SOP

EPILOG FUSION 40 M2 LASER

Training is required before using this equipment

Reservations are required when using this equipment

Closed Toed Shoes required
Eye Protection required

NEVER LEAVE THE LASER CUTTER UNATTENDED WHEN IT IS OPERATING

MATERIAL SPECIFICATIONS

*If your selected material is not on this list please contact an NIS staff member.
Provide SDS (Safety Data Sheets) for materials requiring approval.*

- **Approved Materials:**
  - **Acrylic/Plexiglass**
  - **Plywood**
  - **Chipboard**
  - **Mat Board**
  - **Solid Wood**
  - **Poster Board**
  - **Paper**
  - **ABS plastics**
  - **Laserable Stamp Material**
  - **Glass (etch only)**
  - **Alumna mark**
  - **Corian**
  - **Anodized Aluminum (etch only)**
  - **Powder coated or painted metals (etch only)**
  - **Metals with etching spray applied (etch only)**

- **Banned Materials**
  - **Materials containing Chlorine (PVC, Moleskin)**
  - **Polycarbonate (Barlo, Calibre, Hyzod, Makralon, Palsun, Sustanat, Tecanat, Tristar, Makroclear, Arcoplus)**
  - **Lexan**
  - **Fr4 Boards**
  - **Fiberglass**
  - **Vinyl**

- **METAL CAN BE ETCHED BUT CANNOT BE CUT ON THIS MACHINE. Treated metal (painted, powdercoated, anodized) can be etched directly. Untreated metal must have Cermark spray applied, available for $5.00 per application.**

- Maximum material dimensions: **40" x 28"**
- Maximum material thickness, vector cut:3/8"
- Maximum material thickness, etch only: 13.25".

Turn on the Air Filtration System and Air Assist Pump

There are 2 ventilation systems that must be turned on before you activate the laser.
One is located on the wall below the glass board and to the left of the TV labeled "Ventilation Button".

PULL knob to activate the ventilation system.

The ventilation system is used by all lasers. If your project is complete do not turn off the ventilation if other lasers are being used.
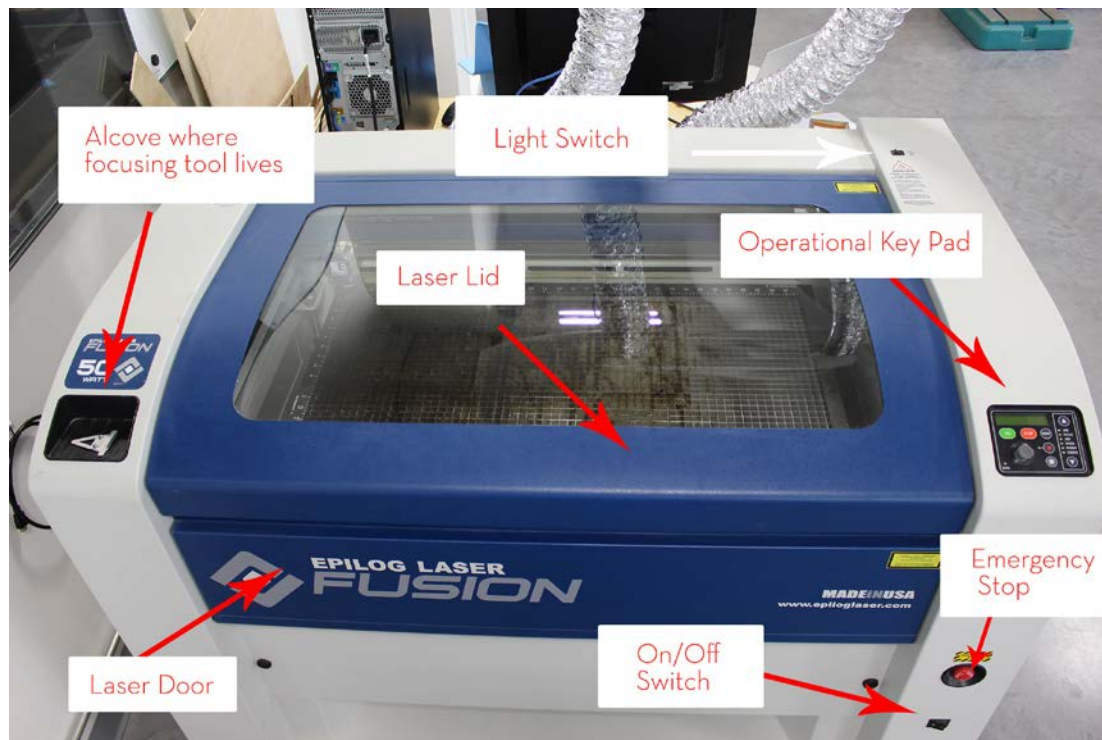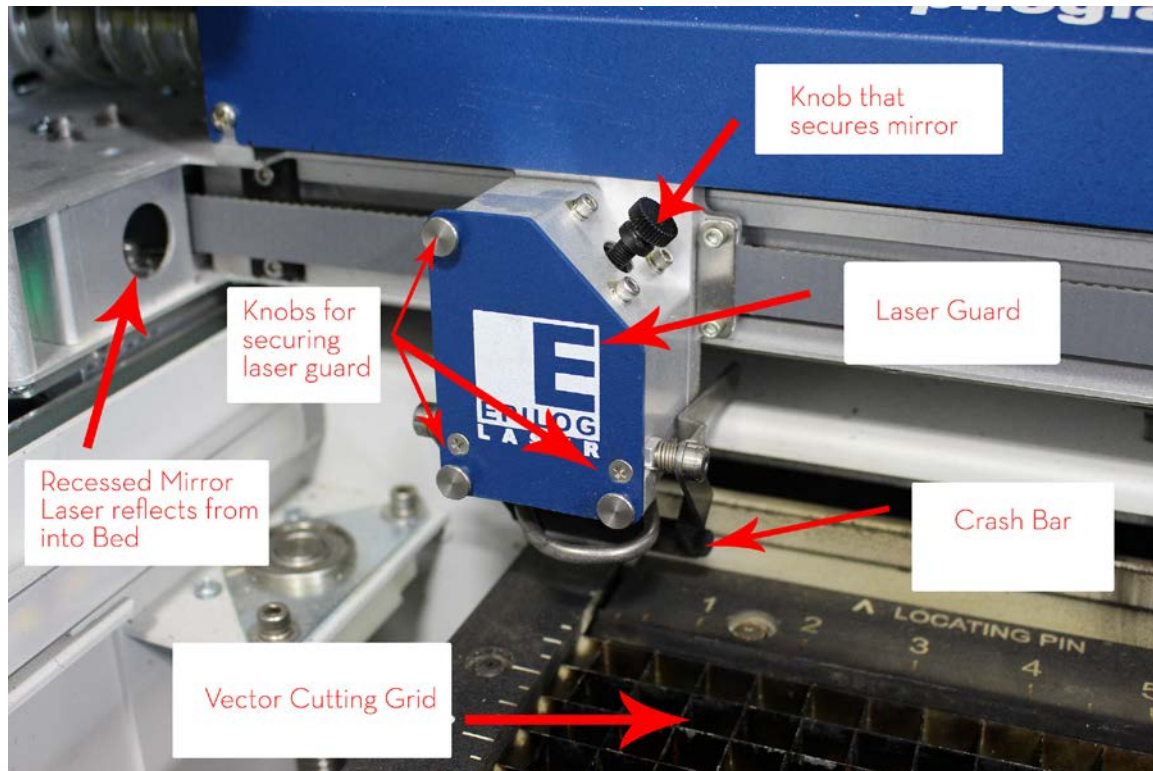

