PRINTSHOP EPILOG LASER

AUTODESK
PIER 9

FOCUS GAUGE
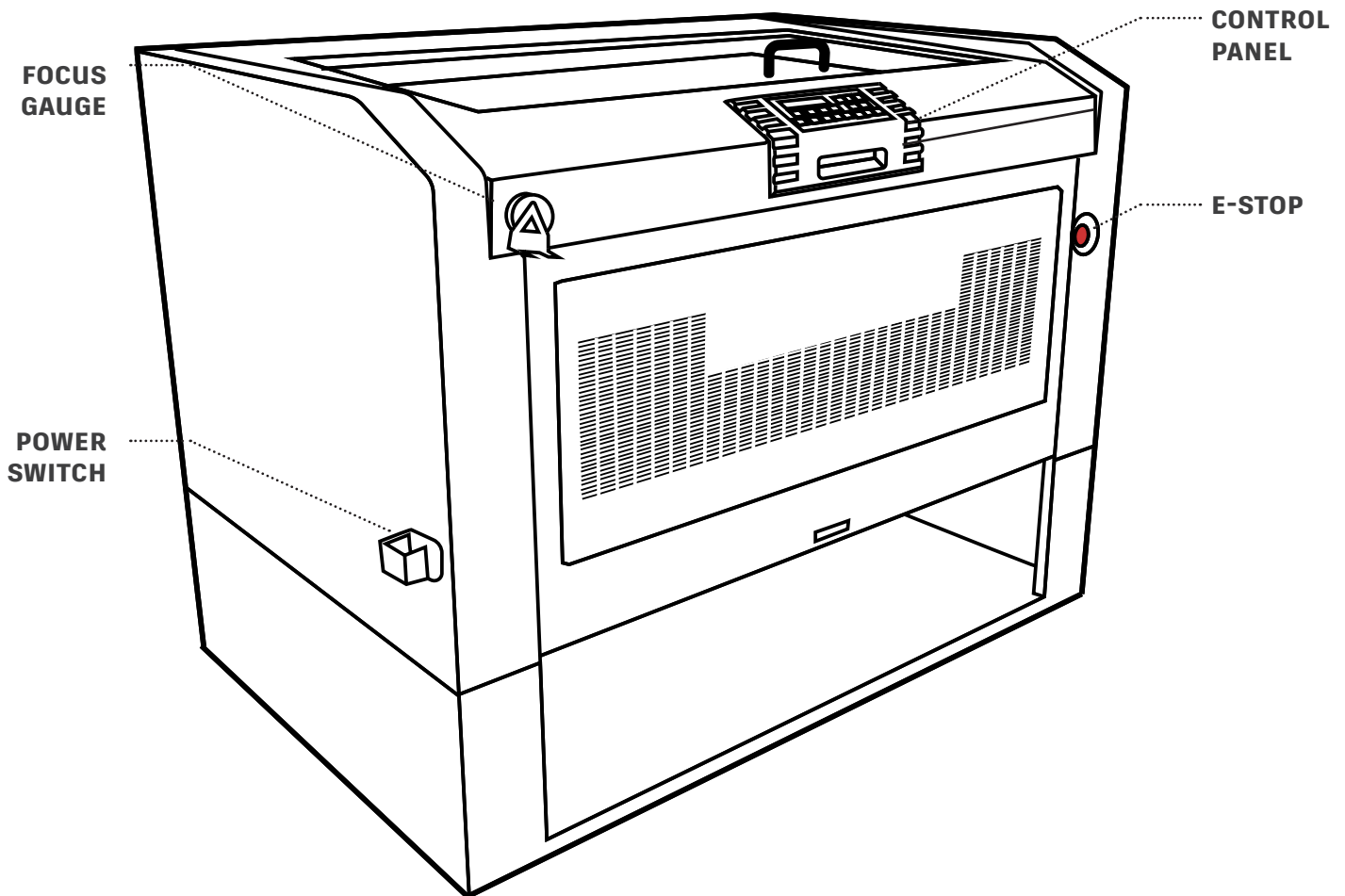
CONTROL PANEL

E-STOP

POWER SWITCH

MATERIALS

ⓘ **ALWAYS CONSULT THE CHART BEFORE CUTTING OR ETCHING ANY MATERIAL ON THE LASER.**

+ See Shop Staff if material is not listed.

