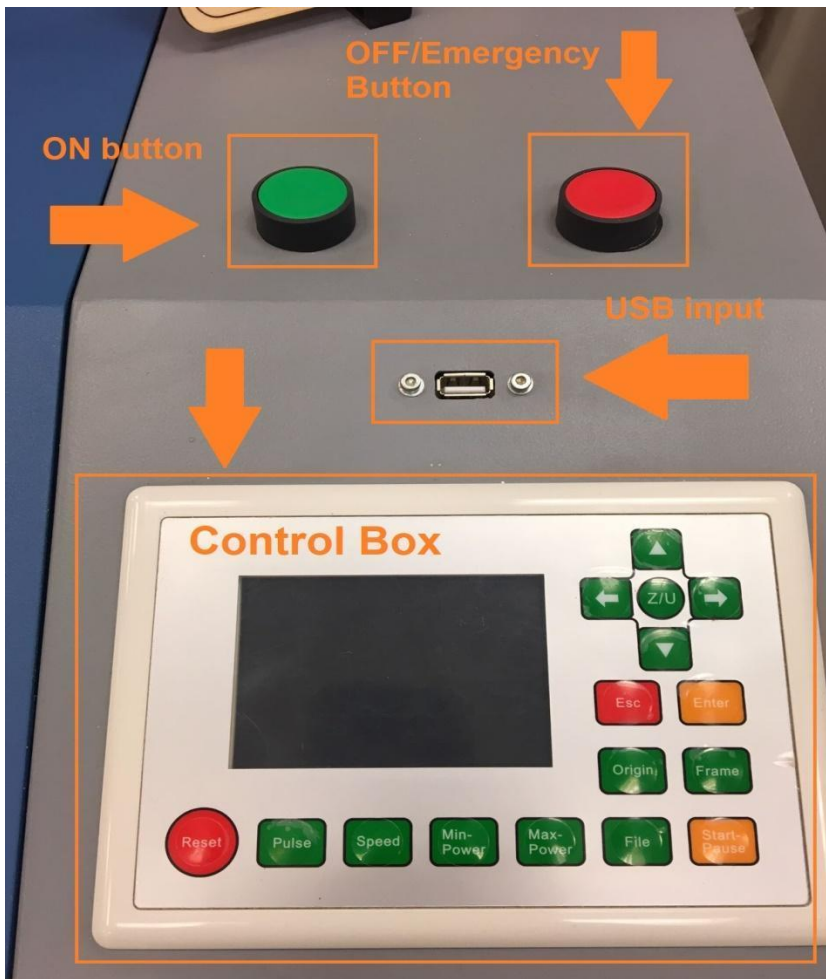


Know the Machine

This is **El Malky ML96 CO2 Laser Cutter**. It is an Egyptian-made CNC laser cutting machine



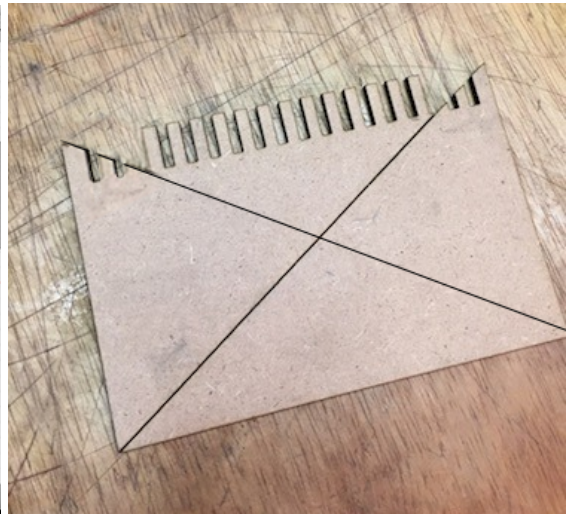
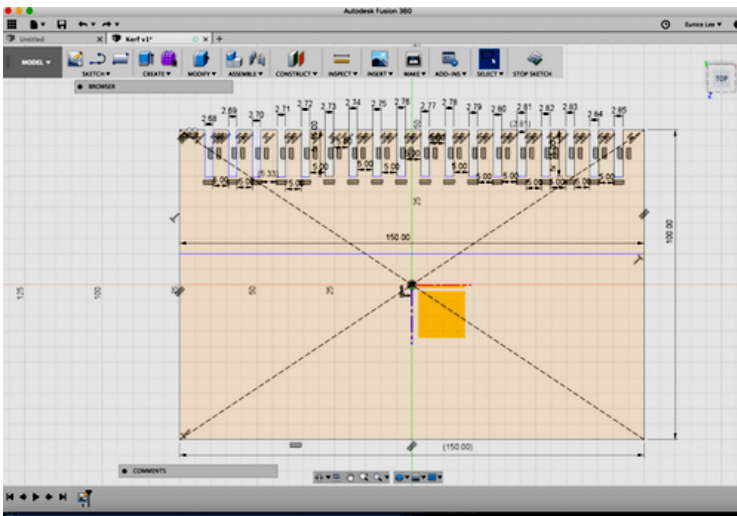
Technical Specs

