

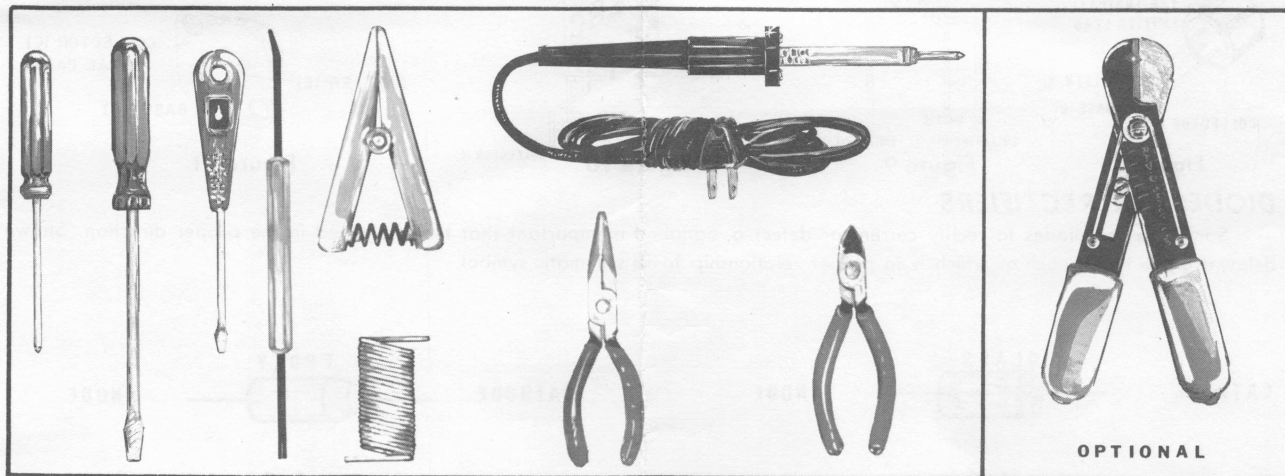


CONSTRUCTION HINTS

SAVE HOURS LATER READ THIS GUIDE BEFORE BEGINNING

Certain tools are always necessary to build a kit. A good basic tool set for electronic kits for the beginner is the Science Fair Tool Kit (Cat. No. 64-2800). It includes a 30 watt soldering iron, solder, solder aid, long nose pliers, diagonal cutters, 3 screwdrivers (1 phillips) and a heat sink.

The only other required items are a ruler to measure wire lengths and a knife to strip wire.



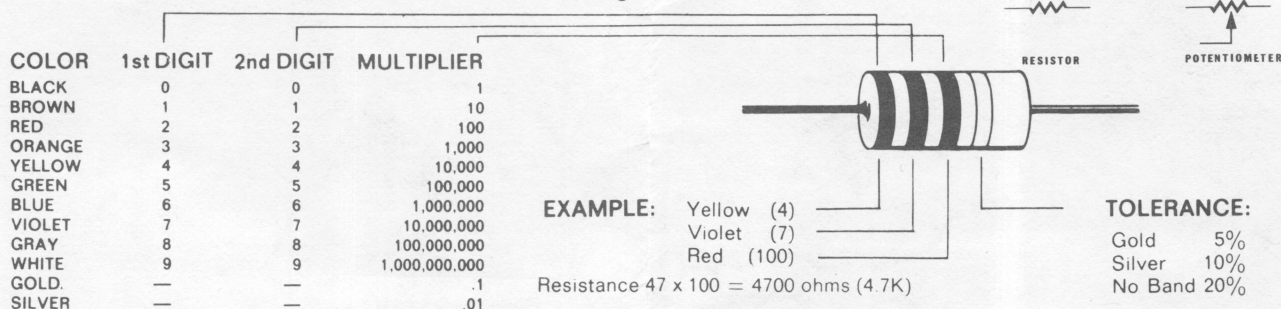
An optional tool for your tool bench is a Wire Stripper (Cat. No. 64-2129).

