

Laser Engraver Basics

Inspiration Station: Geauga County Public Library's Maker Space Instructions

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Introduction

The library has an **Epilog Laser Mini 24** which can engrave and cut glass, plastic, paper, cardboard, fabric, and wood. Check the Materials List or the Material Settings list in the Inspiration Station for more information. The machine can engrave extremely intricate designs and photographs in a grayscale engraving.



Always use the fan and air compressor while the laser engraver is running to avoid fire.

Never leave the laser engraver unattended while running.

**If working on a cylindrical object such as a drinking glass,
go to [Laser Engraver Basics – Cylindrical Designs](#)**

To use the laser engraver, your file should be the same dimensions as your material or include the proper dimensions for the final product. It also should be a **PDF** file.

The Maker Space has Adobe **Illustrator** software on multiple computers, so will be used in this tutorial and is available for you to use for any design needs. You can also use CorelDRAW or Inkscape (free open-source software). You can use any design software for engraving designs but need vector lines for cutting. Check out **LinkedIn Learning** on the GCPL website for tutorials on this software.

Changing the Home Position

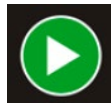
Pressing the X/Y Off key and then pressing the Go key disables the X and Y motors and allows you to move the carriage by hand to any location on the table. This way you can make sure to focus correctly on odd-shaped items or be specific about exactly where the design should be engraved.

Manually focus anywhere on the table or with the rotary attachment.

1. Press the **X/Y Off** key



2. Press the **Go** key

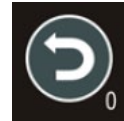


3. Carefully move the carriage to the desired focus position.
4. Place the manual focus gauge on the carriage and press the **Up** or **Down** arrow keys to move the table up and

down until the focus gauge is just touching the material.



5. Press the **Reset** key to send the carriage back to its park position.

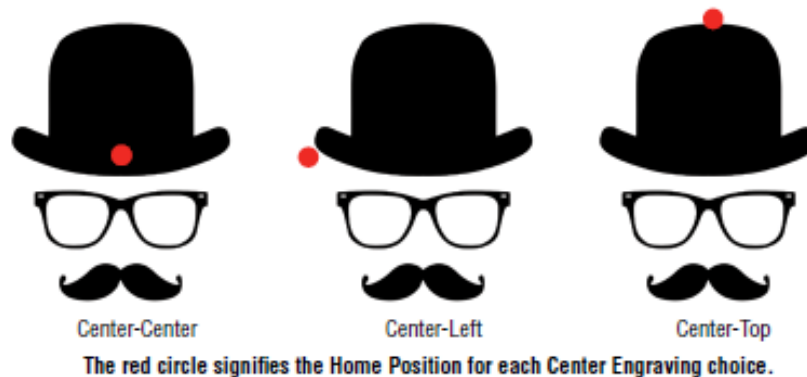


Create a new temporary Home Position.

Changing the Home Position allows you to set where you measure the design for more accurate results.

You can choose different points instead of Center-Center depending on your preferences.

- Center-Center: lines the center of the artwork to the center you choose. You can also do Center-Left and Center-Top which work as illustrated below:



- Page-Center: lines the center of the workspace (or full page) of the file with the center you choose.

How to change the Home location:

1. Press the **Red Dot Pointer** key to locate the precise position where you want the new Home Position.



2. Press the **X/Y Off** key and then the Go key to manually move the carriage to the proper location.

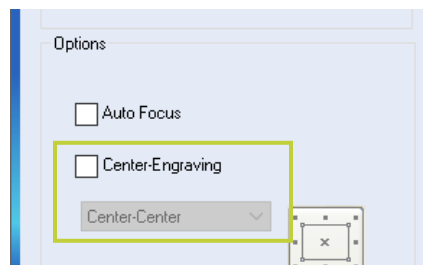


3. Carefully move the arm to line the red dot with the center of your piece or where you want center to be.
4. Press the **Set Home** key.



- a. Pressing the **Reset** key will move the carriage to its park position ½ inch to the front of where you set home.

When ready to engrave, make sure to check the box next to “Center Engraving” on the Properties window. Leave it set to “Center-Center.” If not checked, the job will not start.



Resetting Home Position

When you are finished with your specific project, return the carriage back to the default home position for the next user.

1. Press the **Maintenance** key.



2. Press the **Down** arrow key to see **1. Restore Home.**



3. Press the **Go** key.



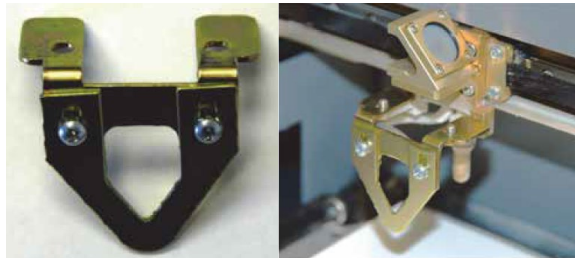
- a. The carriage will return to the top left corner.

Engraving Your Flat Design

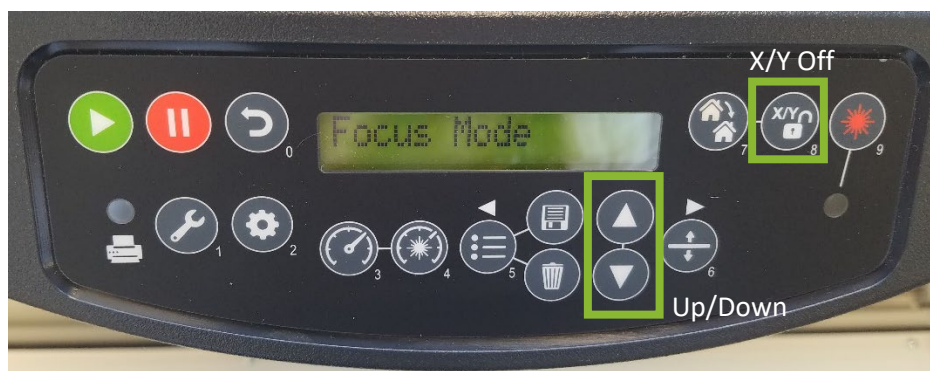
1. Turn on the laser engraver.
2. Move the bed down to give yourself space if needed.
 - a. Press the **Focus Mode** Button and then press the Down arrow until your material and the manual focus tool can fit.



3. Place your flat material on the bed.
 - a. Put the material in the top left corner.
4. Flip the Manual Focus Tool so that it points down towards the item.



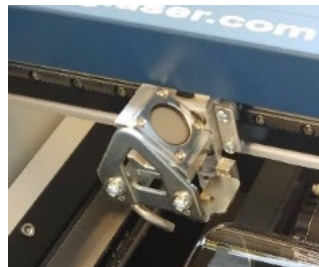
5. Press the **UP** and **DOWN** arrows on the engraver to raise and lower the bed.
 - a. If you wish to focus anywhere on the table other than the upper left corner, press the **X/Y Off** button and then **Go** to disable the axes and gently move the carriage by hand. Press the Reset button to return the engraver to Focus Mode.



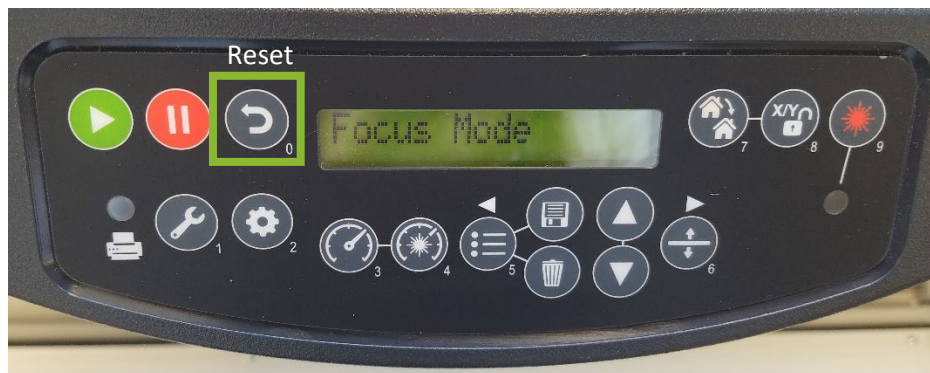
6. Bring the item up on the bed until it just barely touches the Manual Focus Tool. The laser is now focused.



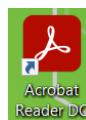
7. Flip back up the **Focus Tool**.



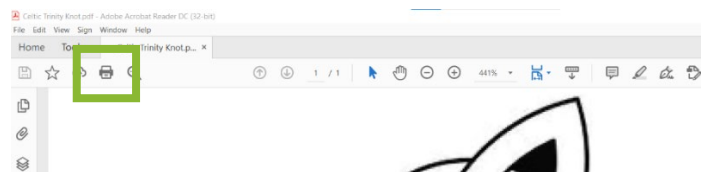
8. The item is now properly focused. Press the **Reset** button to exit Focus Mode.



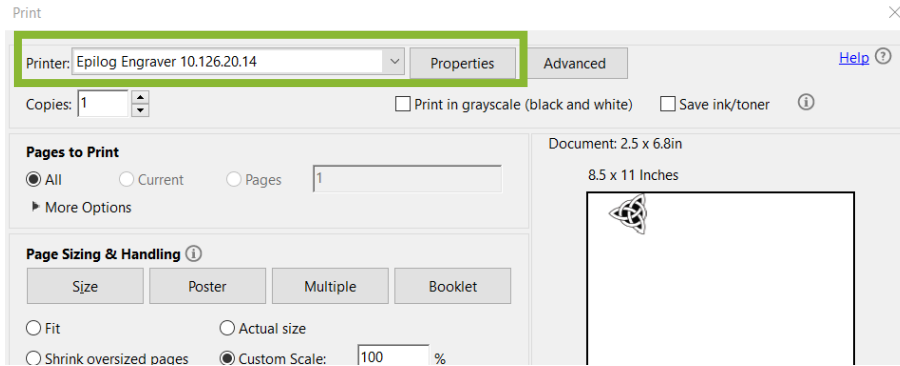
9. Plug in your USB drive to the engraver laptop.
10. **Open** the PDF file you want to print with Adobe Reader.



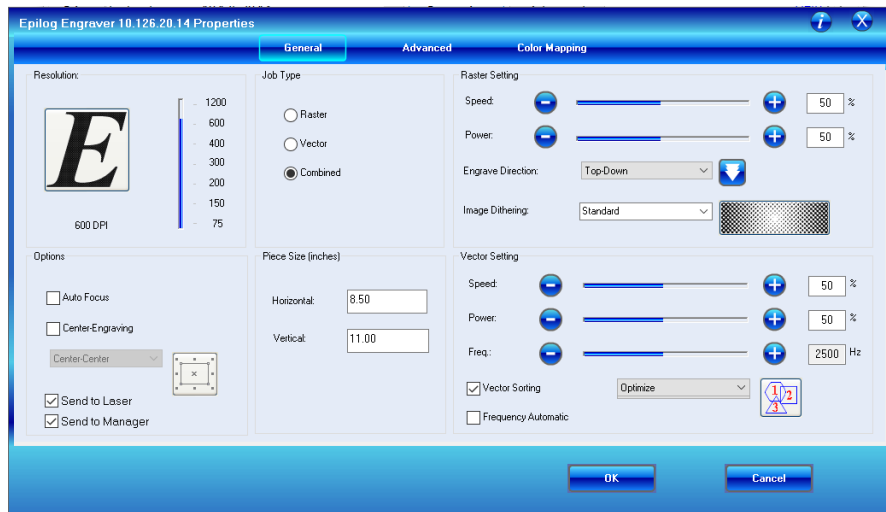
11. Click the **Print** icon.



12. Make sure the Epilog Engraver is chosen as the printer. Then click **Properties**.



- a. This will open the Epilog Engraver Driver.

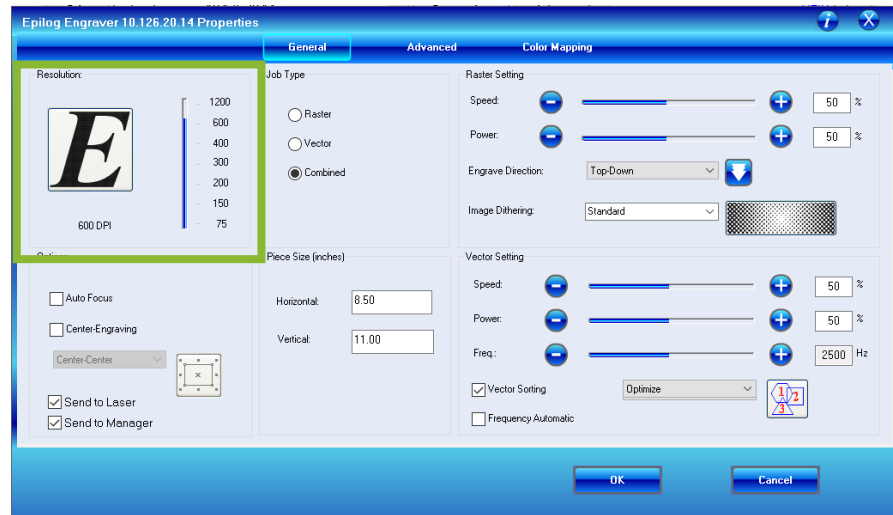


13. Refer to the chart next to the laser engraver in the maker space.

- It is also on the laser engraver's computer desktop as: Laser Engraver Material Settings
- This chart is simply a suggestion or a starting point. You do not need to follow exactly, but these are the settings that Epilog has found best. Experiment with the settings if you feel comfortable doing so.
- For example, below is the information for acrylic. The circled areas are what we will need.
 - The hypothetical project we will create is a text/clipart engraving and cut on a 4 x 4 x 1/8 inch acrylic sheet.