- Working area: 60 x 90 cm
- Laser tube: 80 WATT
- Engraving Speed: Up to 600 mm/sec
- Cutting Speed: Up to 400 mm/sec
- Minimum Engraving size: English letter 1mm * 1mm

1. Preparing your Design

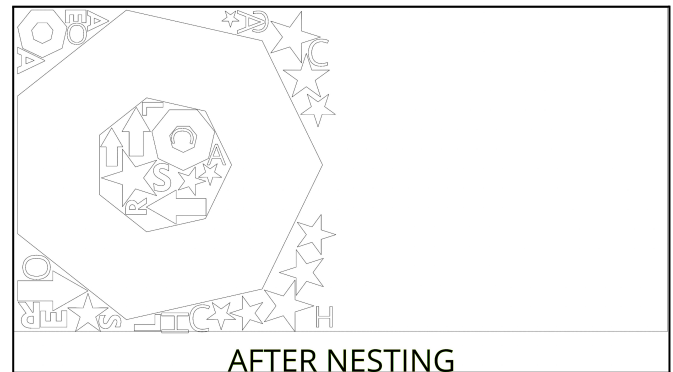
- Remove construction lines

Construction lines will be transferred to the LaserWork program and you'll get a sliced part.
Copy your designs to another sketch or layer and remove everything you don't want to cut.



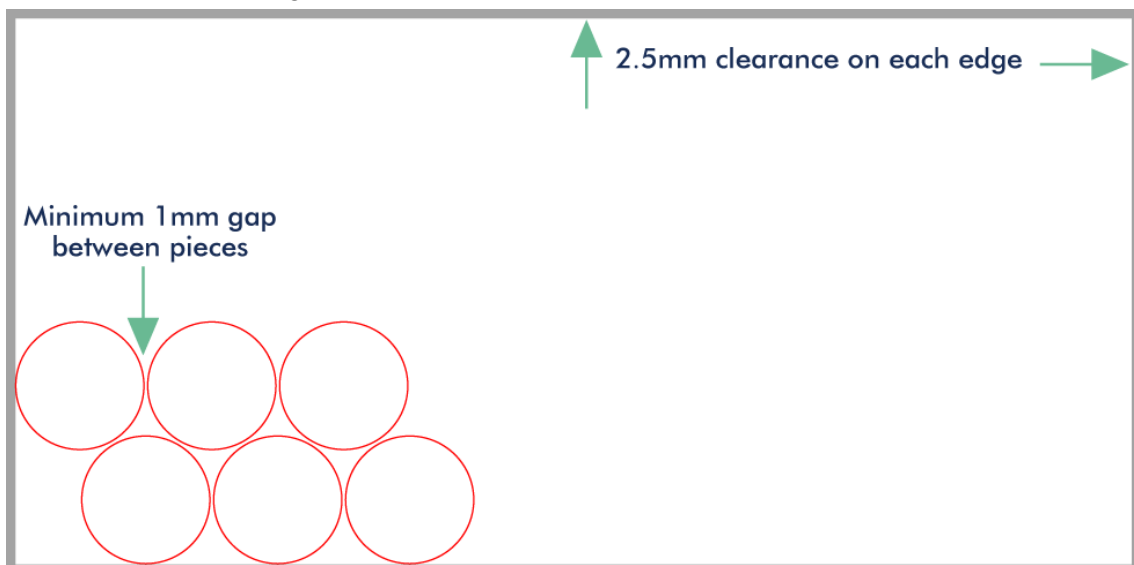
- Space Optimization and Nesting

Move and rotate each part and make use of each space.



