

Protoboard Guide: An Introduction to the ECE331 Protoboard

A board designed to insert DIP (dual inline package) circuits and other electronic components and to connect them using wires is called a *protoboard*. A protoboard has one or more notches running across the board where DIP circuits are plugged in. The wire insertion points on either side of the notch are connected together to form nodes for connecting components using wires. Figure 1 shows the connectivity of a typical protoboard. Protoboards also typically have one or more “power rails” that are electrically connected and run perpendicular to component wiring nodes; these are intended to be wired to power supply nodes and provide power supply connection points across the protoboard.

Figure 1 shows the top portion of the ECE331 protoboard. It has 4 vertically connected “power rails” (2 on each side and 4 down the middle), 2 components notches, and 5 horizontally connected insertion points along each side of the component notches. The second image in Figure 1 illustrates some of these features and highlights connectivity of the insertion points.

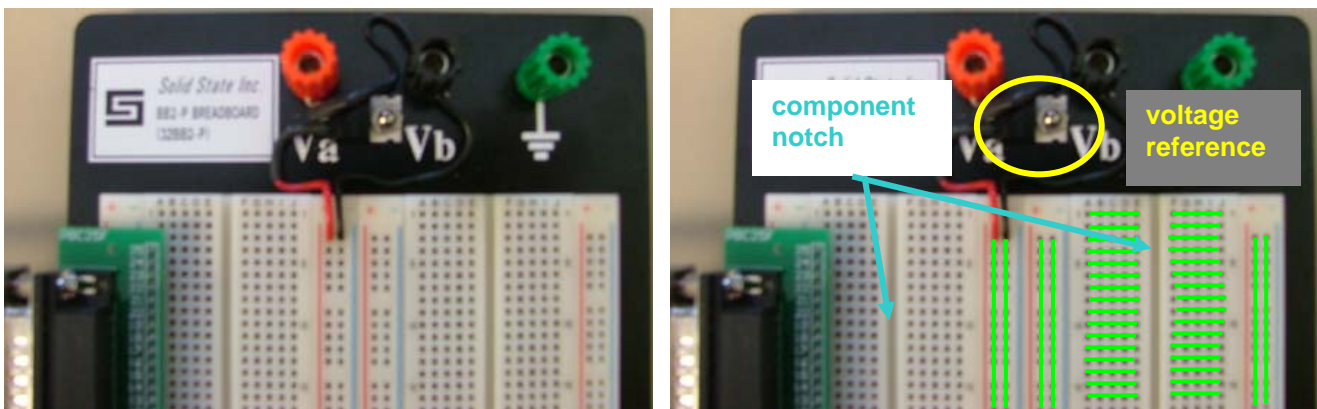
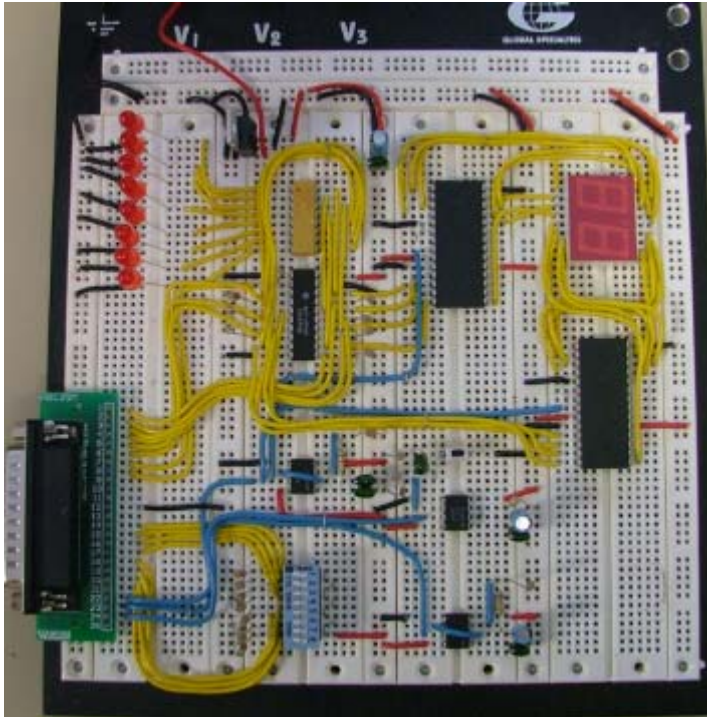


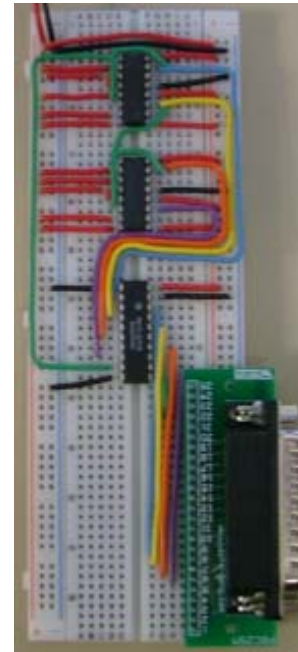
Figure 1. Top portion of the ECE331 Protoboard. The image on the right highlights the connectivity of some of the insertion points.

Protoboards often have “banana” plug connectors intended for connecting the protoboard to a power supply using “banana” cables. Digital circuits (and newer analog components) generally require one positive power supply and a ground reference. It is customary to connect the positive supply lead to the red banana plug and the ground supply lead to the black banana plug. The ECE331 Switch Register Board (SRB) that you will often use with the protoboard permits a 7-9V supply. However, some of the other digital components we will use in lab require only 5V. To ensure an accurate and stable 5V supply is available, the protoboard has a built in 5V reference; when you apply Ground to the black banana plug (Vb) and 7-9V to the red banana plug (Va), the reference will output 5V on the red wire. Note that by default the protoboard should have one of the inner power rails connected to 5V and one to Ground. Please do not alter these connections. If you set the power supply to 7-9V (nominally 8V), you can plug the SRB banana-connector powers lead directly into the banana plugs (Va and Vb) on the protoboard.

Figure 2 shows two excellent examples of circuits wired on the protoboard. Figure 2a shows a protoboard with a prototype SRB circuit. Notice in particular the neatness of the wiring and the use of color-coded wiring (red for power, black for ground, other colors for internal nodes) to ease in construction and debugging. These are good examples to try to follow when you wire up your own boards.



(a)



(b)

Figure 2. a) The SRB prototype circuit implemented on a protoboard. b) Example of color coded wiring on a protoboard.