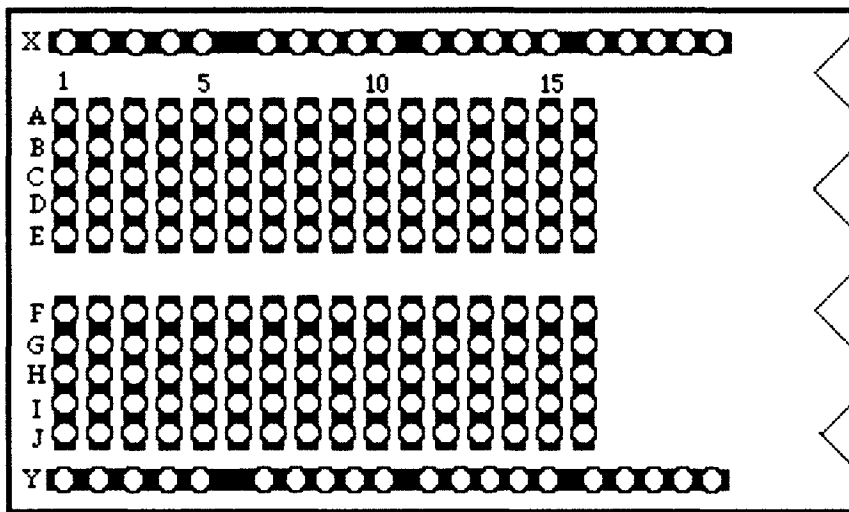


## Circuit Board or Bread Board



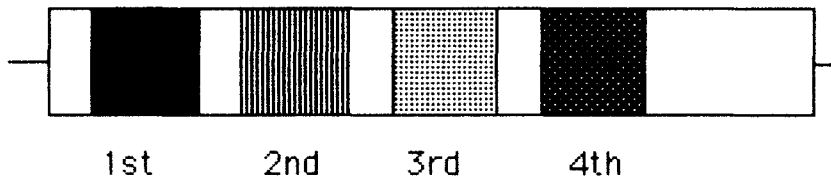
A circuit board is an easy way of wiring circuits together. It saves on twisting wires together or using lots of leads with alligator clips.

All the connections on the "X" row are connected together. That is X1 to X47 are all connected together. The same is true for the "Y" row. Y1 to Y47 are all connected together.

Columns are in two sections. Column 1A to 1E (1A, 1B, 1C, 1D, 1E) are all connected together. Column 1F to 1J are all connected together, but they are not connected to 1A to 1E. 2A to 2E make up another column that is all connected together, and so on.

The shaded areas show which terminals form a common junction.

## Resistor Color Code



The first two bands give the first two digits of the resistance. The third band is the multiplier that gives the power of ten of the resistance value. The fourth band gives the tolerance of the resistor. In other words, if the fourth band is silver, the resistance is within plus or minus ten percent of the stated value. Notice that there is only two significant figures in the resistance.

1st and 2nd Band  
Value of Resistor

Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Gray	8
White	9

Third Color Band  
Multiplier - Power of 10

Black	0	$\times 10^0$
Brown	1	$\times 10^1$
Red	2	$\times 10^2$
Orange	3	$\times 10^3$
Yellow	4	$\times 10^4$
Green	5	$\times 10^5$
Blue	6	$\times 10^6$
Silver	-2	$\times 10^{-2}$
Gold	-1	$\times 10^{-1}$

4th Color Band  
Tolerance

Gold	5%
Silver	10%
none	20%

Sample:

Orange	Violet	Red	Gold		
3	7	$\times 100$	5%	$37 \times 100 = 3700 \Omega$	$.05 \times 3700 = 185$

$3700 \pm 200 \Omega$

acceptable range of values for the resistor 3500-3900  $\Omega$