Epilog Mini Suggested Material Settings				
Material	Resolution	Frequency	Speed	Power
Acrylic				
Photo Engraving	300 DPI		90%	55%
Text/Clipart Engraving	300 DPI		90%	75%
Text/Clipart Engraving	600 DPI		90%	70%
Cutting 1/8" (3 mm)		5,000 Hz	12%	100%
Cutting 1/4" (6 mm)		5,000 Hz	6%	100%
Cutting Note: Adjusting the standard focus distance so it is closer to the lens by about .030" (.762 mm) will produce better edge quality on 1/4" acrylic and thicker. Two passes may produce better results and allow for cutting through thicker materials. There are two types of acrylic: cast is better for engraving (creates a frosted look when engraved) and extruded acrylics are better for smooth-edge cutting.				

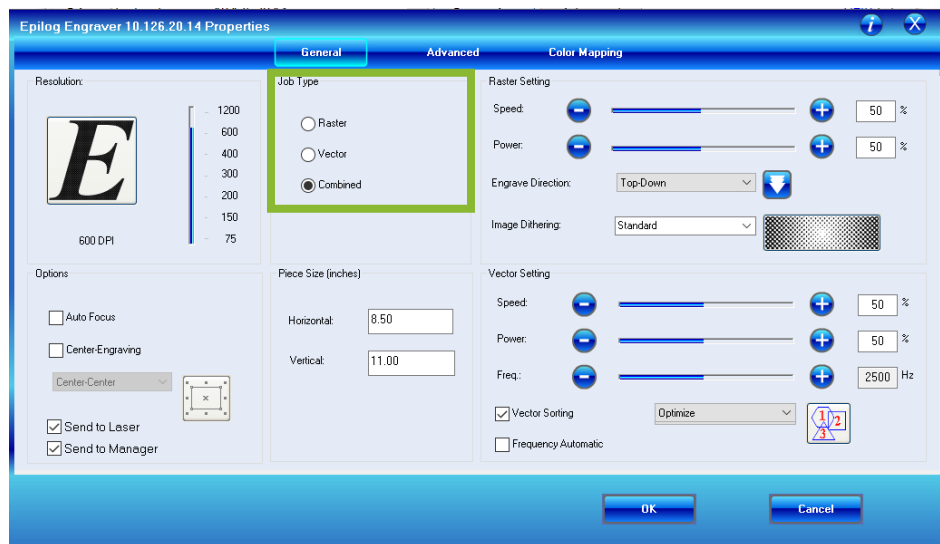
14. Choose the **Resolution: DPI** (dots per inch)



- a. For our example, since it is a text/clipart engraving, we would set the DPI at either 300 or 600 DPI. If our design was complex or small, having 600 DPI could make better results, but is not always necessary. Let's say we chose 300 DPI.

15. Choose the **Job Type**: Raster, Vector, or Combined

- a. Raster = Engrave Only
- b. Vector = Cut Only
- c. Combined = Engrave and Cut
 - i. For the example, it is Combined since it will engrave and cut.



16. Set the **Raster Setting** (for Raster or Combined job types) – *Skip for Vector jobs*. These are the engraving settings.

- a. Change the **Speed** and **Power** according to the Engraving Settings on the chart.
 - i. For the example, we would set the speed to 90% and the power to 75%.
- b. Choose the **Engrave Direction**
 - i. The default is to engrave from the Top-Down, which is good for most jobs.

c. Choose the **Image Dithering**

- i. Look at the preview next to the drop-down menu to see the difference between the image dithering options.
- ii. This changes how the dots of the laser are spaced, changing the look of the final engraving.

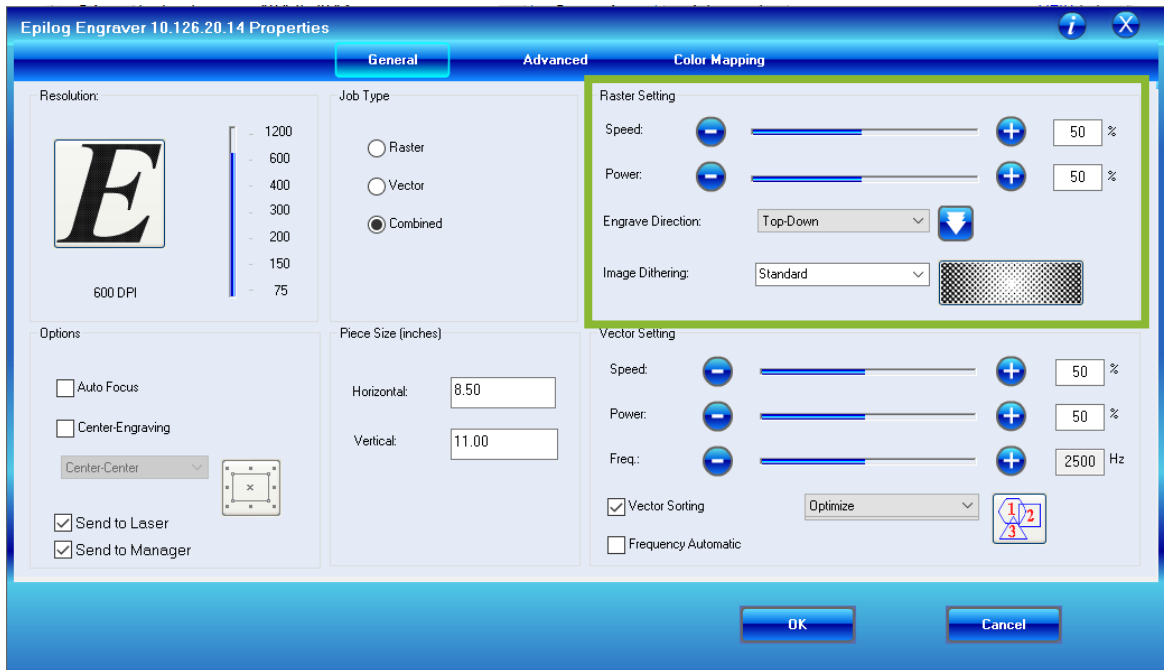


Image Dithering

Dithering defines how the dot patterns will be engraved in raster images that contain grayscale graphics, blends, or color images. There are six (6) different dithering patterns available. Standard is the default. Jarvis is an overall favorite.



300 DPI Standard Mode



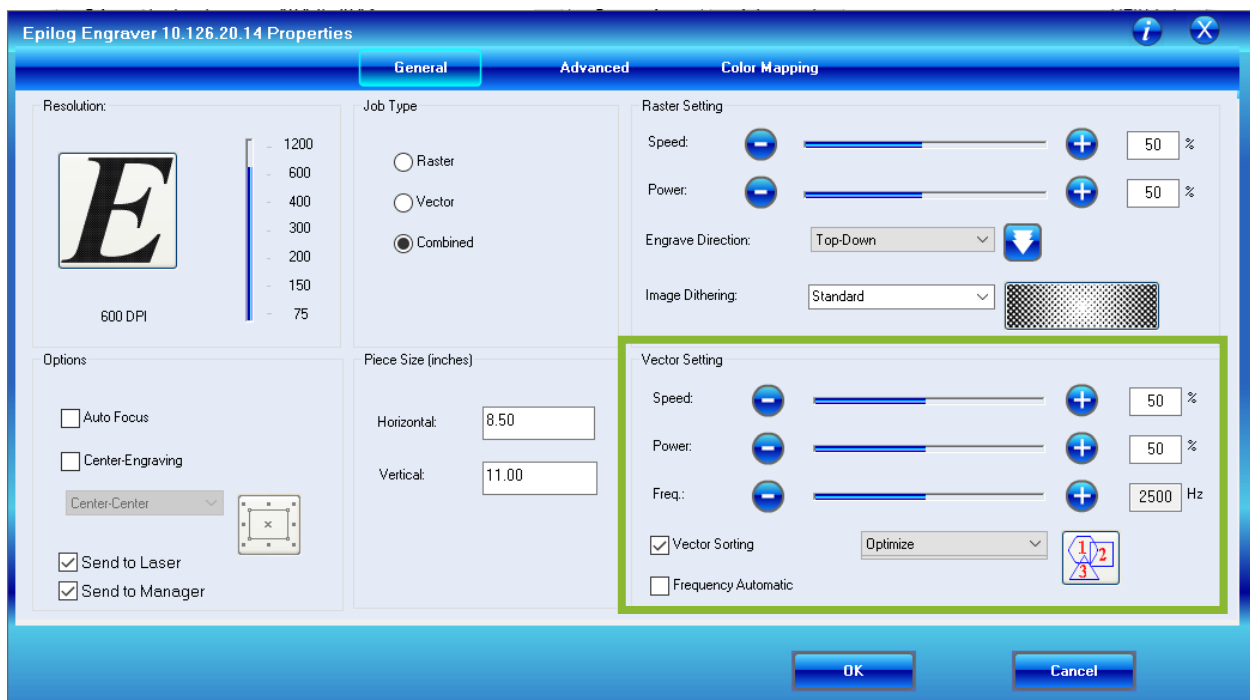
300 DPI Stucki Mode

Dithering is a great way to enhance your engraved products, but it is very material dependent. A dithering pattern that looks good on marble might look very different when engraved on plastic. Give yourself time to experiment with different dithering patterns. You will find which dithering patterns fit your uses.

Dithering Type	Best for	Notes
Standard	Text & Clip Art at 600 dpi	Default
Brighten	Text, Clip Art, & photos at 600 dpi	Great for engraving photos to wood or marble
Low Res	Low-resolution photos	Adds an artistic half-tone look
Floyd-Stenberg	High-detail photos	Wave-like pattern
Jarvis	Photos at 300 dpi	Very consistent for photos and glass
Stucki	Photos at 300 dpi	Very similar to Jarvis, slight difference

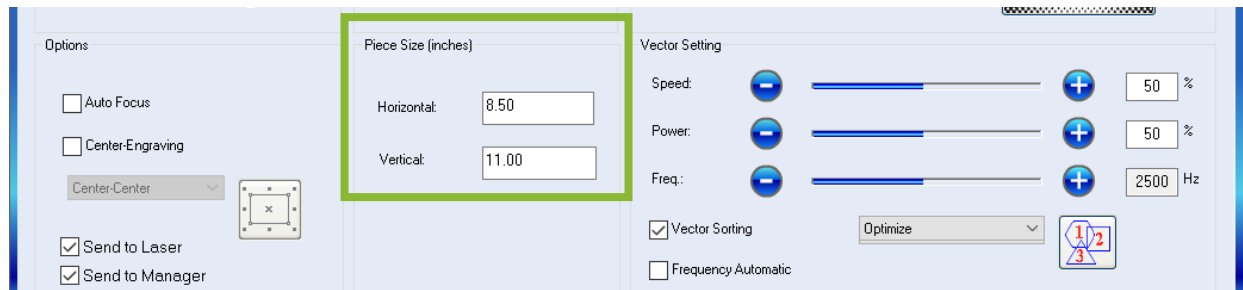
17. Set the **Vector Setting** (for Vector or Combined job types) – ***Skip for Raster jobs.*** These are the cutting settings.

- Change the **Speed**, **Power**, and **Frequency** according to the Cutting Settings on the chart.
- For our example, we would set the Speed to 12%, the Power to 100%, and the Frequency to 5000.
- Vector Sorting references what order the laser will cut. Leave Vector Sorting checked and the engraver will determine this automatically.

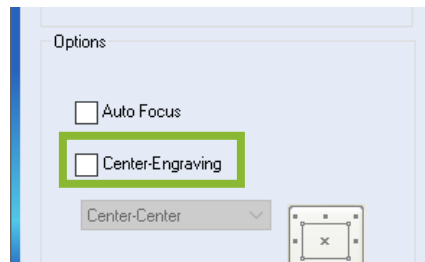


18. Change the **Piece Size** in Inches

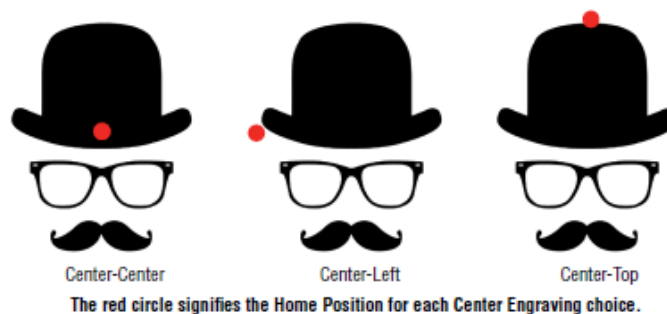
- This should be the size of your material. If you changed the Home Location, it can also be the size of your artwork or workspace.



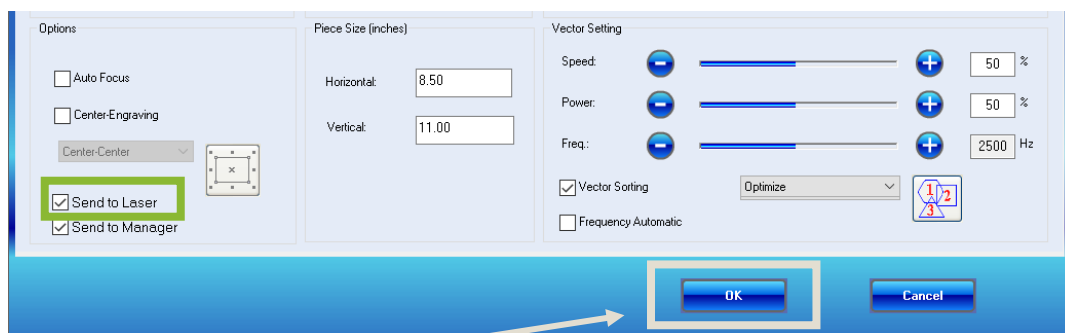
- a. For our example, we would set the Horizontal to 4 and the Vertical to 4 inches.
19. If you changed the Home Location, make sure you click the checkbox next to Center-Engraving.