- Space between parts

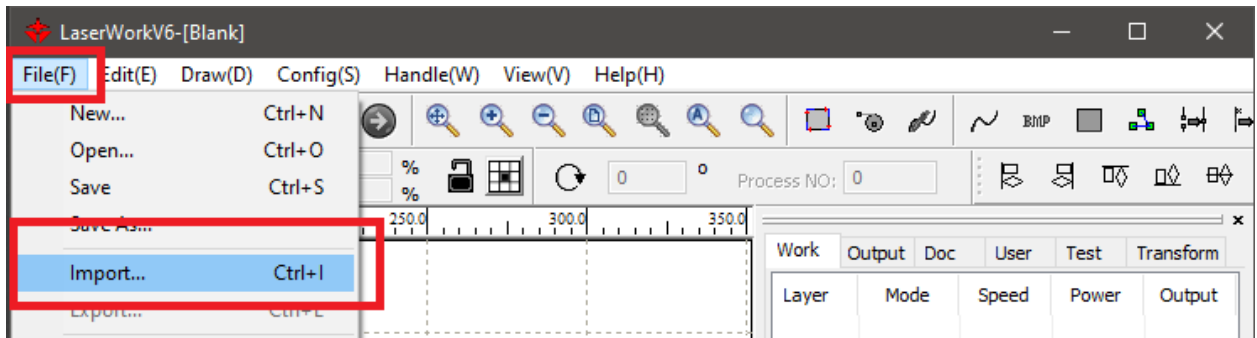
- Leave a 2.5mm gap between your designs and the edges of the sheet.
- Leave a small gap between each piece (about 1mm)



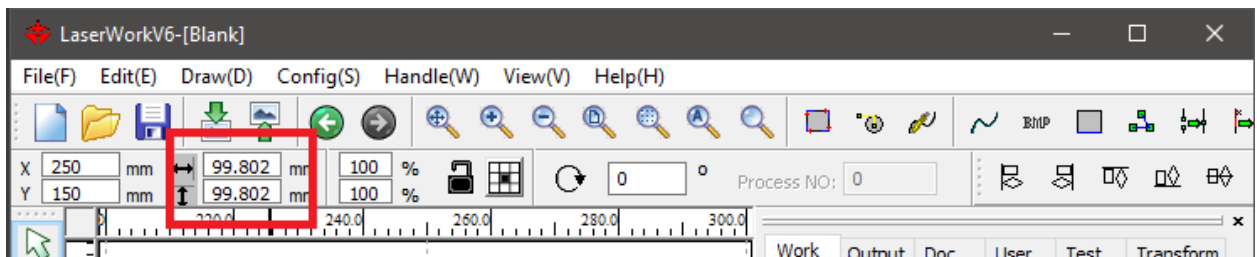
2. Downloading Design File to the Machine

The Machine CAM software can be Rdworks or LaserWorks.

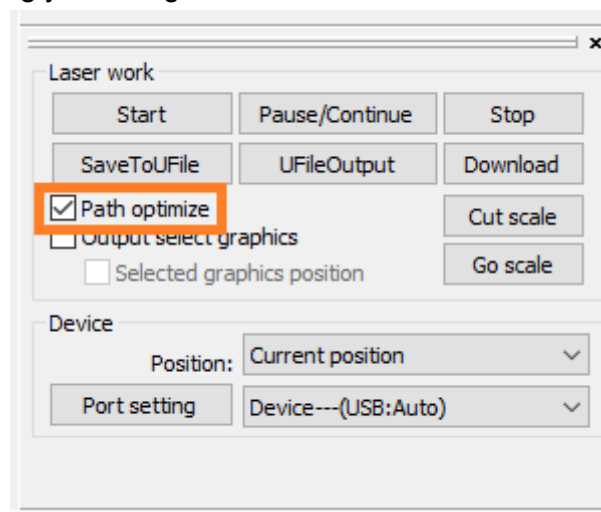
- Make sure the origin of the software is correctly set with the machine (You can ask the Fab Lab specialist for help)
- The files imported to the software have to be in the supported formats. The most common are .ai and .dxf
- Import the design to LaserWorks Or RDworks



