



Cim-A-Palooza 2017: Example Assembly

# LED Sign Project



# Cut Stock to Size

- We used a table saw to rip the Renshape to 4" wide.
- Then set up a sliding miter saw with a stop at 4" for the crosscut operation.
- The Renshape 450 is a little bit less expensive, but a LOT dustier. I think I would pay the extra and go with the heavier 440.

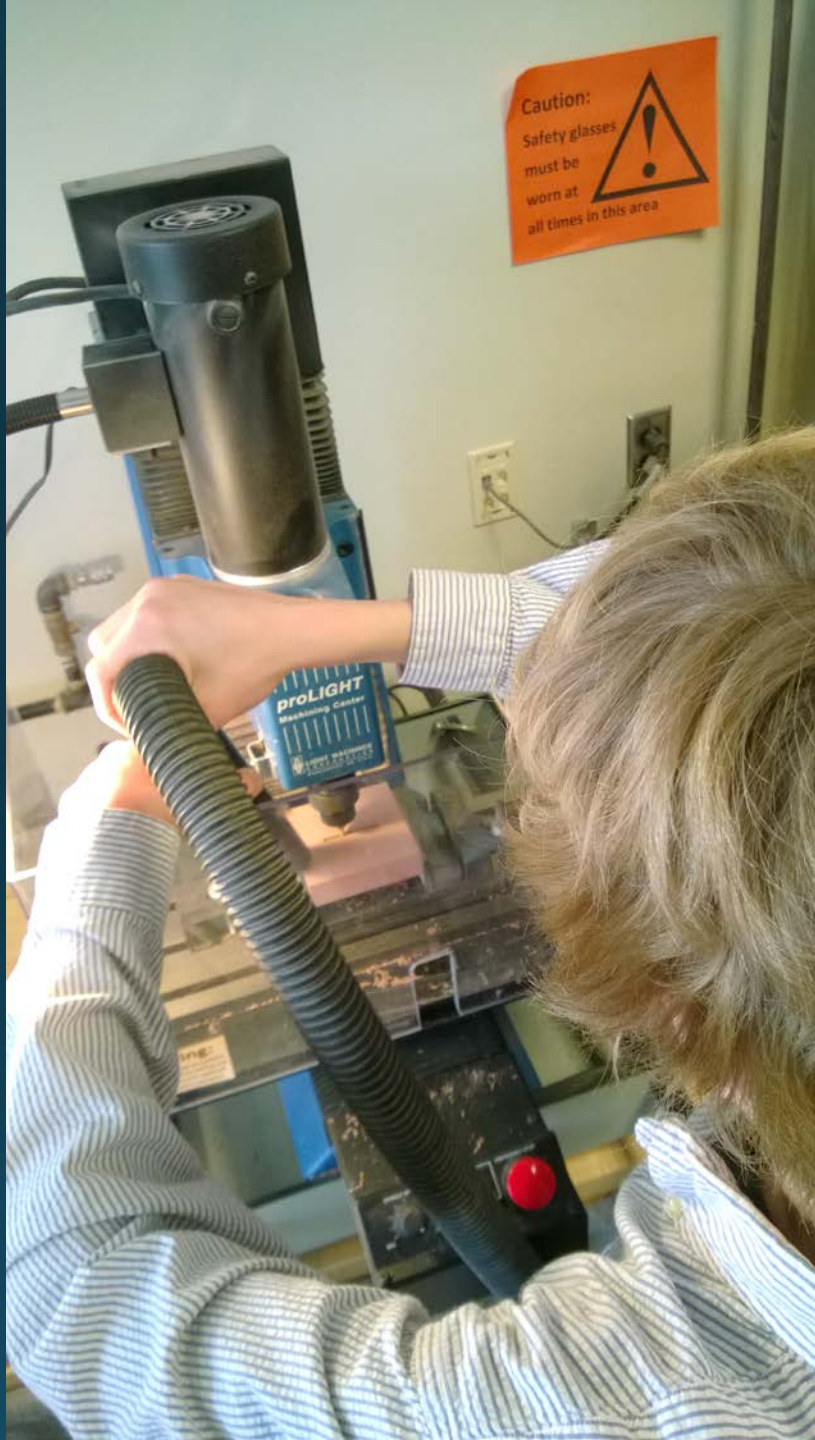




# Machine the Bottom

- We set up one of our two proLIGHT mills to cut out the bottom of the bases.
- We used a one tool operation: less chance for error.
- Used an adaptive cutting technique with a part time of about 5 minutes.
- Two pockets and a profile took over 8 minutes.





# Machine the Top

- We set up one of our two proLIGHT mills with the code for cutting out the top of the part.
- We kept an eye on the machine while it cut, with our hands on the stop button in case of an emergency.
- Used a vacuum to clean up the area as the machine cut to keep the path clear.



# Cut out the Base

- We used a table saw to cut carefully along the guidelines that the mill cut out for us.
- Just came close and then used a finishing process to clean it up next.