+ Materials are banned due to potential fires or the release or toxic gases when heated.

⊗ **BANNED MATERIALS**

+ PVC
+ Thick Lexan
+ ABS
+ HDPE
+ Polypropylene
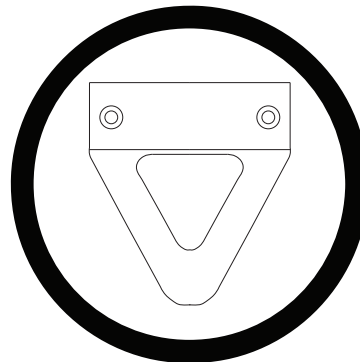+ Fiberglass and Carbon Fiber

NEVER LEAVE THE LASER UNATTENDED WHILE CUTTING

A fire can start in a laser at any time; stay next to the machine at all times.

DO NOT USE AUTOFOCUS

Always use the manual focus gauge. Autofocus can cause damage to the nozzle.

USE APPROVED MATERIALS ONLY
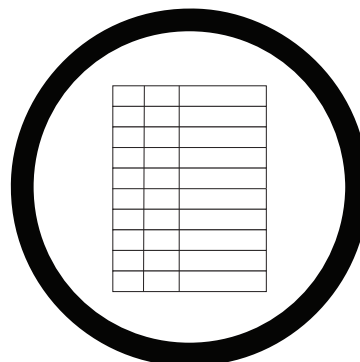
Some materials release poisonous gases or burn when heated. Always consult the chart (on the wall and computers) for materials before using the laser.

VENTILATION & EXHAUST

The vent system must be on for all laser work. The control is to the left of the power washing station.

1. The *fan status* light must be lit.
2. To start the fan, press the black fan start button.
   ▸ Keep the button down until the green light comes on.
3. Wait for the display to reach a value between -1.40 and -1.70.
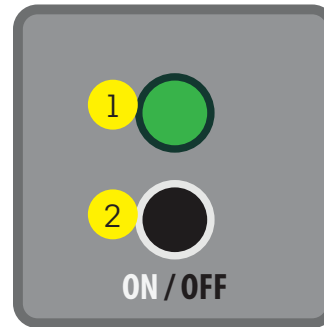
BLAST GATES

+ Each laser has a *blast gate* that must be open while in use.
   ▸ In case of fire, close the blast gate to stop the ventilation system from bringing fresh air to the fire.
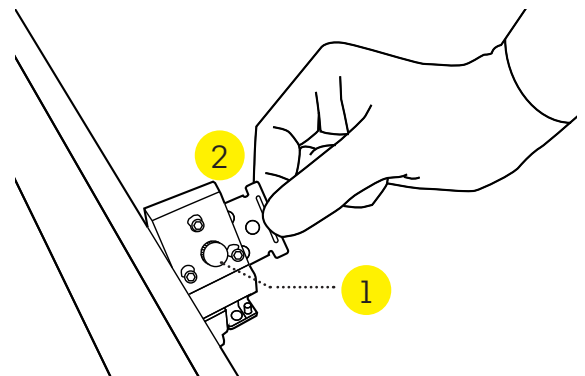+ Pull to open.
+ Push to close.
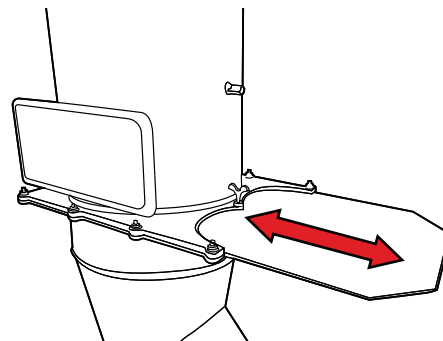
OPTICS

Inspect the optics before using the laser.

