

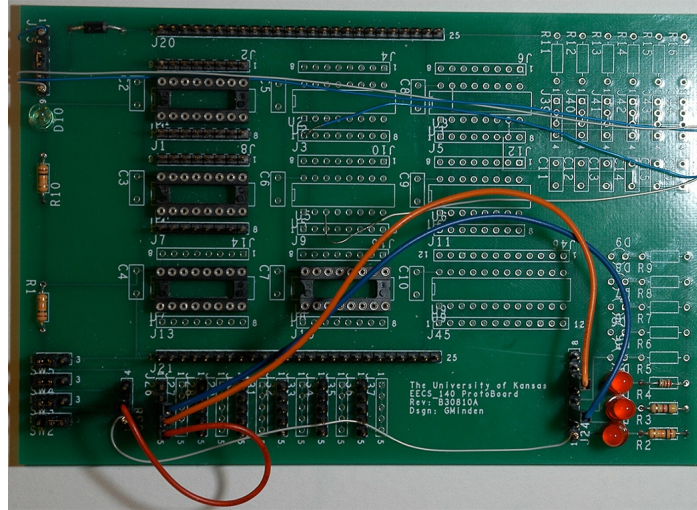
Building the EECS 140 Prototyping Board

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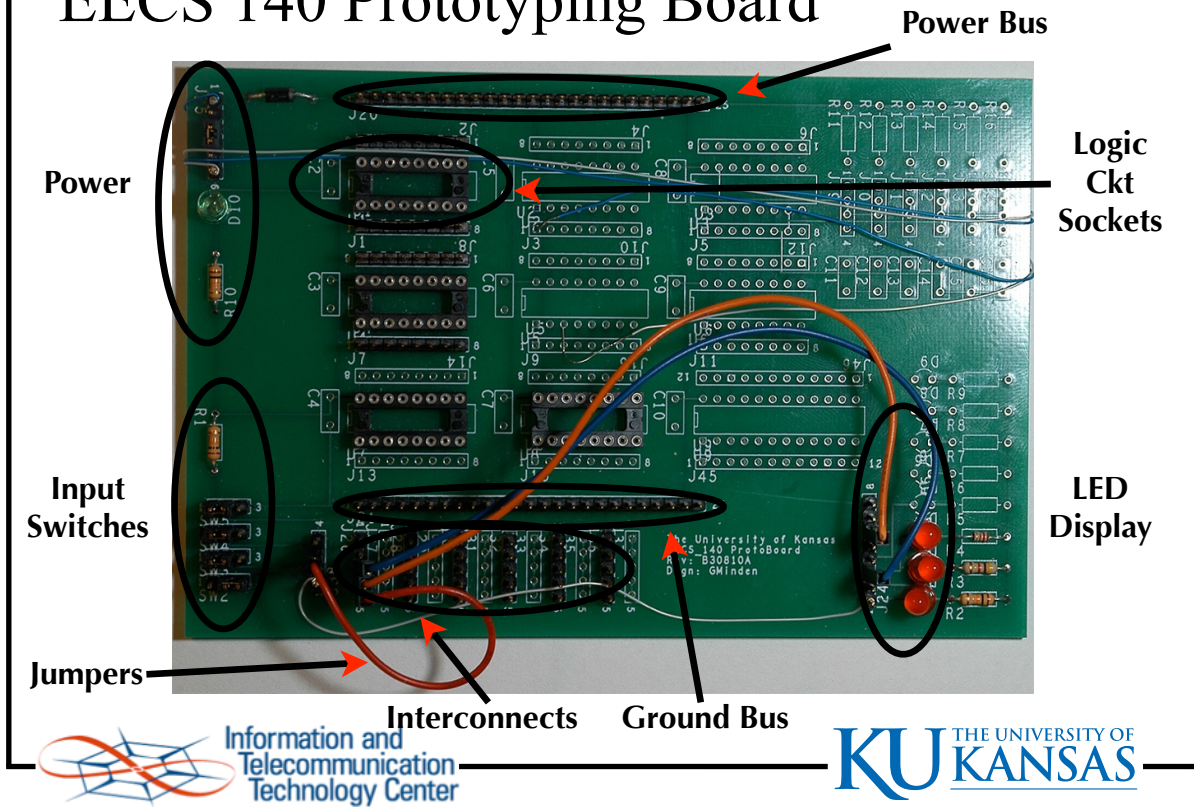


