

LASER CUTTER ORIENTATION



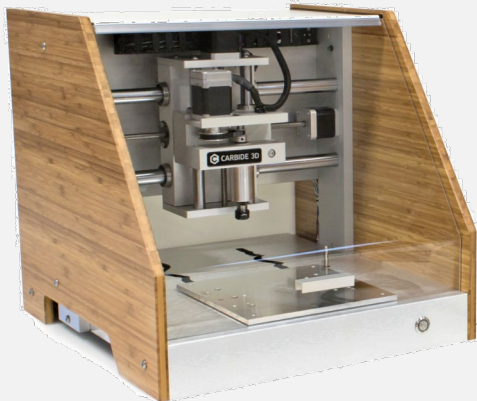
POLICIES AND PROCEDURES

KEY POINTS:

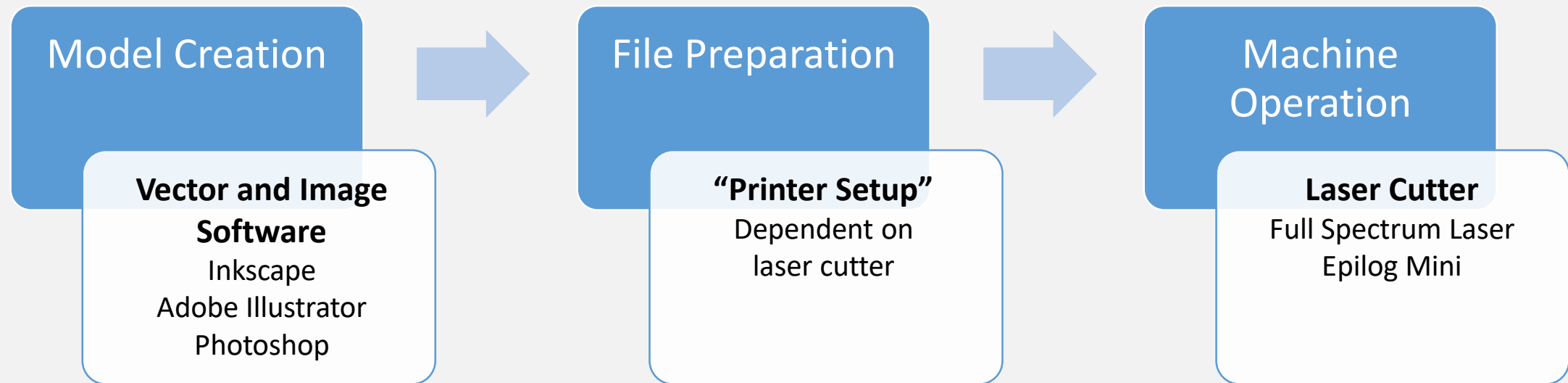
- Patrons need to be badged in the machine to be requested (e.g., earn the “Laser Cutter” badge to use any HCPL Laser Cutter).
- Patrons need to be present throughout the use of the laser cutter.
- Patrons under age 16 must be accompanied by an adult guardian.
- Illegal or inappropriate items, or items which would violate copyright laws are not permitted.
- Default reservation time is one hour, with extensions possible based on machine and staff availability.
- Library staff supervision required at all times.
- Makers supply their own material, subject to approval from Lab Staff.

DIGITAL FABRICATION

Manufacturing process where the tools/machines are controlled by a computer



DIGITAL FABRICATION: LASER CUTTING





**DO NOT LEAVE LASER
UNATTENDED DURING
OPERATION**

EPILOG MINI 60W CO₂ LASER

- 24" x 12" Working Area
- Vector Cutting & Engraving and Raster Engraving
- Cuts wood and acrylic up to ¼" thick

Generally allowed materials: natural wood, natural fabric, tile, paper, cardboard, acrylic

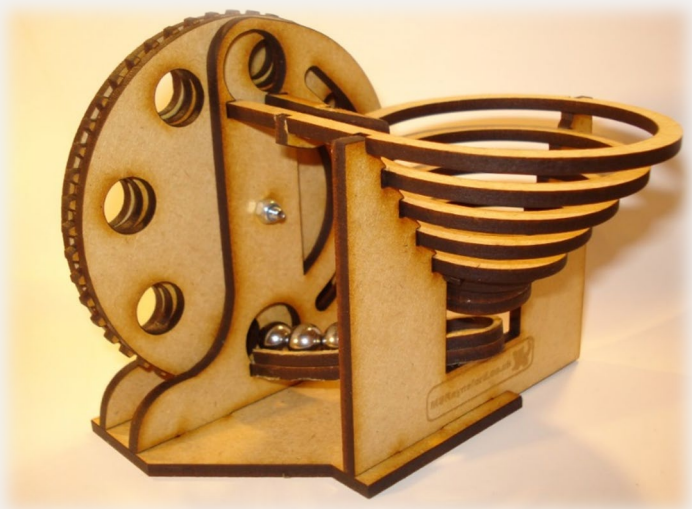
No PVC or chloride-containing materials!



