Introduction to LightBurn software

Instructor: Whoever

Version 2021-05-01

What is LightBurn?

LightBurn is the software ETA uses to control our new lasers.

- **IMPORT** shapes and arrange them. Some shape creation (lines or images) can be done in LightBurn, but this is best program that can export lines and images. *
- **CREATE** you laser plan.
  - Set cutting/engraving speed and power parameters.
  - Determine order of cutting/engraving objects.
- **ALIGN** your design and your material in the laser.
- **CHECK** you cut using Frame
- **START** your cutting/engraving job.

* LightBurn can import the following:
Image files: .bpm, .jpg, .jpeg, .png, .gif, .tif, .tiff, .tga
Vector Files: .ai, .pdf, .sc, dxf, .hpgl, .plt, .rd, .scpro, .svg, .lmrn

Q&A

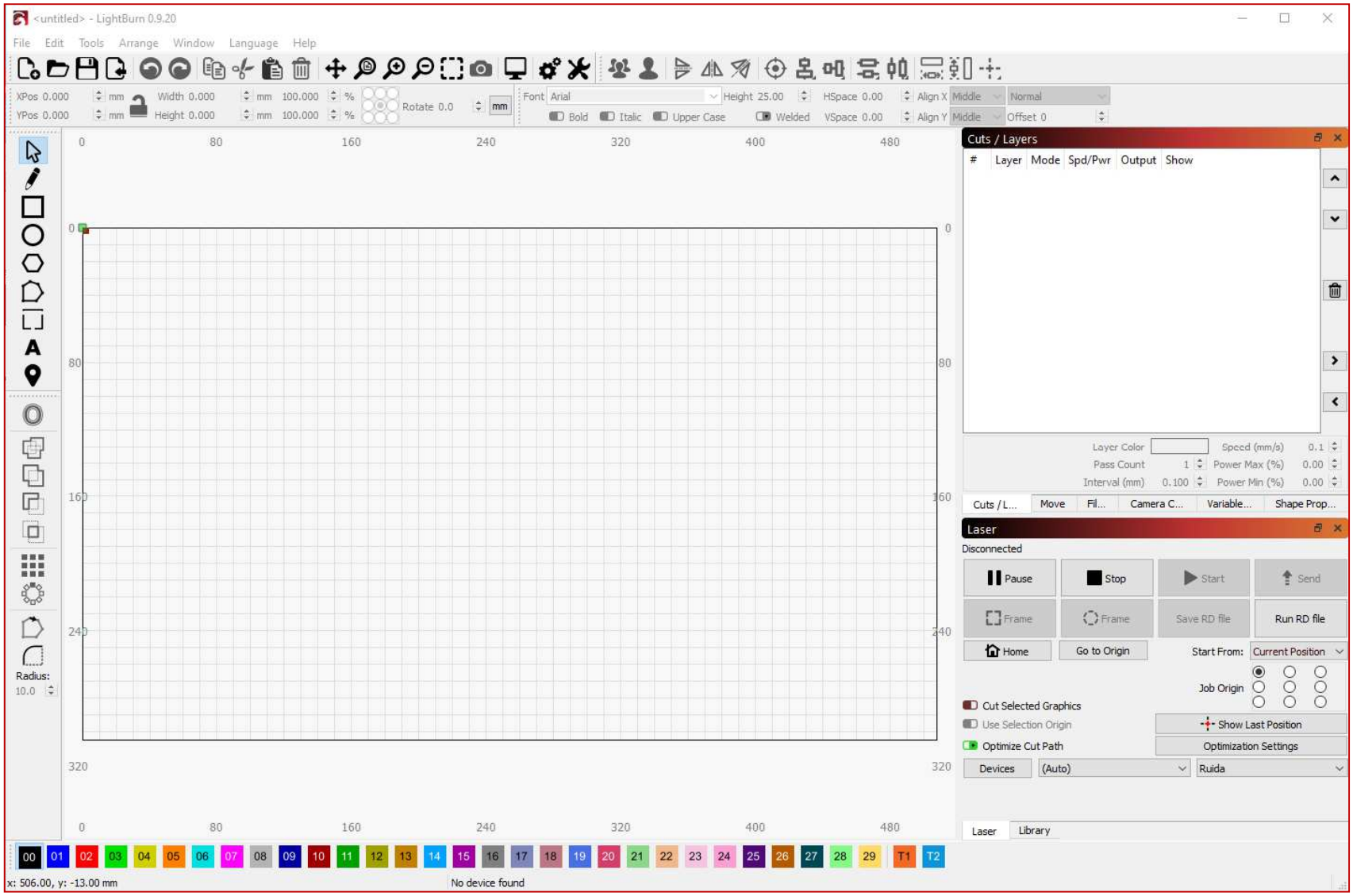
Q: Why LightBurn/ what happened to RetinaEngrave
A: LightBurn enables you to access the full features available in the controllers of our new lasers. It's better than RetinaEngrave and easier to use.

Q: Can I run LightBurn on my own computer?
A: Yes, but you'll need to buy a license to use it for more than 30 days. One license can be used on up to two computers.

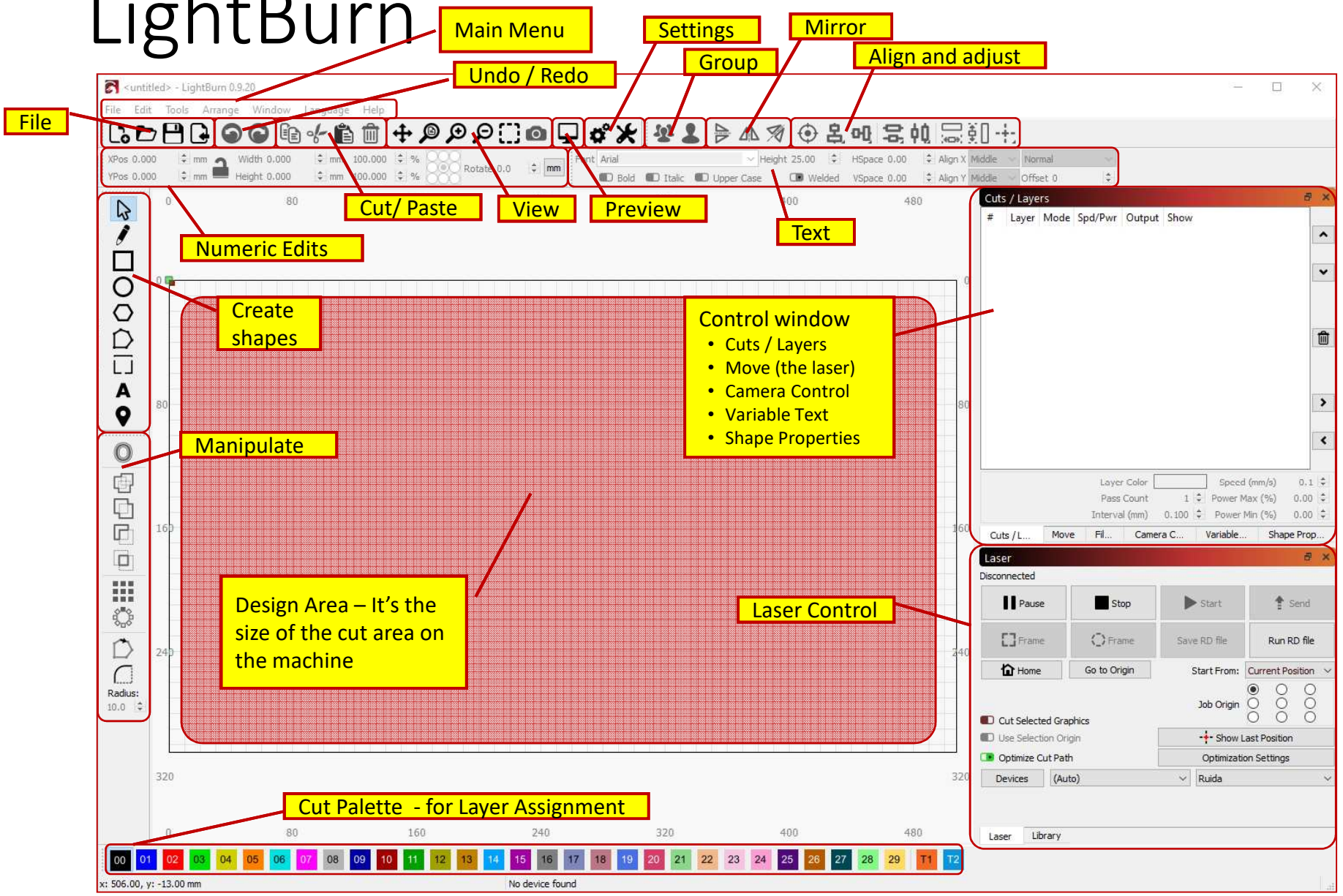
Q: Do I need to do all my project work on the computers conenctd to the lasers?
A: No, LightBurn is also available on the workstations in the ETA studio. It's best to prep there to give osthers access to the lasers.

Q: Can I still use Inkscape?
A: Yes, but you'll need to export your project and import into LightBurn to get it onto the laser.