EECS 140 Prototyping Board

- A hardware platform for experimenting with simple logic circuits
- An exercise in building logic hardware



EECS 140 Prototyping Board



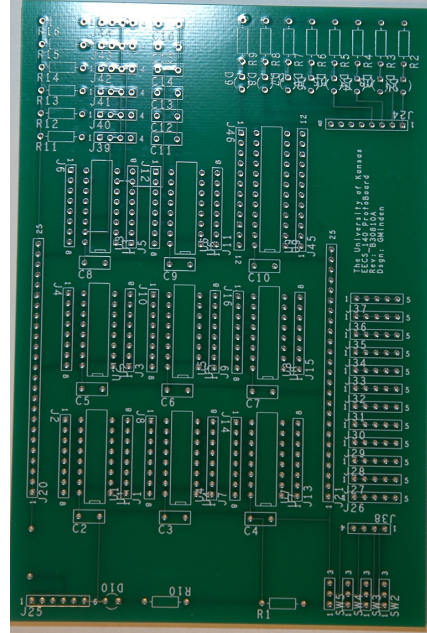
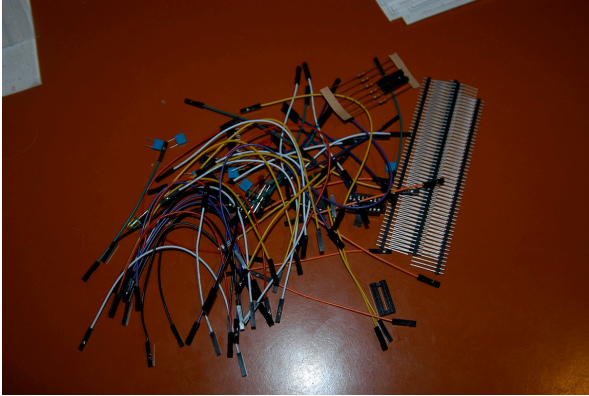
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The picture shows a partially completed EECS 140 Prototyping Board. The major areas are:

- (1) Power input with LED indicator and protection diode
- (2) Input switches using jumpers and a set of switch outputs
- (3) Interconnect buses, used when a signal is used in multiple places
- (4) Jumpers to connect the components on the board
- (5) A Ground bus for '0' logic levels
- (6) LED display and connections, LEDs light up when the signal is low ('0')
- (7) Sockets for logic circuits
- (8) Power bus for '1' logic levels

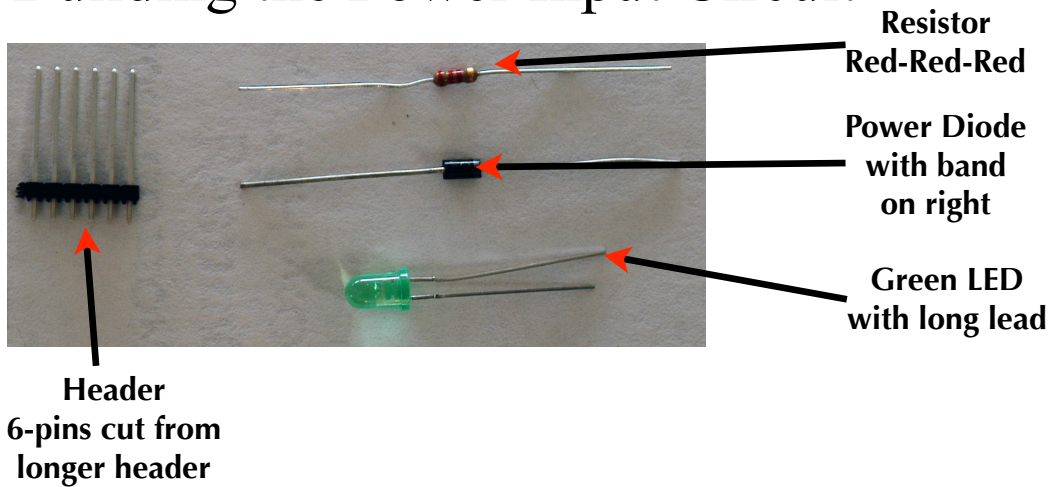
Prototype Board Starting Point



You will be provided with a bare prototyping board and a bag of parts.