MATERIAL SOURCES

- Hobby Stores (Michaels, JoAnn, Texas Art Supply, etc.)
 - Balsa wood, thin birch plywood, EVA craft foam, cardstock, foam-core, slate, craft paper
- Hardware Stores
 - MDF, thin plywood, thin poplar wood, tiles, acrylic
- Art Supply Stores
 - Scratch board, canvas board, foam-core
- Inventables.com
- JohnsonPlastics.com (was laserbits.com)
- Local plastic suppliers (A&C Plastics, Regal Plastics, etc.)

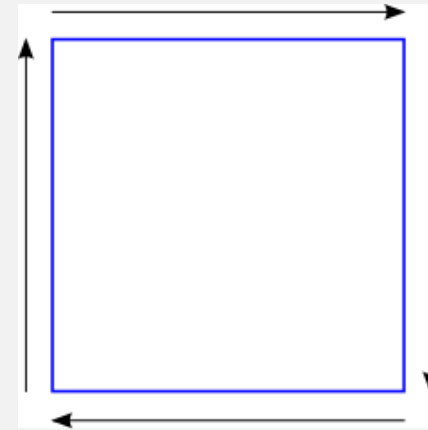
PROJECT IDEAS FROM EPILOG.COM



MODES OF OPERATION

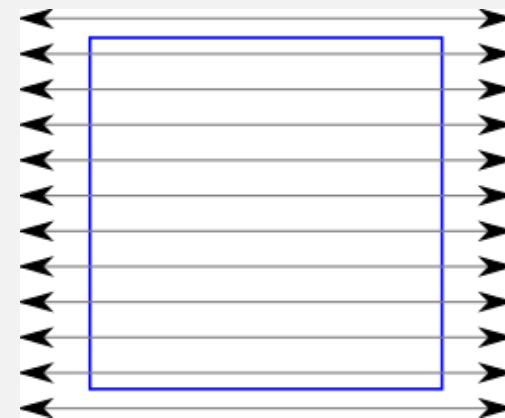
- **Vector**

Cutting precise shapes or engraving/etching precise lines



- **Raster**

Printing and engraving bitmap images



7x Magnification



Vector



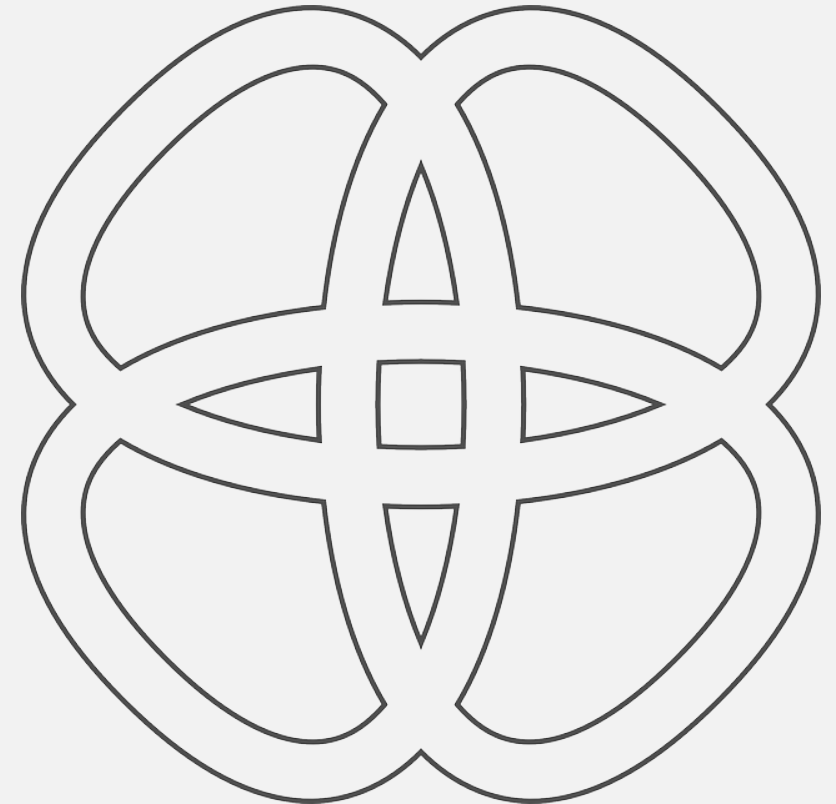
Bitmap



VECTOR
VS.
BITMAP

VECTOR IMAGES

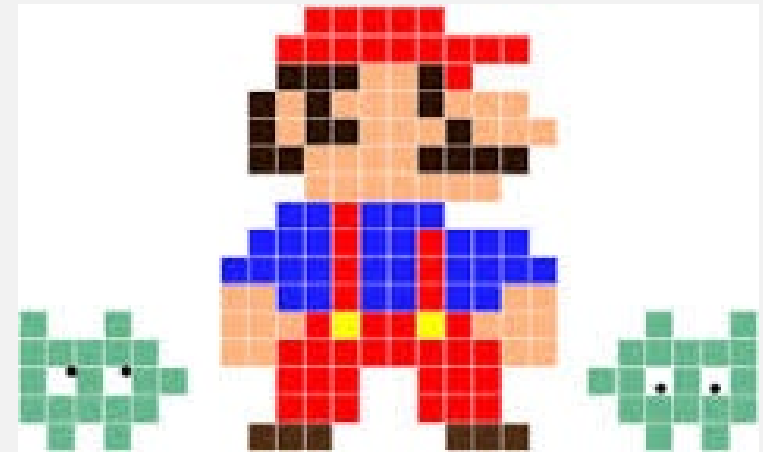
- CAD programs (.dxf, .dwg)
- Inkscape (.svg)
- Adobe Illustrator (.eps, .ai)
- CorelDRAW (.cdr)
- Portable Document Format (.pdf)