The LightBurn Screen

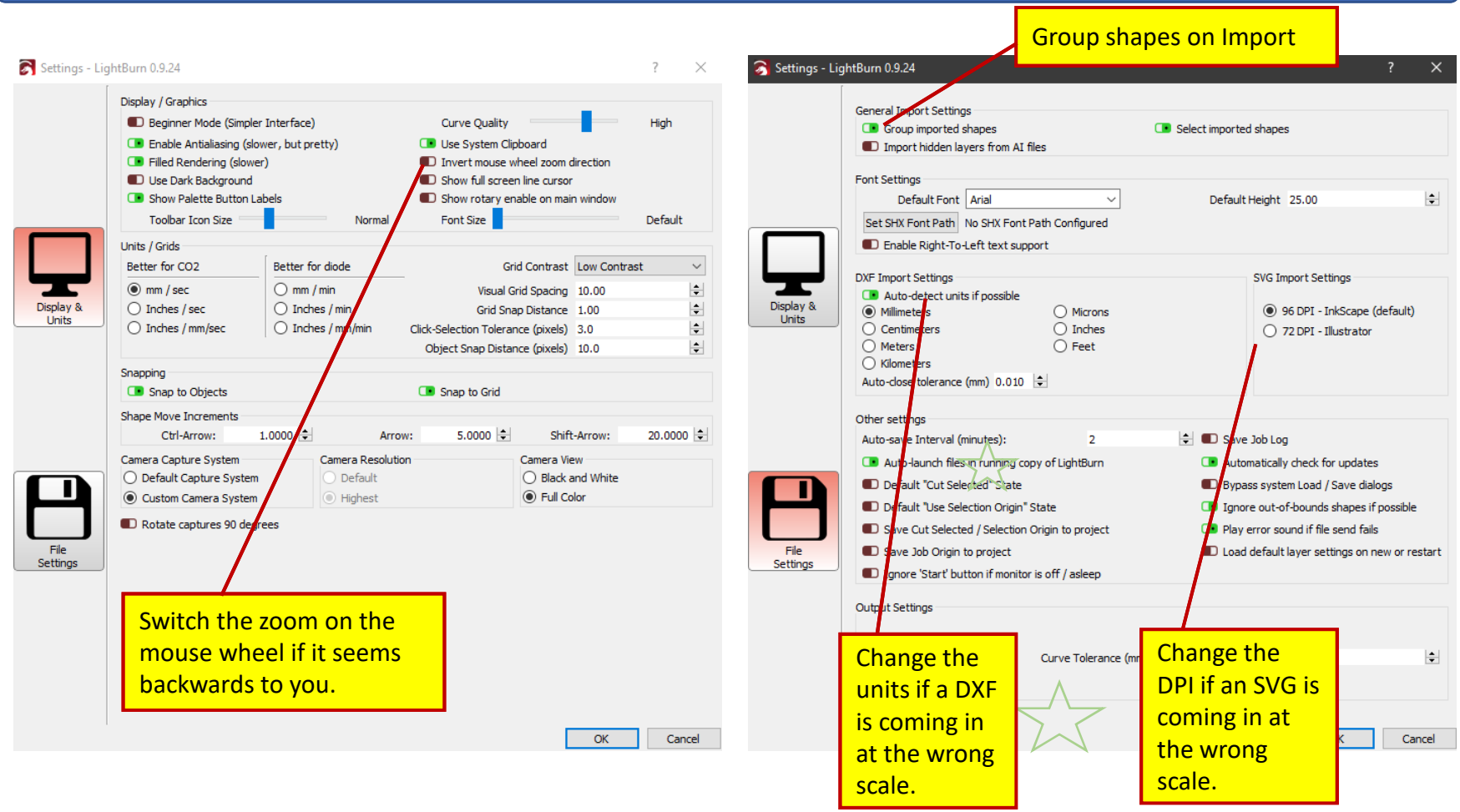


LightBurn

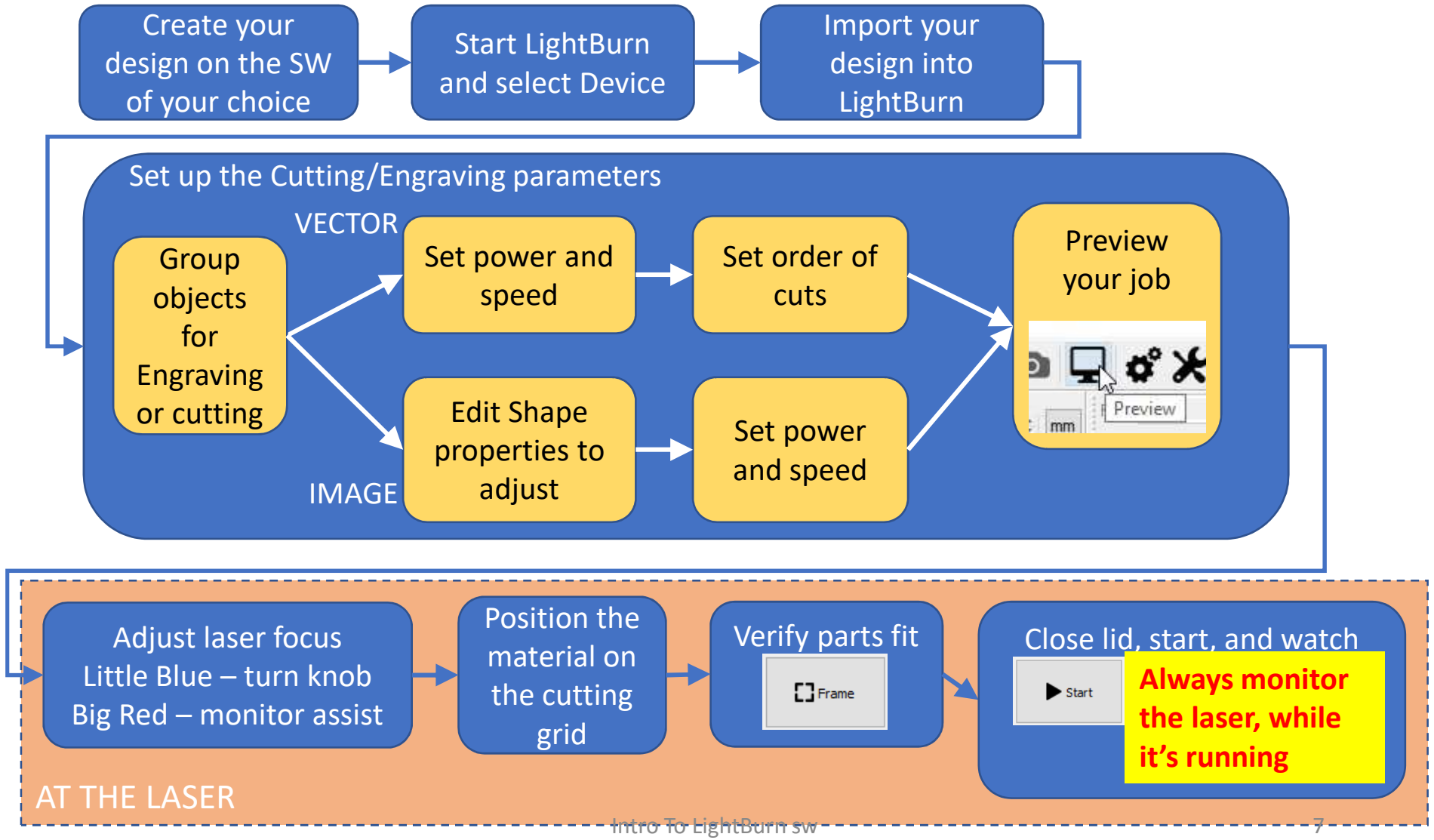

Main Menu
Settings
Mirror
Group
Align and adjust
Undo / Redo
File
Cut/ Paste
View
Preview
Text
Numeric Edits
Create shapes
Control window
• Cuts / Layers
• Move (the laser)
• Camera Control
• Variable Text
• Shape Properties
Manipulate
Design Area – It's the size of the cut area on the machine
Laser Control
Cut Palette - for Layer Assignment

Some user settings to know

Click Edit, then select “Settings” to open the Settings window. There are two sections, Display and Units, and File Settings.

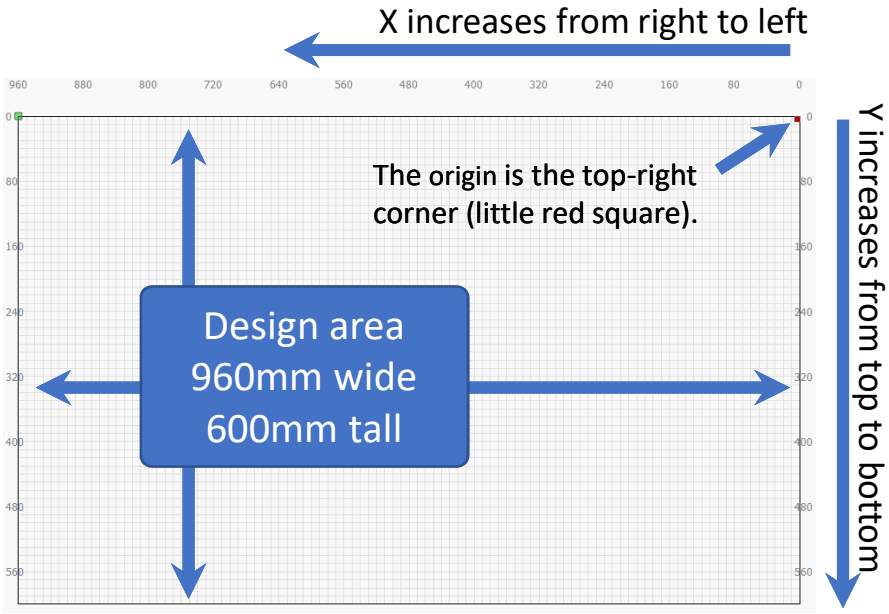


Typical Laser Workflow

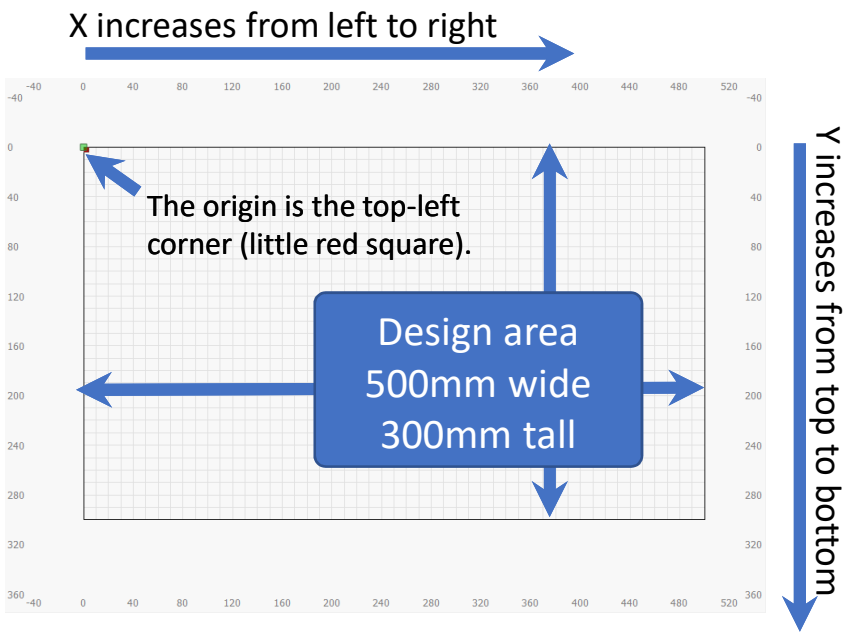


The Design Area

When you start the LightBurn app, it will find the laser connected to it and import parameters associated with it. The important parameters are the size of the design area, and where the origin is (which sets the direction of X and Y).