- Ensure the design dimensions are correct

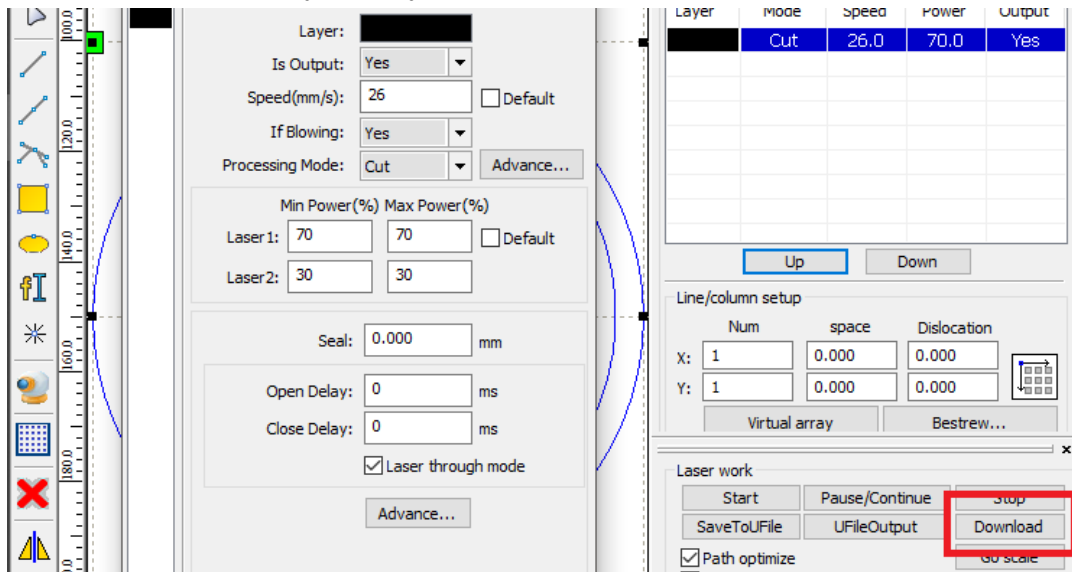


- Adjust speed and power of cut
Refer back to the Rdworks/LaserWork video tutorial if you're not sure how to do it
Ask the Fab Lab specialist about the right parameters for curing (speed and power)
- Make sure you click “**Path optimize**” in settings, it will help the machine in better optimizing implementing your design.

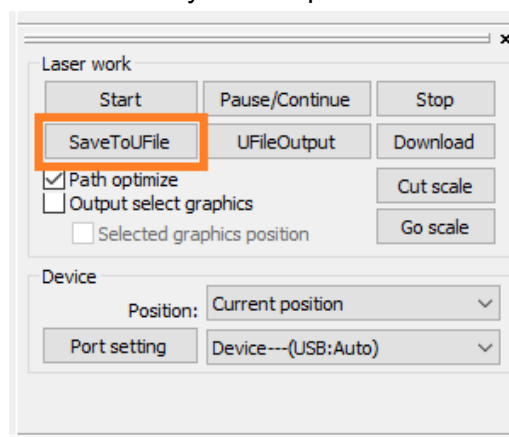


- Make sure that the machine is ON.

- Download to the machine; you can use one of either ways:
 1. *Connect the machine USB cable to your computer:* You'll be asked to enter a name for the file. Write any name you could remember. And click download



2. *Save to USB:* Insert the USB to your computer and then click **“SaveToFile”**



3. If you used the 2nd method, these are extra steps
4. Insert your flash drive into the USB Input.
5. Click on **“File”** in your control Box.
6. Click **“Udisk+”**



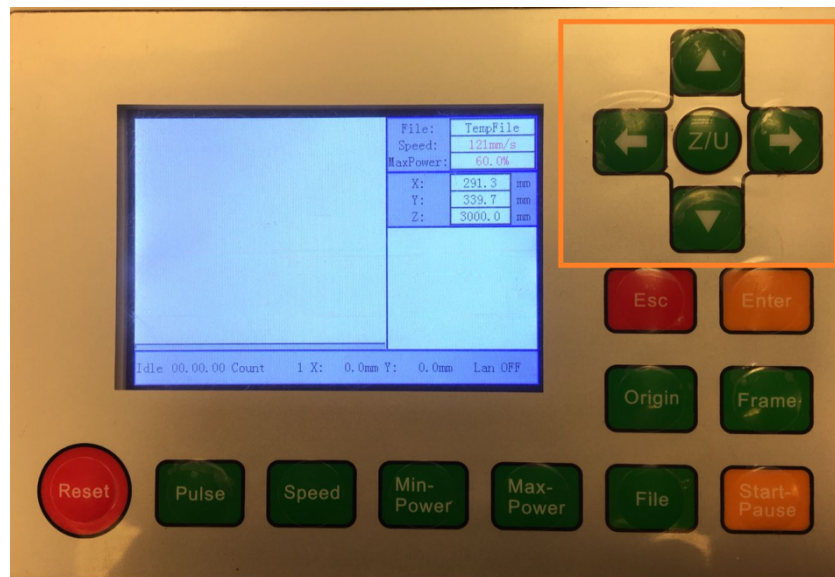
7. Click ***“Read Udisk File”***



8. Select your file
9. Click ***“Copy to mem”***

3. Setting the Machine Up

- Move the machine head to the **top-left corner** of the machine.
Use the arrow keys to move it