PARTS IDENTIFICATION

RESISTOR COLOR CODE

Resistors are easily recognized by their shape. Particular values for the resistors are given by the colored bands which are coded. The first three bands (reading from left to right in the diagram) indicate how many ohms the resistor has. The last band is either gold or silver and indicates the percentage variation that the resistor will have. Only the first three colors are listed in the instructions.

Figure 1



CAPACITORS

Capacitors come in many different shapes. Each has the value clearly stamped on the case. Some times other information such as percentage tolerance, heat tolerance, maximum voltage, etc. is also included. Only the value of the capacitor is given in the instructions. Remember, electrolytic capacitors have a plus lead and a minus lead which must be connected properly as indicated in the instructions.

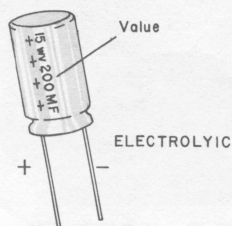


Figure 3

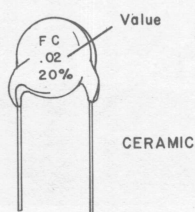


Figure 4

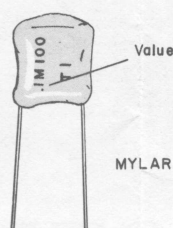


Figure 5

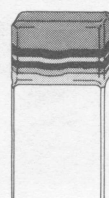


Figure 6

METALIZED
POLYESTER



Schematic Symbol

TRANSISTORS

Depending upon which kit you have purchased you will use one or more of the four types of transistors shown below. Remember, it is very important to connect the right lead to the right place. Each lead has a different function and can not work properly if connected in the wrong place.

Schematic Symbol

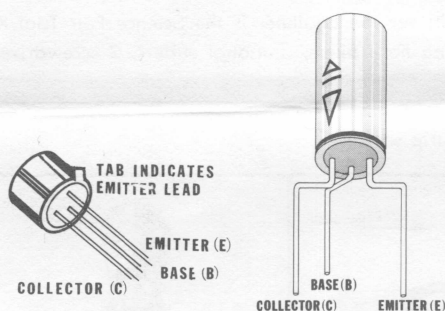


Figure 8

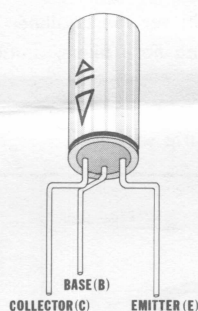


Figure 9

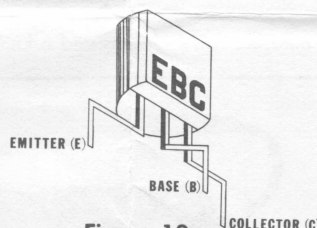


Figure 10

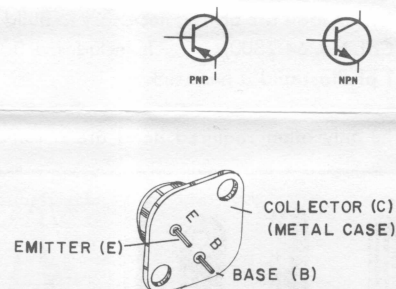


Figure 11



DIODES OR RECTIFIERS

Some kits use diodes to rectify current or detect a signal. It is important that they be wired in the proper direction. Shown below are two types, each of which is in proper relationship to its schematic symbol.

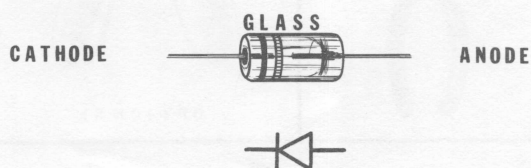


Figure 13

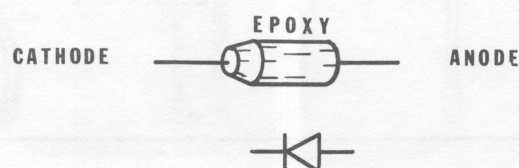


Figure 14

DOES NOT APPLY TO PRINTED CIRCUIT BOARDS--SEE PAGE 4

Your kit will look neater and will be more likely to work if you follow the instructions provided for the layout of the components. The location for components is shown on the pictorial diagram and is also given in the instructions. An instruction which says "mount 'push-in' terminal at A1" means, mount the terminal in row A column 1. You can locate the proper row and

Most of these problems can be avoided by mounting the components on the top of the board and making the connections underneath the board as shown in the diagram below.