Big Red

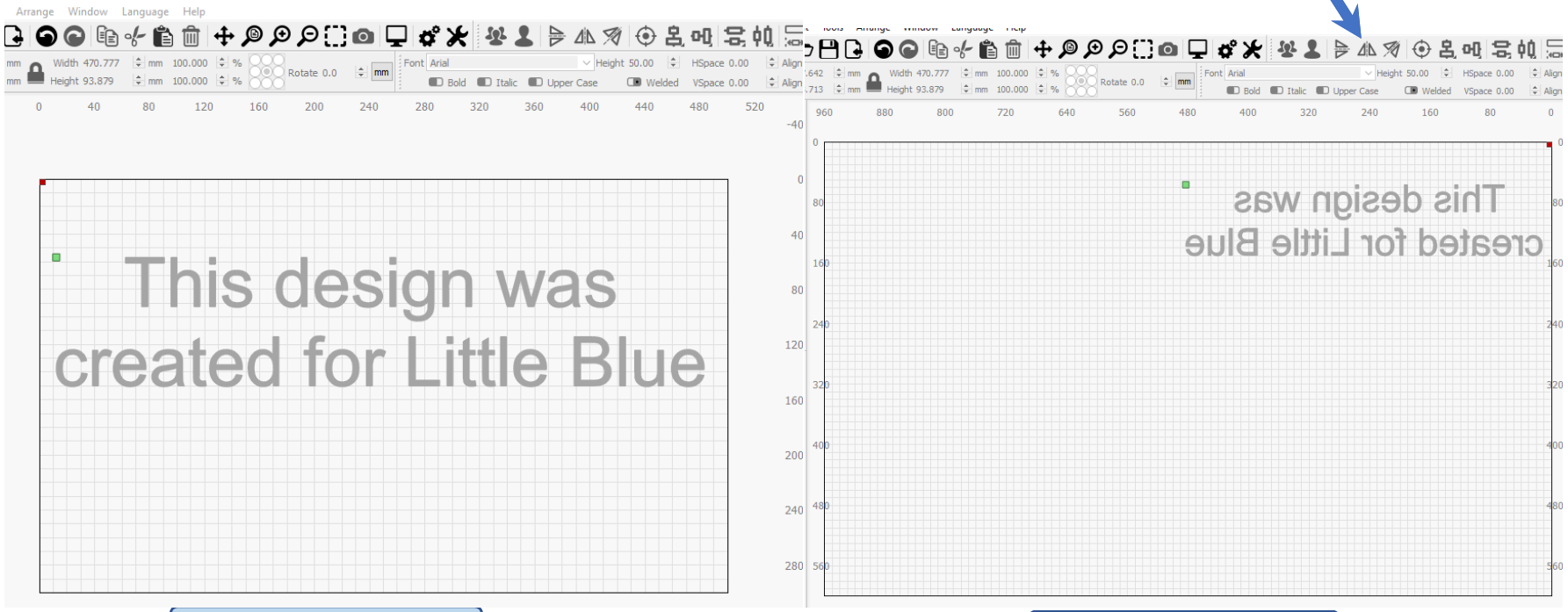


Little Blue

Switching Machines

If you save your design on one machine and then open it on the other, the different directions of the Y axis will cause the design to be mirrored. The fix? Make sure Show is ON for all layers, select all objects and do a horizontal mirror

Horizontal mirror

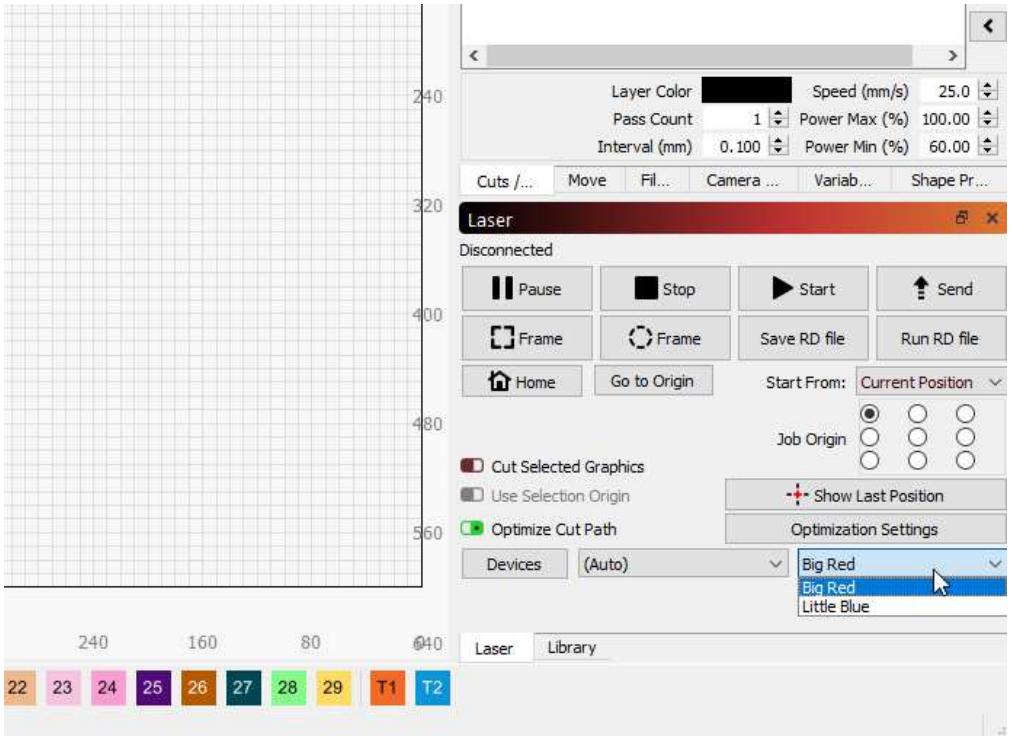


Little Blue

Big Red

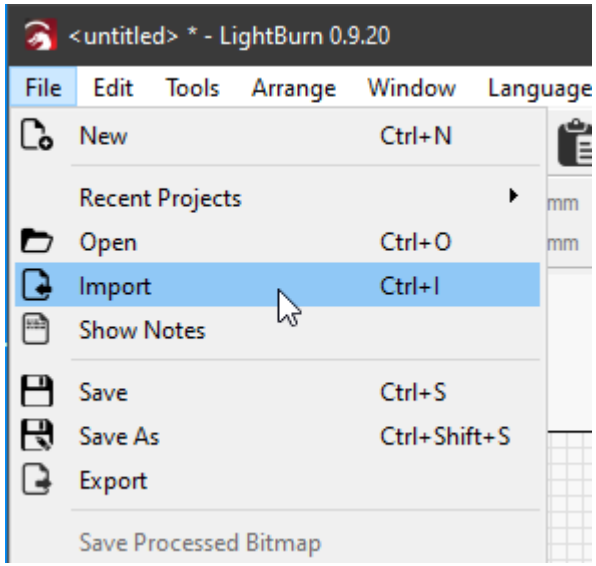
Using the Studio workstations

If you are using a workstation in the main studio (or a personal copy of LightBurn), you should select the device (Little Blue or Big Red) that you plan to use when you go to the laser. Look in the bottom right corner of the Laser window and there is a dropdown with all the devices this copy of LightBurn has set up.



The Laser Window has a drop down for Devices. Pick the one you plan to use.