BITMAP IMAGES

Many common file types:

- Windows Bitmap (.bmp)
- Graphic Interchange Format (.gif)
- Joint Photographic Expert Group (.jpeg)



FILE PREPARATION (EPILOG)

- The laser cutter is seen by the computer as a printer. Adobe Illustrator (available in the Maker Street lab) is the most reliable software for use on the Epilog.
- For vector cutting and engraving, make line thickness ≤ 0.001 pts.
- For rastering, make lines ≥ 0.2 pts.
- The Epilog laser software can recognize different colors for vectoring (line color) and rastering (fill color). You can specify cutting order, speed and laser power.
- The document size should match the document size of the work material.

SOURCES OF VECTOR FILES

[Inventables.com/projects](https://inventables.com/projects)

Obrary.com

Thingiverse.com

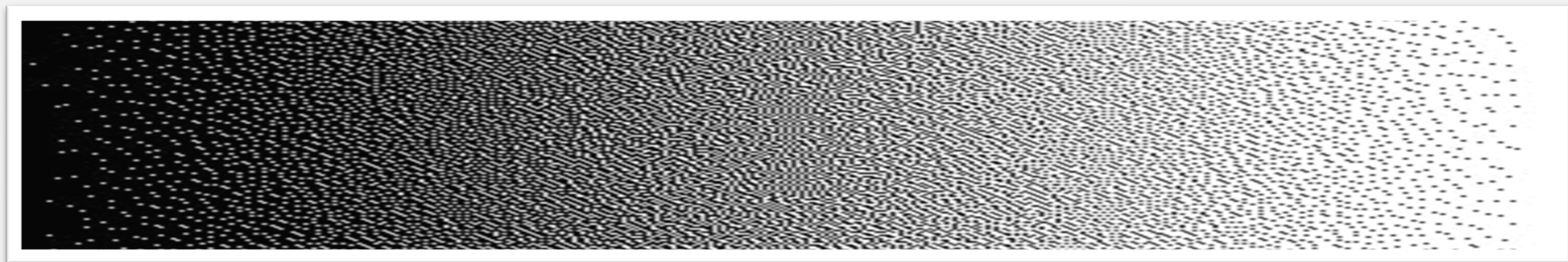
Makercase.com

Vecteezy.com

Epiloglaser.com/resources/sample-club.htm