The air assist pump is located next to or on the floor beside each laser. Each laser has its own pump.

A 2" flame is okay for short lengths during a cutting pass.

- If the flame persists make sure that both ventilation systems are on.
- If your material is on fire push the stop button on the control panel, open the laser lid and smother the flame by blowing on it, misting it with plain water, or using scrap plywood to smother it.
- If a fire extinguisher is needed contact an NIS staff member immediately.

Laser Cutter Components:

Knob that secures mirror

Knobs for securing laser guard

Laser Guard

Recessed Mirror Laser reflects from into Bed

Crash Bar

Vector Cutting Grid

LOCATING PIN

Alcove where focusing tool lives

Light Switch

Operational Key Pad

Laser Lid

EPILOG LASER FUSION

MADE IN USA
www.epiloglaser.com

Emergency Stop

Laser Door

On/Off Switch

Step 1: # Turning on the Laser

The Laser must always be turned on to receive your job.
-The switch is located on the front of the machine in the lower right hand corner below the emergency stop button.


-The lens will move and reset its position to home. The machine will go through an initialization process where green lights will run up and down on the control panel. When this is complete the operational keypad should read **<JOB:>**

Step 2: **Setting up your file to print**

- Open your project using Adobe Illustrator
  - ○ Make sure your project's artboard is defined as the same size as your piece of material and no larger than the print bed (40" x 28").
  - ○ MAXIMUM MATERIAL SIZE IS 40" X 28"
 - ○ Your Artboard is the white area in your design in Illustrator.
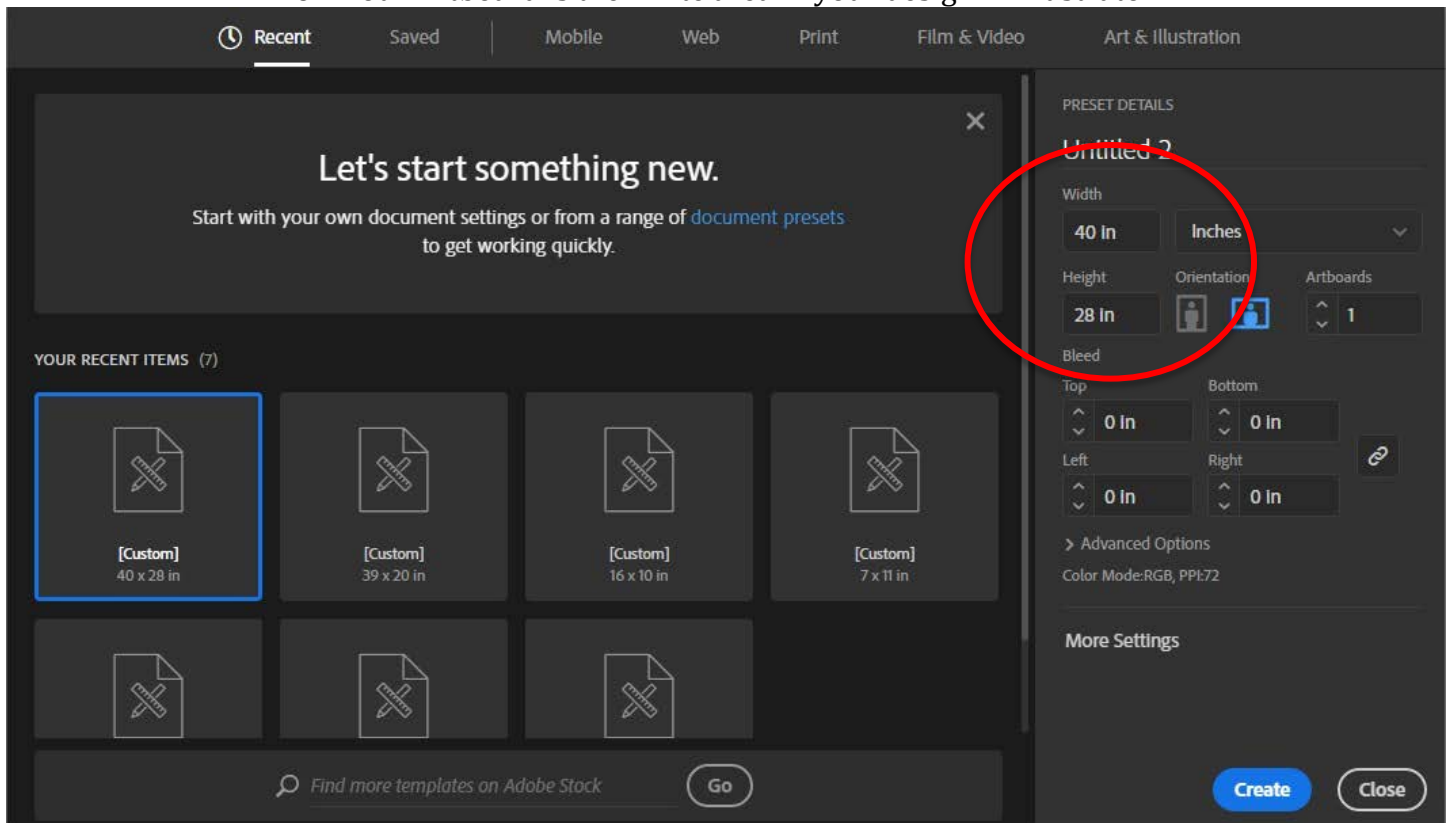
*Your design file should be created outside of your reservation time. Each member is able to reserve each laser **once per day for up to 2 hours. You cannot reserve more than one laser at a time.***

Creative Cloud, AutoCAD, Rhino, Fusion 360 and Solid Works are available in the computer lab for you generate your design files.

Vector and Raster

o To **Vector (Cut)** lines must be .12pt or smaller
(NIS recommends you set the lines to .001 pt stroke width to keep consistency between AutoCAD and Illustrator)
o To **Raster (Engrave)** lines must be .13pt or larger.
o An image file not created using design software will be a raster only file. If you want to vector cut on or around your image you will need to perform an image trace and define your vector lines.
o Set your stroke and fill accordingly
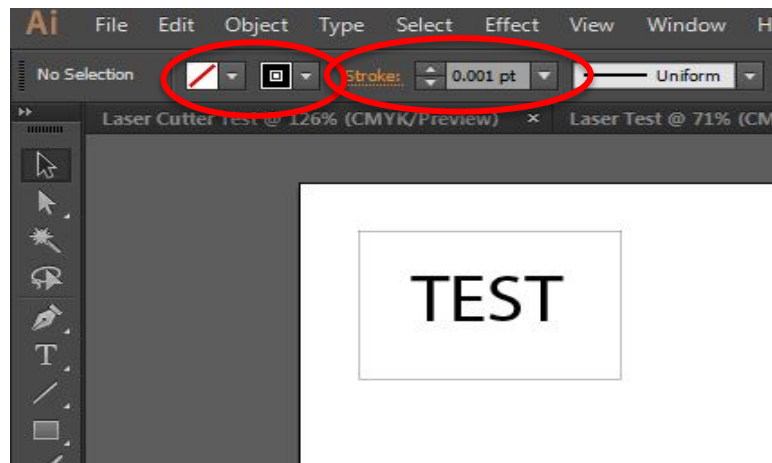
Sending your Job to the Print Driver