Import your design

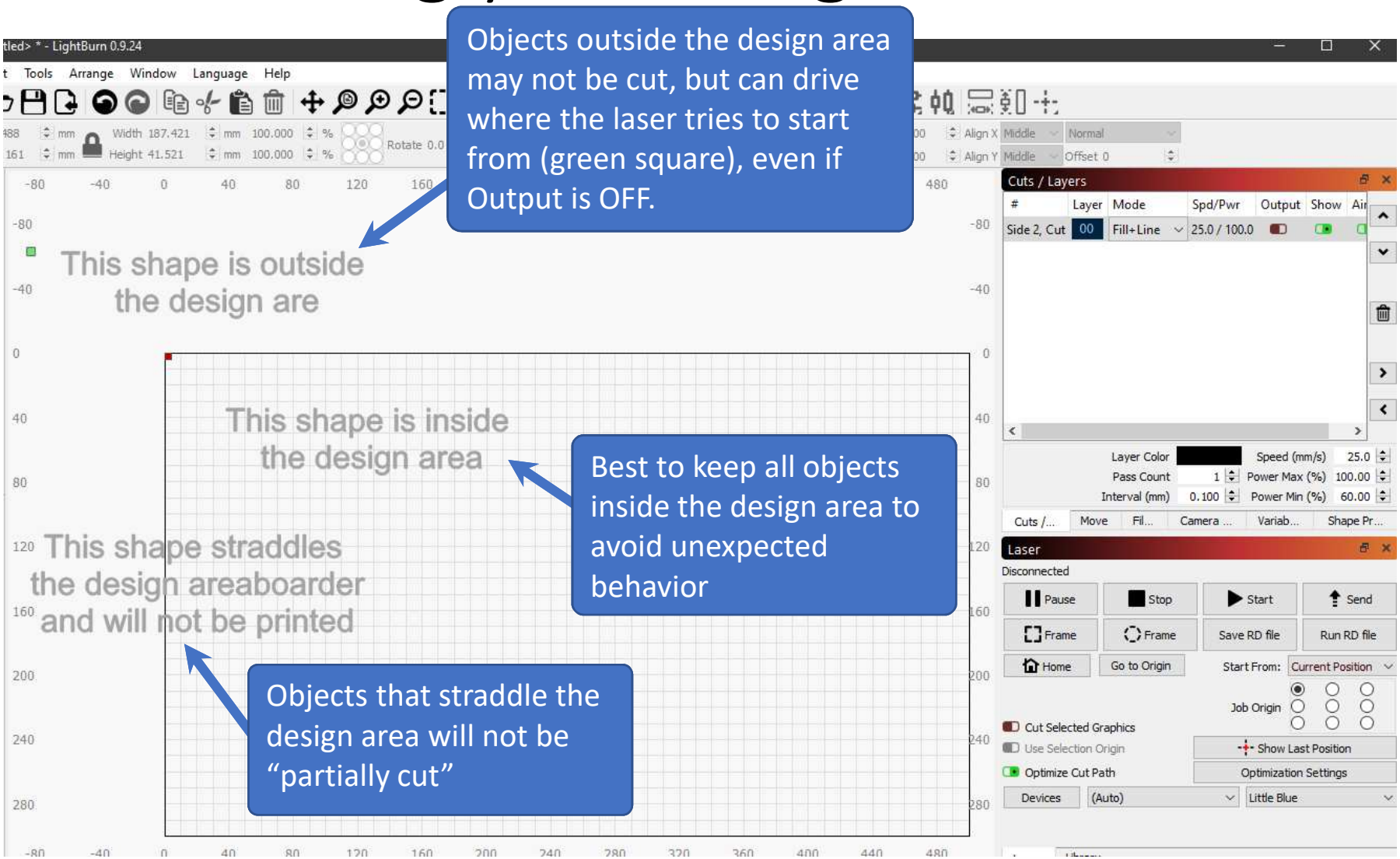


1. File Menu
2. Import
3. Select your file

OR

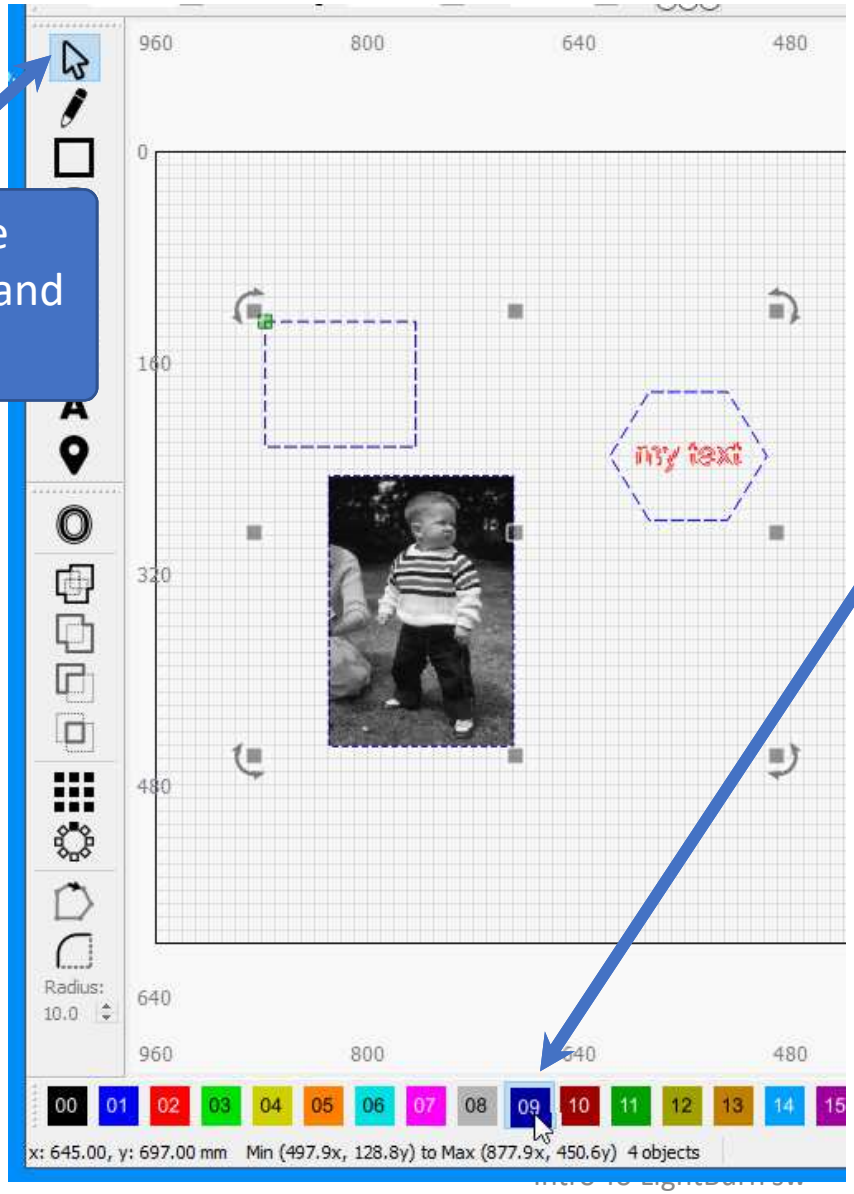
Drag and drop you file onto the design area.

Positioning your design



Assigning objects to layers

Be sure to use object select and move mode



1. Select one or more objects that you want to use the same cutting parameters on.
2. Select a Layer (your choice) from the “Layer Palette” and the lines of the objects will change to that color

Selecting multiple objects

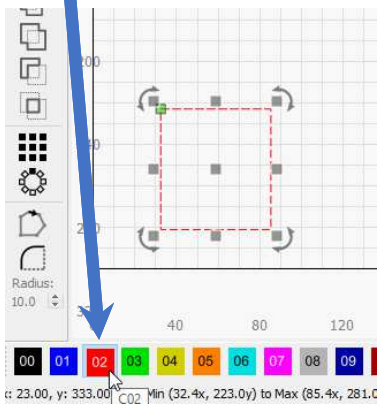
Boxing from the left only selects shapes fully enclosed

Boxing from right selects all shapes with any bit in the box

Setting Cut parameters

Each object needs to be assigned to a “Layer”. The “Cut Parameters” control what the laser does with each object. The order of the layers can (usually does) control the order the objects are cut/etched.

First, select an object, then select a layer from the bottom row. The color does not matter.



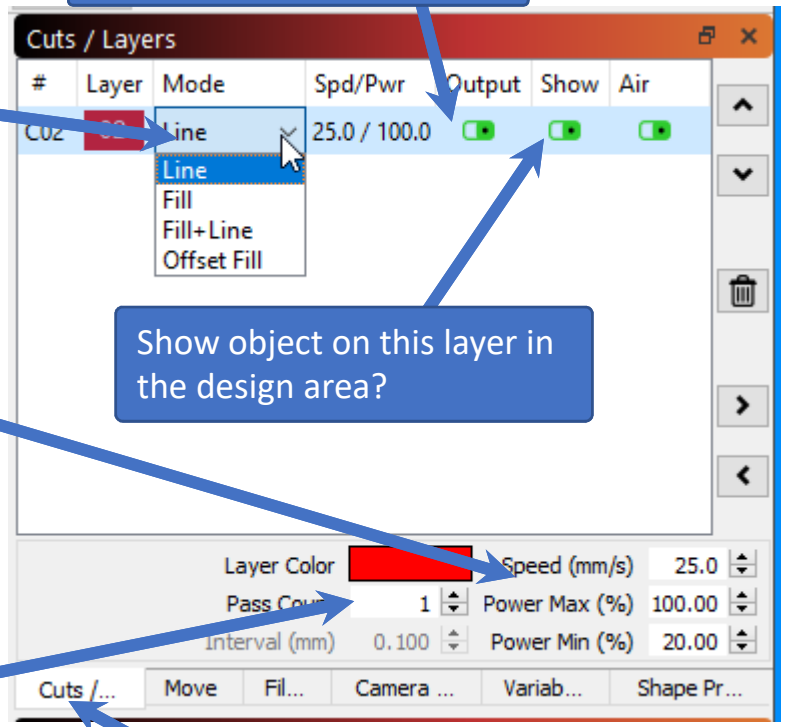
Select a “MODE”
Line – follow vectors
Fill – raster fill the object, but no outlines
Fill + Line – do both
Offset fill – spiral fill (vs raster)

Speed – speed of laser
Power Max - “normal” power
Power Min - minimum power when the laser slows down at a corner.

How many times to repeat this layer

Lase objects on this layer?

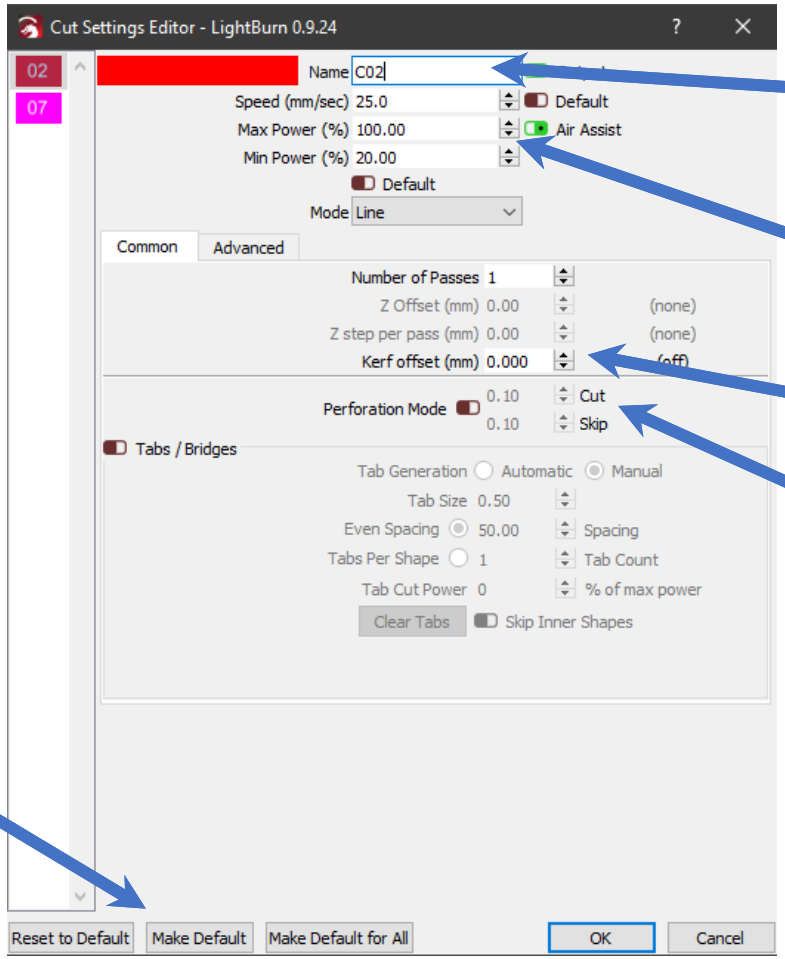
Show object on this layer in the design area?



If the window is hidden, click on it’s tab

More Cut parameters

Double clicking on a layer in the Cuts/Layers window opens the full set of cut parameters. We'll only talk about a few here.



Naming your layers helps you keep track of things in your design .

Speed/Power/Mode settings

Offset the cut to account for the laser kerf

Make a dashed cut or etch line.

Please don't reset the defaults

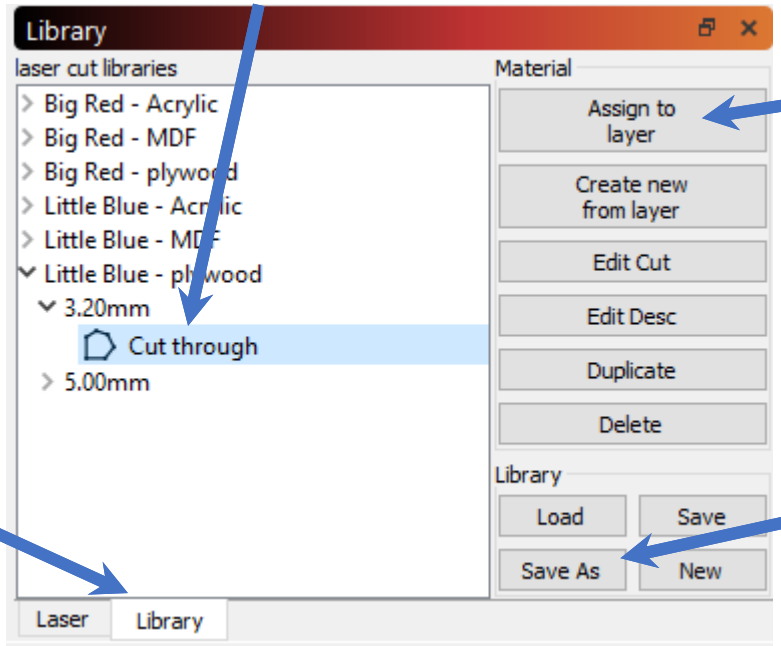
What cut settings to use?

We have created a library of cut settings for typical materials. These can be assigned to a layer. It's a great starting point.