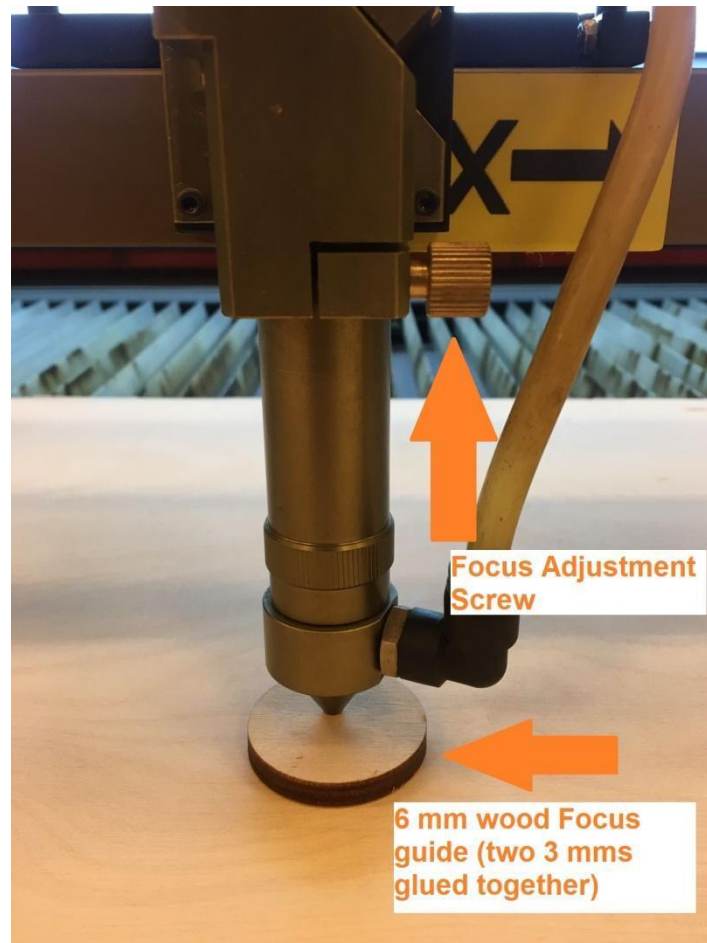


- Select a good material sheet out of the available stock. Make sure it is not skewed.
Make sure it sits nicely in the laser cutter with no wobbling