- Save your file before sending to the printer
- Select **File >> Print** in Illustrator
- Make sure <**Epilog Engraver WinX64 Ethernet** > is selected
- Under **Options>Placement**, click on the upper most left box in the placement area
- Never use the Auto-Rotate. Rotate your design in illustrator and then print
- Click on <**Set-up**> in the print driver
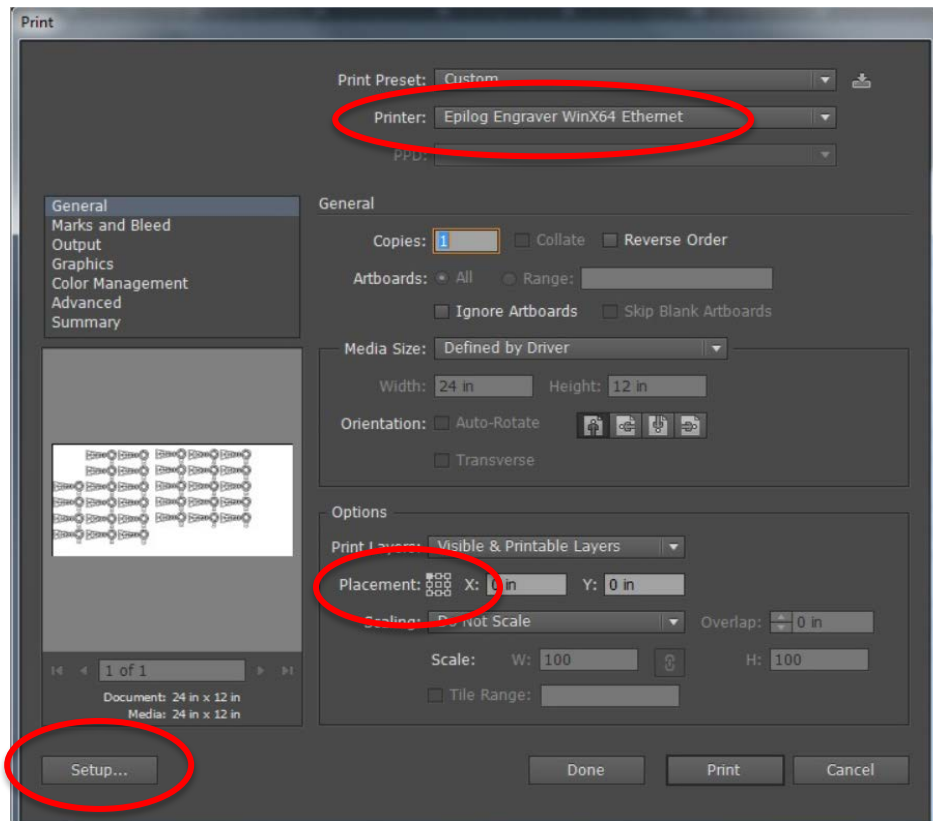
- Confirm the selected printer is "Epilog Engraver WinX64 Ethernet" and "Ready" status is displayed
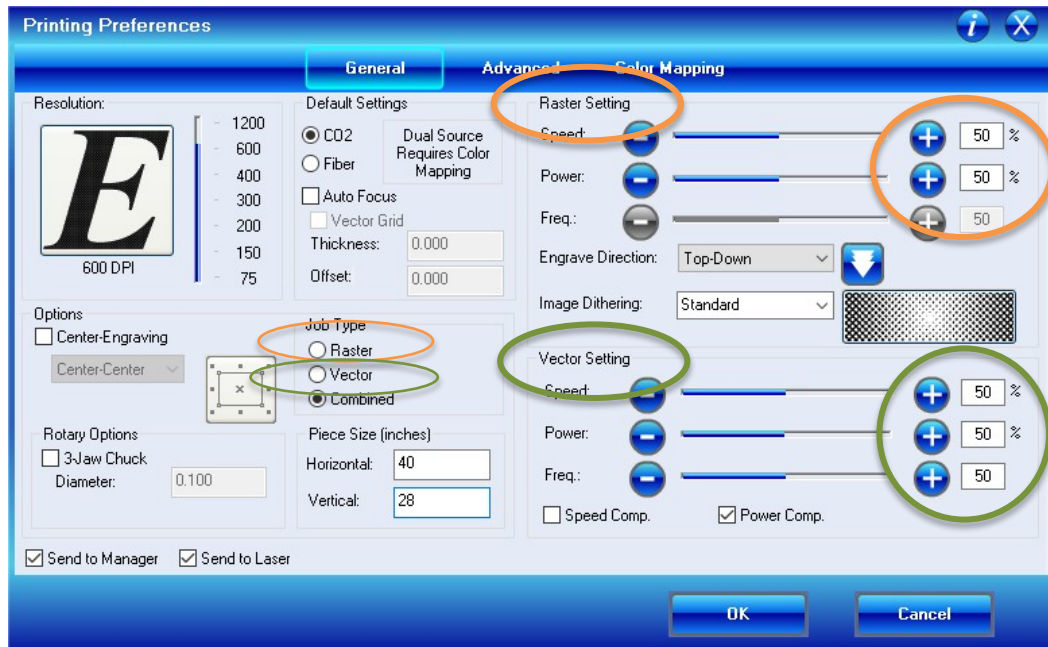- Click on <**Preferences**> to access the Print Driver
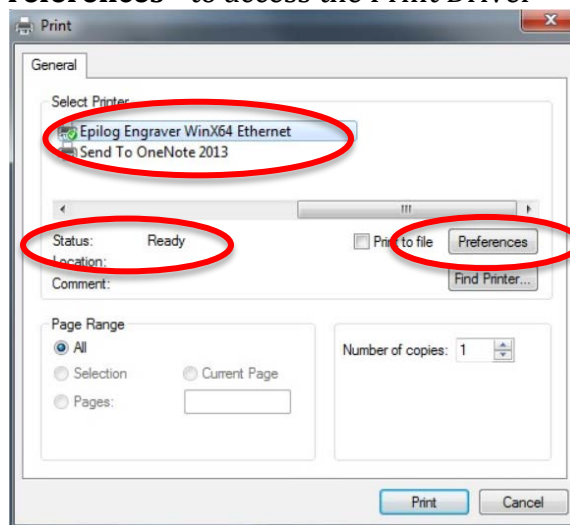
# Selecting your Print Preferences