1. Select a layer you want to assign library cut parameters to

3. Expand material, thickness, and select a named cut

Important – pick for the machine you plan to use



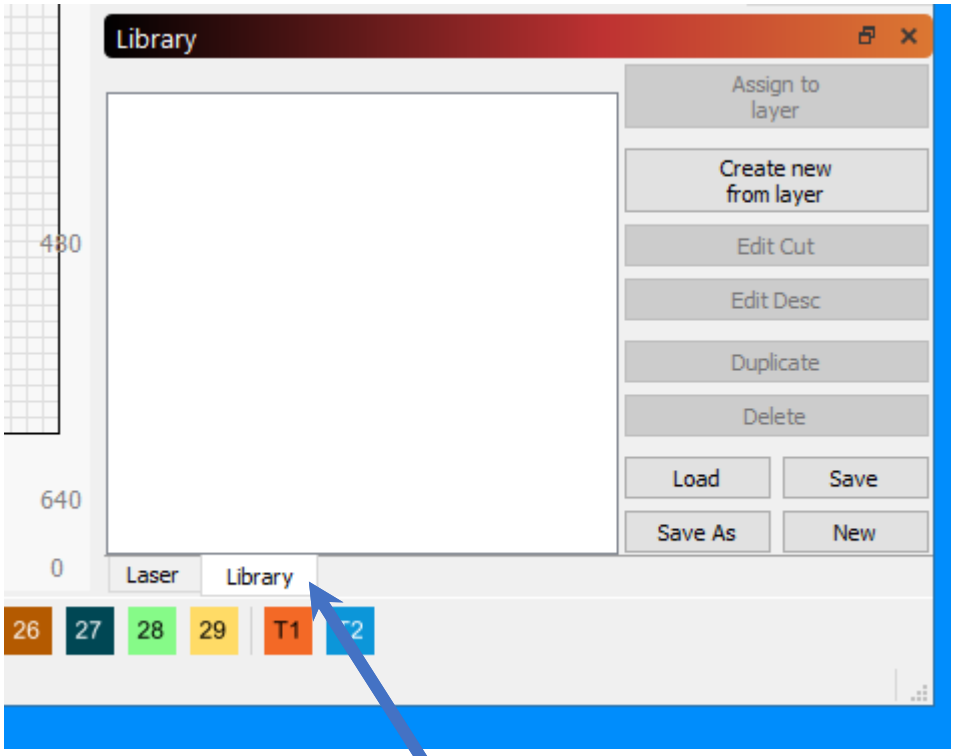
4. Click "Assign to Layer" to copy the cut parameters to your current layer

2. Select the Library tab if the library window is not visible. Normally the laser tab is visible.

You can save a copy of the studio library to use at home.

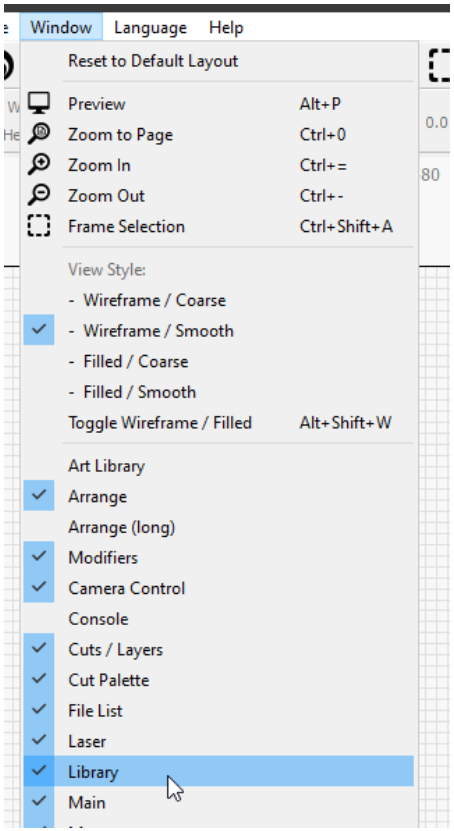
After assigning a library cut to your layer, you can modify the cut settings for that layer without affecting the library. - it's a copy operation, not a linking operation.

Select material

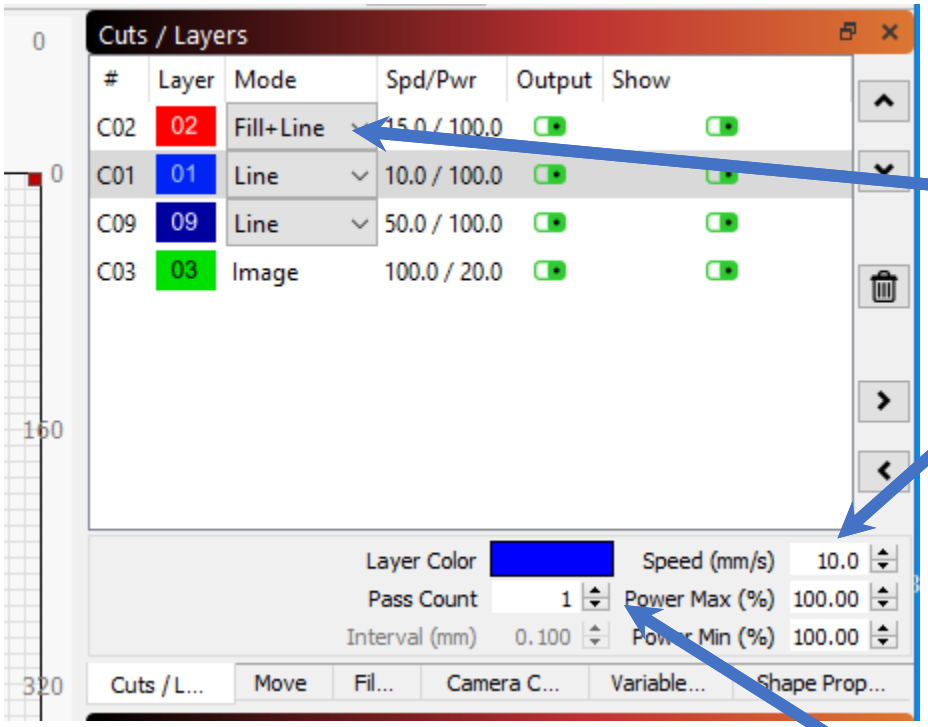


Select the Library tab, then …

If the Library tab or window is not visible, turn it on from the Window menu



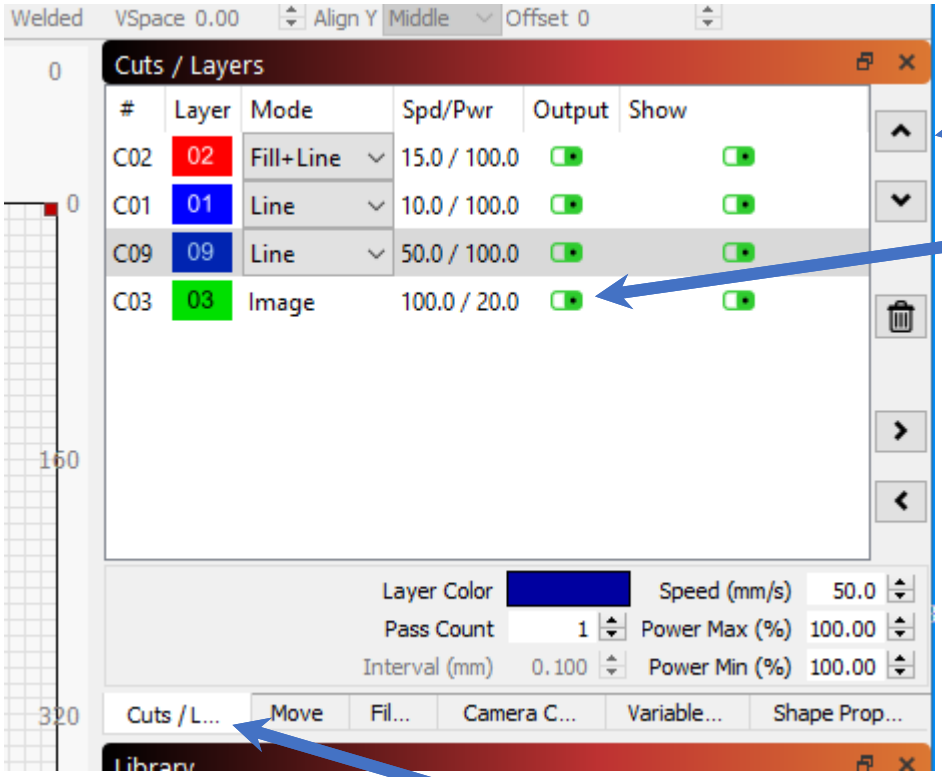
Set Power and speed



1. Select a layer.
2. Select the mode – Applies to all shapes on the layer. LB will select "Image" for image shapes.
3. Select the cutting speed and power. Consult BARN recommendations, use the material library, or make your own test cuts. The min power is the lowest it will go to as it slows down at corners. If you get burned corners, reduce this.
4. Select the number of passes the laser will make.

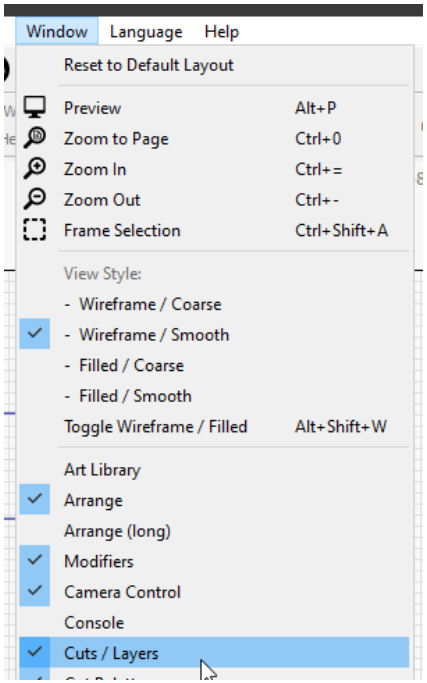
If the Cuts/Layers tab or window is not visible, turn it on from the Window menu

Cutting order… Too many ways
Most used – Cuts/Layers



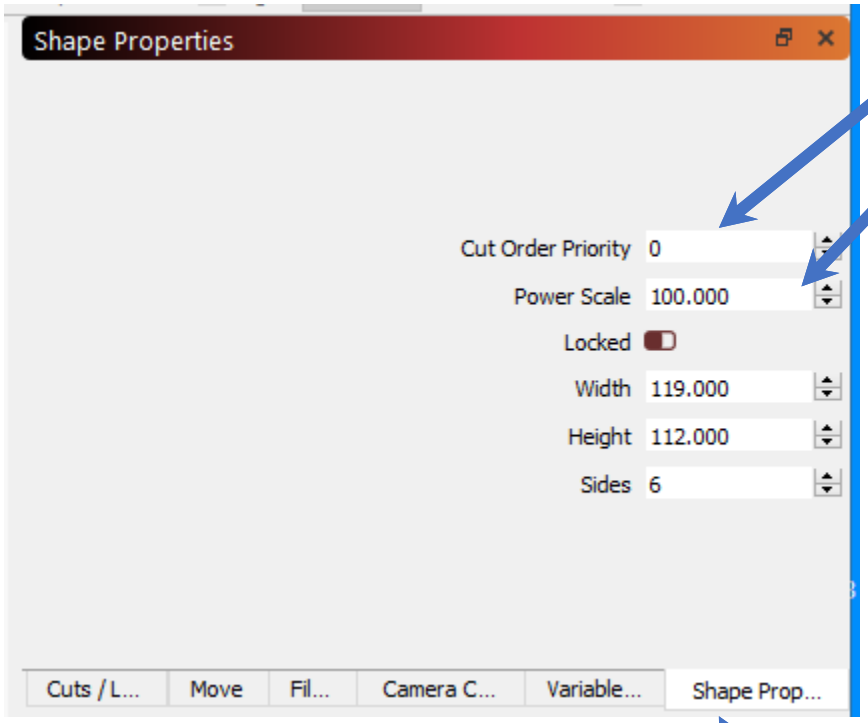
Most common - priority by layer order

- Move a layer up or down in priority with these arrow buttons
- Turning off “Output” means it wont’s be cut



