HOW TO LASER

UNIVERSAL LASER SYSTEMS

COLLEGE OF DESIGN

University of Minnesota
GENERAL RULES/POLICIES

- NEVER LEAVE A LASER RUNNING UNATTENDED
  FIRES HAPPEN: YOU DON'T WANT TO BE THAT PERSON!!
  - Laser cutting costs $0.20/min for all of the time that you are logged onto the laser computer.
  - A minimum GopherGOLD balance of $20 is required to log onto a laser computer.
  - Academic work has first priority, commercial or freelance work is NOT PERMITTED.
  - Have all files ready-to-cut before logging onto a laser computer.
  - Laser cutting is first-come, first-serve. Reservation sheets may be available during times of heavy use.
  - Avoid long projects when others are waiting.
  - NEVER operate a laser without the EXHAUST FAN on.
  - NEVER cut an "unknown" material, damage to the laser and/or toxic emissions may occur.
  - Clean up after yourself, use a vacuum to clean up scraps.
  - DO NOT brush waste pieces into the laser cabinet!

FILE SETUP

- Use the template from the Digifablab webpage
- Arrange artwork to be cut in a rectangle that is the same size as your stock
- Allow a 1/4” margin around the stock to assure that all artwork is cut
- Vector cutting and vector engraving is most effective for line work
- Raster engraving is most effective for solid artwork and grayscale images
- Lines to be vector cut/engraved MUST be drawn/saved with a stroke of .01 or less
- CREATE OUTLINES of all text — if your font is not on the laser computer your artwork will change
- Avoid stacked lines - if there are 10 lines — the laser will cut them 10 times.
- Like any other cutting tool, you need to consider the width of the cut
- The laser has a kerf of about .010” — minimum element width is about 1/32”

LASER MODE, POWER AND SPEED SETTINGS ARE ASSIGNED BY OBJECT COLOR

<table>
<thead>
<tr>
<th>BLACK &amp; GRAYSCALE</th>
<th>RASTER ENGRAVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED (RGB 255,0,0)</td>
<td>VECTOR ENGRAVE - SHALLOW</td>
</tr>
<tr>
<td>GREEN (RGB 0,255,0)</td>
<td>VECTOR ENGRAVE - DEEP</td>
</tr>
<tr>
<td>YELLOW (RGB 255,255,0)</td>
<td>VECTOR CUTTING - CUTS FIRST</td>
</tr>
<tr>
<td>BLUE (RGB 0,0,255)</td>
<td>VECTOR CUTTING - CUTS SECOND</td>
</tr>
</tbody>
</table>
FILE PREPARATION

USE THE TEMPLATE
or create a New Document

make your artboard/s the same size as the laser cutter bed

width = 32in
height = 18in

in Advanced settings:
set Color Mode to: RGB

you can print multiple artboards at the same time

Pull down File
> click Document Color Mode

MUST be set to RGB Color
FILE PREPARATION

RASTER ENGRAVING

text and artwork that is black or grayscale can be raster engraved

raster engraving will burn the surface of your material pixel-by-pixel

raster engraving large areas can be very time consuming

adjusting image contrast and raster settings will change output qualities: be prepared to make adjustments and some test cuts

VECTOR ENGRAVING AND CUTTING

the laser will follow lines in your artwork

line stroke MUST be .01 or less

to be VECTOR ENGRAVED should be RED or GREEN

to be VECTOR CUT should be YELLOW or BLUE

colors MUST be absolute RGB values

<table>
<thead>
<tr>
<th>Color</th>
<th>RGB Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>(255,0,0)</td>
</tr>
<tr>
<td>GREEN</td>
<td>(0,255,0)</td>
</tr>
<tr>
<td>YELLOW</td>
<td>(255,255,0)</td>
</tr>
<tr>
<td>BLUE</td>
<td>(0,0,255)</td>
</tr>
</tbody>
</table>

colors will cut in the order above
PRINTING

Pull down File > click Print

Select Printer > LASER CUTTER

Click Setup

Click Preferences
**PRINTING**

1. Click **Manual Control**.

2. Click **Load**.

3. Navigate to: Desktop > open **LASER MATERIALS**.

4. Double click the material and thickness that you are cutting.
   - If your material is not listed, select a material of the same thickness and similar density.
   - Consult with a laser technician if you are cutting material that is not in the laser library!
**PRINTING**

Black is skipped by default if you are raster engraving; select **Black**

change **Mode** to **Rast**

click **Set!**

adjust laser **Mode**, **Power**, **Speed**, **PPI**, and **Z-Axis** for each color as necessary

**Z-Axis** should be set to actual material thickness!!

click **Set** if you make changes!

raster engraving and other laser specific properties can be adjusted here:

**MORE INFORMATION!**

click **Ok**
**PRINTING**

change **Media Size** to:

User-Defined LANDSCAPE

adjust **Orientation** so that the preview looks correct

place the artwork in a corner to align with the cutting table

click **Print** to send file to the laser cutter and UCP

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**UCP**

(Universal Control Panel)

open UCP from the taskbar, start menu or desktop

in UCP your file is shown as it will be laser-cut

what you see is what you get, if artwork is missing, properties are probably incorrect

many laser settings and functions can be controlled in the UCP
UCP functions:

- **START file**
- **CHANGE file**
- **MOVE artwork**
- **ESTIMATE time**
- **CHANGE artboard**
- **ADJUST settings**
- **LASER status**

**ADDITIONAL INFORMATION:**

- **UCP Manual Controls**: advanced information on manual laser controls and settings

- **Regis XYZlab raster samples**: reminder - raster engraving can be very time consuming and should be done only when others are not waiting to use a laser cutter

- **User Manual**: the complete User Manual from Universal Laser

- **Rotary Fixture**: instructions for calibrating and using the rotary fixture

- **10 Tips and Tricks**: good stuff from Geordie at ADX Portland

- **BoxMaker**: this cool web tool will generate a finger-jointed box of the dimensions of your choosing. open PDF and laser-cut from Illustrator or Rhino.

- **Pokono**: lots of good, laser specific, tutorials and tips