- Select your job type: **<Raster>, <Vector>, or <Combined>**.

  - Raster will engrave
  - Vector will cut
  - Combined will raster then vector
 - **If you are etching on glass or metal always select raster**

- Use the chart in the owner's manual or the laminated settings charts to enter the appropriate values for the Raster or Vector Settings. *These are recommended settings and can change from job to job depending on the quality of your material.*
- *If your materials are burning too much or melting adjust your frequency to a lower number. Check the Owner's Manual for best recommended settings.*
- Set **<Piece Size>** the same as your material size. Your artboard should also be the size of your material. Maximum piece & material size for this laser is 32Hx 20
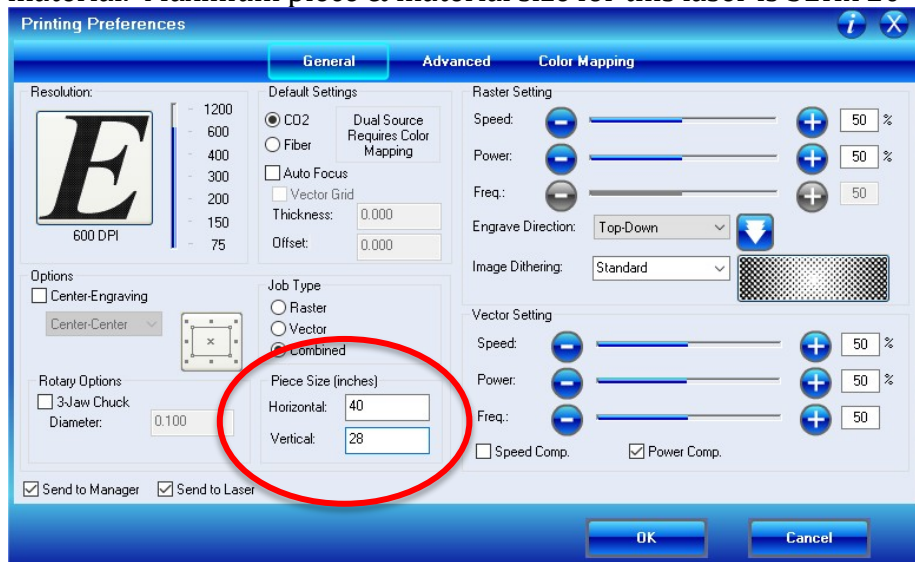
- **DPI default setting is 600 – if you adjust your DPI reference the recommended raster & vector setting in the User's Manual for the selected DPI.**
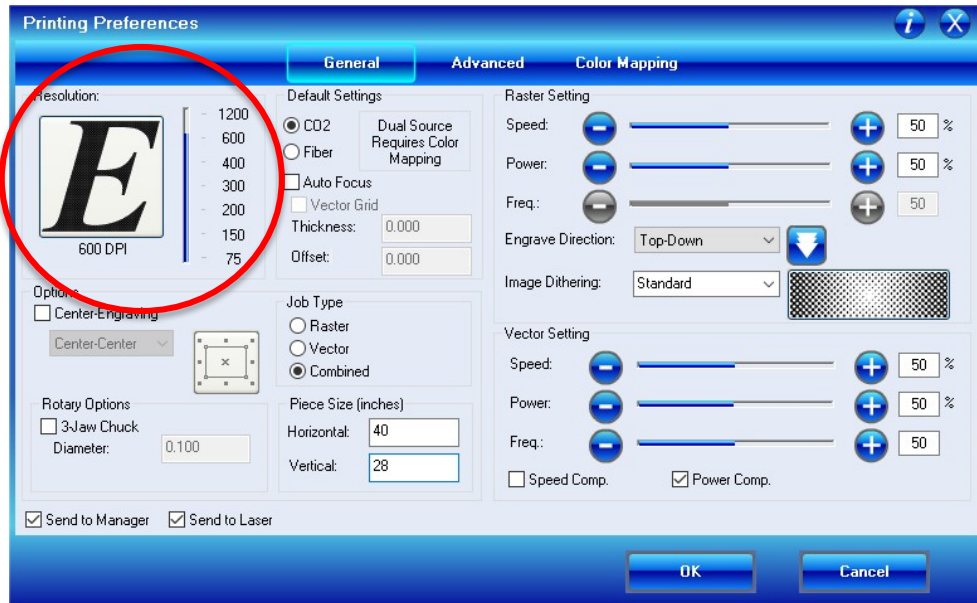
- Change your engrave direction to your preference. Either **<Top-Down> or <Bottom-Up>.** This will tell the laser which direction to start cutting your print. *It is recommended when engraving on paper that you always start from the bottom-up direction.*