- a. Choose from the drop-down menu which Center-Engraving you wish to use.
- i. Center-Center: lines the center of the artwork to the center you choose. You can also do Center-Left and Center-Top which work as illustrated below:

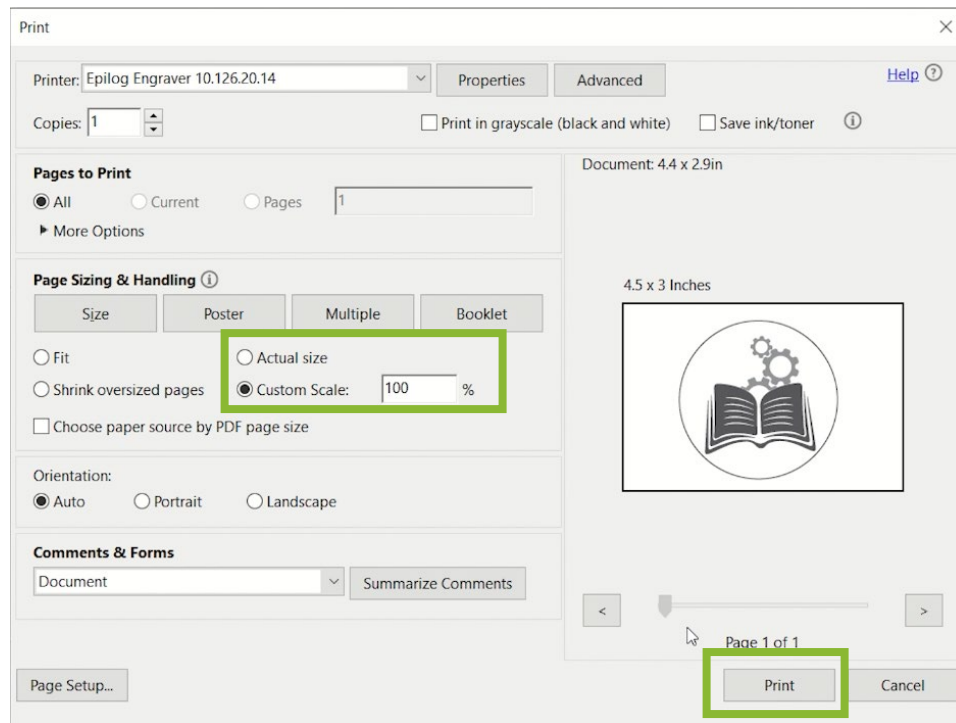


- ii. Page-Center: lines the center of the workspace (or full page) of the file with the center you choose.
20. Make sure **Send to Laser** is checked.



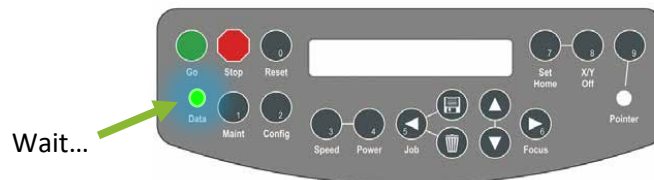
21. Click **OK**.

22. The preview of the print will update to show the changes. Make sure **Custom Scale** (set to 100%) or **Actual Size** is checked. "Fit" or "Shrink oversized pages" may change the size of your engraving and mess up the job.



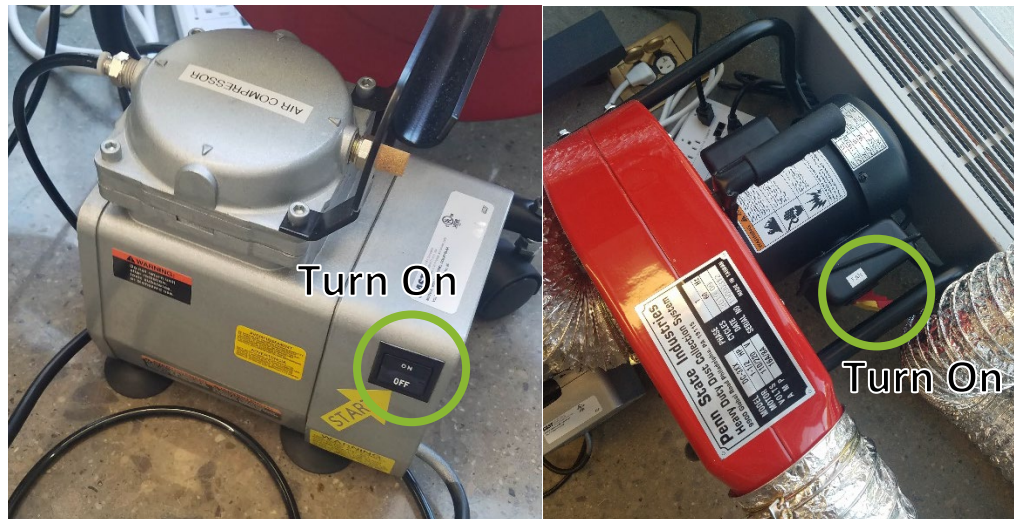
23. Click **Print**

24. The green light on the laser engraver will flash as it uploads the new job. Wait for the light to stop blinking before you print. If the job is small enough, you may not see the light blink.
- The name of the job will appear on the screen.



25. Turn on the air compressor and the fan.





a. ***This is very important*** as it will keep the machine clean and decrease the chance of fire.

- i. The air compressor blows air on the material to keep it from overheating.
- ii. The fan sucks away any smoke and dust.

26. Press **Go**.



a. The engraver will begin engraving. Once done engraving, it will cut if it's a combined job.

27. Watch the machine for the entire process in case there is a fire.

28. Once finished, open the lid, and remove your material.

29. You can now start another job or turn off the laser engraver if finished.

- a. The air compressor and fan can be left on for the entirety of your session. Make sure to turn them off before you leave.

Laser Engraver Basics

Cylindrical Designs

Inspiration Station: Geauga County Public Library's Maker Space Instructions

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Introduction

This tutorial explains how to engrave on cylindrical objects like drinkware and jars.

If working on a flat area (even on round items), use the [Laser Engraver Basics](#)

The library has an **Epilog Laser Mini 24** which can engrave and cut glass, plastic, paper, cardboard, fabric, and wood. Check the Materials List or the Material Settings list in the Inspiration Station for more information. The machine can engrave extremely intricate designs and photographs in a grayscale engraving.

To use the engraver, first design your PDF file and then create the job for the machine.



Always use the fan and air compressor while the laser engraver is running to avoid fire.

Prepare Your Cylindrical Design

When engraving on a cylindrical object, take different steps to prepare your design. Skip to the Rotary Attachment if your design is already prepared.

If changing the home location, skip to those directions for more information. These settings are ideal for designs that will go all the way around the item.

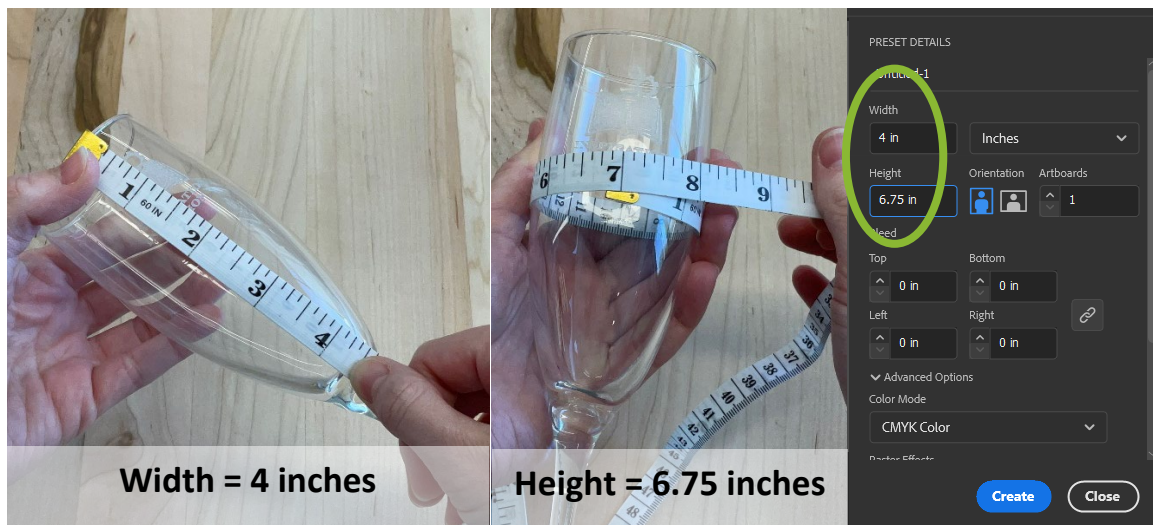
To use the laser engraver, your file should include the proper dimensions for the final product. It also should be a PDF file.

The Maker Space has Adobe **Illustrator** software on multiple computers, so will be used in this tutorial and is available for you to use for any design needs. You can also use CorelDRAW or Inkscape (free open-source software). You can use any design software for engraving. Check out **LinkedIn Learning** on the GCPL website for tutorials on this software.

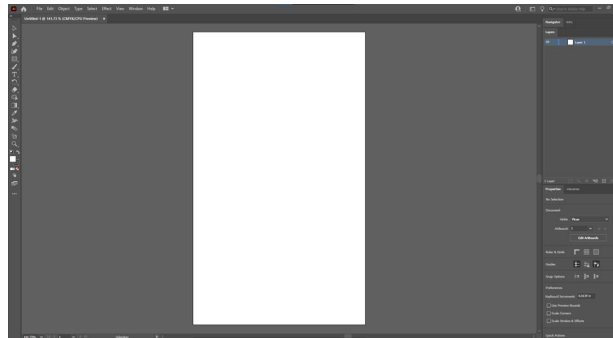
**Refer to this process to do it in the Inspiration Station,
but it can be done at home as well with different software.**



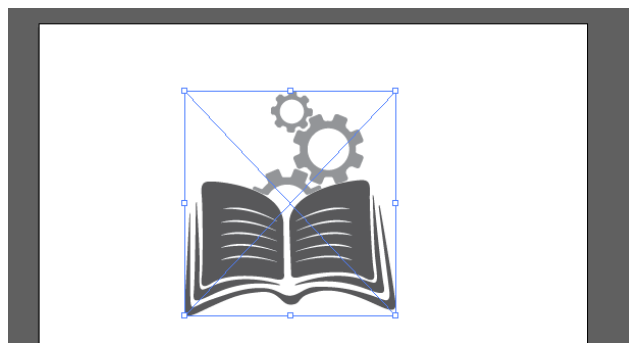
1. Open **Illustrator** and click **Create New** to create a new project.
2. Choose the size of your design. This should be the height of the object as your width and the circumference of the object as your height.



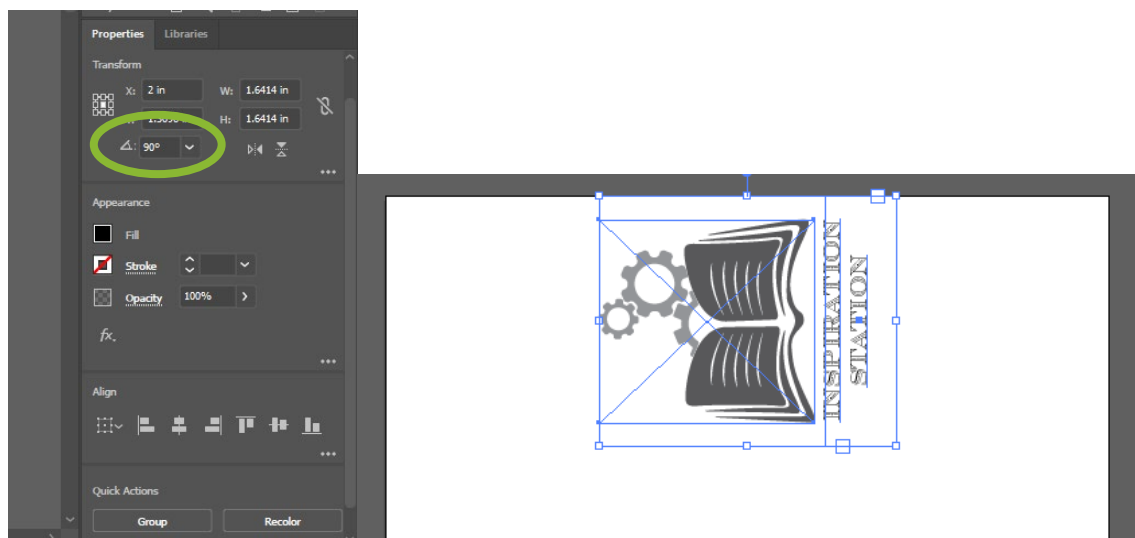
- a. The rotary attachment engraves sideways, which is why the height of the glass becomes the width.
3. Click **Create**



4. Add your design by clicking **File** and then **Place**
 - a. Find your file and click **Place**
 - b. Click and drag on the workspace until your design is a good size.



5. While having your design highlighted, rotate your design by **90°** (counter-clockwise) under **Properties** and place it along the top of the workspace.



- a. This will make it easy to know exactly where the engraver will start engraving.
 - b. If the design goes all the way around, you can center it on the workspace.
6. Save as **PDF**
 - a. On the laser engraver's computer, you will open the PDF file to access the print driver.
 - b. Put your file on a USB drive to transfer it to the engraver computer.

Rotary Attachment

When engraving on cylindrical objects such as wine glasses or water bottles, use the rotary attachment.

The laser engraver **MUST** be **turned off and unplugged** before adding the rotary attachment.