Put on nitrile gloves before inspecting the optics.

Inspect the mirror

1. Loosen the thumb screw.
2. Remove the mirror, and inspect.
3. If the mirror is dirty, wipe it with a cotton swab dipped in the correct cleaner.
4. Return the mirror to its holder.
5. Gently snug the thumbscrew.

Inspect the lens

1. Unscrew the two screws of the lens assembly (attached to the X axis).
2. Inspect the lens for smudges.
3. If smudged, find a member of Shop Staff to clean the lens. Do not attempt on your own.
4. Reinstall the lens assembly into the carriage and snugging the two screws.

Note: See Instructable *Pier 9 Guide: Cleaning the Epilog Lens* for more information.
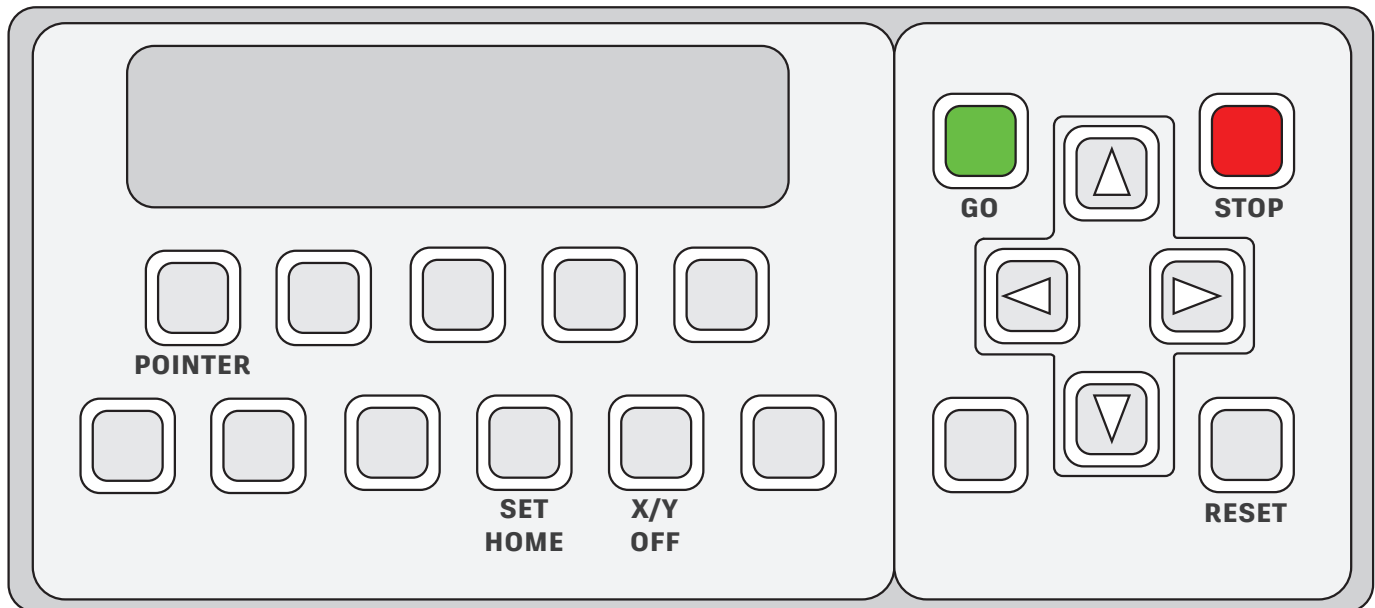
BUTTONS NEEDED FOR BASIC USE

GO - starts the laser job.

► Resumes a job paused with the STOP button.

► Answers "yes" to questions on the display.

STOP - pauses the laser job at the end of the current line.

► Answers "no" to questions on the display.

Arrows (up, down, left, and right) - used to navigate menus.

RESET - Resets the current operation.

► Sends the laser home, or to user defined home.

► Exits current mode.

