# Laser Engraver Quick Start
# &
# Resource Guide



## JESSAMINE COUNTY
## PUBLIC LIBRARY

**Epilog Mini 40 Manual and Guide**

**JCPL Laser Cutter Engraver - Epilog Mini 40 Manual:**

https://www.epiloglaser.com/tech-support/laser-manuals.htm

**BossLaser Settings Page:**

https://www.bosslaser.com/laser-settings

## Laser Cutter / Engraver Basics and Training

**Instructables Laser Cutting Projects:**

http://www.instructables.com/id/Teachers-Resource-3D-Laser-Cut-Projects/

http://www.instructables.com/id/Laser-Cutting-1/

**Laser Engravers' Bible:**

https://www.johnsonplastics.com/engravers-bible/introduction

## Vector and Raster Software

**Inkscape – Vector Graphics Software**

https://inkscape.org/en/

**Gimp – Raster Graphics Software**

https://www.gimp.org

**Krita – Raster Graphics Software**

https://krita.org/en/

## Materials

**Laser Cutter Material Vendor:**

https://www.johnsonplastics.com

https://www.tapplastics.com

**Cermark Alternative (Metal / Ceramic Engraver Coating):**

CRC Dry Moly Lube

http://www.evilmadscientist.com/2013/laser-moly/

# Laser Engraving Quick Start Guide

## Safety Precautions

The laser cutter uses a high intensity beam of light that can generate extremely high temperatures when it encounters material.  Some materials are extremely flammable and can easily ignite and burst into open flame setting the machine ablaze.  This open flame is very dangerous and has the potential to destroy not only the machine, but also the room or even building housing the laser cutter. Experience shows that vector cutting with the laser has the most potential to create an open flame.  Many materials are susceptible to igniting, but acrylic,

in all its different forms, has been shown to be especially flammable when vector cutting with the laser.

Please read the following warnings and recommendations and follow them closely at all times!
• Stay with the laser.  Never operate the laser system while unattended.
• Keep the area clear.  Clean around the machine and keep the area free of clutter.
• Know where the nearest fire extinguisher is located.
• Use Air Assist.  Always use the system's Air Assist feature when vector cutting.
• Use caution when vector cutting.  Many materials have the potential to burst into flames when cut with a laser – even materials that may be very familiar to the user.

**ALWAYS** **monitor the machine when it is operating.**

## Best Practices

1. Do a test print – Not only does this show you if you will get the results you want, if the machine has not been used recently, it sometimes needs to fully warm up before it will begin cutting / engraving.

2. When cutting, use the honeycomb grid bed.

3. Clear debris collection tray after cutting; accumulation of debris can be a fire hazard.

4. Reflective materials often require a marking spray or coating.  These sprays and coatings can be purchased from various material vendors such as Amazon.com or JohnsonsPlastics.com.  JCPL does not supply any of these sprays.

5. Leave the workspace clean of any debris or trash.

6. Ask for help if unsure about how to operate the equipment.

# CorelDRAW Quick Start

## 1. Create a New Document

   a. Using the rulers found on the laser cutter or tape measure at the computer desk determine your material's dimensions.  Use these as the dimensions for your new document.

   b. Name the job – This is what will appear on the LCD screen found on the laser cutter.

   c. DPI of the document should always be set at 300.

## 2. Create Any Text or Shape You Wish To Add To Your Design

    a. Select the Text Tool found in the left hand tool bar and begin typing – no need to draw a text box.

    b. You can use the Shape Tool to add pre-made shapes such as a star, spiral, square, or circle to your design.

    c. Use the Pick Tool to manipulate text, shapes, or images.

    d. To center any object on the page, select the object then press the "P" key.  If you select multiple objects, it will bring them all to the center.

## 3. To Vector Cut Your Design

    a. Select the text/object you want to cut.  These have to be vector based objects, not raster.  Anything created inside CorelDRAW is a vector object, however, most images imported will be raster.  Common vector image formats include SVG, AI, EPS, DXF, and DWG.  The more common JPG, GIF, PNG, and BMP files are not vector based and can only be engraved.

    b. Under the Object Properties box, adjust its thickness to hairline.  This can be found on the right hand most pane.

    c. This step can be ignored if you are engraving.  Raster and vector based objects can be engraved without modifying any properties such as outline thickness.

## 4. To Send to Laser Cutter / Engraver

    a. Go to the File menu and select Print.

    b. Adjust DPI to desired setting (default is set to 600).

    c. Verify Auto Focus is enabled.

    d. Only use the Center Engraving feature if you need to manually center the job – To use this feature turn X/Y off, turn on the Red Pointer, finally move the laser arm to your desired location.  This technique is useful when engraving / cutting an item that is oddly shaped.

    e. Select Job type

          **Raster = Engraving**
          **Vector = Cutting**

f. Speed / Power / Frequency settings can be found in the Epilog Manual, the last page of the 1 on 1 handout, or at https://www.bosslaser.com/laser-settings.

g. Press Apply, and then press Okay to send the job to the laser cutter / engraver.