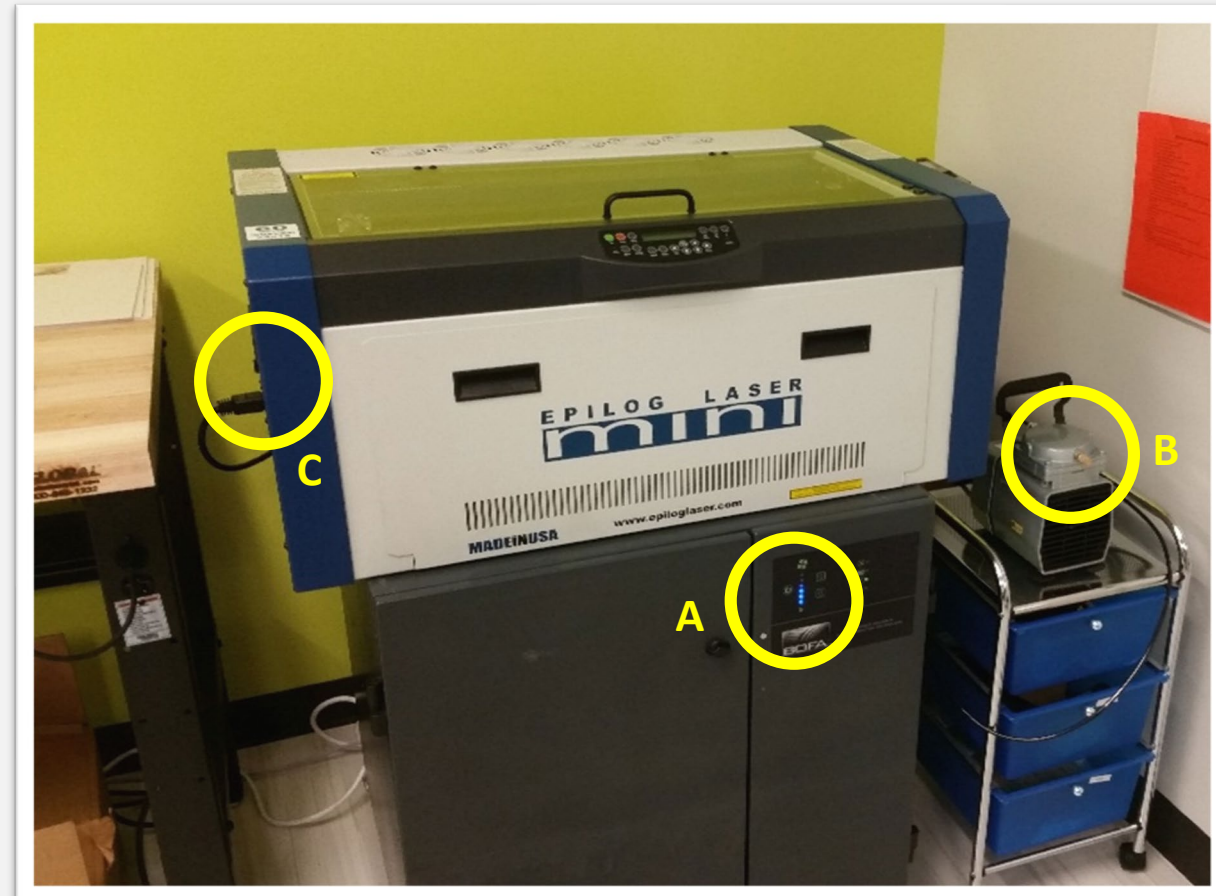
ENGRAVING BITMAPS

- The laser can only print black pixels. Grayscale is printed by changing the pixel density.
- Print grayscale by selecting “Image Dithering” options from within the printer software. Different options will give different effects.
- The quality of the original image will have a significant effect on the quality of the engraving



PREPARING THE LASER CUTTER

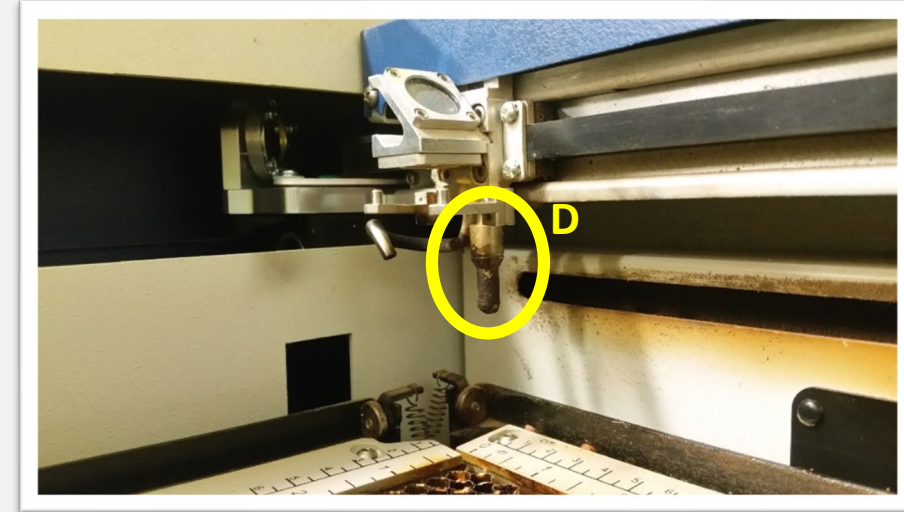
1. Turn on ventilation (A)
2. Turn on air pump (B)
3. Turn on Epilog laser (C)



PREPARING THE LASER CUTTER

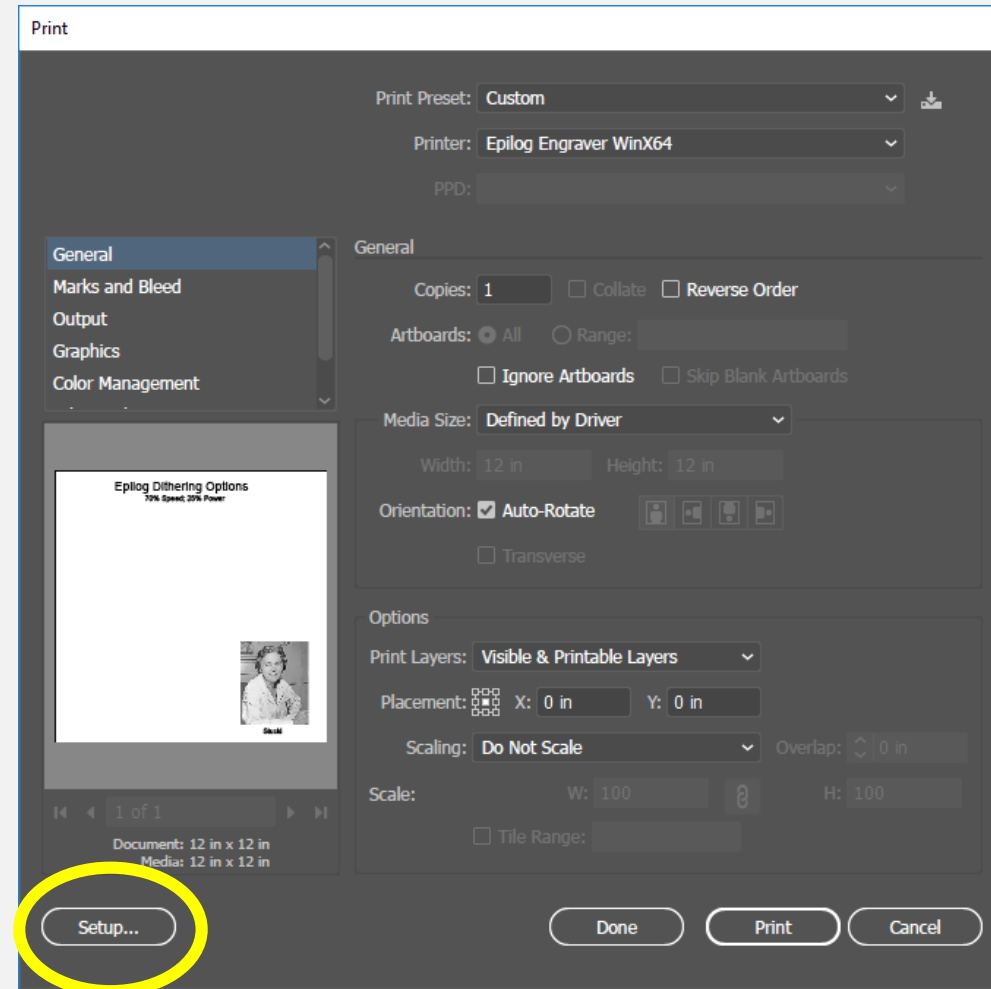
- 4) Position work material in back left corner
- 5) If focus plunger (D) is touching the surface of work material:
 - Remove material
 - Press the “Focus” button
 - Lower the bed until the plunger clears the material
 - Press “Reset”
 - Return work material