POINTER - turns on the red dot (non-cutting) laser.

► This shows where the cutting laser is pointing.

SET HOME - allows you to move the gantry and set user defined home.

► Use X/Y Off to disable the gantry motor and move to the desired location first.

X/Y OFF - allows moving the laser carriage by hand.

► Press X/Y Off.

► Press the green GO button to confirm, and release the gantry motors.

► The laser cutter is a precision machine; be gentle when moving the gantry.

STOP pauses the job at the end of the line.

+ To instantly stop the cutting laser, lift the lid.

► The gantry will continue to move.

+ To instantly shut off the machine, press the E-stop.

EPILOG LASER CUTTER

PREPARING FOR USE

VERSION 3.1

NEVER USE AUTO-FOCUS; ALWAYS MANUALLY ADJUST THE TABLE HEIGHT.

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CHECK THE BED FOR POTENTIAL FIRE SOURCES

1. Use the power switch to turn on the machine.
2. Open the lid.
3. Look through the honeycomb.
   - ▶ If there are more than a few pieces of paper or combustibles under the bed, it will need to be cleaned.
4. Press the down arrow to lower the bed.
   - ▶ The button is located on the left side, towards the front, inside the machine.
5. Flip up the three ruler guides.
6. Remove the honeycomb.
   - ▶ Take care to not hit the laser optics.
7. Use a vacuum to clean the lower tray.
8. Reinstall the honeycomb.
   - ▶ The extended aluminum sides go down.
9. Flip down the ruler guides.
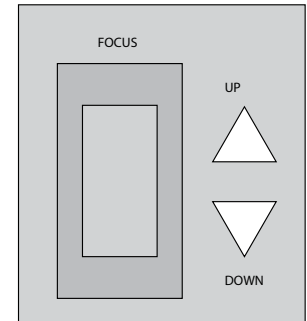
LOAD THE MATERIAL

1. Open the door.
2. Check the tray and ruler guides before placing your material on the bed.
   - ▶ The ruler guides should be flipped down flat, on top of the tray.
3. Place your material flat on the honeycomb, taking care to not hit the optics.
   - ▶ If using weights to hold down warped material, make sure the laser will not hit them.

FOCUS THE LASER

The laser must be manually focused before each job.

- + **Never use the autofocus option.**

1. Press **X/Y OFF**.
2. Press **GO** (to confirm).
3. Gently move the gantry ₵ optics until the red dot is pointed directly at your material.
   - ▶ If your material is warped, focus it at the average warped point of your material.
4. Place the focus gauge on the pins.
5. Use the up/down arrows to adjust the table height until you touch the material with the focus gauge.
6. Place the focus gauge back on the front of the laser.
7. Press **RESET** to exit **X/Y OFF** mode.

If you use the same material, and do not move the bed, you can continue to use the laser without refocusing.
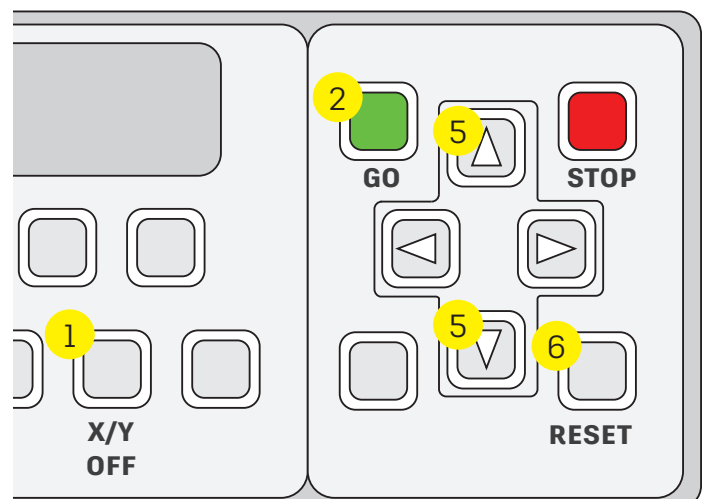
ETCHING VS. CUTTING

+ *Etching* is the process of removing a small layer of material from the top of the workpiece.