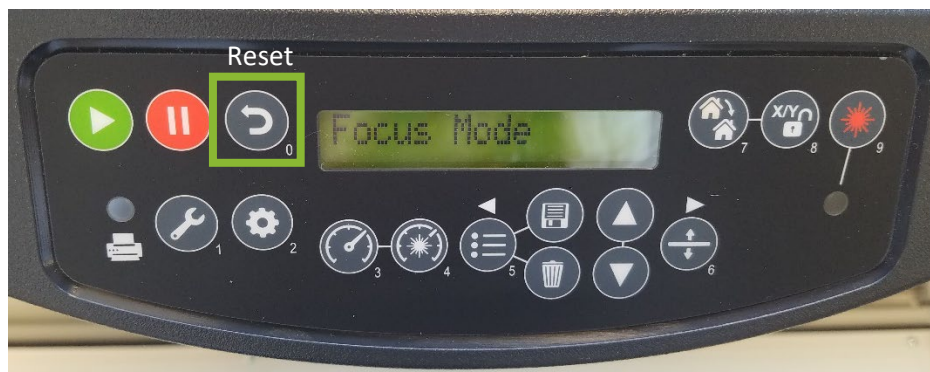
Engrave your Design

If the bed is high in the machine, you will have to lower it before adding the rotary attachment.

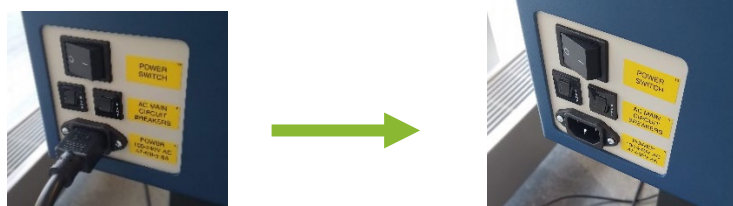
1. Turn on the laser engraver.
2. Move the bed down to give yourself space.
 - a. Press the **Focus Mode** Button and then press the Down arrow until the rotary attachment can fit. GCPL recommends lowering it until you see the two holes in the back of the machine.



3. Press the **Reset** button to exit Focus Mode.



4. Make sure the laser engraver is **turned off and unplugged**.
 - a. If the machine is on when you plug in the rotary attachment, it will destroy the attachment. **DO NOT DO THIS**. You will be responsible for replacing the rotary attachment.



5. Remove the honeycomb tray or holed tray (whichever one is there) inside the engraver.
 - b. Flip up the rulers to remove it.



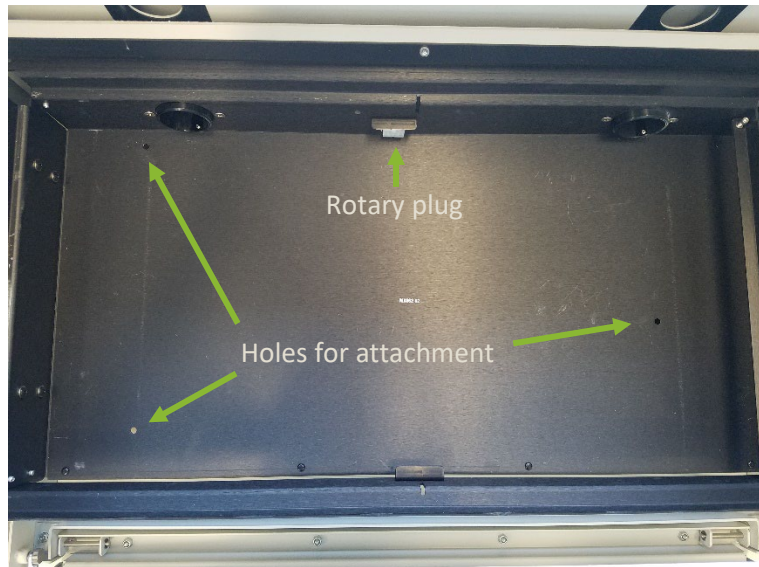
6. Open the door on the front of the machine.



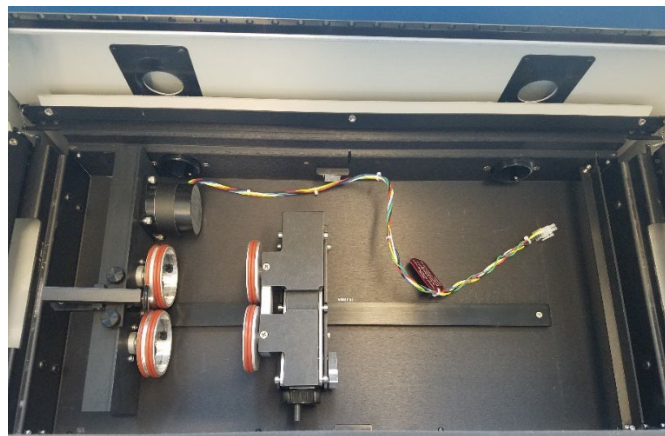
7. Remove the waste tray by lifting the flaps.



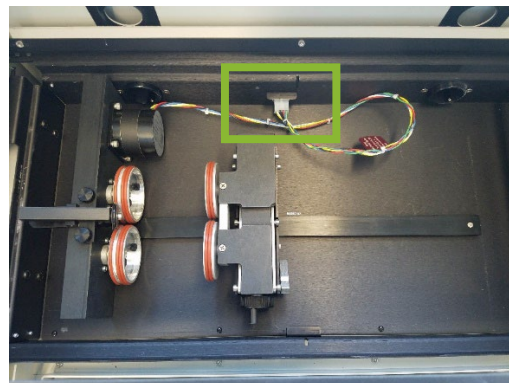
8. Where the rotary attachment plugs into the machine should now be visible in the bed.



9. Place the rotary attachment into the machine. The three (3) pegs go into the three holes in the base.



10. **Double-check that the laser engraver is off and unplugged.** Plug in the rotary attachment into the side of the bed.



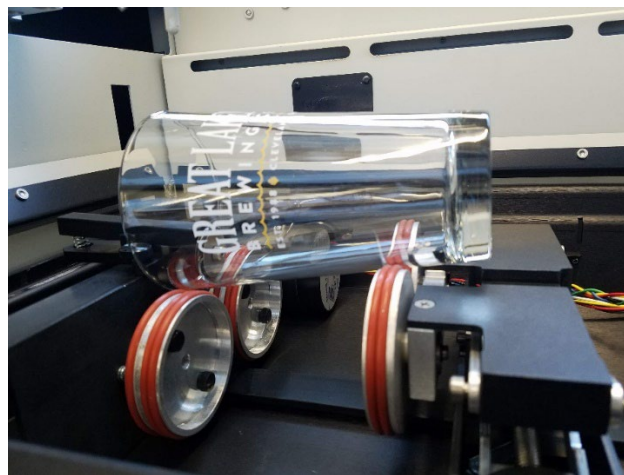
11. You can now plug in the laser engraver. Turn on the machine.



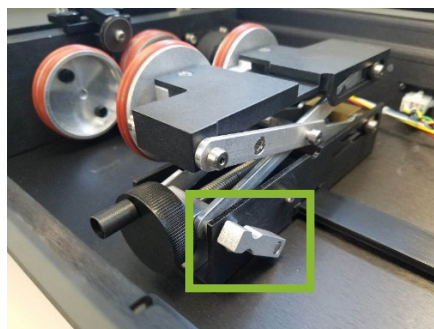
12. The laser will recognize that the rotary is attached and move to the appropriate home location.



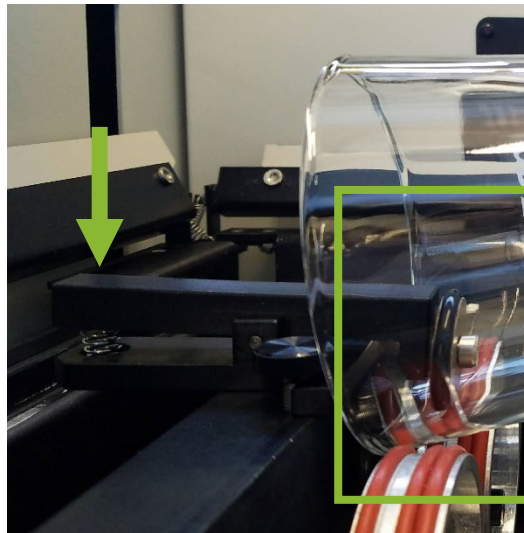
13. Place your item on the wheels.



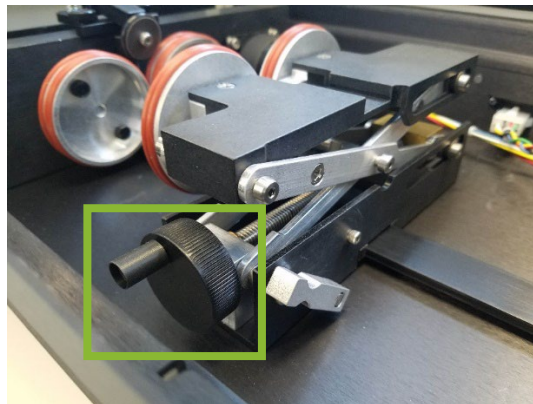
c. The silver latch unlocks the one side to fit smaller items.



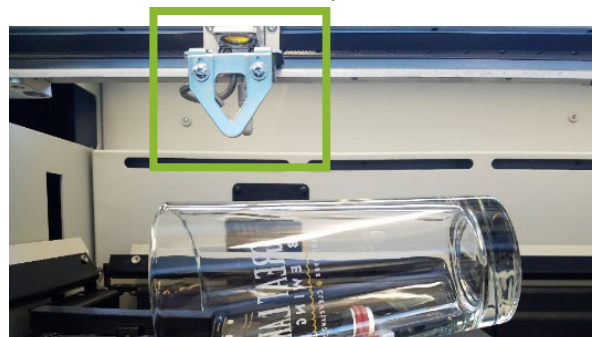
- d. Pinch the lever on the front to fit the glass under the black wheel. This will help add pressure to make sure the glass spins with the wheels.



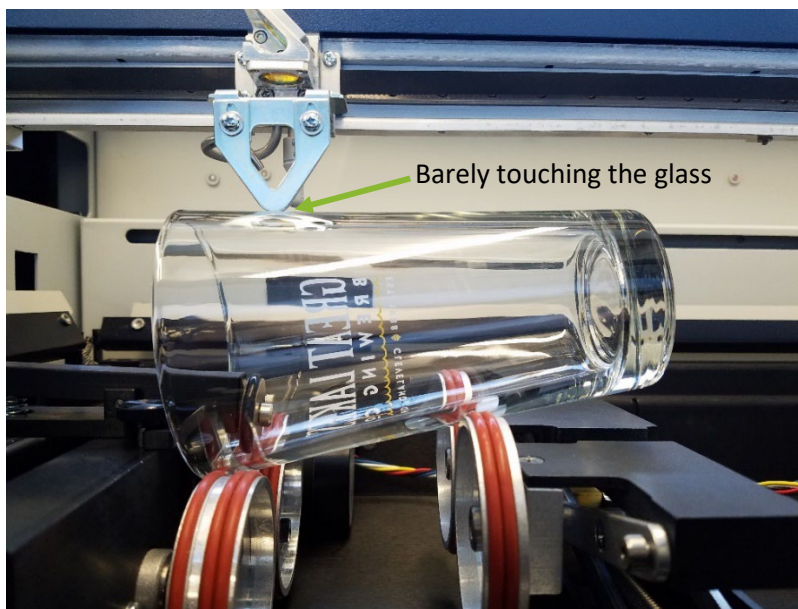
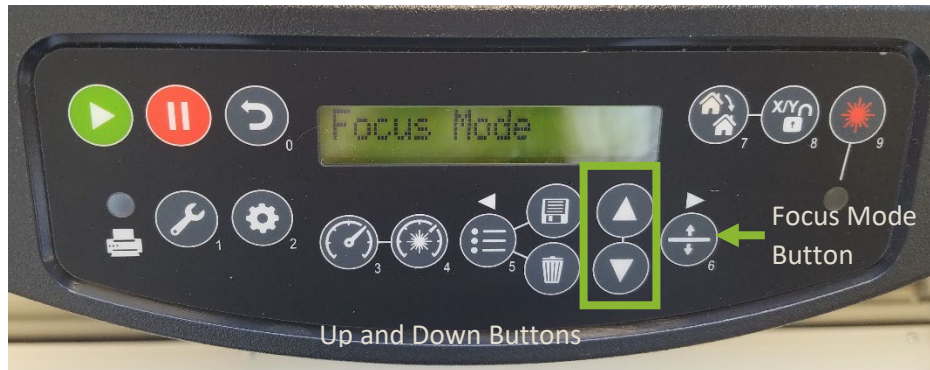
- 14. The glass needs to be perpendicular to the arm as much as possible to ensure a good engraving. If the focus gets skewed, it can distort the image.
 - e. Turn the black knob to lift and lower the glass.



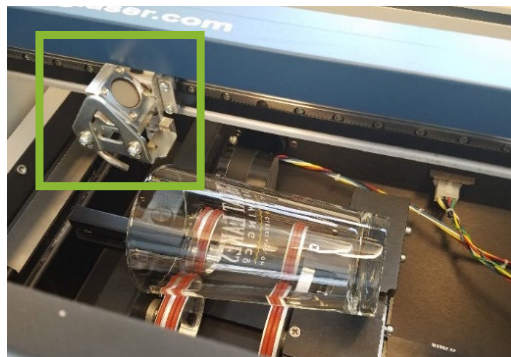
- 15. Flip over the **Focus Tool** on the laser so that it points down.



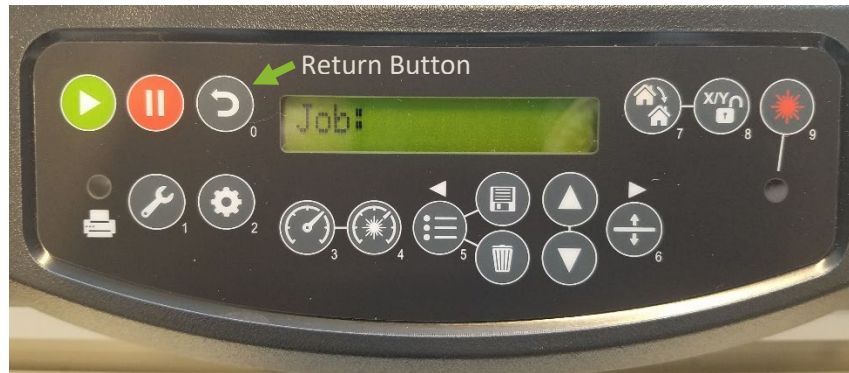
16. On the control panel, press the **Focus Mode** button.
 - f. This will bring up the words, "Focus Mode"
 - g. Press the "Up" and "Down" buttons until the glass barely touches the bottom of the Focus Tool.



