

1. Protoboard and Vulcan Board

The protoboard allows circuits to be constructed and tested without permanently mounting or soldering components together. In figure 1, each of the pins in the columns 1 – 66 in rows A – E and F – J are connected together internally within the board. For example, the green pins in column 1 rows A – E are connected, and the pins in column 1 rows F – J are connected. However, the connection does not span the groove. Also, adjacent columns are not connected. DIP chips are placed on the protoboard to straddle the groove (between row E and F) on the protoboard. The DIP chip pins should be placed in rows E and F.

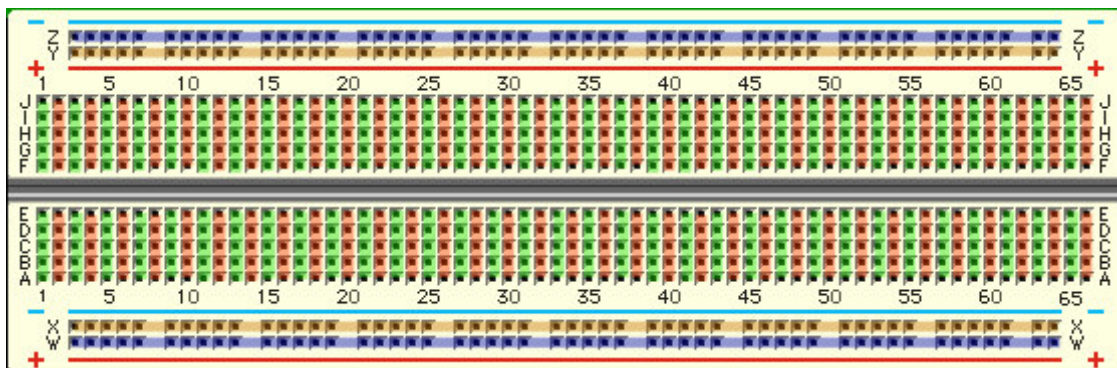


Figure 1: Protoboard electrical connections (from JCM inVentures [<http://www.jcminventures.com>])

The pins in the rows W, X, Y & Z are connected which allows power and ground to be distributed (bussed) the length of the protoboard as indicated by the “+” and “-” designations.

The protoboards used in lab do not have the rows and columns numbered and lettered as shown in figure 1; however, the electrical connections are the same.

The Vulcan Digital Logic Trainer board provides the +5VDC to power the circuit under test as well as the output displays. A wiring kit is provided along with a digital logic parts kit which includes the TTL DIP's required for the labs.

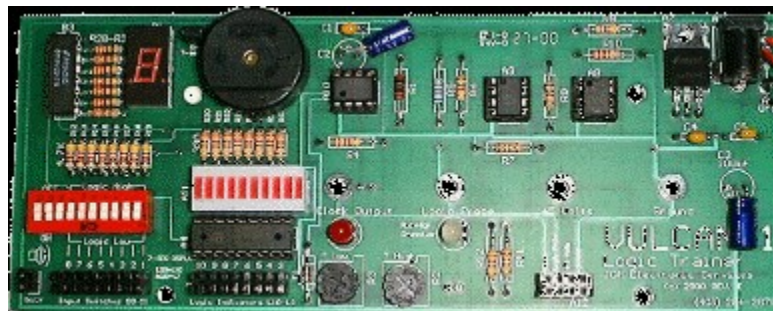
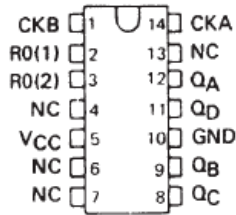


Figure 2: Vulcan Digital Logic Trainer Board

2. Dual Inline Package (DIP) Chips

In all but a few 74LSxx DIP's, ground is the lower left pin (pin 7 in a 14 pin DIP) and +5VDC is upper right (pin 14 for a 14 pin DIP).



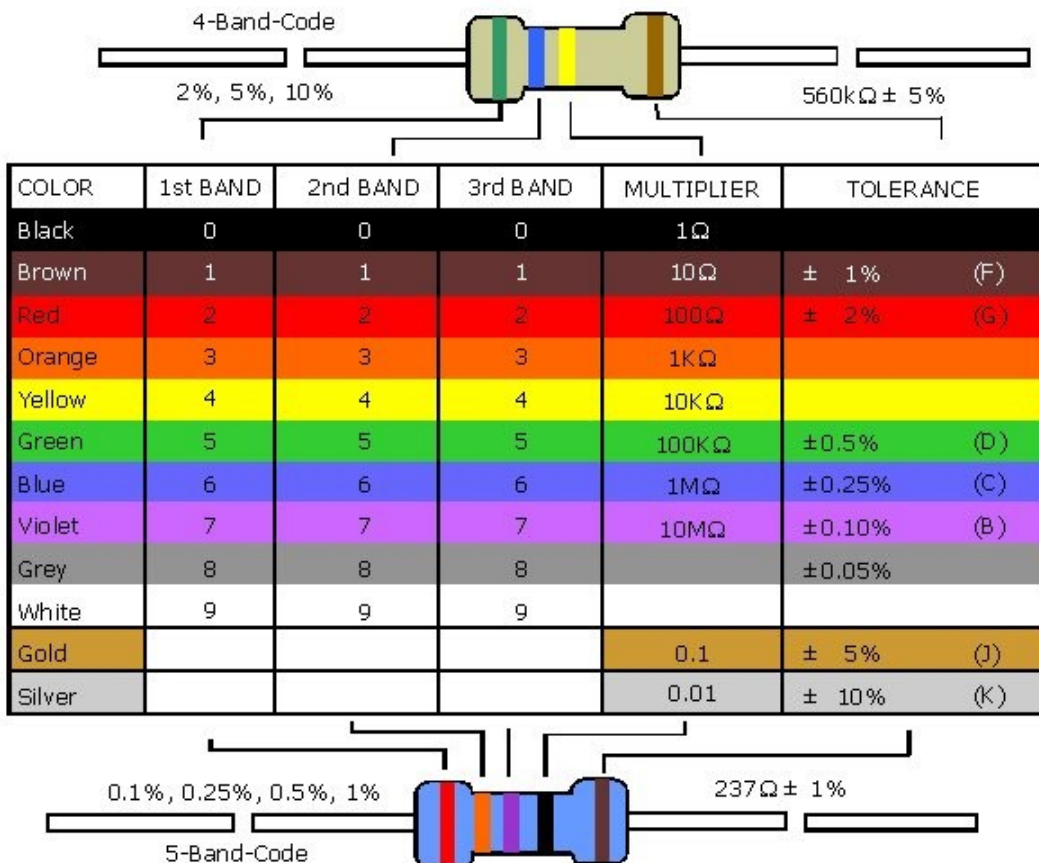
The 74LS93 is an exception as shown in figure 3. Be careful to properly connect power (+5VDC) and ground for each DIP.

Also, be careful to use the correct DIP diagram from the TI data sheet, "SN74LS93 ... D or N package", where N refers to the DIP package. In the OrCAD counters library, select part 74LS93.

Figure 3: 4-Bit Binary Counter, 74LS93

3. Resistor Color Code

The resistors are color coded by value in ohms and tolerance. We will be using the "4-Band-Code" resistors. See figure 4 below.



Electronix Express / RSR
<http://www.elexp.com>

1-800-972-2225
 In NJ 732-381-8020

Figure 4: Resistor Color Code