+ *Cutting* goes all the way through the material.

VECTOR VS. RASTER

Vector artwork is a collection of straight or curved lines. Illustrator files and DXF files are examples of vectors.

The laser software will follow a vector line and cut or etch, depending on power settings.

Bitmap or *raster* artwork is a collection of individual points. JPG, GIF, PNG and Photoshop are examples of bitmap files.

The laser software will interpret raster lines as instructions to etch, not cut. The laser will hit each dot or pixel with a short blast of light to burn an image into the material.
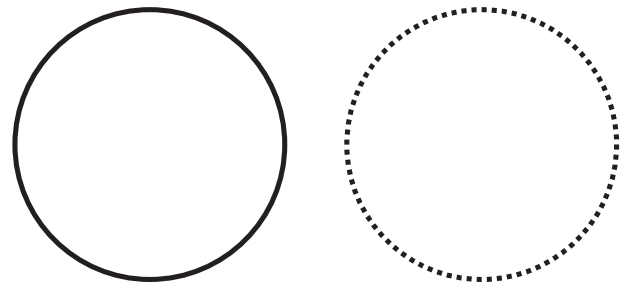
VECTOR

RASTER

Vector vs. raster, at extreme magnification.

The interface for the laser is a printer driver that works from **AutoCAD**, **Adobe Illustrator** or **CorelDRAW**. Autodesk CAD products can export flat surfaces (faces) as a DXF and imported into graphics software.
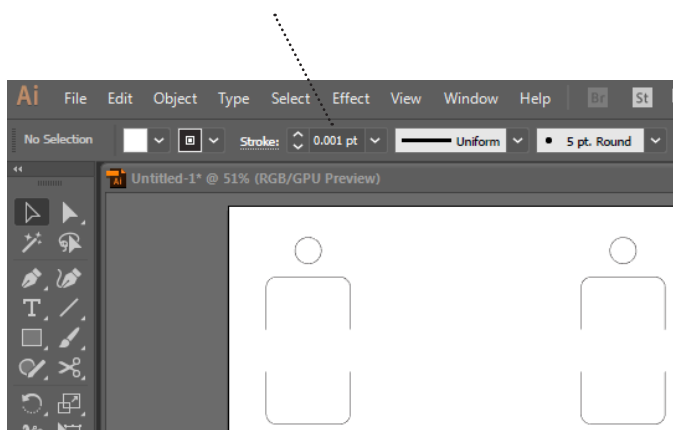
In Illustrator or CorelDRAW, starting with an artboard size of 36" x 24" will make placing artwork easier.

SELECTING VECTORS IN DESIGN SOFTWARE

Adobe Illustrator

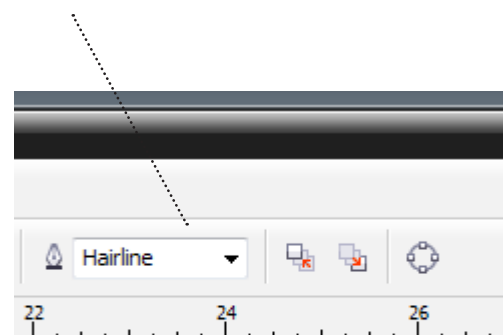In Illustrator, lines with a 0.001" stroke will be a vector.

All other lines will be interpreted as a raster.

CorelDRAW

In CorelDRAW, lines with a width of *hairline* will be a vector.

All other lines will be interpreted as a raster.