- h. Double-check that the glass is perpendicular to the focus tool. It should be able to slide down the glass just barely touching the length of the area to engrave.
17. Flip back up the **Focus Tool**.



18. Press the **Return** button on the control panel to return to the Job display.



19. Close the front door and lid.
20. The rotary attachment is now ready.

Changing the Home Position

When engraving on cylindrical objects, you can change the home position and pick the exact center where you want the artwork to engrave. The size of your workspace should be the size of the design you want. For example: you have a drinking glass that is 5 inches tall and 11 inches around. You can make a design that is 1 inch by 2 inches to fit nicely on the side of the glass.

If your design will go all the way around the glass, it is recommended that you follow the directions described earlier in this tutorial.

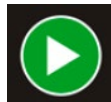
Pressing the X/Y Off key and then pressing the Go key disables the X and Y motors and allows you to move the carriage by hand to any location on the table. Moving the carriage by hand allows you to perform several different functions:

Manually focus anywhere on the table or with the rotary attachment.

1. Press the **X/Y Off** key



2. Press the **Go** key

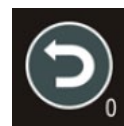


3. Carefully move the carriage to the desired focus position.
4. Place the manual focus gauge on the carriage and press the **Up** or **Down** arrow keys to move the table up and

down until the focus gauge is just touching the material.



5. Press the **Reset** key to send the carriage back to its park position.



Create a new temporary Home Position.

Changing the Home Position allows you to set where you measure the design for more accurate results. See the different options for Center-Engraving to determine where to set the new Home Location.

1. Press the **Red Dot Pointer** key to locate the precise position where you want the new Home Position.



2. Press the **X/Y Off** key and then the Go key to manually move the carriage to the proper location.

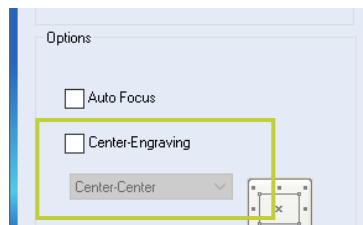


3. Carefully move the arm to line the red dot with the center of your piece or where you want center to be.
4. Press the **Set Home** key.



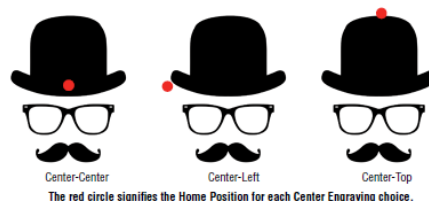
- a. Pressing the **Reset** key will move the carriage to its park position $\frac{1}{2}$ inch to the front of where you set home.

When ready to engrave, make sure to check the box next to “Center Engraving” on the Properties window. Leave it set to “Center-Center.” For cylindrical objects, it would be easiest to leave it as Center-Center, especially if your workspace is only the size of the artwork.



You can choose different points instead of Center-Center depending on your preferences for the Home Location.

- Center-Center: lines the center of the artwork to the center you choose. You can also do Center-Left and Center-Top which work as illustrated below:



- Page-Center: lines the center of the workspace (or full page) of the file with the center you choose.

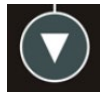
Resetting Home Position

When you are finished with your specific project, return the carriage back to the top left corner of the machine for the next user.

1. Press the **Maintenance** key.



2. Press the **Down** arrow key to see **1. Restore Home.**



3. Press the **Go** key.

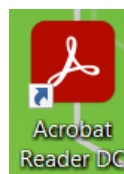


- a. The carriage will return to the top left corner.

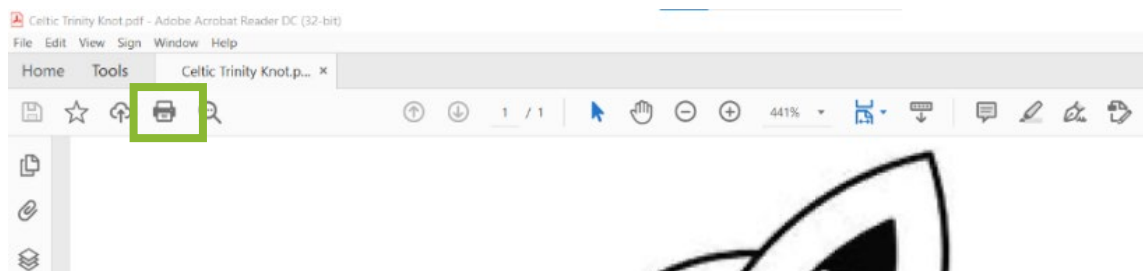
Engraving Your Cylindrical Design

After preparing your design and setting up the rotary attachment, you are ready to send your job to the engraver.

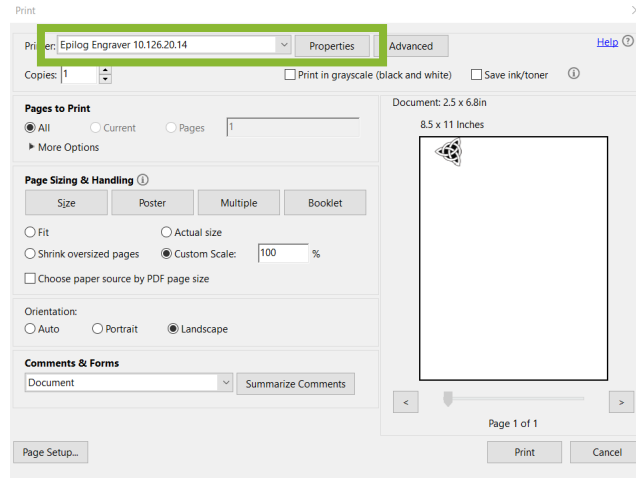
21. Plug in your USB drive to the engraver laptop.
22. **Open** the PDF file you want to print with Adobe Reader.



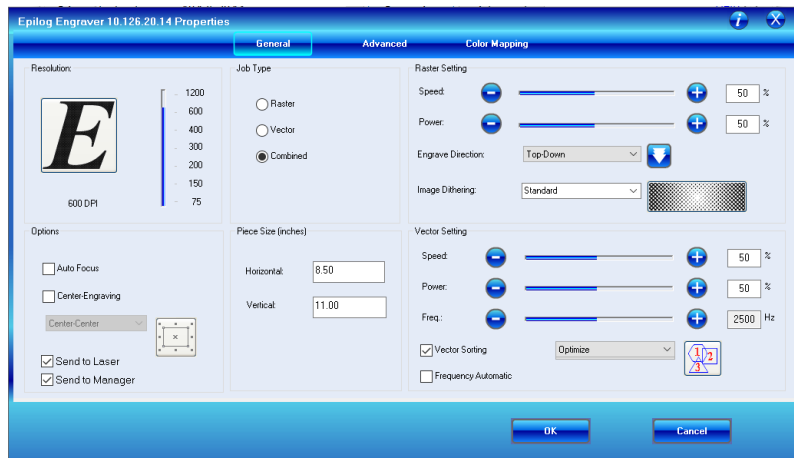
23. Click the **Print** icon.



24. Make sure the Epilog Engraver is chosen as the printer. Then click **Properties**.



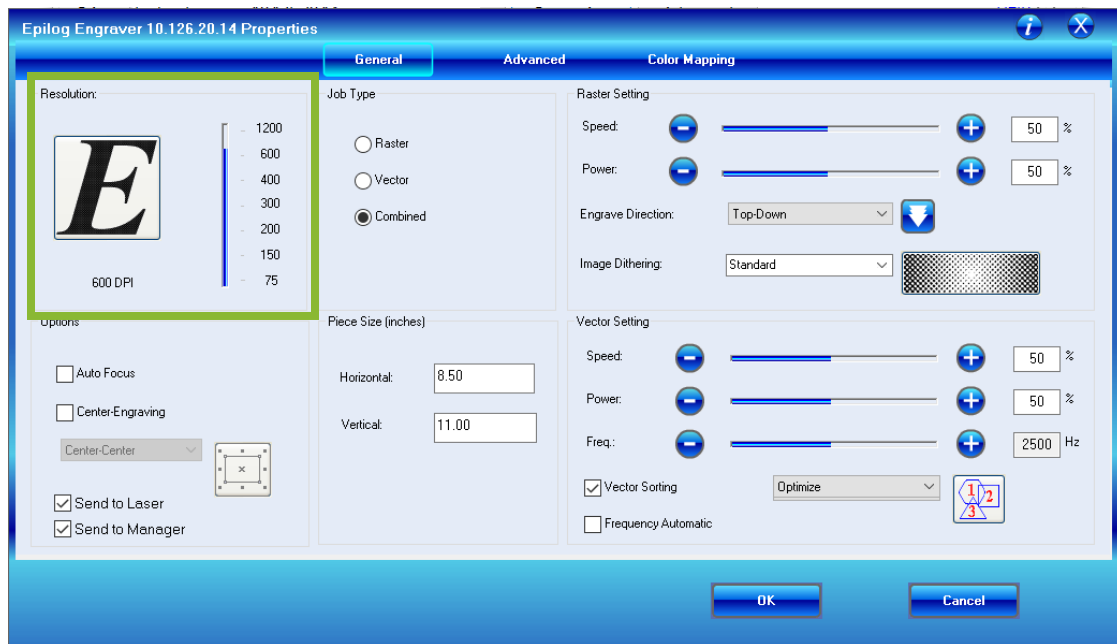
a. This will open the Epilog Engraver Driver.



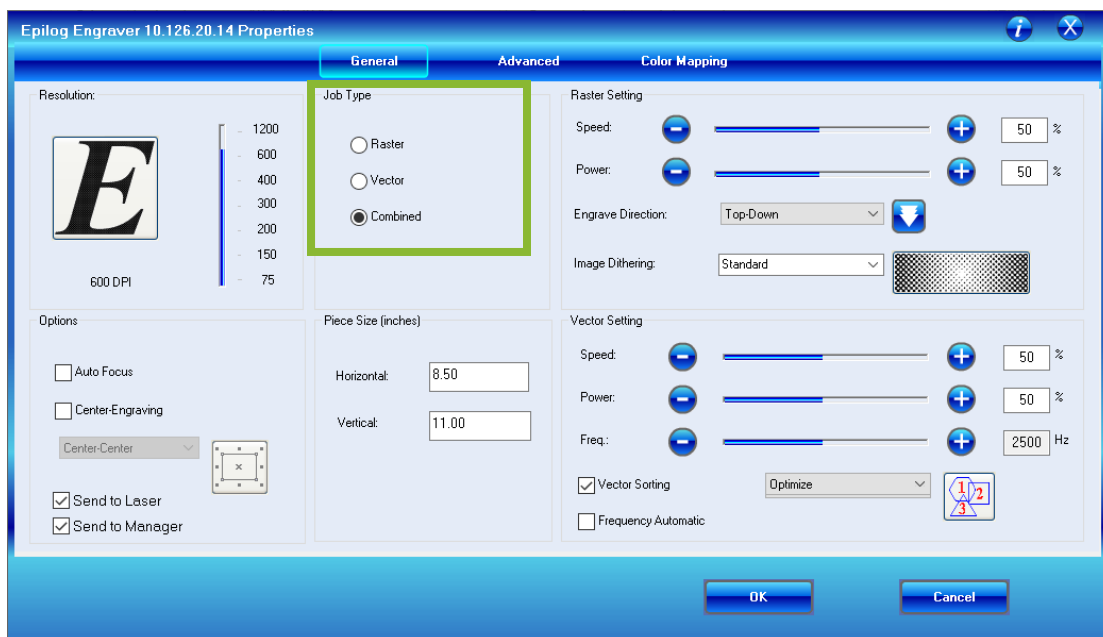
25. Refer to the chart next to the laser engraver in the Inspiration Station.

- It is also on the laser engraver's computer desktop as: Laser Engraver Material Settings
- This chart is simply a suggestion or a starting point. You do not need to follow exactly, but these are the settings that Epilog has found best. Experiment with the settings if you feel comfortable doing so.
- For example, below is the information for glass.
 - The hypothetical project we will create is a text/clipart engraving on a drinking glass.

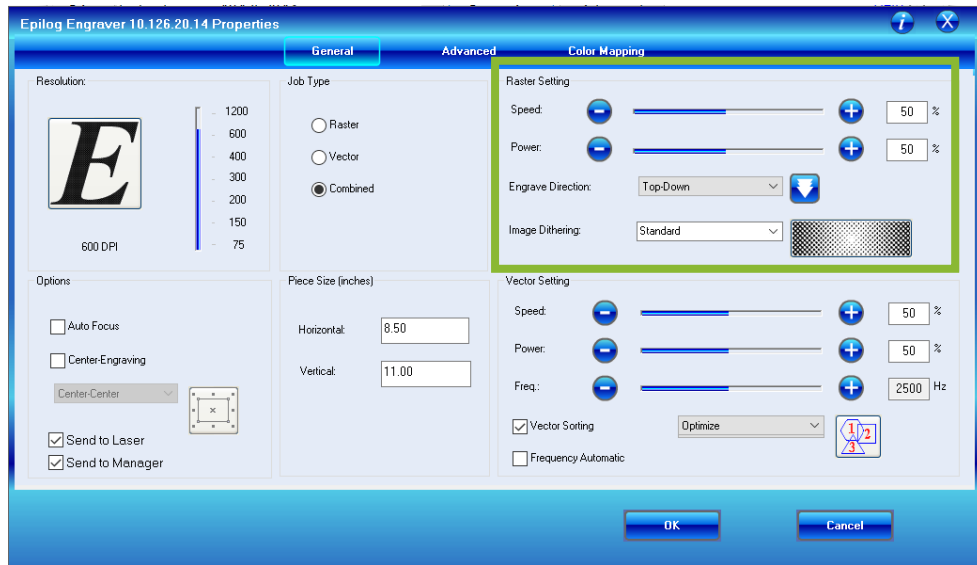
Epilog Mini Suggested Material Settings				
Material	Resolution	Frequency	Speed	Power
Glass				
Engraving	300 DPI		20%	100%
When etching glass, try changing the graphic to 80% gray before engraving and use the Jarvis dithering pattern. You can also diffuse heat by covering the glass with a thin sheet of dish soap.				