5. **To Begin Sent Job on Laser Cutter:**

   a. Press Go to start

   b. Press Stop or Reset to emergency stop job.

   c. You can re-run the same job by simply pressing Go again.  This allows you to do multiple passes on materials to get a desired effect or depth of engraving.  This is also useful if needing to make many copies of a particular design.  The laser cutter has memory, so it will remember every job sent unless manually deleted or switched off.

   d. Main keys on laser cutter

      i. Go = Starts a job

      ii. Stop = Stops a job

      iii. Focus = Moves the bed up and down

      iv. Reset = Stops all jobs and returns laser to home position

      v. Trash Can = Deletes selected job

      vi. Config – **FOR TECH SUPPORT ONLY (DO NOT TOUCH)**

## Settings Tips

The JCPL Laser Cutter is an Epilog 40 Watt Mini. The 40-watt information needs to be taken in to account when you find setting suggestions from online sources, such as the settings page on https://www.bosslaser.com/laser-settings.

**Power Settings:**

- Higher burns deeper, but too much power sacrifices detail or damage material.
- Lower burns shallower, but too little power sacrifices detail and necessitates multiple passes.

**Speed Settings:**

- Higher saves time, but burns shallower and reduces detail sometimes necessitating multiple passes.

- Lower increases time, but burns deeper and if it is too deep, it will reduce detail or damage material.

**Frequency Settings:**

- Higher frequencies are transient and will not pass through dense material, such as wood, but will cut paper or acrylic just fine.
- Lower frequencies have more sustain and are capable of cutting through denser materials, such as wood, but can distort or damage materials such as cork or acrylic.
- Hz can be translated in PPI (Pulses Per Inch).  The frequency corresponds to the number of laser pulses being fired per inch of material.  For example, 500hz = 500PPI.

# JCPL Approved Material

**Materials that may be engraved (raster):**

- Acrylic
- Anodized Aluminum
- Bamboo
- Cork / Mat Board
- Granite
- Marble
- Paper / Card Stock
- Wood / MDF
- Avonite, Corian, Melamine
- Rubber
- Leather

## Materials that may be cut (vector):

- Acrylic (up to ¼" thick)

- Bamboo

- Cork / Mat Board

- Paper / Card Stock

- Solid Medium-Soft Wood / MDF (up to ¼" thick)

- Leather

## JCPL Banned Materials for use in its Laser Cutter

**Banned Materials:**

- PVC (including vinyl)

- Galvanized Metal

- Styrofoam / Hobby Foam

**ABSOLUTELY NO PVC (INCLUDING VINYLS), GALVANIZED METAL, OR FOAM IS TO BE USED IN THE LASER CUTTER.  THESE MATERIALS, WHEN IN CONTACT WITH A LASER, RELEASE POISON GAS.**

| Material | 300 DPI Raster Engraving Speed/Power | 400 DPI Raster Engraving Speed/Power | 600 DPI Raster Engraving Speed/Power | Vector Cutting Speed/Power/Frequency |
|---|---|---|---|---|
| Acrylic | 100/70 | 100/60 | 100/50 | 1/8": 12/100/5000 ; 1/4": 8/100/5000 |
| Alumamark | 90/45 | 90/40 | 90/35 | NO VECTOR CUTTING |
| Anodized Aluminum | 100/60 | 100/50 | 100/45 | NO VECTOR CUTTING |
| Bamboo | N/A | N/A | 80/20 | NO VECTOR CUTTING |
| Cork | N/A | N/A | 80/20 | 25/45/500 |
| Granite | N/A | 10/100 | N/A | NO VECTOR CUTTING |
| Marble | 20/100 | 25/100 | 30/100 | NO VECTOR CUTTING |
| Mat Board | 100/65 | 100/55 | 100/45 | 30/40/500 |
| Paper (Card Stock) | N/A | N/A | 90/30 | 70/30/2500 |
| Wood (Alder-Cherry-Maple) | 40/100 | 50/100 | 60/100 | 1/8" : 40/100/500 ; 1/4": 10/100/500 |
| Laserable Plastic | 100/50 | 100/45 | 100/40 | 20/80/5000 |
| Leather | 100/40 | 100/35 | 100/30 | 1/8" : 50/90/500 ; 1/4": 30/100/500 |
| Glass | 20/100 | N/A | N/A | NO VECTOR CUTTING |
| Stainless Steel (with Coating)* | N/A | 35/100 | 40/100 | NO VECTOR CUTTING |
| Brass (with Coating)* | 100/65 | 100/55 | 100/45 | NO VECTOR CUTTING |