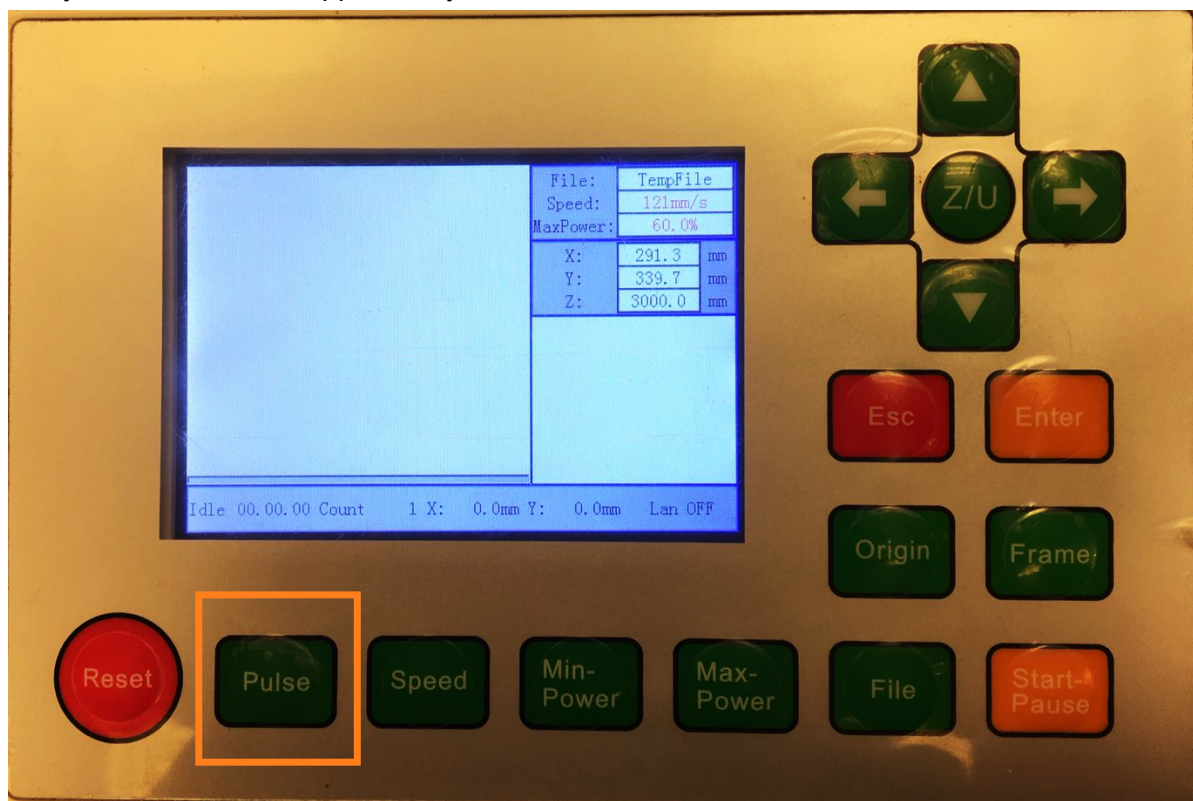


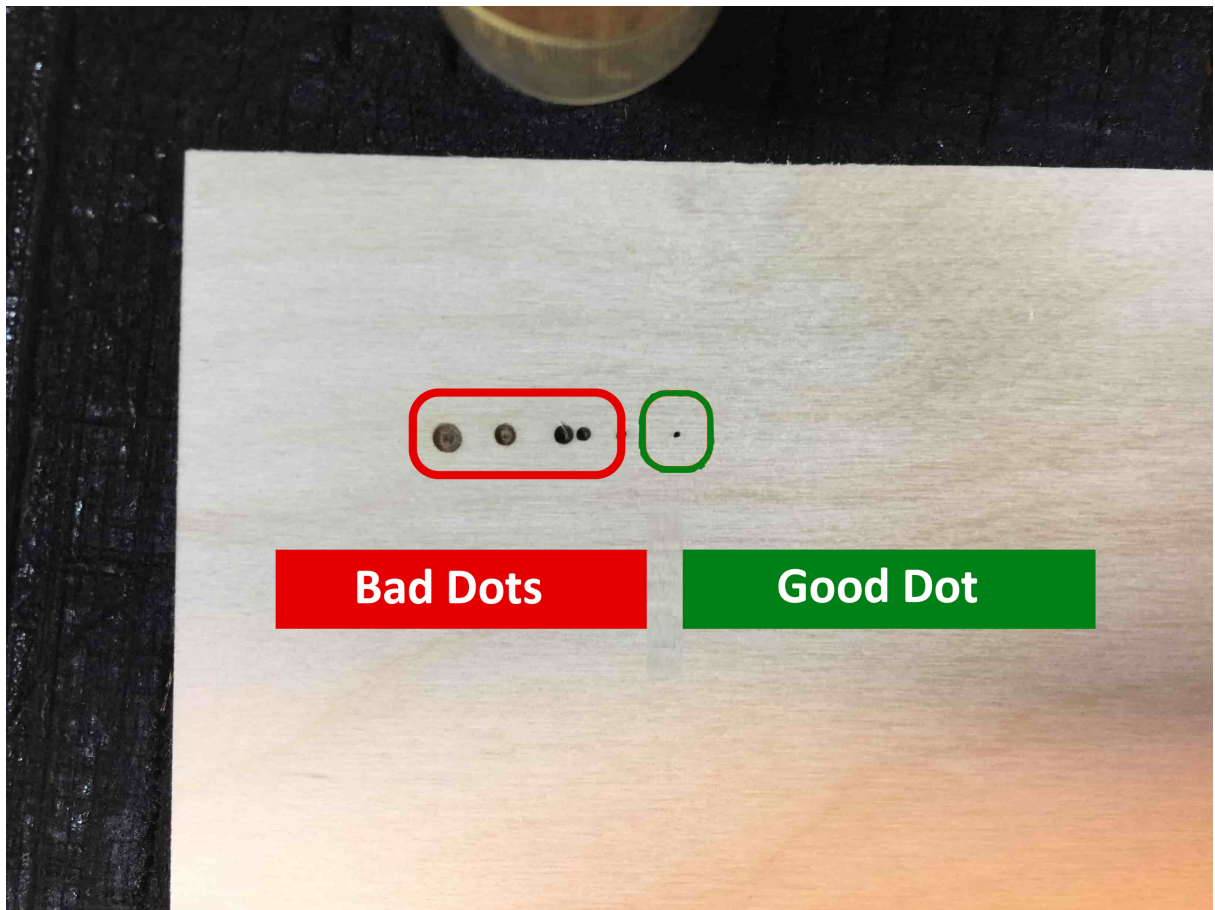
4. Adjusting Focus

The Machine Focus is adjusted manually through adjusting the laser head.



- Test the focus by pressing the **Pulse** button for less than a second. A tiny small dot should appear on your sheet under the laser nozzle.

