that maintains data content after power has been removed. EEPROM can be erased and reprogrammed within the computer or externally.

**Fan-out:** Fan-out is routing small traces from the surface-mount component pads to a space where a via can be inserted to connect to the plane layers. This term is not to be confused with the digital device's definition of fan-out.

**Flexinol:** See nitinol.

**Flip-Flop:** An electronic circuit or mechanical device capable of assuming either of two stable states, especially a computer circuit used to store a single bit of information.

**Flux:** Flux is a chemical that aids in the soldering process. It cleans oxides from the pads and breaks the surface tension of solder.

**Footprint:** The footprint is the outline and pad location required by a component.

**Gait:** A particular way or manner of moving legs.

**IC:** integrated circuit - A complex set of electronic components and their interconnections that are etched or imprinted on a chip.

**LCD:** liquid crystal display - a digital display that uses liquid crystal cells that change reflectivity in an applied electric field; used for portable computer displays and watches.

**LED:** Light Emitting Diode. LED is a semiconductor p-n junction diode that emits light when electric current runs through it.

**Locomotion:** The ability to move from one place to another.

**Microcontroller:** A single-chip microcomputer with on-board program ROM and I/O that can be programmed for various control functions.

**Multi-layer board:** A multi-layer board is a PCB that has more than two layers.

**Nitinol:** An alloy of nickel and titanium. Unlike other metals Nitinol contracts when heated. It also produces a 100 times greater thermal movement (expansion, contraction) than standard metals. Another interesting property is the alloy can be heat treated to remember a particular shape. Afterwards, if the

shape is bent and distorted the alloy may be heated to regain its original shape. Stiquito uses a specific form on Nitinol called Flexinol™.

**Pads:** A pad is the copper connection (usually tinned) of a trace to which a component's pins are soldered.

**Padstack:** The padstack is the detailed information about how the pad is made on different layers.

**Parallax Basic Stamp 2 processor:** A BASIC Stamp is a single-board computer that runs the Parallax PBASIC language interpreter in its microcontroller. The developer's code is stored in an EEPROM, which can also be used for data storage. The PBASIC language has easy-to-use commands for basic I/O, like turning devices on or off, interfacing with sensors, etc. More advanced commands let the Stamp interface with other integrated circuits, communicate with each other, and operate in networks. The BASIC Stamp has prospered in hobby, lower-volume engineering projects and education due to ease of use and a wide support base of free application resources.

**PCB:** Printed Circuit Board. A flat piece of material, often fiberglass, covered with small, flat wires. PCBs are the means in which integrated circuit components are connected.

**Plane Layers:** A plane layer is a general term for a power or ground layer.

**Potentiometer:** A variable resistance device, with the the resistance value determined by a mechanical screw or wiper which is moved with a screwdriver or similar device.

**Prototype:** One of the first units manufactured of a product, which is tested so that the design can be changed if necessary before the product is manufactured commercially.

**Pulse-width modulation:** PWM. The signal consists of a continuous pulse train of constant frequency and duration based on duty cycle. The amplitude of the pulses is constant.

**RAM:** Random Access Memory. RAM is a temporary storage space in a computer where the operating system, application programs, and data in current use are kept so that they can be quickly accessed by the computer's processor.

**Reference Designators:** A reference designator is a label used to identify the individual parts. The reference designator usually has a letter identifying the type of part and a number for the instance of the part.

**Resistor:** A device used to control current in an electric circuit by providing resistance.

**Robotics:** Study of robots.

**Schematic:** A structural or procedural diagram, especially of an electrical or mechanical system.

**Silkscreen:** The silkscreen is the ink printed on a PCB that gives the reference designators and other information about the parts or circuit board.

**Single-sided board:** A single-side board is a PCB that has traces only on one side of the board.

**Socket:** A receptacle (holder) into which an electric device is inserted.

**Software:** The programs, routines, and symbolic languages that control the functioning of the hardware and direct its operation.

**Solder mask:** The solder mask is the solder resistant lacquer that is placed on the board to prevent solder flowing where it is unwanted.

**Solder side:** The solder side of the board refers to the bottom layer. This is the side that the solder wave touches.

**Soldering:** A method of joining metals using any of various fusible alloys by applying heat.

**State diagram:** A diagram that shows the states of an object and the events that causes the object to change from one state to another.

**Stiquito:** A self-sufficient small, six-legged walking robot.

**Thermal Relief:** A thermal relief is a contact that connects a trace to a plane.

**Trace:** A trace is a thin copper wire that is laminated onto the PCB material.

**Transistor:** A small electronic device containing a semiconductor and having at least three electrical contacts, used in a circuit as an amplifier, detector, or switch.

**Tripod:** Device with three legs.

**ULN2803A:** The ULN2803A is a monolithic high-voltage, high-current Darlington transistor array. The device consists of eight NPN Darlington pairs that feature high-voltage outputs.

**Via:** A via is a contact connecting a trace on one side of the PCB to a trace on the other side.

**Voltmeter:** A device that measures voltage across a circuit.