- Your default origin on the Mini Epilog Laser is in the upper left hand corner.

- When Vector Sorting is checked you have the option to *Optimize* your cuts or to cut from the *Inside-Out.* The default is set to optimize.
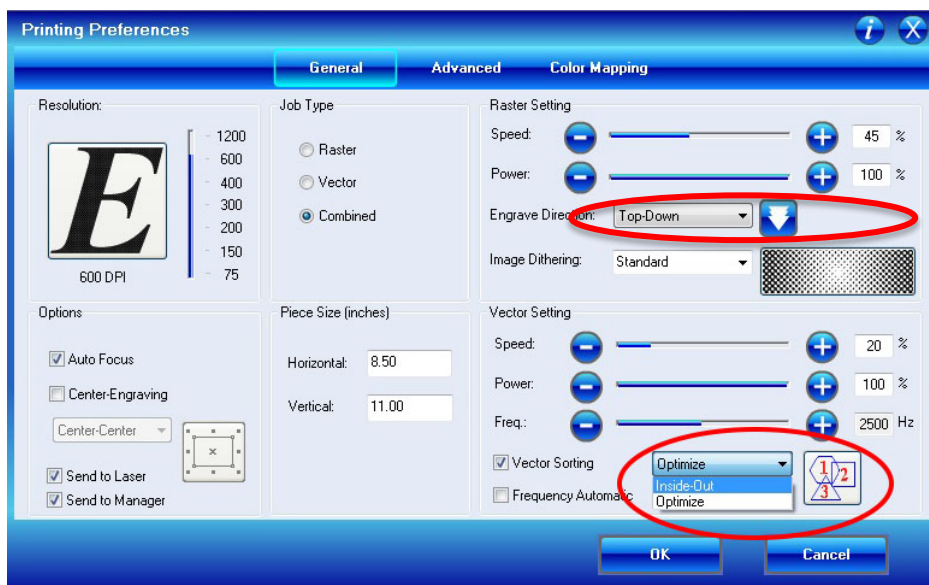
- Click **<OK>** when all of your settings are correct.

- In the print driver click on **<Print><Setup><Print>.** This will set your "media size" to correspond to your "document" (artboard) size in the Illustrator print window. Illustrator media size defaults to 8.5x11 and must be changed or your job will fail.

- In Adobe Illustrator's Print Driver click **<Print>**
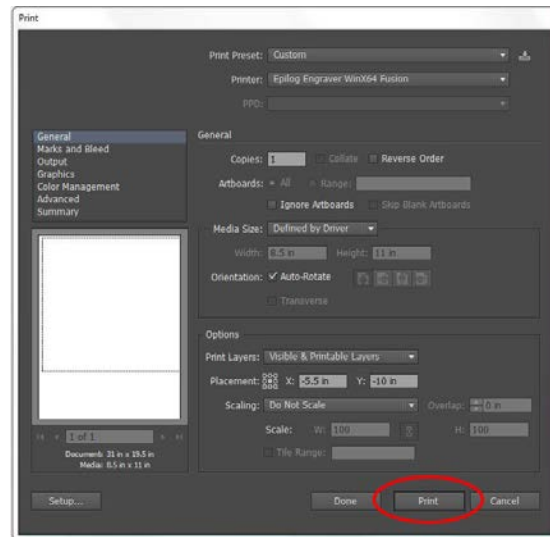
- It should now read **<JOB: (Title of piece)>**
- Below your job name there is a display that shows your estimated print time. *Make sure that your job will be completed in your allotted reservation time.*

Step 5: **Placing your material**

Place your material in the upper left hand corner of the print bed. Do not push down on the Vector Cutting Grid or place heavy material on the vector grid. If your material is heavy and is a raster only job you must remove the vector bed. . Use masking tape to secure your material to the rulers to aid in flattening.