26. Choose the **Resolution:** DPI (dots per inch)

- a. For our example, glass recommends 300 dpi.
27. Choose the **Job Type:** Raster, Vector, or Combined
 - a. Raster = Engrave Only
 - b. Vector = Cut Only
 - c. Combined = Engrave and Cut
 - i. For our example, it is Raster because cylindrical objects can't be cut.
 - ii. We are only engraving, which means Raster.



28. Set to the **Raster Setting** (for Raster or Combined job types)



- a. Change the **Speed** and **Power** according to the Engraving Settings on the chart.
 - i. For the example, we would set the speed to 90% and the power to 75%.
- b. Choose the **Engrave Direction**
 - i. The default is to engrave from the Top-Down, which is good for most jobs.
 - ii. If engraving on a cylinder such as a drinking glass, Bottom-Up can be better because Top-Down might cause debris to get in the way to the laser as it continues.
- c. Choose the **Image Dithering**
 - i. Look at the preview next to the drop-down menu to see the difference between the image dithering options.
 - ii. This changes how the dots of the laser are spaced, changing the look of the final engraving.

Image Dithering

Dithering defines how the dot patterns will be engraved in raster images that contain grayscale graphics, blends, or color images. There are six (6) different dithering patterns available. Standard is the default. Jarvis is an overall favorite.



300 DPI Standard Mode



300 DPI Stucki Mode

Dithering is a great way to enhance your engraved products, but it is very material dependent. A dithering pattern that looks good on marble might look very different when engraved on plastic. Give yourself time to experiment with different dithering patterns. You will find which dithering patterns fit your uses.

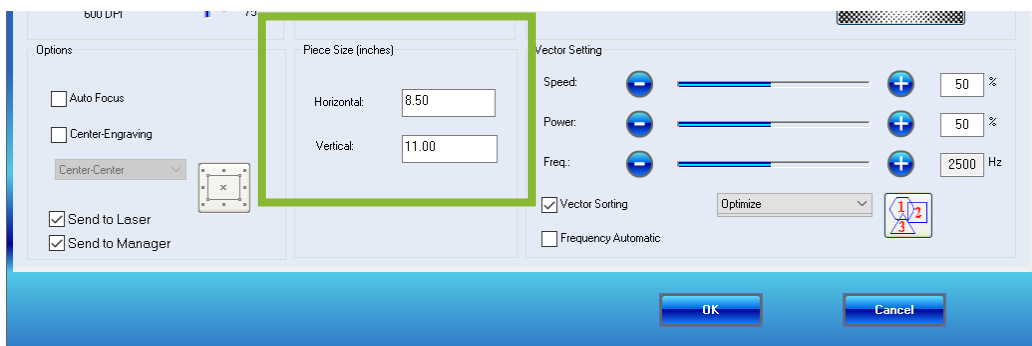
Dithering Type	Best for	Notes
Standard	Text & Clip Art at 600 dpi	Default
Brighten	Text, Clip Art, & photos at 600 dpi	Great for engraving photos to wood or marble
Low Res	Low-resolution photos	Adds an artistic half-tone look
Floyd-Stenberg	High-detail photos	Wave-like pattern
Jarvis	Photos at 300 dpi	Very consistent for photos and glass
Stucki	Photos at 300 dpi	Very similar to Jarvis, slight difference

29. Ignore the Vector Settings.

- This is for cutting jobs, which is not applicable to the rotary attachment.
- They should be grayed out for cylindrical objects as this is a Raster job.

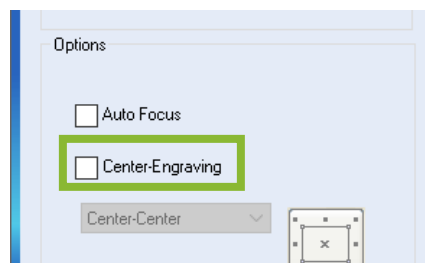
30. Change the **Piece Size** in inches

- This should be the size of your material. If you changed the Home Location, it can also be the size of your artwork or workspace.



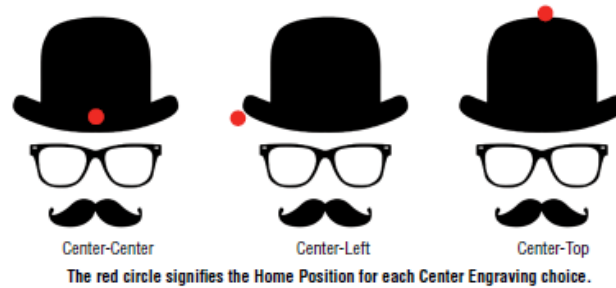
- For our example, we would set the Horizontal to 4 and the Vertical to 6.75 inches.
- Or if using the Center-Engraving, the size could be Horizontal 2 and Vertical 3 inches. Even this way, the design should be rotated 90° to the left.

31. If you changed the Home Location, make sure you click the checkbox next to Center-Engraving.



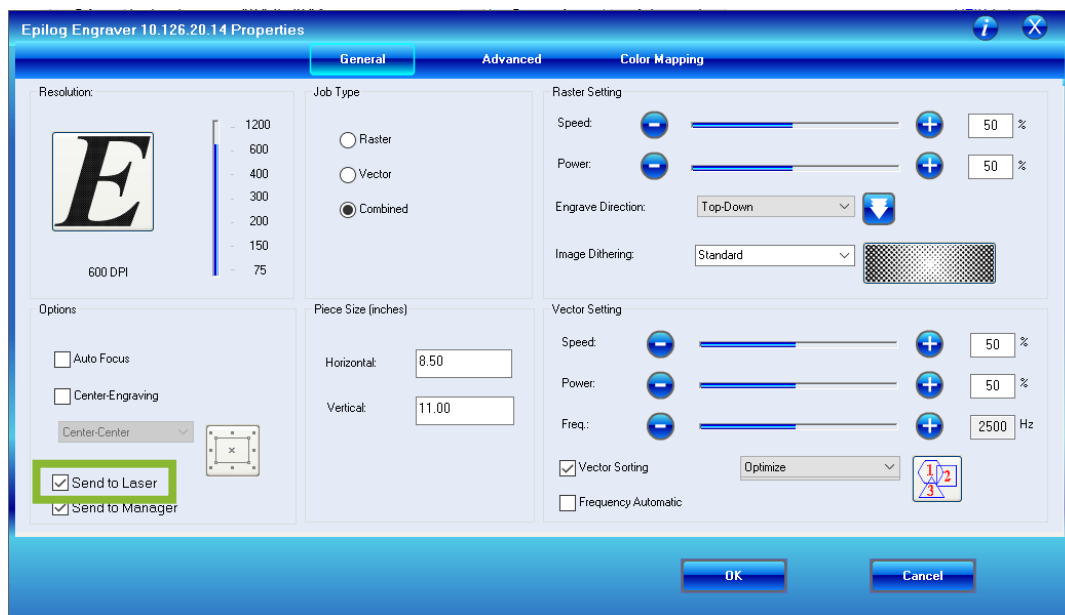
- Choose from the drop-down menu which Center-Engraving you wish to use.

- i. Center-Center: lines the center of the artwork to the center you choose. You can also do Center-Left and Center-Top which work as illustrated below:

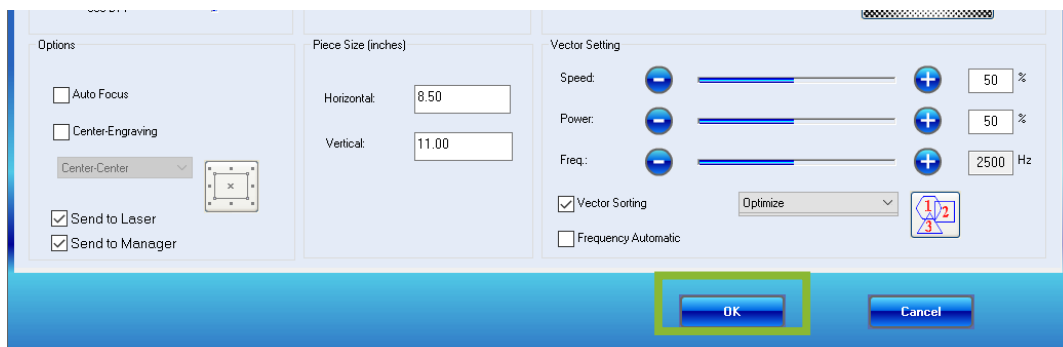


- ii. Page-Center: lines the center of the workspace (or full page) of the file with the center you choose.

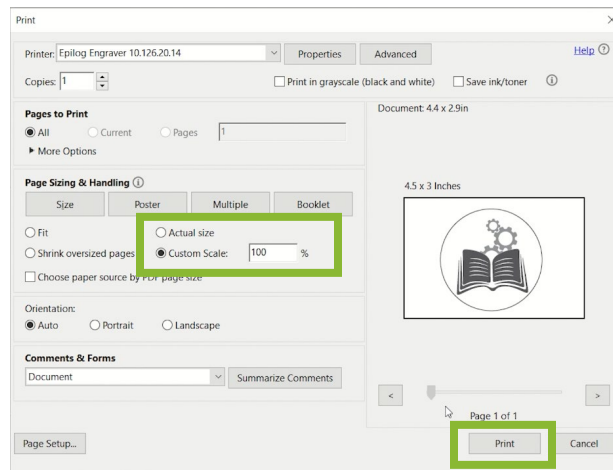
32. Make sure **Send to Laser** is checked.



33. Click **OK**.

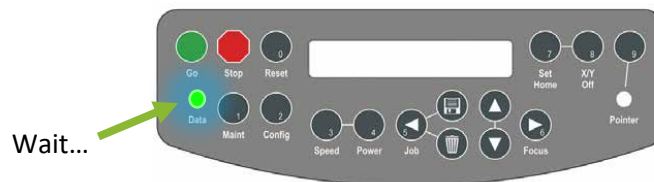


34. The preview of the print will update to show the changes. Make sure **Custom Scale** (set to 100%) or **Actual Size** is checked. "Fit" or "Shrink oversized pages" may change the size of your engraving and mess up the job.

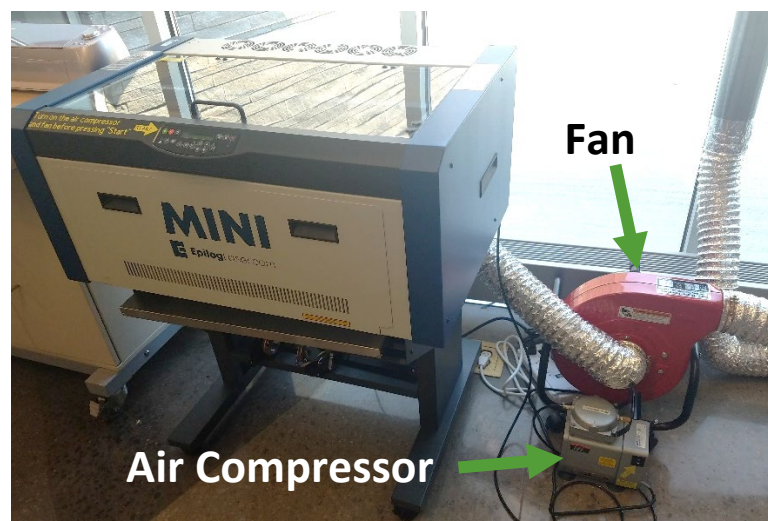


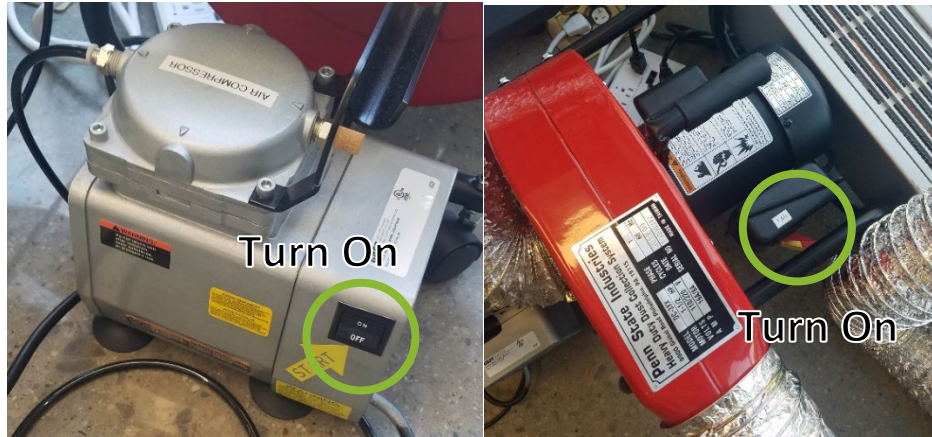
35. Click **Print**.

36. The green light on the laser engraver will flash as it uploads the new job. Wait for the light to stop blinking before you print.



37. Turn on the air compressor and the fan.





- a. ***This is very important.***
- b. The air compressor blows air on the material to keep it from overheating.
- c. The fan sucks away any smoke and dust.