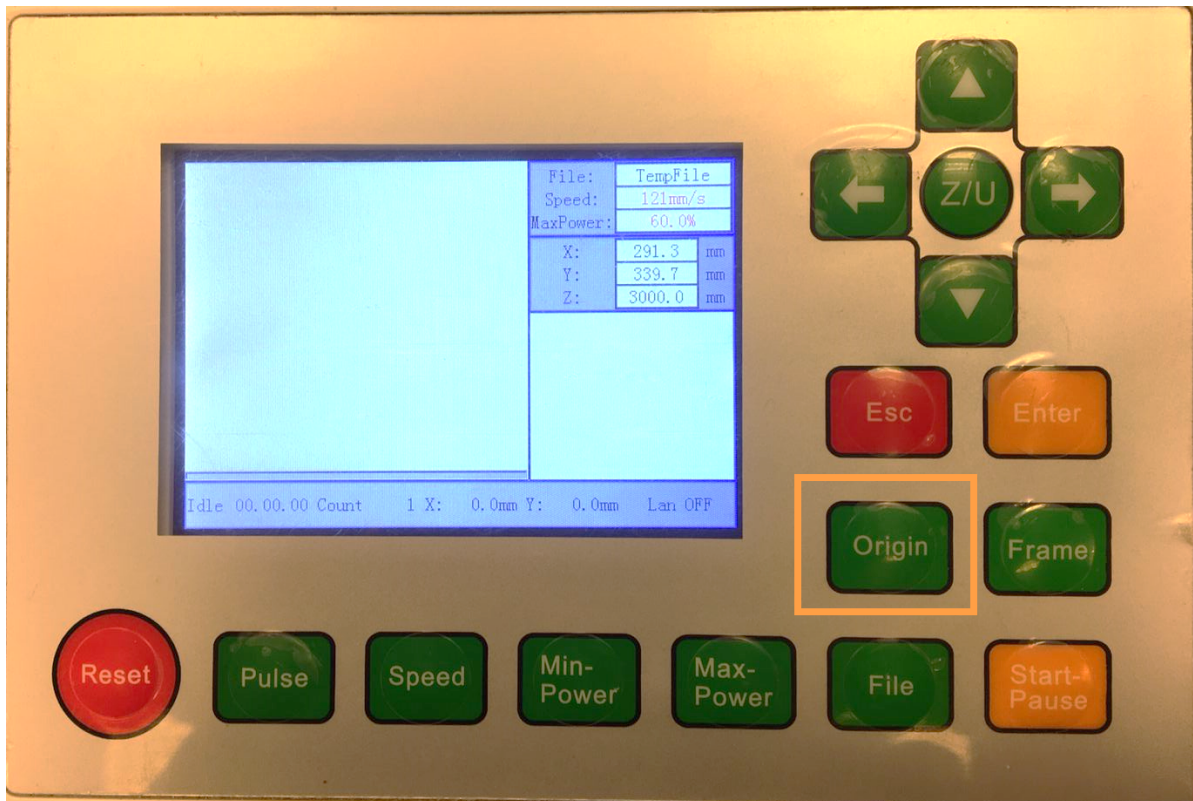




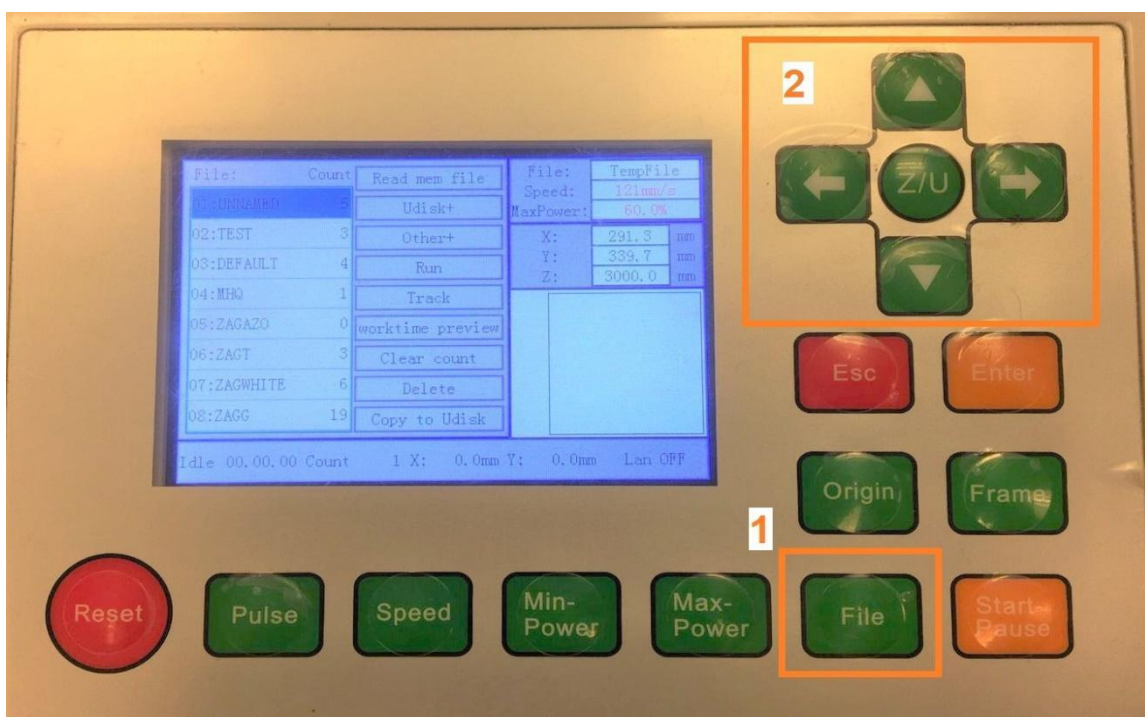
If you think that it's a big dot, ask for confirmation from the Fab Lab Specialist.