# Inspect LED Fit

- We used a microscope on low power to check the fit of the LED in the base.
- Also checked for cold solder joints.
- If the LED is contact with the acrylic part of the sign, light transmission is better.
- Inspection occurs during assembly as well.
- All parts are tolerance to be a tight fit. The sign is a press fit, as is the base cover. Base cover is about 0.010" oversize. Goes in tight, but doesn't come out unless you break it.



# Drill Base Hole

- Place the hole so it doesn't interfere with the cover.
- Also, not too high on the base as to make it tippy.
- Measure USB Cable diameter and make the hole just big enough it slides through.
- Held in place inside with a bead of hot glue.
- Fixture was made on the laser to locate the hole correctly on all the pieces.



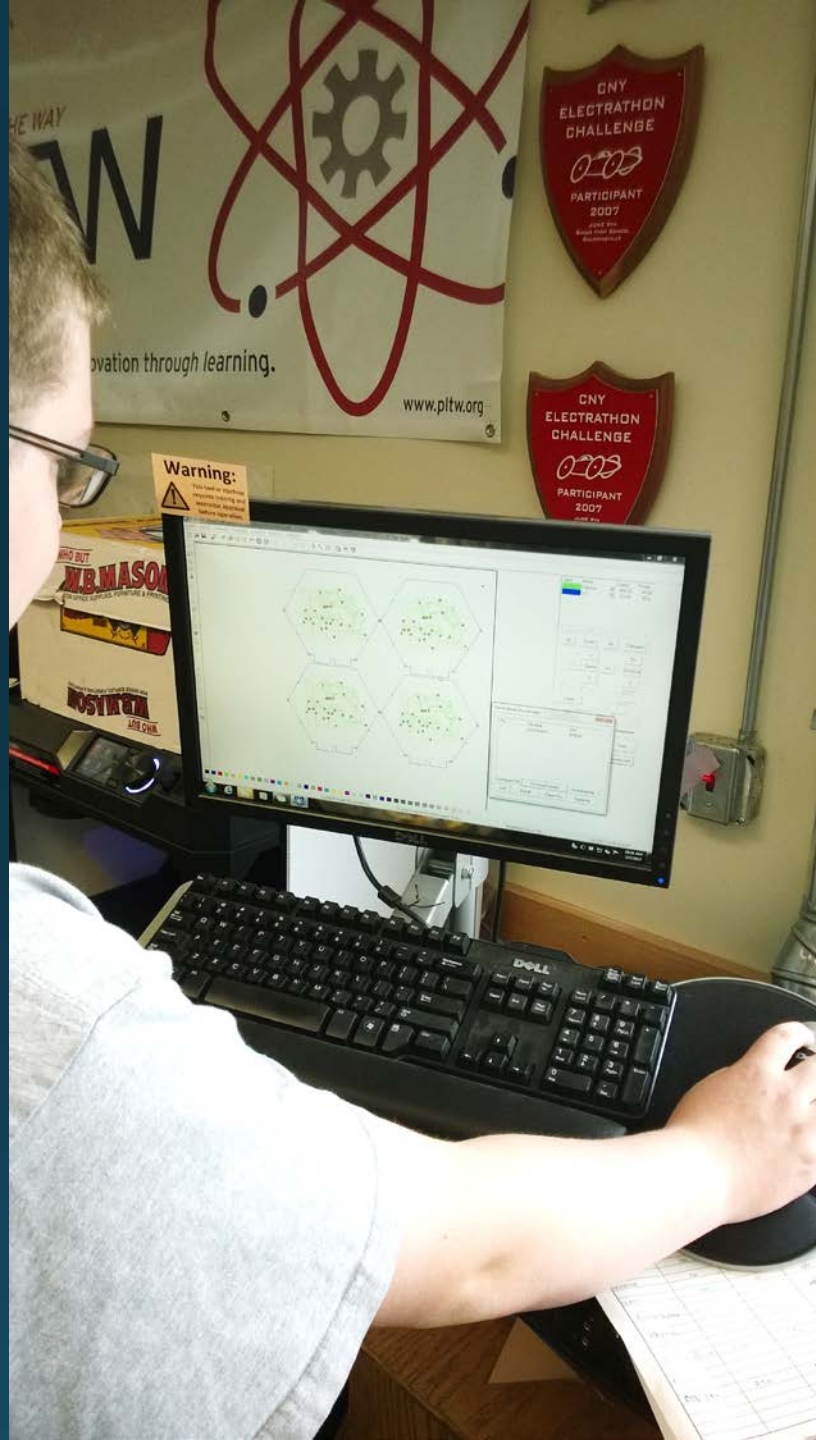


# Design Graphic

- We used Photoshop, Adobe Illustrator or CorelDraw to design the logo. Our laser requires a DXF or JPG file.
- We had the best luck with CorelDraw DXF files.
- File has to be a true 2-bit black and white image to work best.
- Laser is a Brightstar Laser: Advantage 24  
More info here:

<http://www.brightstarlasers.com/advantage.htm>





# Laser Cut Acrylic Parts

- File has to be a true 2-bit black and white image to work best.
- Laser is a Brightstar Laser: Advantage 24  
More info here.  
<http://www.brightstarlasers.com/advantage.htm>
- We engrave four at a time, then cut them out.
- Flip the  $\frac{3}{8}$ " acrylic and cut four more.
- Design it right, and you can use the leftover for the base covers.