Time for software!



PREPARING THE SOFTWARE

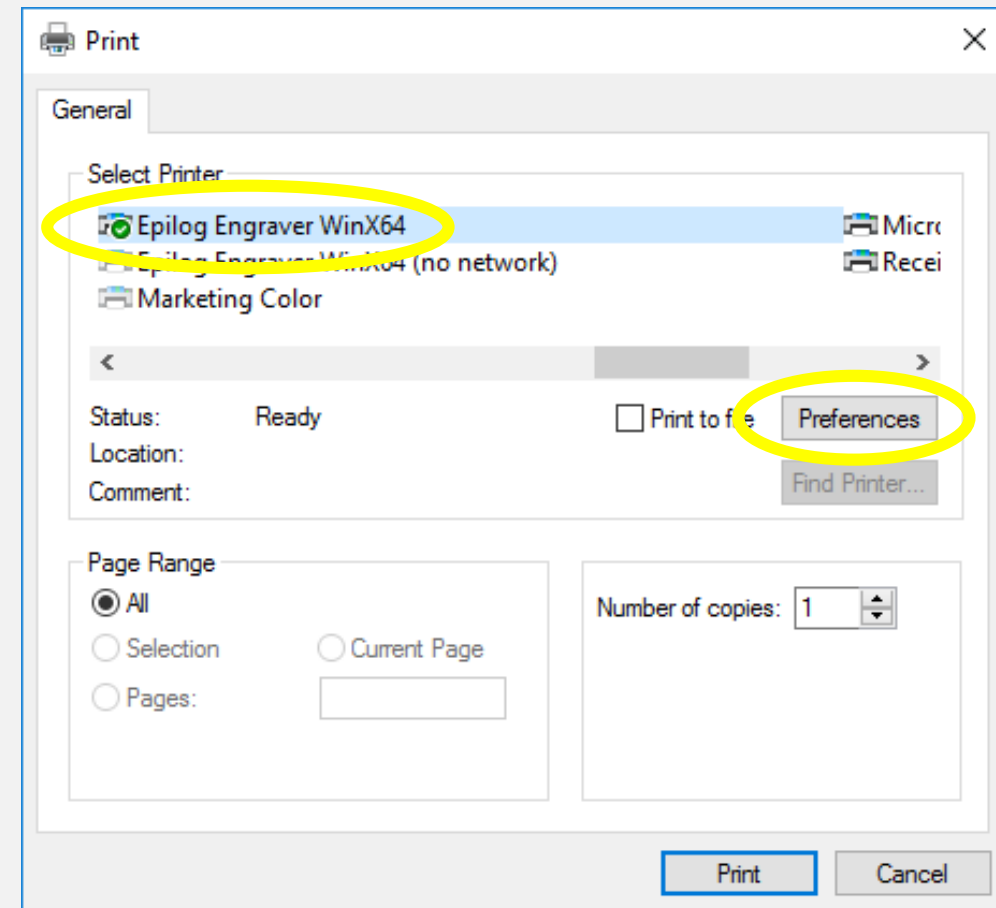
- 6) Open Adobe Illustrator and open your file
- 7) Under the “File” menu, click on “Print”
- 8) Click on “Setup”



PREPARING THE SOFTWARE

9) Verify that the “Epilog Engraver WinX64” printer is highlighted in blue

10) Click on “Preferences”