If the cuts/Layers tab or window is not visible, turn it on from the Window menu

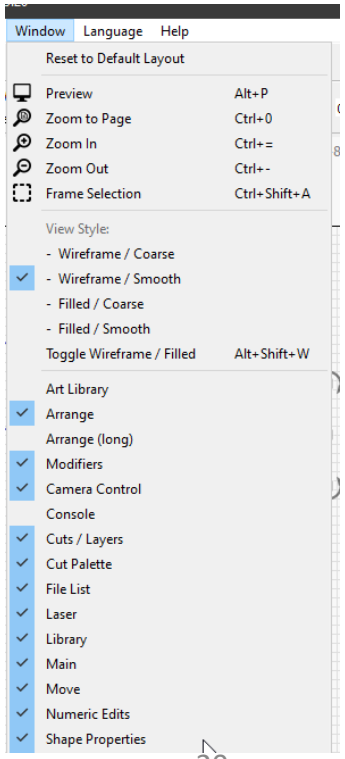
Cutting order… Too many ways
Shape Properties



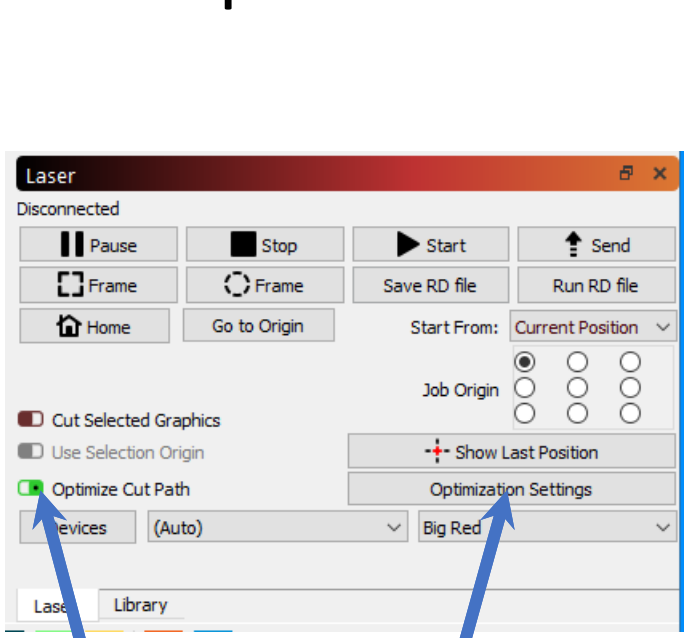
Usually used to set priority of shapes within a single layer

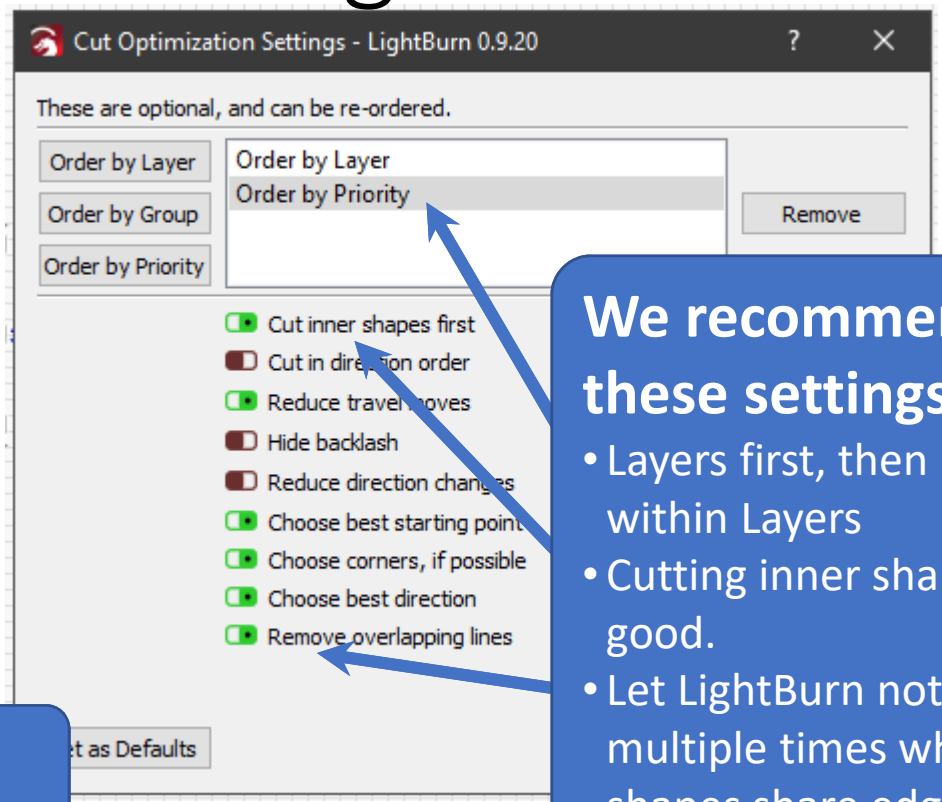
- Give a Cut priority here.
- You can also scale the layers power setting for each shape
- menu items in this window change based on the shape selected.

If the Shape Properties tab or window is not visible, turn it on from the Window menu



Cutting order… Too many ways Optimization Settings





LightBurn will select an optimized cut order if it can. This window sets it.

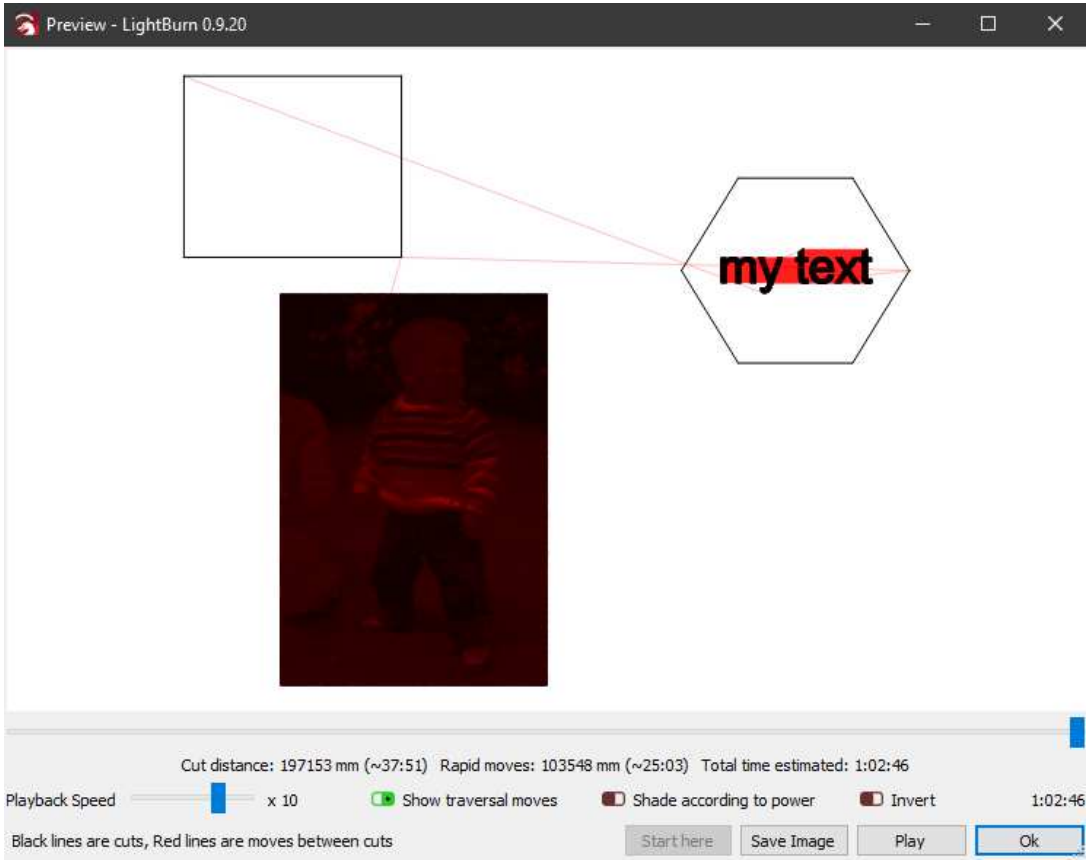
- LightBurn optimization can be turned off. We like it left on.

We recommend these settings

- Layers first, then priority within Layers
- Cutting inner shapes first is good.
- Let LightBurn not cut multiple times when shapes share edges.

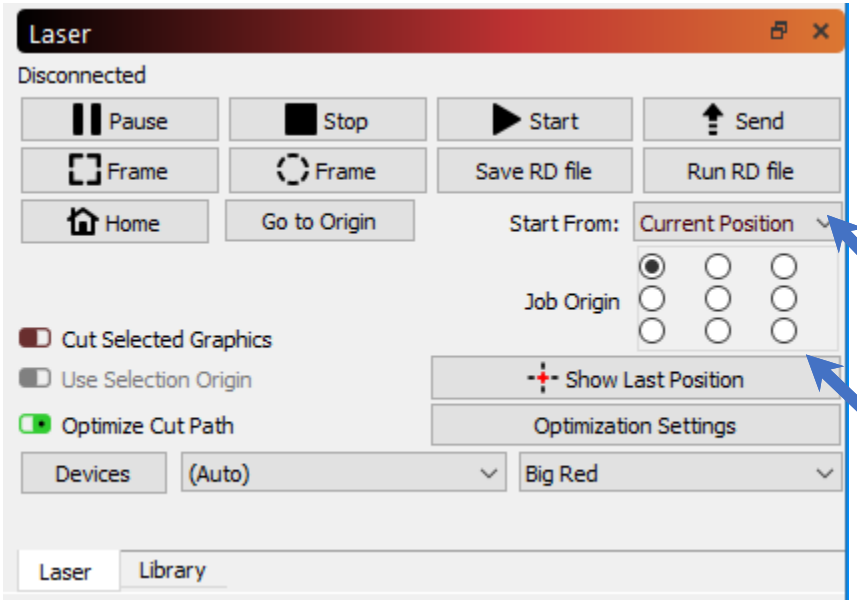
Preview your cutting

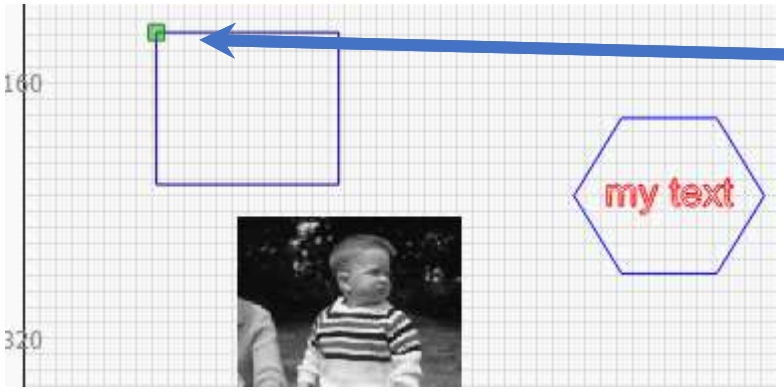
Select the Preview icon on the tool bar, or right click on the design space and select Preview.