PREPARING THE JOB

1. Open the file in your graphics software.
2. Select "**Print**" from the *File* menu.
3. Select the laser cutter you want to use.
   ▸ Earth, Water, Fire or Air.
4. Open the Printing Preferences or Setup dialog to open the Epilog settings dialog.
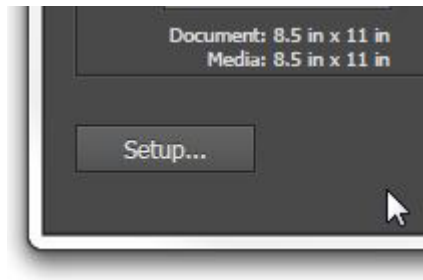
CHANGING THE SETTINGS

1. Use the *Epilog Settings* file on the desktop to look up settings for your material.
2. If rastering, set the resolution.
   ▸ As DPI increases, the image will look better but the job will take longer.
3. Ensure that *Autofocus* and *Center Engraving* are **not checked**.
4. Select the job type.
   ▸ You can choose to only work on rasters or vectors, or run both jobs together.
5. Double check that the *Piece Size* is 36" x 24".
6. Set speed & power for rasters.
7. Set speed, power & frequency for vectors.
8. Click OK.
   ▸ This will close the setup dialog, and return you to your graphics program.
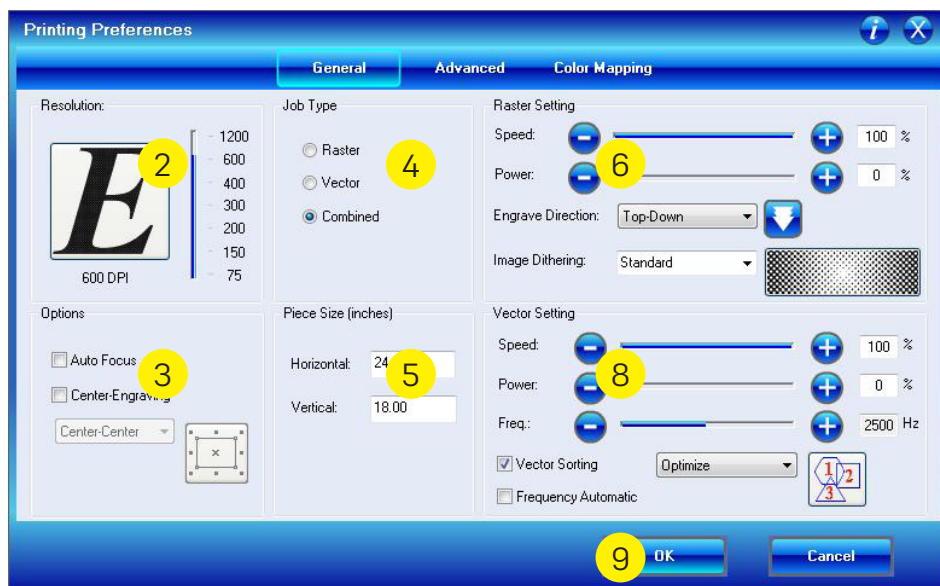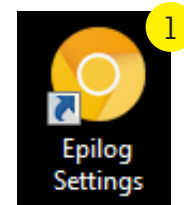9. Click "print" in your graphics program to send the job to the laser.

Image Dithering is the process of turning greyscale images into .

+ Jarvis & Stucki produce the best patterns for photos.
+ You will need to make a test cut to see the results.

**Vector Sorting** selects the order that items will be cut.

+ In general, inside pieces should be cut before the perimeter.
+ Use this option to override the default.

EPILOG LASER CUTTER

AUTOCAD

VERSION 3.1

USING THE LASER WITH AUTOCAD IS MORE COMPLICATED, BUT MORE POWERFUL.

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AutoCAD

AutoCAD uses *color mapping* to define different laser options.

+ Each line can be assigned a color in the drawing software.
  ▶ This works in Illustrator and CorelDRAW also.
+ In the laser software, each color is given different attributes (speed, power, vector, raster, etc).

