

ANU MAKERSPACE TROTEC USER GUIDE

! Save time ! Before beginning this process make sure your job is suitable for Laser Cutting - 2D designs using approved materials only**

Using the laser is like sending a job to a school printer, but with a few more steps. The laser can carry out cuts, etches and scores using a single Adobe Illustrator file*. In order to ensure the job sends and cuts or etches correctly, we must ensure that the file is set up correctly and that the laser settings we select are correct for the material being processed.

This document is broken down into a workflow of 5 parts and a trouble-shooting section.



- [Part 1: Illustrator Set Up](#)
- [Part 2: Print Dialog](#)
- [Part 3: Job Control & Preparing/Running the Laser](#)
- [Part 4: Emergency Shutdown Procedure](#)
- [Part 5: Honouring the Laser
Trouble-shooting](#)

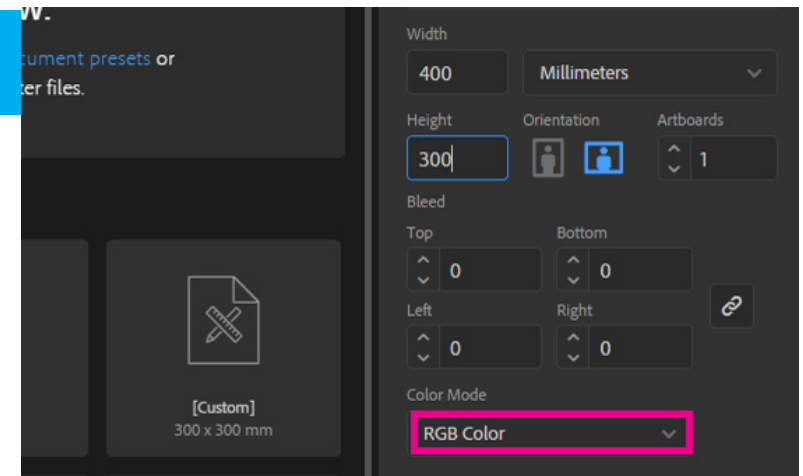
*You can use other software to design your file such as Inkscape or Corel. However, this is not recommended as files will ultimately be sent to the laser through Adobe Illustrator. If you must use another program use this guide for document/cut/etch parameters and export as PDF.

**If your material is not on the YES/NO laser list you MUST submit it for testing by technical staff.

How to make a file for laser cutting...

Part 1. Illustrator Set Up

1. Open a new document with the parameters;
Document Maximum size - @SoAD 1200mm w x 700mm h
- @ANU MakerSpace 800mmW x 500mmH
- Colour Mode - RGB (NOT CMYK)
2. Create two layers - CUT&ETCH.
3. File > Save As - unnumber_projecttitle_versionnumber.ai
i.e. u12345678_123DMake_v2.ai



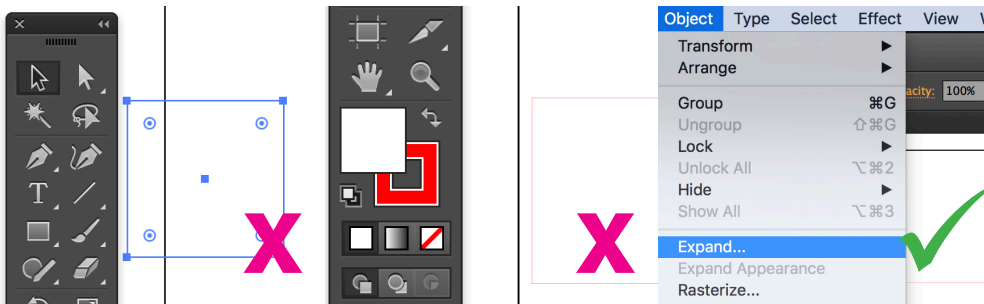
Cuts Parameters;

Cuts WILL NOT be transmitted to the laser driver Job Control(JC) unless they are set at these parameters;

Lines and shapes stroke colour of R:255G:0B:0 or #FF0000 (RGB Red) @ 0.001mm or 0.025pt.

Cutting Notes;

1. Place Cuts on CUT LAYER and lock if necessary.
2. Cut artwork must be within the art-board.
3. Cuts will be performed in the order the lines/shapes are drawn.
4. There must not be fill in cut shapes
5. Fonts must be 'Expanded' (Object>Expand) and assigned cut parameters before exporting from personal computers
6. Clipping masks can not be used to create cuts around etches. Duplicate the shape onto the cut layer and assign cutting parameters.



Etch Parameters;

Etched artwork is transmitted easily to the laser driver JC using these parameters;

Colour/Greyscale/Halftone artwork, black lines of any stroke weight at #000000 or percentage greyscale as found in the Trotec Swatch Library on MS Computer.

Etching Notes;