38. Press **Go**.



- a. The engraver will begin engraving.
39. Watch the machine for the entire process in case there is a fire. Leaving the engraver unattended will remove the privilege of using the laser engraver in the Geauga County Public Library system.
40. Once finished, open the lid, and remove your material.
41. You can now start another job or turn off the laser engraver if finished.
- a. The air compressor and fan can be left on for the entirety of your session. Make sure to turn them off before you leave.
 - b. Each job is saved in the engraver. After replacing with a new item, press **Go** again and the engraver will repeat the job.
42. When finished, turn off the engraver.
- a. Remove the rotary attachment and replace the tray for the next user.
 - b. Turning off the engraver deletes the jobs.

Creating Cut Lines – Laser Engraver

Inspiration Station: Geauga County Public Library's Maker Space Instructions

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This tutorial covers how to make cut lines for the laser engraver to cut certain materials. The laser engraver cannot cut all materials, check the Suggested Material Settings for more information.

If the line is too thick, the laser will automatically engrave it. You can tell if this happens because the engraver will save the cut lines until after engraving. If it includes them while engraving, the line is too thick, and the engraver did not recognize the vector line to cut.

See table below depending on resolution used in the project:

Line Width	150 DPI	200 DPI	300 DPI	400 DPI	600 DPI	1200 DPI
.001" (.025 mm)	Cut	Cut	Cut	Cut	Cut	Cut
.002 (.058 mm)	Cut	Cut	Cut	Cut	Cut	Cut
.003 (.076 mm)	Cut	Cut	Cut	Cut	Cut	Cut
.004 (.101 mm)	Cut	Cut	Cut	Cut	Cut	Cut
.005 (.127 mm)	Cut	Cut	Cut	Engrave	Engrave	Engrave
.006 (.152 mm)	Cut	Cut	Cut	Engrave	Engrave	Engrave
.007 (.177 mm)	Cut	Cut	Engrave	Engrave	Engrave	Engrave

Basic Cut Lines

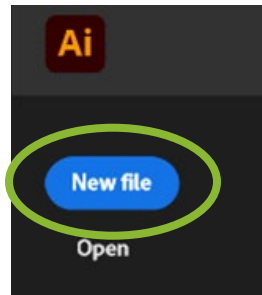
Basic cut lines are simple shapes you can quickly put around your design, such as a circle, square, or star.

You can use JPG or PNG files but remember to save it as a **PDF** for the laser engraver.

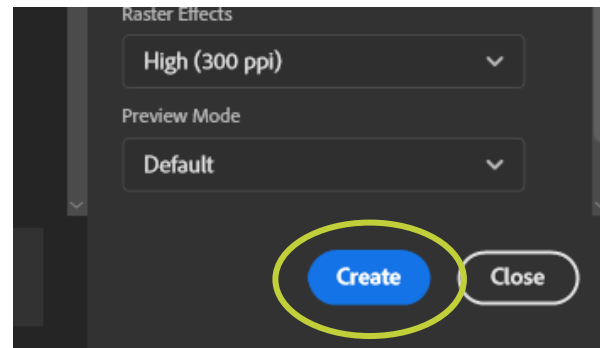
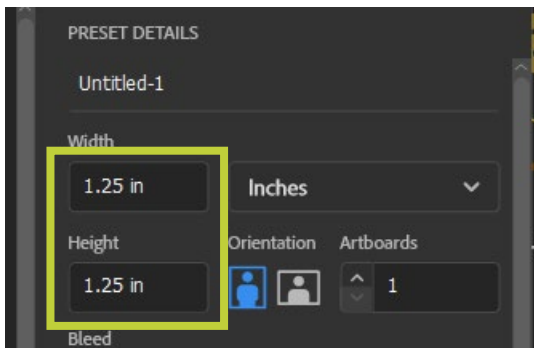
1. Open Adobe Illustrator on the computer
 - a. This is available on all laptops and Macbooks in the Inspiration Station.
 - b. If only designing, the library recommends borrowing a Macbook as they are for design only.



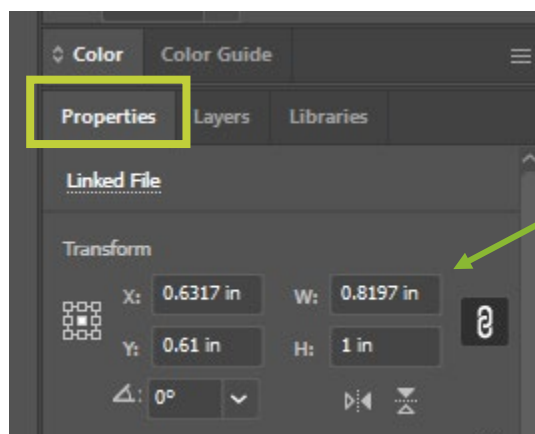
2. Click **New File**.



- a. Set the size of your workspace to fit your final project. For stickers, only design one. You can add multiple copies while preparing the print job for the printer.
- b. For example, to make 1" stickers, make a workspace that is 1.25" x 1.25" for space to design.

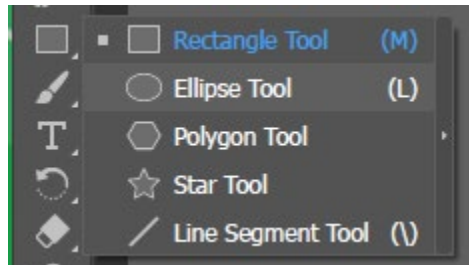


3. Click **Create**.
4. Click **File** and then **Place** to add your design.
 - a. Find your file and click **Place**.
 - i. Click and drag your design to fit or double-click to place your design as its default size.
 - b. If you need to resize your design, click and drag the corners or alter the size in the **Properties** tab.
 - i. If the Properties tab is not showing, Click Window → Properties and the tab will appear.

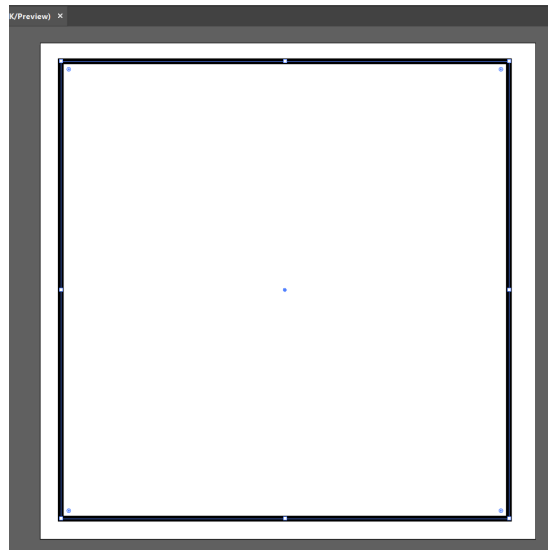


Change width (W)
and height (H) of
object here.

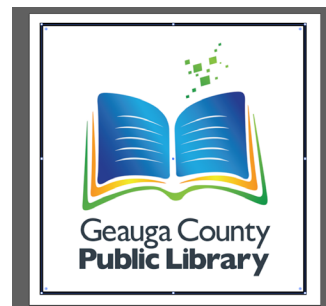
5. Add a shape for the cut line.
 - a. Right-click on the **Rectangle Tool** to change it to a circle (ellipse), polygon, or star.
 - b. If you want a custom line, check the Contour Cut Lines steps.



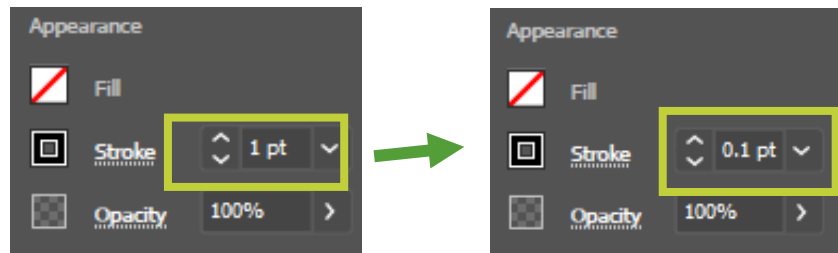
6. Click and drag over the design. This example shows a circle around it.
 - a. Under the Properties tab, you can specifically determine the height and width as with the design.



7. The default shape has white on the inside and a black border or stroke line.
 - a. We need to change these two things.
8. In the toolbar, click the square with a red line through it. This will change the center to no fill instead of white.
 - a. You should now be able to see your design. There should still be a black border around it.



9. Under the Properties tab and Appearance, change the stroke line from 1 pt to .1 pt. The line must be thinner than 1 pt to be recognized as a cut line.



10. Your line should look more like this:



11. Click File then Save As... and save your file as a PDF.

You are ready to cut!

You will know the cut line worked because the engraver will not engrave the line. It will engrave and then cut. Make sure you set the job as Vector or Combined and match the Vector settings to your material. The design will be grayscale.

Contour Cut Lines

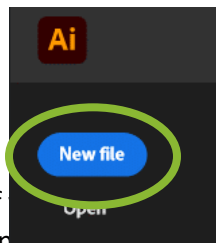
Create a line that follows the outer border of your design instead of using a basic shape. This takes a few more steps and practice.

You can use JPG or PNG files but remember to save it as a **PDF** for the laser engraver.

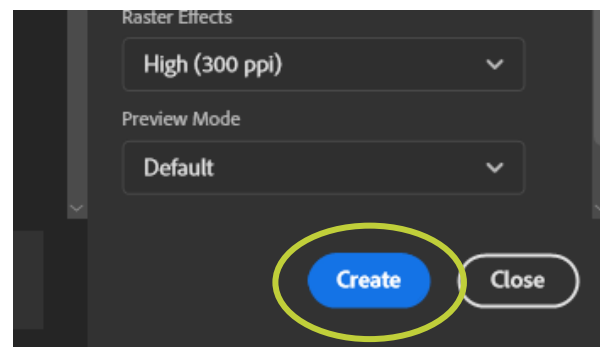
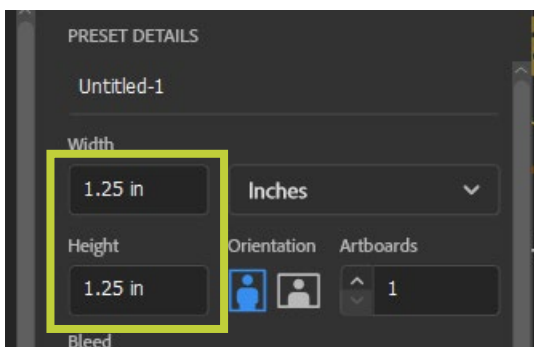
1. Open Adobe Illustrator on the computer
 - a. This is available on all laptops and Macbooks in the Inspiration Station.
 - b. If only designing, the library recommends borrowing a Macbook as they are for design only.



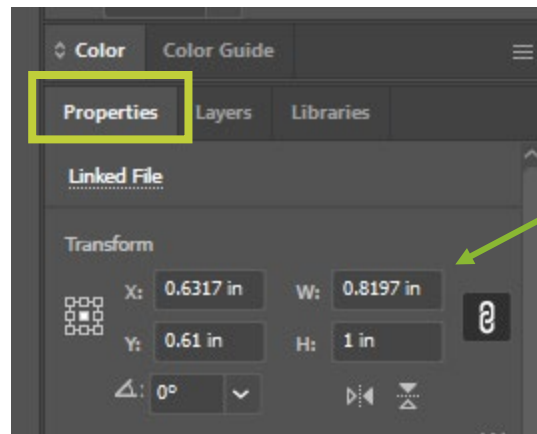
2. Click **New File**.



- a. Set the size of the workspace to fit your final project. For stickers, only design one. You can add multiple copies while preparing the print job for the printer.
- b. For example, to make 1" stickers, make a workspace that is 1.25" x 1.25" for space to design.

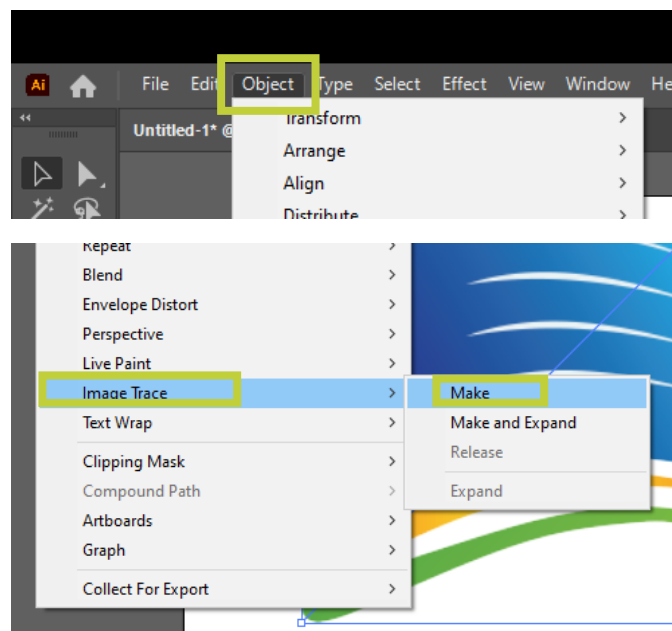


3. Click **Create**.
4. Click **File** and then **Place** to add your design.
 - a. Find your file and click **Place**.
 - i. Click and drag your design to fit or double-click to place your design as its default size.
 - b. If you need to resize your design, click and drag the corners or alter the size in the **Properties** tab.
 - i. If the Properties tab is not showing, Click Window → Properties and the tab will appear.