DOES NOT APPLY TO PRINTED CIRCUIT BOARDS--SEE PAGE 4

(2) To solder the connections, place the tip of a hot soldering iron on the leads close to the place which you wish

- (6) Keep the iron on the connection until all of the solder has flowed thoroughly over the connection, then remove the iron. Use only enough solder to cover the wire at the connecting point.



TOO MUCH SOLDER



TOO LITTLE SOLDER



COLD JOINT



**GOOD
CONNECTION**

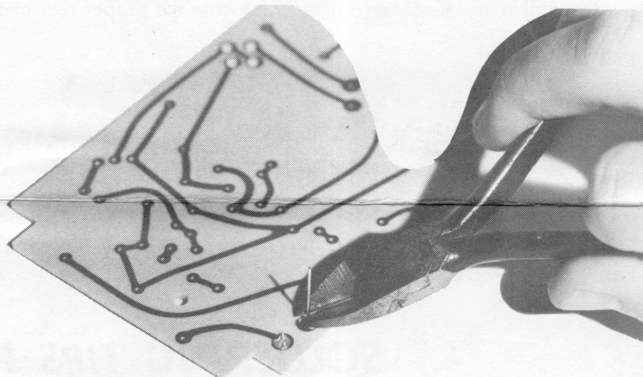
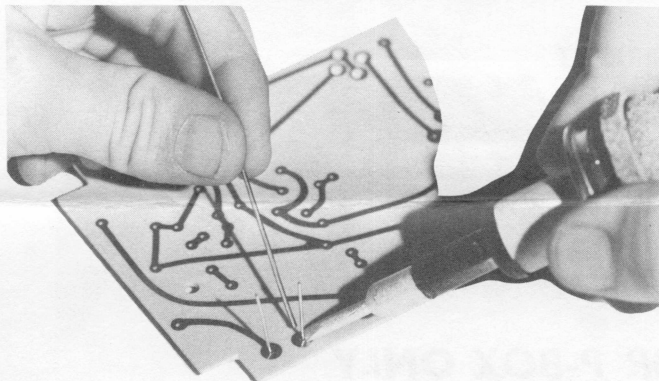
SOLDERING TIPS FOR PRINTED CIRCUIT BOARD ONLY

Always use only resin core solder. Acid core solder will ruin your kit. Before starting, make sure that the tip on the solder gun is clean and free from pits. If not, clean and reshape the tip with sandpaper or file. Before using, recoat the tip with solder. Before starting on the kit itself, practice on some scrap wire using the directions below.

- (1) Place the tip of the soldering iron so that it touches both the copper foil and the wire at the point to be soldered. Now lightly touch the solder to the copper foil, the wire, and tip of the soldering iron at the point of soldering. Immediately, as the

solder begins to flow onto the foil and wire, remove the soldering iron and solder. Do not use too much solder.

- (2) A good solder connection will be bright and smooth and will adhere evenly to both the copper foil and wire. Check to see that excess solder has not filled an empty hole in the circuit board or made a bridge connection with another foil. If this occurs, it can be cleaned by heating the connection and rapidly brushing away excess solder. When the solder cools, cut off the wire at the solder joint.



GUARANTEE

The parts supplied in Science Fair kits are guaranteed to be free of defects for 90 days from date of purchase. Within this period we will replace any defective part (except those damaged in kit construction).

This guarantee is void if acid core solder or paste flux is used in construction.

There is no obligation under this guarantee to provide labor to replace any defective parts or for shipping expenses other than the cost of shipping the replacement part to the buyer.

For Technical Assistance and Parts write to:
National Parts Center

Radio Shack
2615 West Seventh Street
Fort Worth, Texas 76107