The following slides will lead you through assembling your prototyping board.

Building the Power Input Circuit



First, select a resistor, diode, LED, and header strip from your bag of parts.

The resistor should have color bands of red-red-red. This is a color-code used to indicate the resistance value of the resistor, 2.2 KOhm. Resistor color codes are described at: <https://wiki.ittc.ku.edu/ittc/Image:EECS140ResistorCode.gif>.

Note that the power diode has a white band at one end. It is important to insert the power diode with the white band towards the power bus.

Note that one lead on the LED is longer than the other. It is important to insert the LED with the longer lead towards the resistor.

Cut off six (6) pins from a header strip using diagonal cutters.

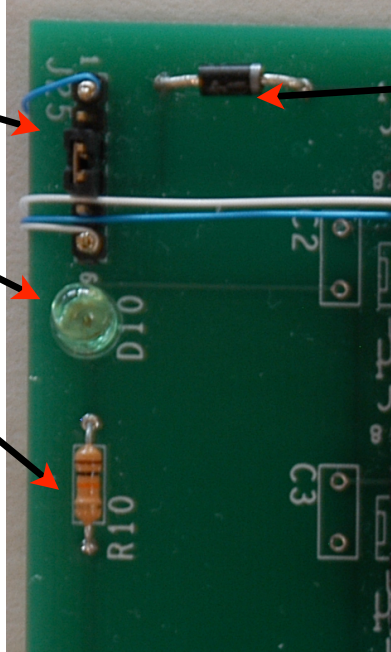
Placing the Power Input Circuit

Header
6-pins cut from
longer header

Green LED
with long lead
towards R10

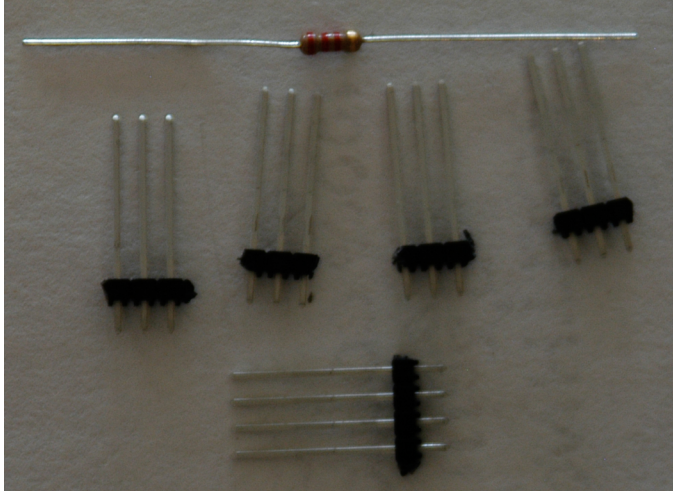
Resistor
Red-Red-Red

Power Diode
with white band
on right



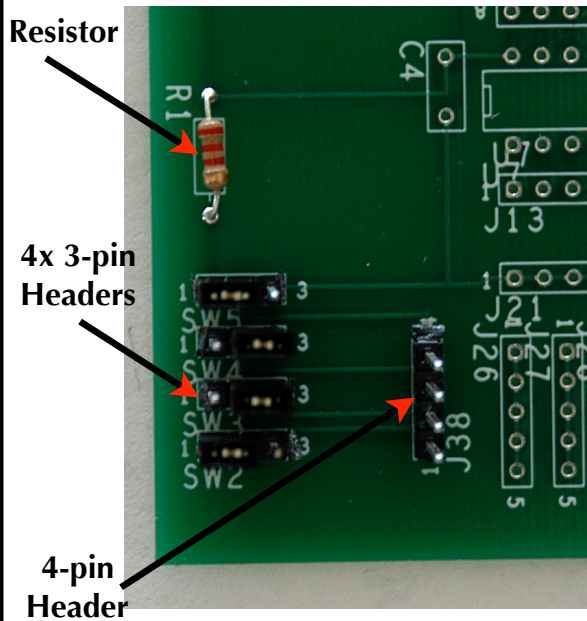
- (1) Identify the upper left corner of the board that has J25, D10, and R10 displayed.
- (2) Insert the six pin header in to J25.
- (3) When the header is firmly inserted, turn the board over and solder all pins into place
- (4) Bend the pins on the black diode into a U-shape and insert into place.
- (5) Insert the LED D10 with the long lead towards R10.
- (6) Bend the leads on the resistor into a U-shape and insert the 2.2 KOhm R10, the orientation does not matter.