PREPARING THE SOFTWARE

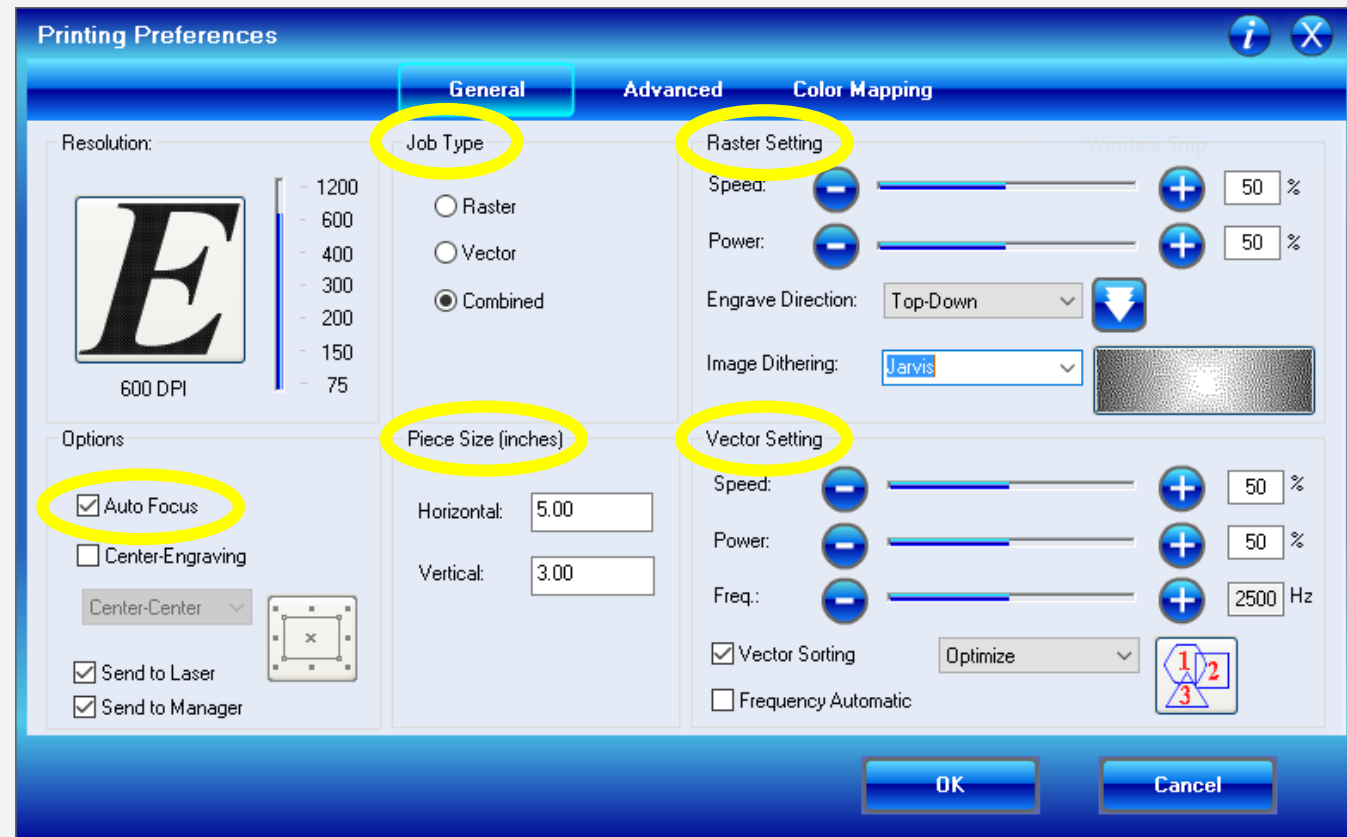
11) Select “Job Type”

12) Set “Raster Setting” and/or
“Vector Setting”

13) Set “Piece Size” to match
artwork size

14) Select “Auto Focus”

15) Press “OK”