Step 6:   # Setting the <X/Y> Home Position

The laser cutter has a default home position in the upper left hand corner. If the default home position has been changed by a previous user you can reset the default home position by doing the following:
- o   Press the arrow button until **CONFIG** is highlighted
- o   The display should now read **RESTORE XY HOME**
- o   Depress the joystick to engage the home set function

    The print head should now move itself to the home position

Manually Setting the <**X/Y**> Home Position

- Turn on the Red Pointer by depressing the **Red Star Button** on the control panel.

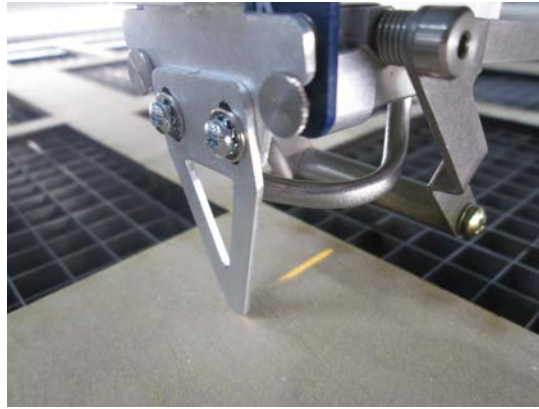- Using the arrow buttons, toggle to <**Jog**>

- Use the **joystick** to move the laser print head to a section of your material that you want to your print to begin.
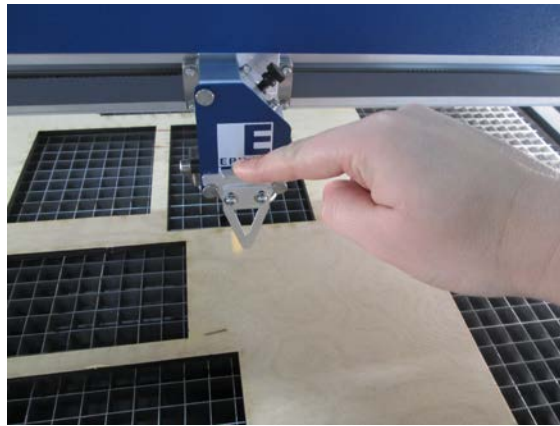- **Depress the joystick once to set your new home position**.

Step 7:   # Focusing Your Laser on the <Z> axis

- Attach the manual focusing tool on the front of the print driver by setting it on the two locator pins.

- Using the arrow buttons toggle to <**Focus**>

- Using the **joystick** move the print driver up or down until the tip of the manual focus tool just makes contact with the surface of your material.   When raising the bed to focus the laser you can adjust the travel speed by moving the joystick to the left and selecting between a single arrow (slow) and a double arrow (fast). If you tap or flick the joystick quickly it will move in fractional increments. Place your left index finger on the top of the manual focus tool and move the joystick with your right hand. Now you can feel when your material touches the tool.

- When you reach the surface of your material with the manual focus tool **press down on the joystick once to set your new focus position**. Screen should read 0.00

- Remove the manual focus tool and place it back in its storage location.

  - When vector cutting acrylic, set your <**Z**> zero as outlined above. Then raise the bed 0.080 and set your focus again. This will ensure a clean cut. Be aware that if you are also rastering the effect may not be desired as your focus point is not correct for the raster function.

Step 8:   # Turn on the Air Filtration System and Air Assist Pump

- The air assist pump is located on the ground next to the laser. This pump cools the laser when it is operating so it MUST be on when the laser is operating
- Each laser has its own air assist pump
- Turn off air assist pump when your job is complete

The Air Filtration system is marked "VENTILATION BUTTON" and is located below and to the left of the TV.

This system filters the air for all lasers. If your project is complete and other lasers are in use you must leave this system on.

Step 9:   Printing your Project

- Close the lid of the printer. Toggle back to **<JOB>**.
- Hit the **<GO>** button on the control panel.
- Hitting **<STOP>** will pause your print. Hit go again to resume your print.
- Hitting **<RESET>** will cancel you current job and reset laser to the home position.

- The lid and front panel need to be closed to engage the laser. If you try printing with either of these doors open the laser will not fire and the print driver will go through ghost motions of your print.

YOU MUST REMAIN AT THE LASER AND BE ATTENTIVE AT ALL TIMES WHILE IT IS IN OPERATION

USING THE ROTARY TOOL

Rotary tool used for RASTERING on glass or treated metal only. No vector cutting is allowed.

Before you can raster on raw metal you must first apply a coating of metal etching spray. Innovation Studio supplies this spray for a small per-application fee. If your metal object is already painted, powder coated or anodized (aluminum) you may raster directly on the treated area.
The laser will not raster on raw metals.

