“Lit from Within” Pre-workshop Information Sheet

The purpose of this workshop is to give the participant a guided hands-on experience in the new IDC maker space, doing soldering and having pieces laser cut, to build a small project that incorporates electronics and art. Specifically, the participant will build a 2.5-inch-diameter cylindrical light box, which is battery-powered, rocker-switch controlled, and contains 20 small LED lights, such that the light radiates out of the enclosure through artistically designed laser-cut holes. The enclosure is constructed by stacking two medallions and four rings, each laser cut from a colored opaque cast acrylic sheet. Two versions of the prototype, one without braided wire and the other with braided wire, are shown below in Fig. 1. The finished enclosure can be displayed on a table top, suspended, e.g., in a window (see Fig. 2), or hung on a holiday tree. The participant has many choices in designs, materials, and colors. Please look over this document to gain an idea of how the workshop is planned. A more detailed plan will be distributed at the workshop.

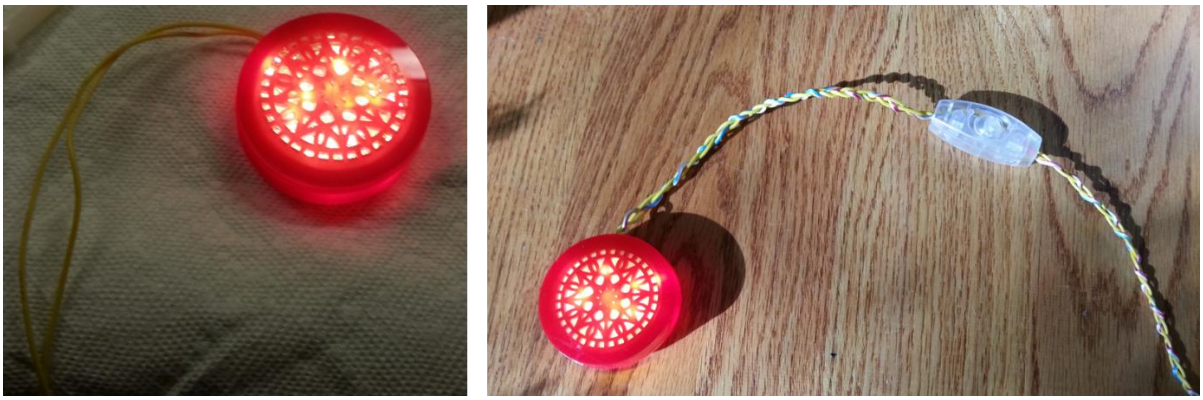

Figure 1. The prototype shown on the left has loose wires, while the one on the right has the two wires braided with a decorative string, with the rocker switch shown.

Figure 2. The prototype displayed in a window (left) and on a table (right).

Before you arrive:

1. **Read the waiver for using the IDC at XXX and be prepared to sign it when you arrive. Arrive a few minutes early to swipe in and sign waivers.**
2. **Wear closed-toe shoes (i.e., no sandals) so you can enter the laser cutting room.**
3. **After reading this sheet, if you have questions, please contact Prof. Weitnauer maweit@gatech.edu or Ms. Samantha Mann smann9@gatech.edu.**

After you arrive:

1. Pick up handouts with medallion choices and the Detailed Workshop Plan, and get your bag, which you will use for carrying your materials.
2. Enjoy your pizza, 6pm to 6:30pm, while listening to several short presentations projected to all. The presentations are about the Hive, soldering, glue safety, and workshop plan.
3. Clean your hands with wipes provided (to not get oil on the acrylic).
4. Make your design choices:

Laser cutting material	wood or acrylic in red, blue, green, yellow, white, or black
Medallion designs	See handout for choices. Choose one for the front and one for the back; they can be the same. See note below if you want to make a custom design.
Electrical wire color	red, blue, green, yellow, white, or black
Fairy lights color (we have plenty of white; non-white selections are quite limited)	White, red, blue, green, yellow
Resistor	Value depends on fairy lights color – see handout with detailed workshop plan
Braiding string, used to braid with your wires, to hold them together	Many choices
Switch	Clear or black

The medallion designs, in both PDF and SVD formats, are available at XXX. Feel free to edit the SVD designs and bring a customized design to the workshop on a USB drive, **but you must adhere to our constraints listed below. NOTE: no editing of laser cut designs allowed during the workshop – not enough time!!** There is a procedure for GT people to get Adobe Illustrator for free. Also, Inkscape is a free-to-download alternative editing package that has lots of self-help and tutorials on the Internet.

*** Constraints on custom medallion designs:**

1. SVD format only
2. The outer edge of the medallion must be a perfect circle of 2.5 inches diameter. Your custom design must fit completely inside a 2 inch diameter and be centered inside the outer edge circle of 2.5 inches.
3. Only cuts are allowed. No etching is allowed (takes too long on the laser cutter !!).

4. All cut lines in your design must be expressed as purely red strokes (255 Red and 0 green and 0 blue)
5. All strokes must be 0.072 pt in width (make sure unit is “pt”).
6. Make sure the cuts make sense in your design. In other words, each closed curve will result in the cut part falling out, so do not have any cuts strictly inside a closed cut contour.