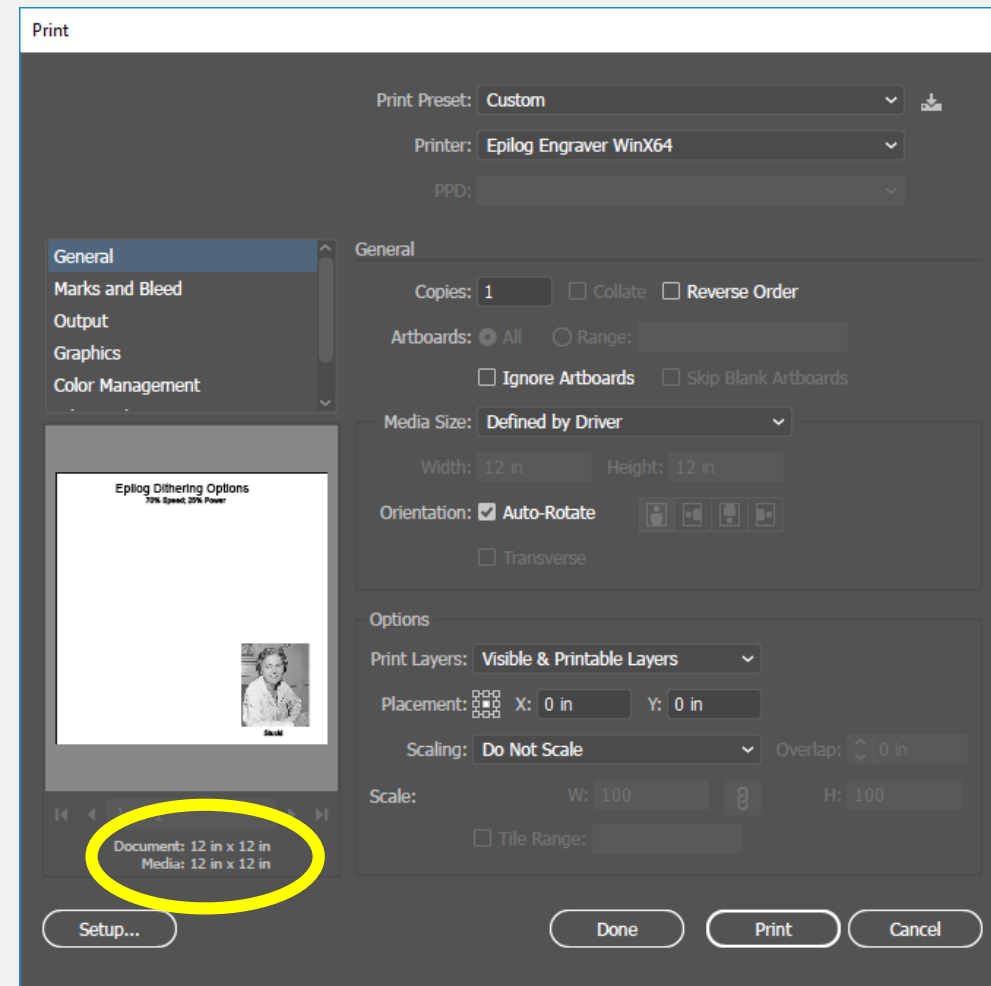
PREPARING THE SOFTWARE

16) Verify that the “Document” size and the “Media” size are the same. If not:

- Press “Setup” on the Print Menu
- Press “Print” on the Preferences Menu
- This should correct the error

17) Press “Print” on the Print Menu

- This sends the job to the laser cutter
- The job will not begin until you start the job from the laser



RUNNING THE JOB

18) Verify your file name in the
“Job” display

19) Hit “Go”

20) Supervise the job at all
times

21) When job is finished...

- Wait at least 15 seconds after all visible smoke has cleared before opening lid.
- At the end of a session, turn off the air pump. Wait at least 5 minutes before turning off laser and ventilation.



SAFETY AND TIPS

If there is a lot of smoke...

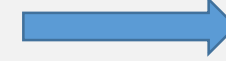
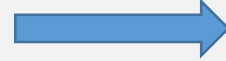
- This clouds the optics and cause them to get dirty – stop the job and lower the power.

If there are flames...

- Small flares are expected. Large flames are not – stop the job and lower the power.
- If the material catches fire or is smoldering, stop the job and home the laser. Use the spray bottle of water for small problems and keep the lid closed until the smoke clears.

SIGN UP FOR MAKER CENTRAL

hcpl.beanstack.org



It is required that you enroll in the Maker Central program to learn about maker machines, how to use them, and book them for your use.

EARNING YOUR BADGE

- Access “Maker Central” (available from hcpl.beanstack.org)
- Create an “Individual” account
 - You don’t need to sign up if you already have a Beanstack account for the Summer Reading Program
- After signing in you can activate Maker Program if it is not already checked.
- Staff will register your orientation completion in the Beanstack system within 2 business days
 - You will receive a confirmation email for receipt of your badge
 - After being badged you are able to click on the rewards tab and make a laser cutter reservation.
- Upon completion of the full orientation you are able to earn additional model specific laser cutter badges. Utilize other laser cutter models within branches by simply scheduling the machine at that branch. (Retaking the full orientation class is not required.)
- Enjoy the perks of being a badged HCPL Maker!



HARRIS COUNTY
PUBLIC LIBRARY
your pathway to knowledge
hcpl.net

@HarrisCountypl
#HCPLmadeit

**We would love for
you to share
creations on HCPL
social media sites!**

MAKING A RESERVATION

hcpl.beanstack.org



More Challenges

Other available challenges.

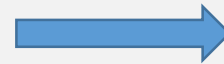
It's as easy as 1, 2, 3!

- 1 LEARN**
AT YOUR HCPL
ORIENTATION
- 2 BADGE**
WITH BEANSTACK,
& RESERVE
EQUIPMENT
- 3 MAKE!**
LET YOUR
IMAGINATION
COME TO LIFE

Activities

Maker Central

Ongoing



Maker Central

Ongoing Program

Overview

Activity Badges

Earned Badges

Rewards

Rewards

7/8 Earned Rewards

6

Reserve a 3D PRINTING machine: Go to your REWARDS tab for the reservation link!

Unlocked with 3D Printer Badge on November 16, 2021.

Instructions

Congratulations! You've earned the 3D Printer badge.  **click** here!