# Solder LED's to Resistor

- We used Digital Electronics class supplies to complete this task. Used helping hands to hold the parts while soldering.
- Use lead free solder.
- 68 ohm resistor gets trimmed, then soldered to the shorter trimmed lead of the LED. See picture.

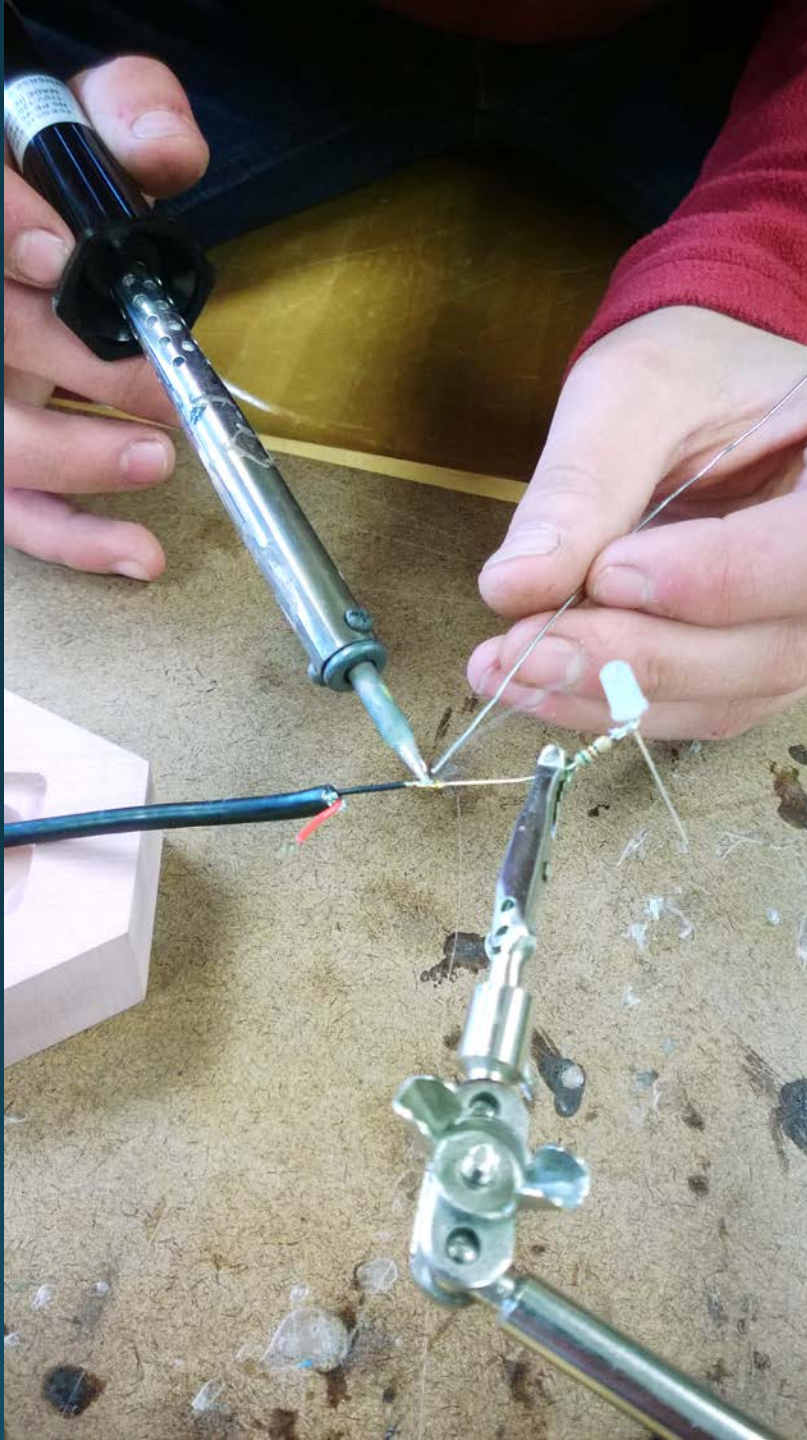




# Paint/Finish Parts

- We used spray paint on your projects. Renshape holds paint well.
- Be sure to have proper ventilation.
- Be sure to clean dust off all parts before painting.
- Renshape 450 stains like a dream. Looks like real wood. Dark walnut looks best.
- If stain is used, it needs to be clear coated soon after, or white stains may appear.





# Solder USB Cable

- Place the wire **THROUGH** the hole in the base first!
- Black wire to the shorter leg of the LED.
- Red wire to the longer leg of the LED.
- Cut off. Or do not strip the green and white wires. They are not used.



# Final Assembly

- Peel the protective coating off the acrylic and clean.
- Insert LED into hole. Be sure it is seated.
- Insert the sign into base securely. Be sure LED is in contact with the acrylic.
- Hot glue the LED in place, as well as the soldered connections.
- Place a drop of hot glue where the cable enters the base.
- Test the light, be sure it works, then press fit the cover in place.