5. Making Sure the Design Fits

- Set the effective cutting area for your job. This can be done by moving the laser pointing nozzle to the top-left point of the cut area you'll be using and pressing **Origin**



- Now let's make sure that the effective cutting area will be capable of containing our design. We'll make the machine move like it's cutting a rectangular piece of wood that can contain our design size but without emitting a laser.
 - Click **"File"** and Mark your file.
 - Using arrows, select **"Track"**
 - Click **"Enter"**

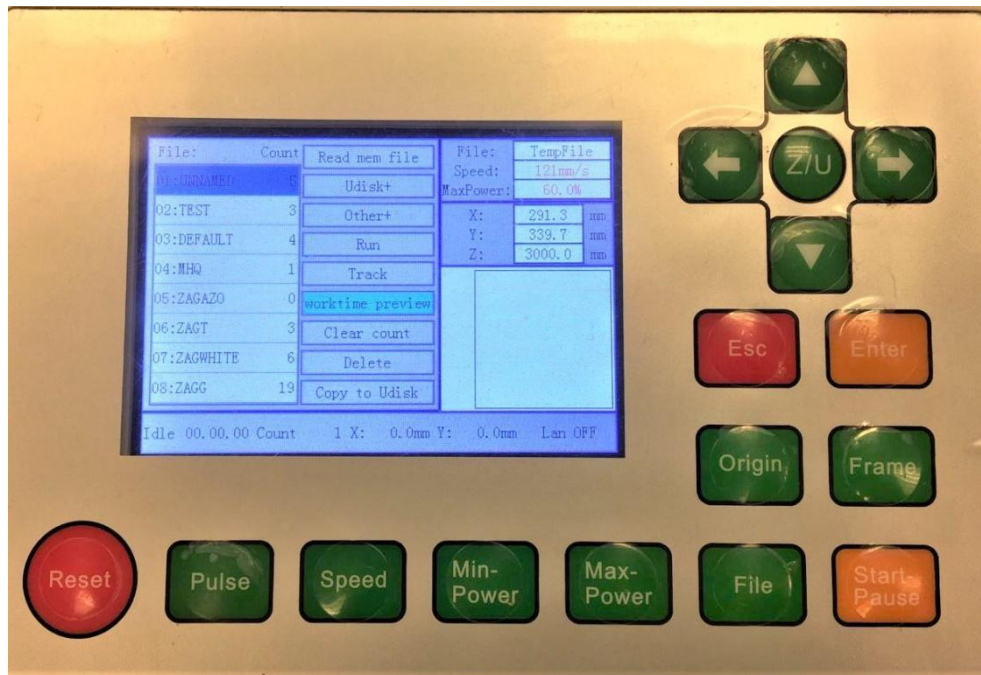


File:	Count	Read mem file	File:	TempFile
01:UNNAMED	5	Udisk+	Speed:	121mm/s
02:TEST	3	3 r+	MaxPower:	60.0%
03:DEFAULT	4	Run	X:	291.3 mm
04:MHQ		Track	Y:	339.7 mm
05:ZAGAZO		Worktime preview	Z:	3000.0 mm
06:ZAGT	3	Clear count		
07:ZAGWHITE	6	Delete		
08:ZAGG	19	Copy to Udisk		
Idle 00.00.00 Count 1 X: 0.0mm Y: 0.0mm Lan OFF				



6. Running the Job

- Calculate the estimated working time for your job.
Make sure you stay along that time. **This is a number one safety rule.**



- Close the Laser Cutter lid door. aaand Now you can run the job!



Always Remember!!

- The Fab Lab specialist MUST register
 - **how much time** did your jobs take,
 - **how many sheets** of wood you have used.
- Please keep track of your usage and tell it to the lab specialist before you leave.
- Take your flash memory if you have used one of yours.
- You can use sand-paper or spray paint to make your fabricated design look great!
- If you got confused, just ask for help :)

Safety Rules

- Only use the approved materials (Ask the Fab Lab Specialist if you are not sure)
- Don't start a file before closing the machine door
- Make sure that the chiller is ON (Recognize the sound once you turn on the machine)
- Don't put your personal belongings on the machine
- Don't touch the laser tube
- In case of fatal problems, hit the big Emergency STOP switch , then ask for help : "D