The preview window will show you the order of cuts, and the total cutting time.

Place your material on the bed





You need to tell LightBurn where to start cutting from This is done in the Laser window.

- We recommend moving the laser to the back left corner of the material, and the following settings
- Start from “Current position” (the place where you just positioned the laser).
- Then select the “Job Origin”” to match which corner of the material you moved the laser to.
- LightBurn will put a little green square on the design to show where the laser will start.
- The Next step (Frame) will tell you if you got everything right.

“Focus” the laser

Place your material on the cutting grid so that it is under the laser cutting head (you might need to move the laser over the top of your material – use the buttons on the laser control panel – you can’t grab the laser and move it like on the old FS laser.

BIG RED

This laser “autofocuses” by moving the material bed up and down. We are still developing procedures that will be sure the laser doesn’t accidentally crash into itself while moving the bed.

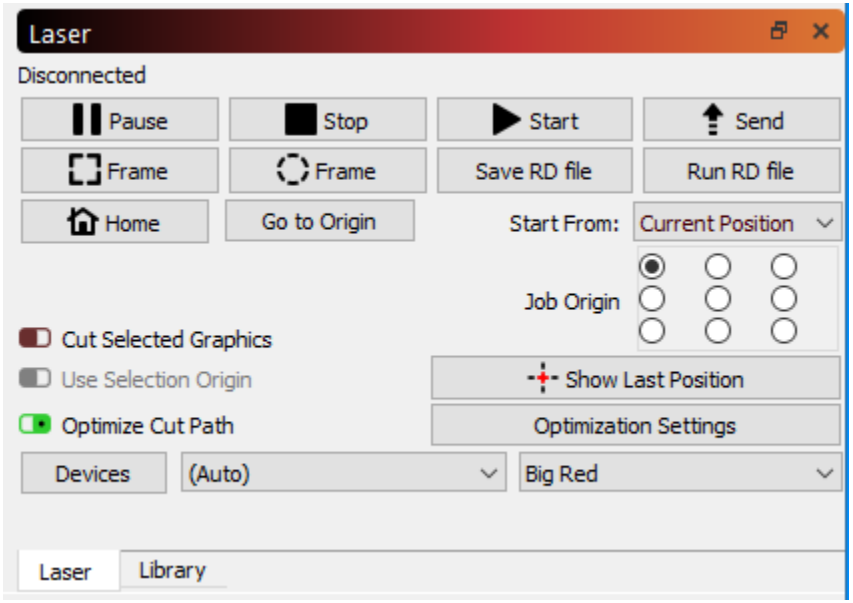
SO… Ask a monitor to help you with the focusing step on Big Red.

LITTLE BLUE

This laser focus is adjusted by moving the med up and down (not fussing with the lens like the old FS laser). There is a knob inside the laser – front right corner – that moves the bed up and down.

1. Move the bed down so your material can be placed under the nozzle.
2. Move the bed up until the nozzle is 6mm from the surface of your material. There is a piece is 6mm plywood to use as a gauge. The setting in not too fussy. You can see when the nozzle just about touches.

Frame



When you click one of the two frame buttons, the laser will move around the outside of the area where the cuts will take place. If the laser traces off your material, something needs to be changed.

The laser traces a rectangle that encloses all the cuts to be made.

The laser traces a “rubber band line” around the shapes it will cut.

Vector Graphics vs Images

VECTOR GRAPHICS:
Definition: Points, lines, curves defined by math.
If you keep zooming in, the lines stay sharp.

Why do we care?

- We can enlarge or shrink vector images and not lose image quality.
- The laser can be easily guided along these lines to cut through the material.
- There are lots of programs that let us create designs we save as vector format.

IMAGES (Raster graphics):
Definition: A group dots (pixels), each with a color , that make up an image.
If you keep zooming in, you eventually see the dots.

Why do we care?

- We can burn a picture of “Little Jimmy” on something we make.
- Since the laser needs to travel to each pixel location, and fire an amount of energy based on the color of the pixel, it can take a long time to render an image.
- We can cut through the material based on a raster image, but it’s tedious and impractical. Like cutting a piece of paper in hole with a hole punch.

Image workflows

There are generally two destinations people are pursuing when working with images:
1. Burn a realistic picture onto something.
2. Extract from the image to create something to cut/engrave.

Realistic pictures

1. Insert your picture.
2. Scale it up/down to fit your intended size.
3. Select the image, then Right click the image and select “Adjust Image” from the pop-up menu.
4. Select the “Image Mode” and adjust as desired. Click OK.
5. Modify speed/power in the Cuts/Layers menu.

This is a trial/error process. Expect to spend time finding your artistic muse.

Extracting from images

1. Insert your picture.
2. Select the image, then Right click the image and select “Trace Image” from the pop-up menu.
3. Adjust with the sliders until you like it. Click OK.
4. Move or delete the original image. If not deleted, set “Output” off in Cuts/Layers window.
5. Scale it up/down to fit your intended size.

Focus

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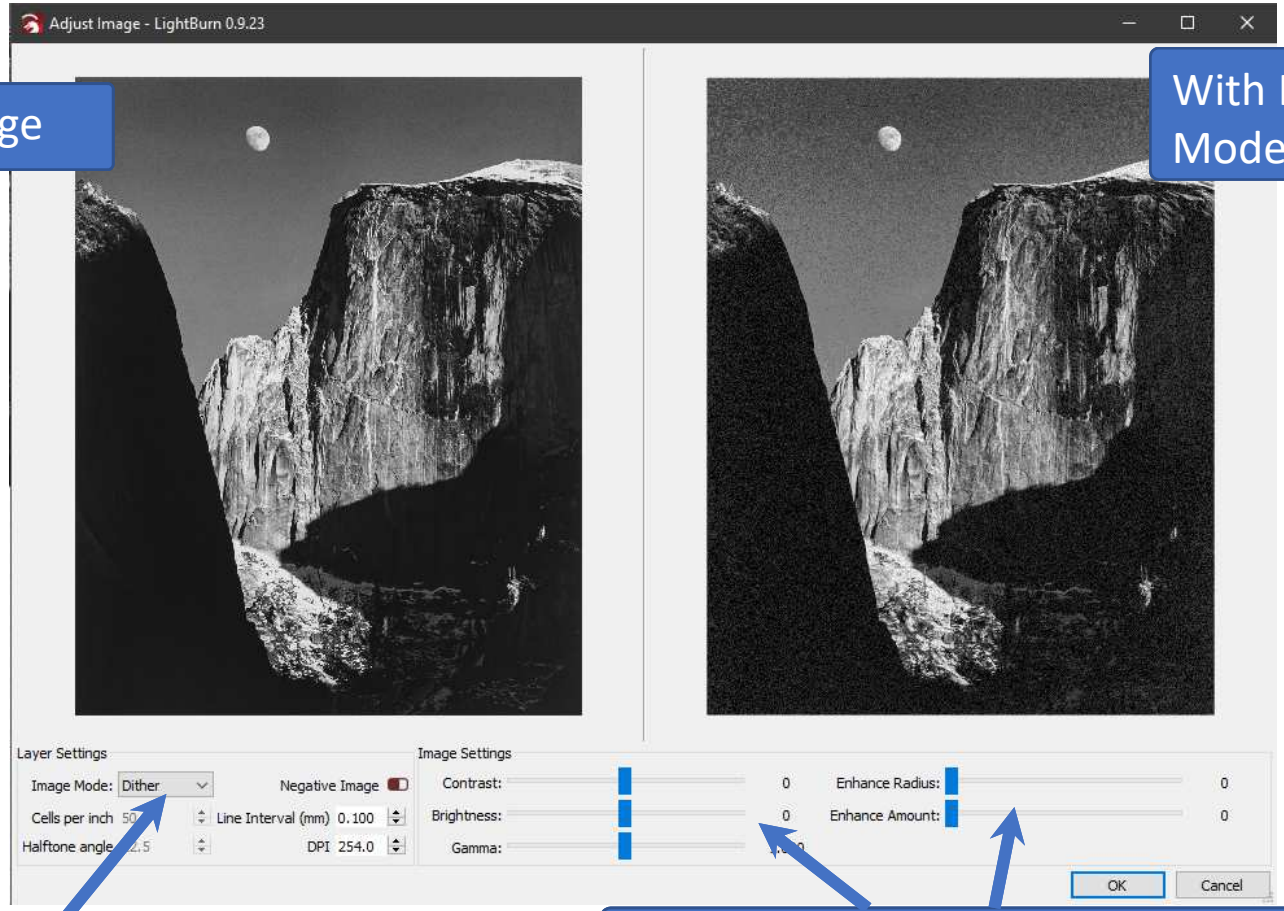
Image Adjust window



Original Image

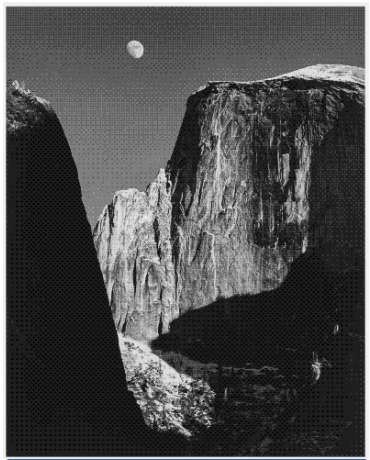
With Image Mode applied

Select Image mode here

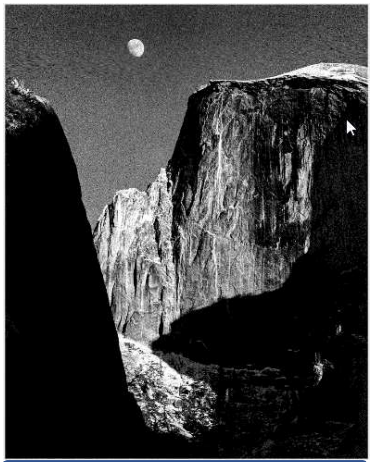
Slider bars adjust the original image before the mode filter is applied.