5. ***Add*** your name to the appropriate form for laser cutting choices and **write your name and group number on your bag**. There is a different form for each material and color combination and each form has a unique group number. Each form has space for at most three people to fill in their information, because one 12 inch by 12 inch acrylic square has room enough for three people’s projects. **Please add your name to a form with other names, for your material and color choice, before beginning a new form, so we don’t waste material.** Your group number will be called out when it is time for you to go to the laser cutter.
6. Activities are arranged by station. Get your first station assignment (A,B,or C) (see Fig 1 and next page for details). To avoid lines forming at stations, we will ask different groups to start at different stations and that you move between stations according to the diagram in Fig. 1. The station descriptions are below, in Fig. 1 and the following table.

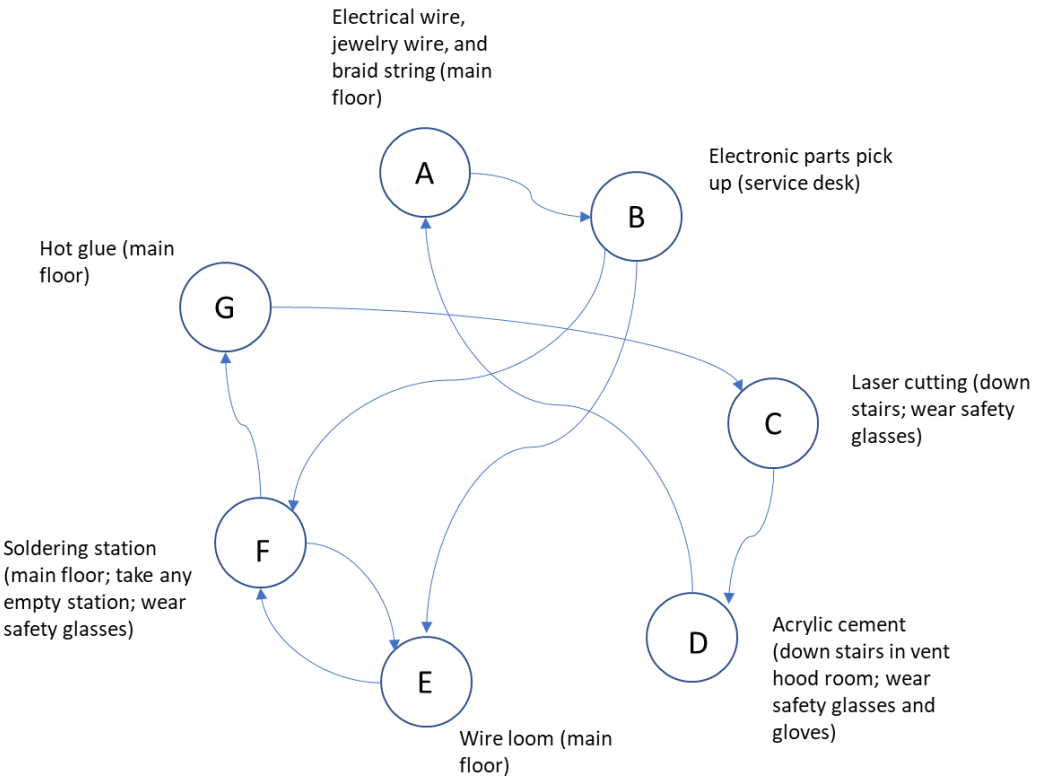

Figure 1. Stations and paths between stations

Table 1. Brief description of activities at each station and where to go next. See Detailed Workshop Plan handout for more details.

Station Index	Station (location; safety gear required)	What you do at this station
A	Electrical wire, jewelry wire, and braid string (main floor)	Cut two electrical wires to each be 24 inches long and cut your braid string to be 26 inches long. Go to E. Get two 2-inch pieces of jewelry wire out of your bag. Using one piece of jewelry wire, tie the three strands together at one end and put that end into a clamp. Braid the electrical wires with the braid string. Tie the other end with the second piece of jewelry wire, so the braid stays together. Then go to B, or if you have already been to B, go to E or F.
B	Electronic parts pick up (service desk)	Get fairy lights, switch, batteries, and resistor. Go to E or F next.
C	Laser cutting (down stairs; wear safety glasses)	Only go here when your group is called. Have the operator cut your medallions and rings. Peel off the paper. Go to D next.
D	Acrylic cement (down stairs in vent hood room; wear safety glasses and gloves)	Glue rings and only one medallion together, with both slotted rings lined up and on top, ensuring that the braided wires (or three wires if you don't have your braid yet) fit through the slots. If you haven't been to A yet, then go to A. If you have already built and tested your circuit, then put your fairy lights bundle inside ,route your braided wires through the slots, and glue the second medallion on top.
E	Wire loom (main floor)	Tape onto loom the four 6-inch segments of jewelry wire, for binding in a tic-tac-toe pattern. If you haven't completed your soldering, can do the loom with coin cell battery still attached to fairy lights. Turn on your lights. Weave fairy lights onto loom to evenly distribute the light, leaving at least two inches of fairy light wire hanging outside of the loom. Tie up binding wires to hold fairy lights in position, and lift the bundle off the loom. Turn off lights. Go to F.
F	Soldering station (main floor; take any empty station; wear safety glasses) Do not leave your materials at a solder station. Put tools away and turn off iron before you leave this station.	If you have already done the loom (E), make the solder connections 1 through 9 (See Detailed Workshop Plan handout). Otherwise, make solder connections 1 through 7, and come back later to do 8 and 9 after you have done the loom. If you did 1 through 9, put the batteries in the holder and test your circuit; if the circuit works, go to G.
G	Hot glue (main floor)	Only do after circuit has been tested and works. Glue the battery holder and voltage regulator to box. Route the wires through the drilled hole and close the box. Go to C if your group hasn't been called yet.