1. Apply a color to your geometry.
2. Select Print from the File menu.
3. Select the laser cutter you want to use.
   ▶ Earth, Water, Fire or Air.
4. Click Properties, then Custom Properties.
5. Click the Color Mapping tab.
6. Change the color to match a color from your AutoCAD file.
7. Adjust the setting that will be applied to all lines of that color.
8. Click the arrow to save the settings for that color.
   ▶ Repeat for other colors if needed.
9. Press Print to send to the machine.
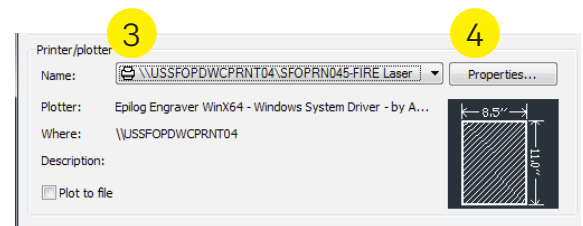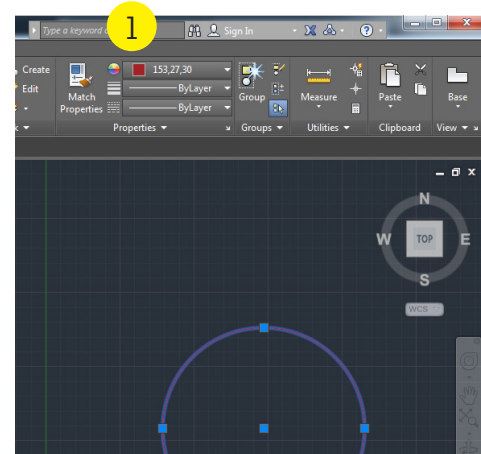
CHANGING THE USER HOME

If you want to work in a specific area of your stock, you can move the head of the laser and set a temporary home.

1. Turn on the pointer.
2. Press **X/Y OFF**.
3. Press **GO** to confirm.
4. Gently move the head & gantry until the pointer is indicating your desired start point.
5. Press **SET HOME**.
6. Press **RESET** to exit Set Home mode.
7. To reset home to the original settings, turn the machine off and back on.
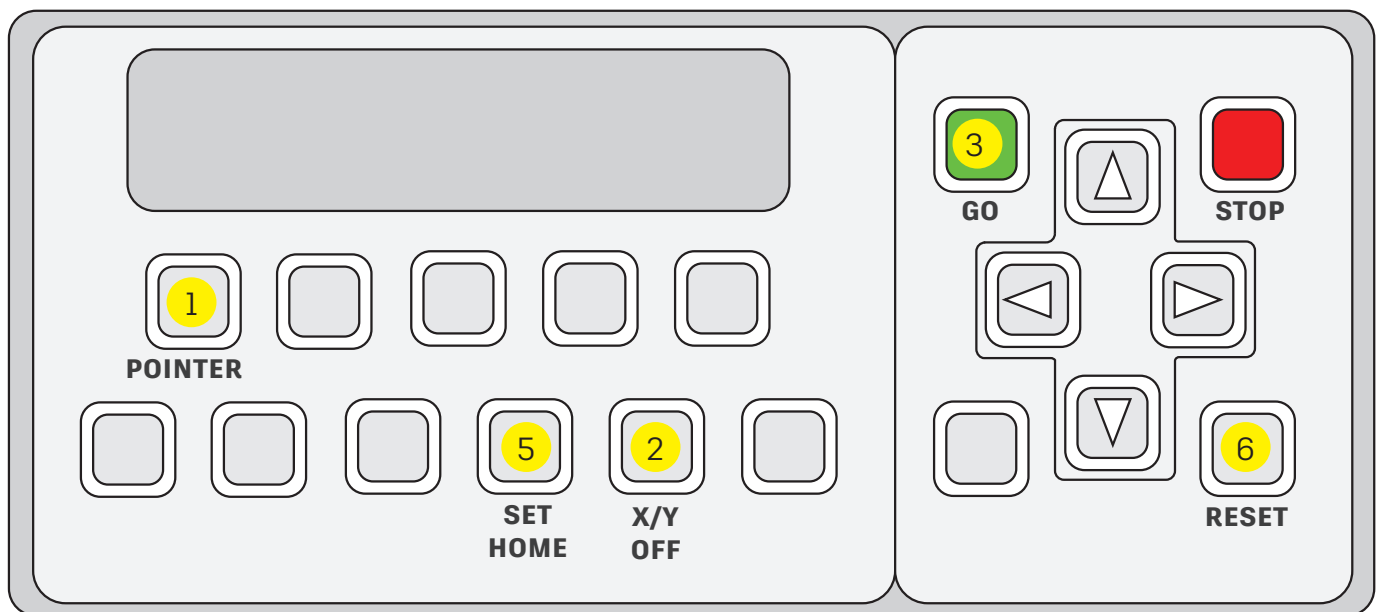
MAKE AN AIR PASS