Switch Circuit



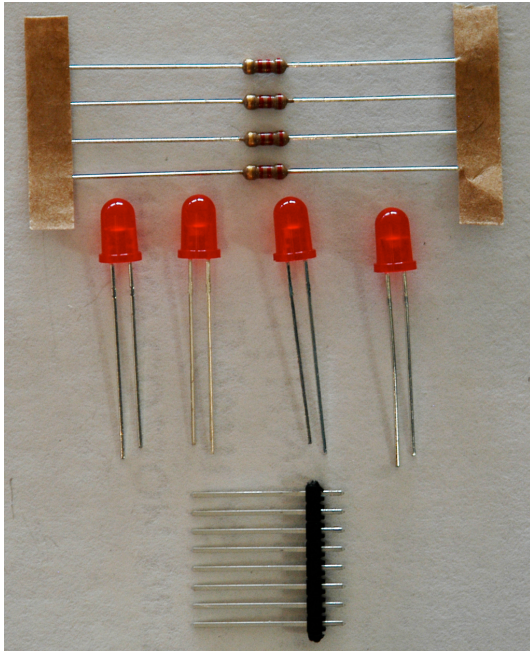
- Cut four units of three (3) pins each from your header strip.
- Cut four pins from your header strip
- Select a 2.2 KOhm (Red-Red-Red) resistor from your bag of parts.

Install Switch Circuit



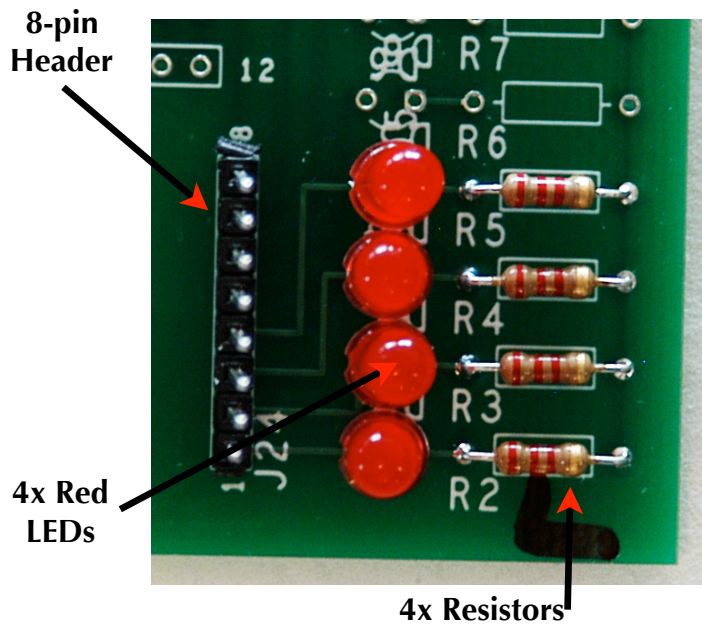
- Insert the resistor and headers
- When firmly seated, solder into place
- You can use shorting jumpers between the left most two pins and the right most two pins
- Outputs of the switches are on J38, the 4-pin header

Select LED Display Components



- Select four red LEDs, four resistors (Red-Red-Red), and cut 8-pins from a header strip
- Note that one pin on the LEDs is longer than the other. This is important.

Install LED Display Components



- Insert the resistors (Red-Red-Red) and solder
- Insert LEDs **with long lead toward the resistors** and solder
- Insert 8-pin header and when firmly in place, solder

First Board Test