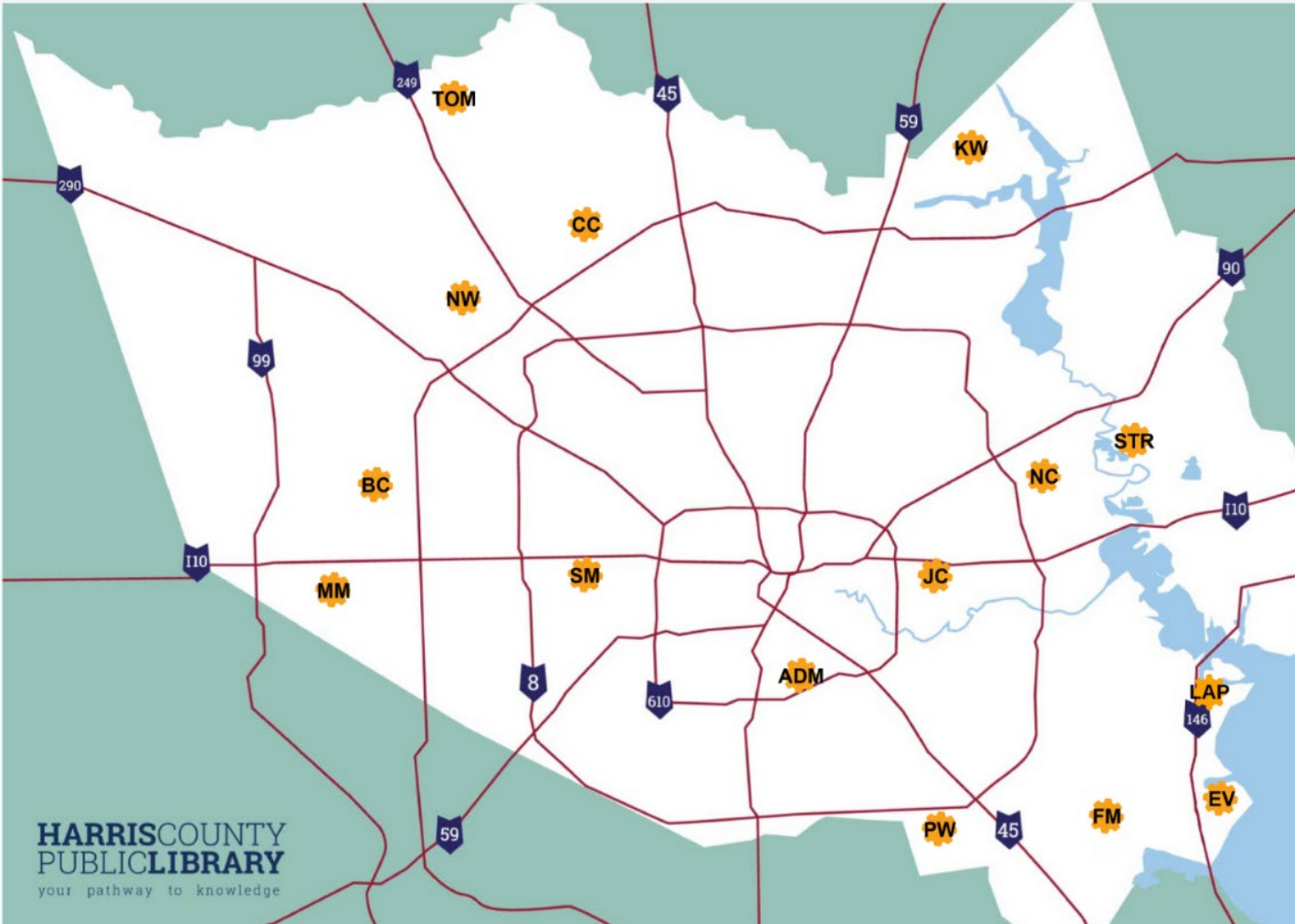
Harris County Friends of the Library



Laser cutting and other services are made possible with the support from the Harris County Friends of the Library and other generous donors.



DIGITAL FABRICATION OPPORTUNITIES @ HCPL



- 1: Administration**
3D Printing
Laser Cutting
Vinyl Cutting
- 2: Freeman Branch**
3D Printing
Laser Cutting
CNC Milling
Vinyl Cutting
- 3: Evelyn Meador Branch**
3D Printing
Laser Cutting
CNC Milling
- 4: North Channel Branch**
3D Printing
- 5: Kingwood Branch**
3D Printing
Laser Cutting
- 6: Barbara Bush Branch**
3D Printing
- 7: Katherine Tyra Branch**
3D Printing

- 8: Lone Star College – Tomball Community Library**
3D Printing
Laser Cutting
- 9: Jacinto City Branch Library**
3D Printing
- 10: Highlands Stratford Branch Library**
3D Printing
- 11: High Meadows Branch Library**
3D Printing
- 12: Spring Branch Memorial Branch Library**
3D Printing
- 13: La Porte Branch Library**
3D Printing
- 14: Maud Marks Branch Library**
3D Printing
Laser Cutting
- 15: Northwest Branch Library**
3D Printing
- 16: Parker Williams Branch Library**
3D Printing
CNC Mill
Laser Cutting

Presenter Contact Information

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Phone: 713-274-6688



Innovation Lab – Houston: Administration

Innovation Lab – **Katy:** Maud Marks Branch

Innovation Lab: **Kingwood:** Kingwood Branch

Innovation Lab: **Houston:** Parker Williams Branch

Innovation Lab – **Clear Lake:** Freeman Branch

Maker Space – **Seabrook:** Evelyn Meador

Innovation Lab – **Tomball:** LSC/Tomball Community Library