The laser will raster directly on glass. No treatment is necessary.

Step 1   Installing the Rotary Tool

- Lower the laser bed to allow enough space to remove the vector grid from the laser. Remove the vector grid.
- Turn off power.
- Install rotary tool in the top left corner making sure that it makes contact with the left ruler and upper ruler guides.
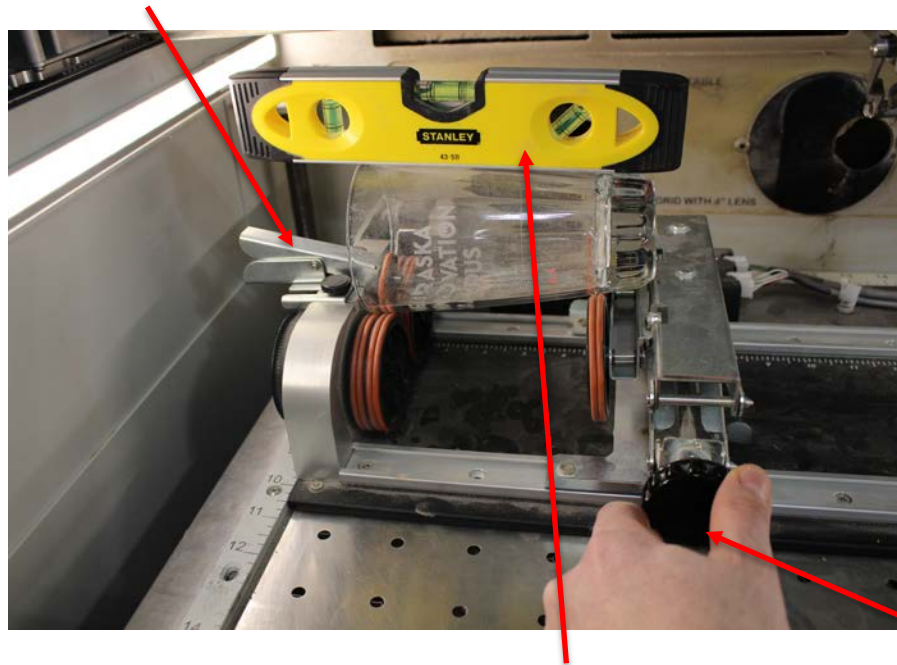

- Plug connectors in on the inside right side of the laser bed area, making sure that connector tabs are facing you.

- Turn laser power back on.

Step 2   Placing your object

- Locate your object by placing it on the left hand and right hand wheels using the clip wheel on the left side of the rotary tool to secure it.

- Level your object by placing the micro level on the area you will raster and adjust the leveling wheel to raise or lower your object until it is level.

Step 3   Setting your <Z> axis

- Select <focus> on the operational keypad. The laser print head will move to the apex of your object.
- Place the <Z> focusing tool in the cradle. Raise the bed until the focusing tool makes contact with your object.
- Depress the joystick. Your <Z> reading should now be '0.00'

Step 4   Setting your <X> & <Y> axes

- Your <Y> axis is set automatically and should not be adjusted.
- Your <X> axis is also automatically set but can be adjusted to line up correctly with your object.
    - Turn on the laser pointer.
    - Place a small piece of plywood or cardboard so that it lines up with the top edge or opening of your object.
    - If the laser pointer is not lined up with the top edge of your object you can adjust it as follows:
    - Select <JOG> on the operational keypad.
    - Using the joystick move the laser head to the correct location in the <X> direction only.
    - Press down on the joystick to set your new <X> axis location.
    - Select <JOB> on the operational keypad.

Step 5　　Setting up your file to print

- Set your artboard size to match the size of your object:
  - Width must match the height of your object.
  - Height must match the circumference of your object.
- Orient your text or image vertically on your artboard (when you stand your object up, after engraving, it will be horizontal)
- For reference, the top edge of your artboard translates to the object's apex when it is in the rotary tool. Make placement adjustments based on this. (If you locate your raster file 1" down from the top edge of the artboard your object will rotate 1" before it is rastered.)
- Go to **<FILE><PRINT>**
- In the options section select the upper left most box in the placement section.
- Click **<SETUP>** then **<PREFERENCES>**
- Select Job Type **RASTER.**   This is very important so the laser does not vector on your object. Glass and metal can never be vector cut, only raster etched.
- Set your piece size to match your object and artboard size.
- Enter your raster speed and power settings.
- Click **<PRINT><SETUP><PRINT>** to correctly reflect your piece size in the print window.
- Click **<PRINT>** in the bottom right corner of your print screen.
- TURN ON VENTILATION ON THE WALL AND ON THE SMALL BLOWER MOTOR LOCATED NEXT TO THE LASER.
- Click GO to raster your file.

When your file is complete, turn off the laser, unplug and remove the Rotary tool, install the Vector grid and turn the laser back on. Shut off the air assist pump.

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