Image adjust filters

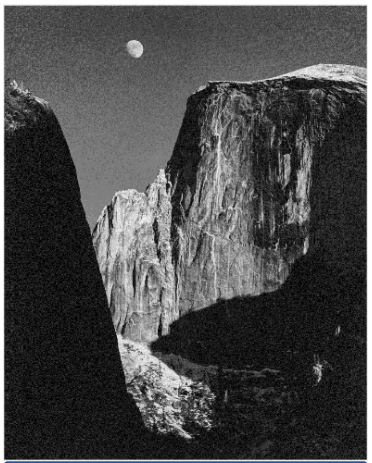
Threshold



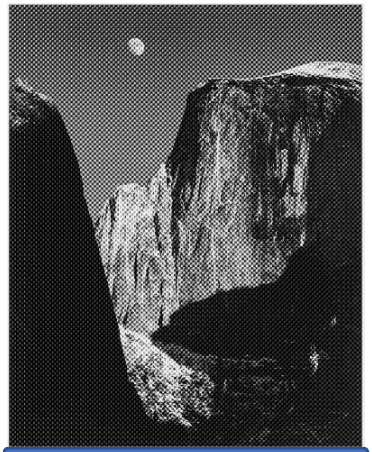
Ordered



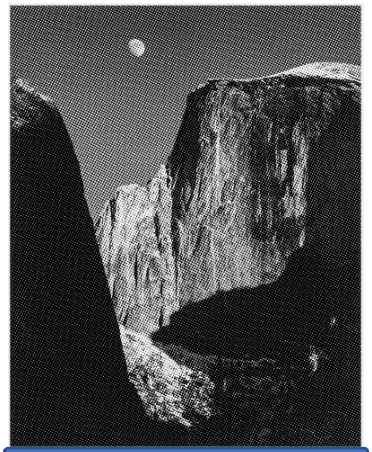
Atkinson



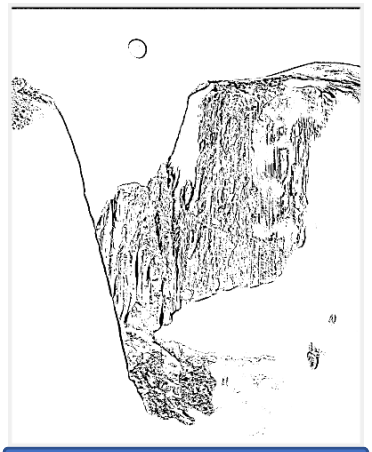
Dither



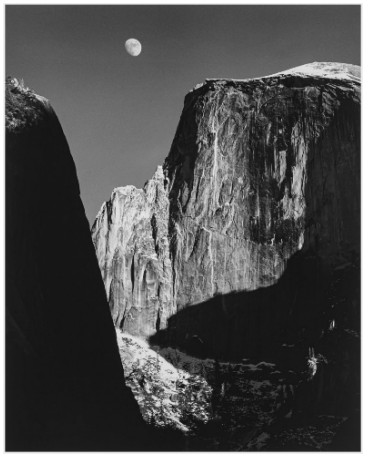
Newsprint



Halftone



Sketch



Grayscale

Photo Summary

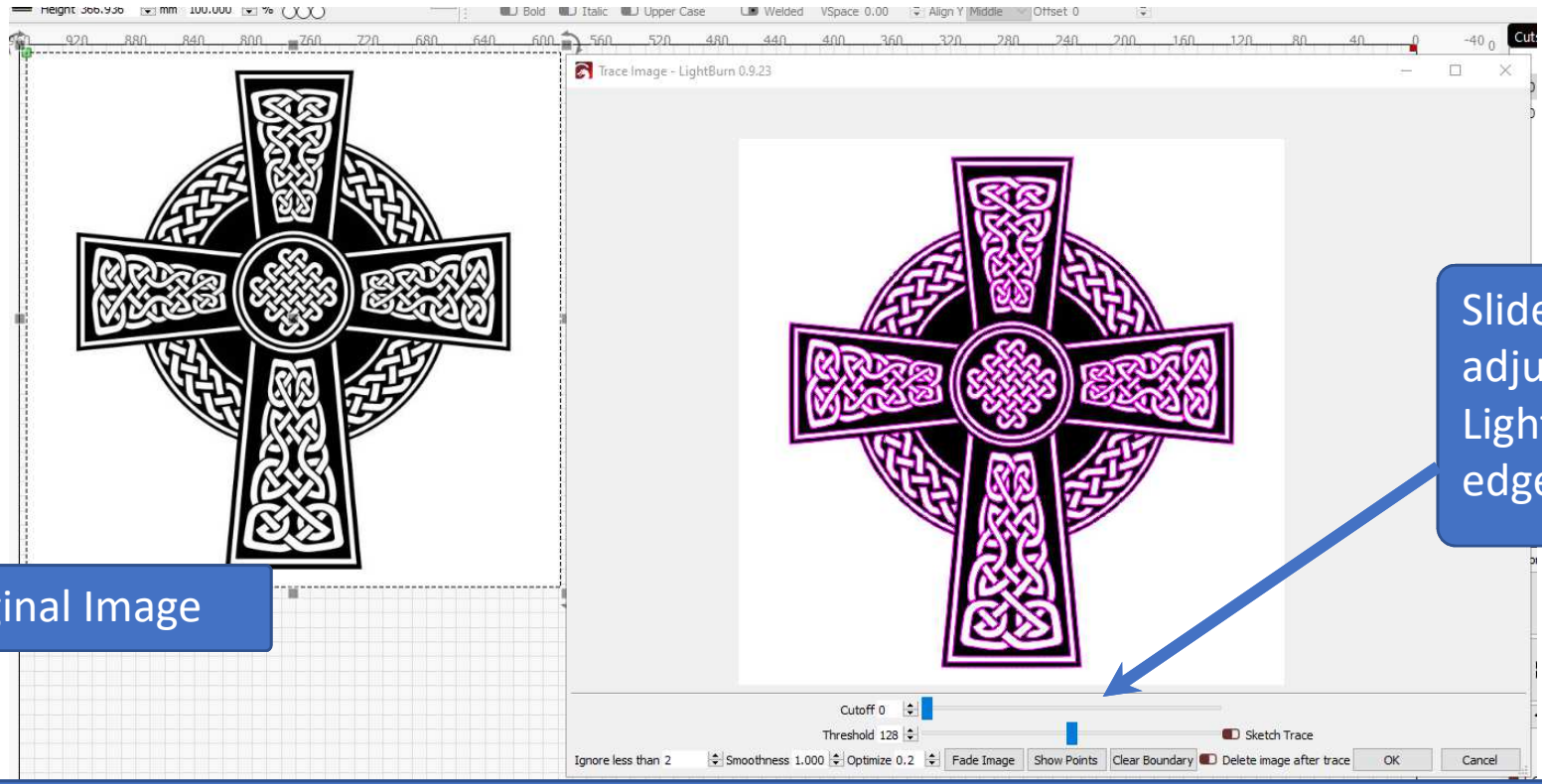
Expect to spend some time practicing with pictures before getting one you this is “just right”. When you do get there, please share what you’ve learned, maybe teach a class on the subject.

Getting your picture “just right” will likely involve applying filters, and adjusting photo parameters. You can use the LightBurn tools, but you can also pre-process photos in a lot of other applications before you import them to LightBurn, and those apps may have better filters. Don’t be afraid to pre-process your photos.

Other good advice to be added here once we learn it.

Converting Images to vectors

You can convert images into vectors - this works better with graphics than pictures. After importing your image, left click to select it, then right click and select “Trace Image” in the pop-up menu.



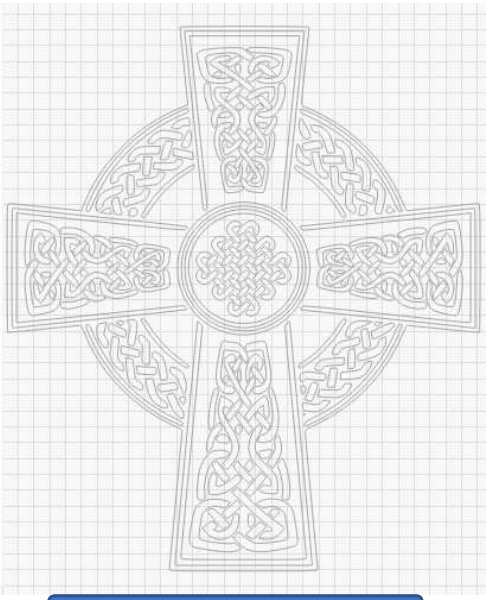
Original Image

Slider bars adjust how LightBurn finds edges.

The traced image is left on top of the original. Move or delete the original to see the vector image

Converting Images to vectors

Original Image



Vector Image

Close up of original image and vector lines.

Other examples

Tips for working with imported shapes

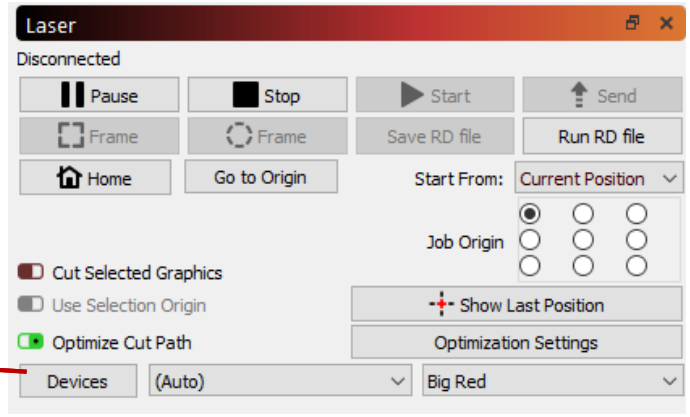
- Imported shapes that are more than just an outline (example, square with a hole in it) are imported as separate shapes. It's important to group them all together if you want to move them easily.
- Be careful when grabbing objects to move them. If you grab a corner or side handle, it's easy to accidentally stretch or shrink a shape.
- The "Numeric edits" window lets you set the sixe of objects, or rotate them a specific amount.
- if you are cutting multiple parts on one piece of material, adding a rectangle the size of your raw material gives you a guide for packing them in. You can rotate and flip them to pack closer together.

Downloading LightBurn

You can run LightBurn on your own computer. Go to https://lightburnsoftware.com/ and follow the “Download/Trial” link. The software is free for 30days.

Installation – When you first run LightBurn, it wants you to connect it to a Device.

1. Select “Create Manually”.
2. Scroll down and select “Ruida” from the controller list, then Select “Next”.
3. Select “Serial/USB”, then Select Next.
4. A. Name your printer “Little Blue”, or “Big Red” – or whatever you want.
   B. enter the X and Y dimensions (X = 500mm, Y = 300mm for little Blue; X = 1000mm, Y=600mm for Big Red). Then Select Next.
5. Select the button for Laser’s origin. “Rear Right” for Big Red, and “Rear Left” for Little Blue. Then Select Next.
6. Select Finish. You are ready to go.
7. You can add another device (or edit the one you created) by clicking on the “devices” button in the Laser window. If you have two or more devices, you can select which to use in this window.



Select “Devices” in the Laser window to add or edit a laser