Make an *air pass* before cutting. An air pass follows the toolpath, with the cutting laser off.

1. Turn on the pointer so you can see the path the laser will follow.
2. Open the lid.
3. Run the job.

EPILOG LASER CUTTER

FIRE SAFETY

VERSION 3.1

BE ALERT FOR A FIRE IN THE LASER CUTTER; DON'T LET A SMALL FIRE BECOME A LARGE ONE.

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STEPS TO PUT OUT A LASER CUTTER FIRE

Always follow these steps, in order, when attempting to put out a fire in a laser cutter.

1. **Lift the Lid**
   - This will turn off the cutting laser and stop adding heat to the flame.
   - When flame is out, adjust your cut settings, then continue or restart the job.

2. **Blow Out the Flame**
   - If the operator feels safe, attempt to blow out the flame.
   - When fire is out, check with Shop Staff.

3. **Power Down**
   - Close the blast gate to stop air circulation within the machine.
   - Shut off the ventilation if no other lasers are in use.
   - Press the E-Stop – this will turn off the laser and disengage the gantry motors.
   - Move the gantry out of the way to protect the machine optics.
   - When fire is out, see Shop Staff and do not resume work job until cleared by a Staff member.

4. **Cover with a Damp Towel**
   - Use the spray bottle of water to soak a shop towel kept near the laser cutter.
   - Place the damp towel on the flames.
   - When fire is out, see Shop Staff and do not resume work job until cleared by a Staff member.

5. **Use the Fire Extinguisher**
   - Close the lid.
   - Confirm that the ventilation blast gate is closed.
   - Get a fire extinguisher from the wall by the nearest exit door.
   - Push the Emergency Alert Button, or have somebody else push it.
   - Keep the lid closed, and discharge the extinguisher into the front grill.
   - The entire extinguisher does not have to be discharged all at once. Aim, shoot, and evaluate.
   - When fire is out, see Shop Staff and do not resume work job until cleared by a Staff member.

6. **Pull the Fire Alarm**
   - Evacuate the room and the building.
   - Get yourself and any coworkers to the safety master location.

AREA AND MACHINE PREPARATION

1. Lookup your settings.
2. Turn on the ventilation.
3. Check under the honeycomb for debris.
   - ▶ Vacuum if needed.
4. Focus the laser.
5. Adjust the settings in the Printing Preferences dialog.
6. Load your material.
7. Send the job to the laser.

CHECK THE CHART FOR BANNED MATERIALS BEFORE OPERATING THE LASER.

MAKING THE CUT

1. Make an air pass before cutting.
   - ▶ Lift the lid to keep the cutting laser from turning on.
2. Press the **GO** button.
3. When the job is complete, you can run it again by pressing **GO**.
   - ▶ Close the lid if the air pass was successful.

ALWAYS PAY ATTENTION TO THE LASER; DO NOT WALK AWAY.

CLEANUP

1. Lower the table.
2. Remove the honeycomb.
3. Vacuum the lower tray.
4. Replace the honeycomb.
5. Flip down the rulers.
6. Turn off the ventilation if needed.
7. Put usable material in the scrap bin.
8. Put trash and recyclables in the correct bins.
9. Clean up near the computer and the laser.
10. Remove your USB drive from the computer.

CHECK TO SEE IF THE LASER COMPLETELY CUT THROUGH THE MATERIAL BEFORE MOVING IT.