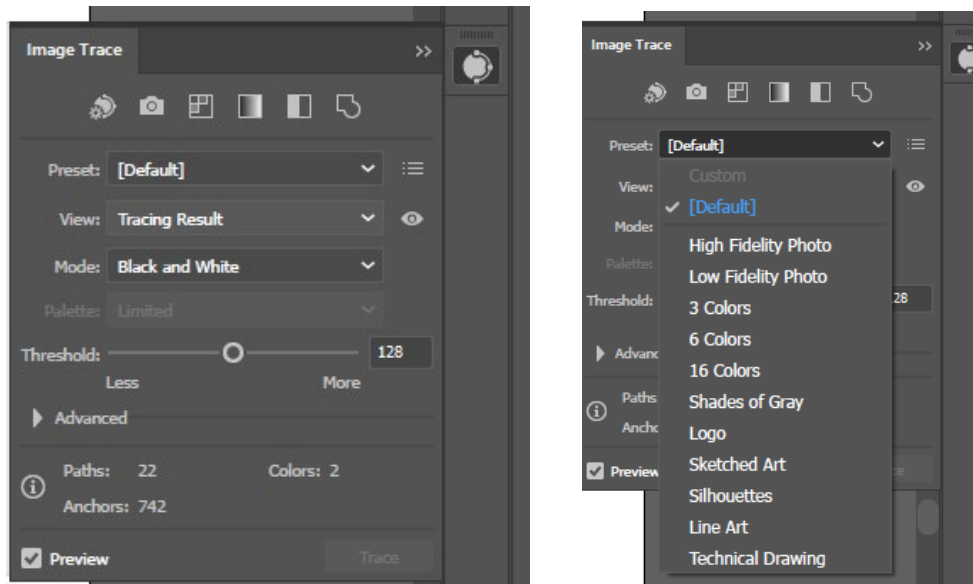


Change width (W)
and height (H) of
object here.

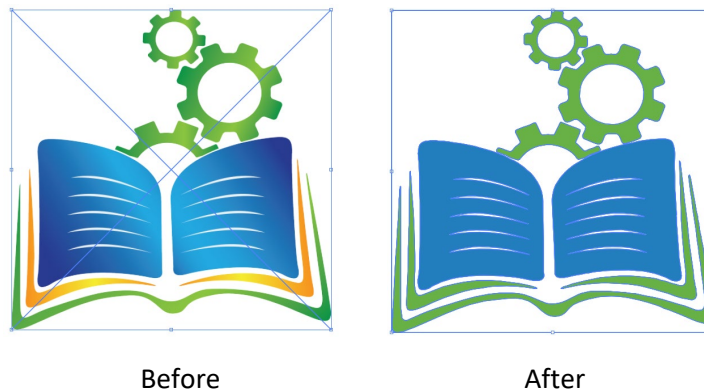
5. Right-click on your design and click **Copy** then click **Paste**.
 - a. You will be editing this second image to turn it into the cut line while leaving your original image alone.
 - b. Align the two images.
6. Click **Object**, **Image Trace**, and then **Make**



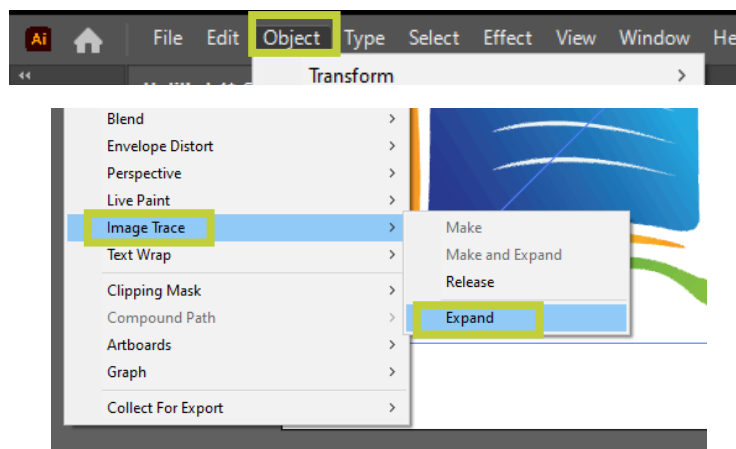
- a. If a notice appears that says, "Tracing may proceed slowly with this large image. Would you like to continue?" Click **OK**
7. Click **Window**, then **Image Trace** to view the Image Trace window.



- a. Change the **Preset** until your image has the correct outline. The colors are less important
 - i. In this example, 3 Colors was used.



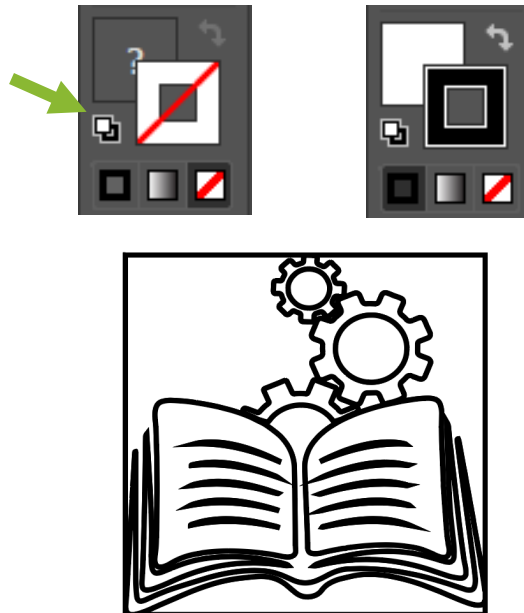
8. Once satisfied, click **Object**, **Image Trace**, and then **Expand**.



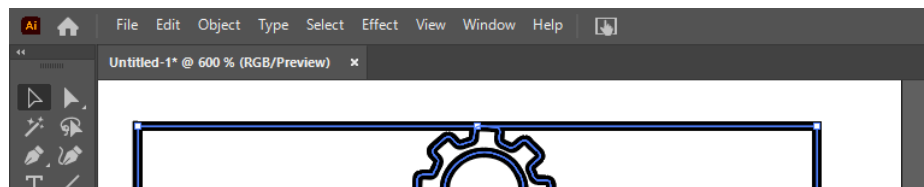
9. There should now be a line around the design.

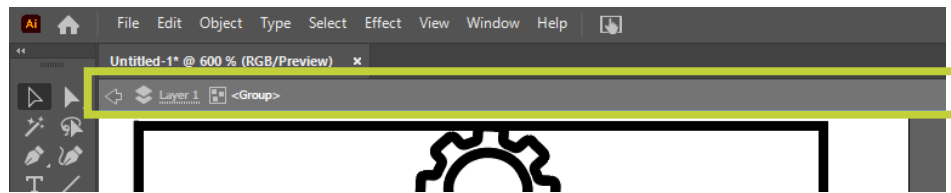


10. Time to turn it into a line. On the left-hand side in the toolbar, change the colors to the black and white default.

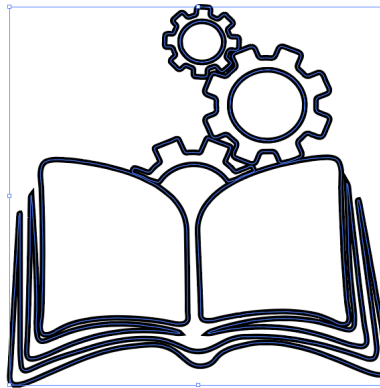


11. Double-click on the lines to enter Isolate Mode.
- a. To tell you are in Isolate Mode, there should be a gray bar under the title.

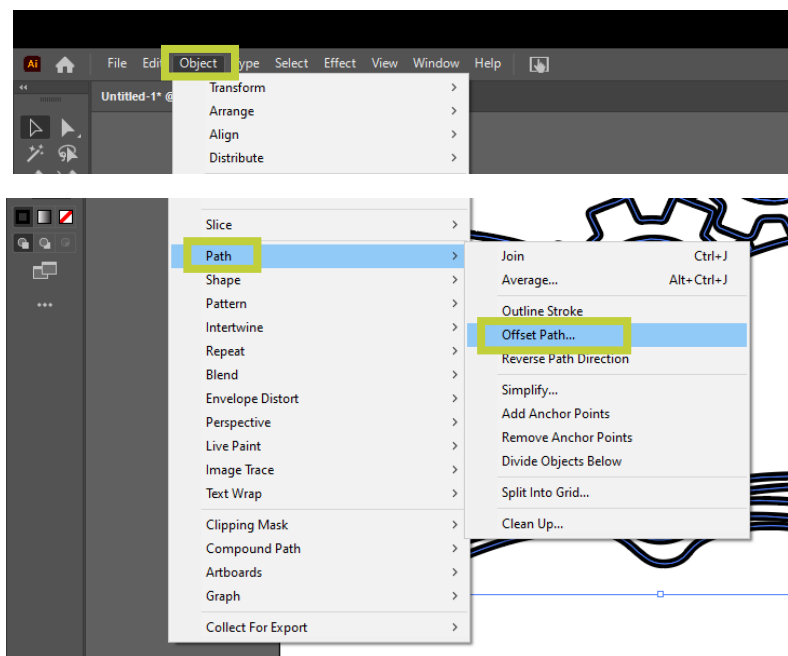




b. You can now remove items until the basic line is left of the image.

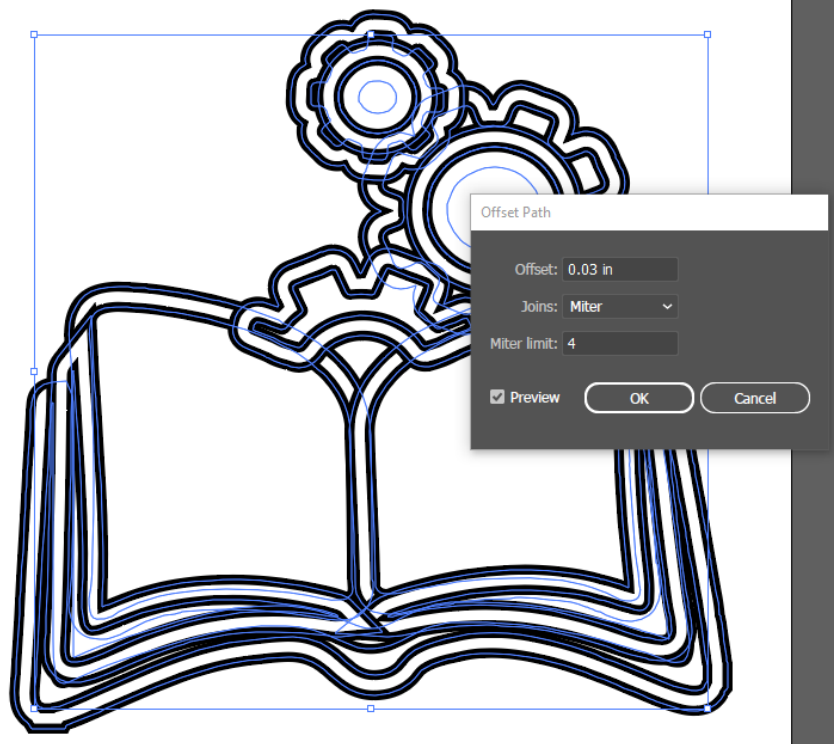


12. To make the line go around the design instead of on top of it, now click **Object, Path, then Offset Path.**

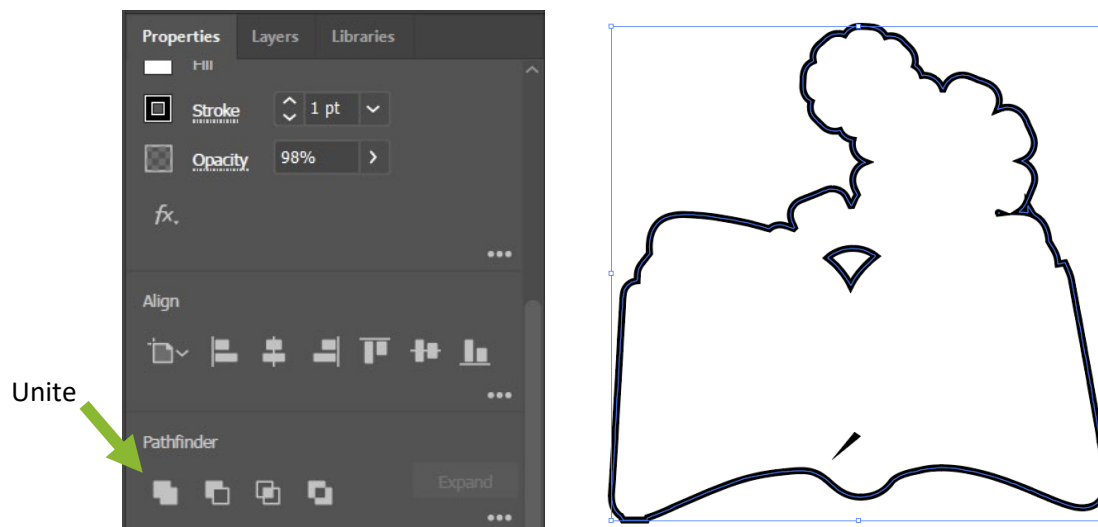


13. Decide how much the line should offset from the image. How far around the image would you like the line?

- If there are lines inside which may cause unwanted gaps in the line, make sure the offset is enough to cover these.



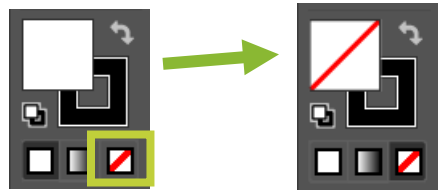
- b. Click the checkbox next to **Preview** to reset the preview and how the line looks.
- 14. When happy with the offset, click **OK**.
- 15. Under the Properties Tab, scroll down to **Pathfinder** and click **Unite**.



- a. You can delete any extra marks by double-clicking on the lines and entering Isolate Mode again.
- b. You can edit the lines with the Pen and Curvature tools:



16. Remove the white fill color by clicking the square with the red line through it in the tool bar.



a. The black line is the new contour line.



17. Under the Properties tab and Appearance, change the stroke line from 1 pt to .25 pt. The line must be thinner than 1 pt to be recognized as a cut line.



18. Your line should look more like this:



19. Click File then Save As... and save your file as a PDF.

You are ready to cut!

You will know the cut line worked because the engraver will not engrave the line. It will engrave and then cut. Make sure you set the job as Vector or Combined and match the Vector settings to your material. The design will be grayscale.