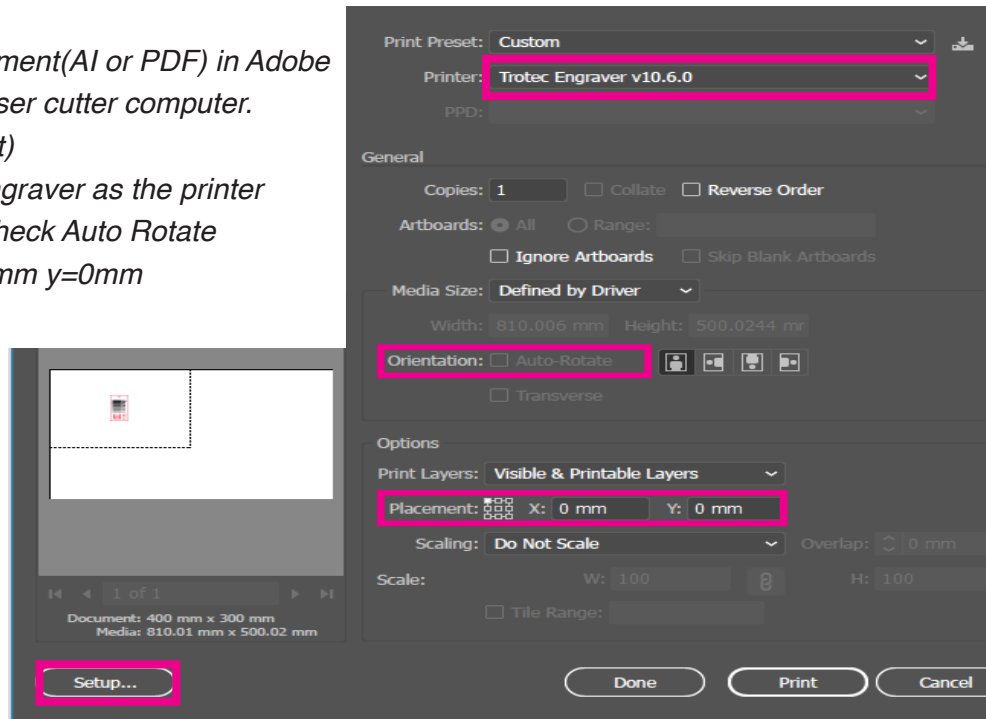
1. Place Etches on ETCH layer and lock if necessary.
2. Etch artwork must be within the art-board
3. Check the materials library to see what effect you desire for your material, and choose the appropriate greyscale tones..
4. High contrast B&W images etch best, use photoshop or similar program to convert images to greyscale and change their contrast.
5. Fonts must be 'Expanded' (Object > Expand) and assigned etch parameters before exporting from personal computers
6. Clipping masks will not be identified by the laser software. If you need to use clipping masks make sure you Rasterise (Object > Rasterise) your etch artwork before sending to print.

If you haven't already; File > Save As unnumber_projecttitle_versionnumber.ai
i.e. u12345678_123DMake_v2.ai

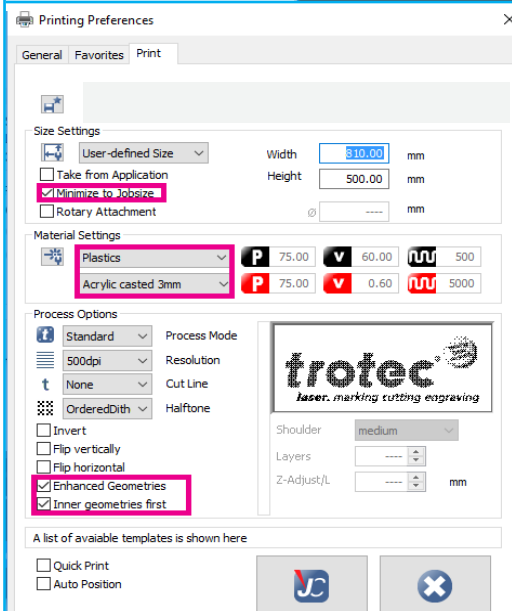
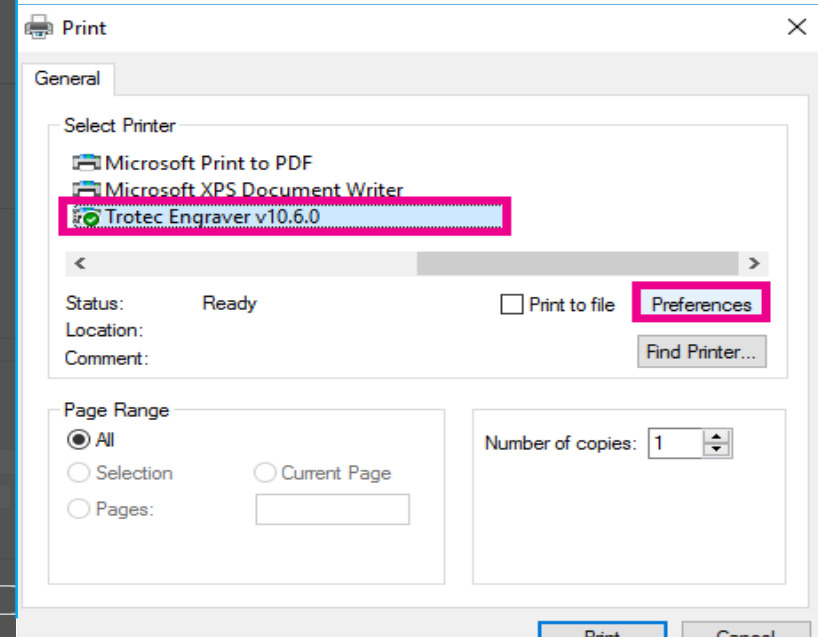
How to send a job to the laser cutter

Part 2. Print Dialog

1. Open your document(AI or PDF) in Adobe Illustrator on the laser cutter computer.
2. Print (File > Print)
3. Select Trotec Engraver as the printer
4. Orientation: uncheck Auto Rotate
5. Placement: x=0mm y=0mm



6. Enter Trotec Printer dialog (Setup > Preferences)



7. In the Print tab you can double check the material settings.

- Check that 'Minimise to Jobsize' 'Enhanced Geometries' and 'Inner geometries first' are selected.

- You may also use this time to set the resolution of your etch. Note that cuts will not be read below 333 DPI but higher resolution = longer etching time. Higher isn't necessarily better. 500DPI is the best option if you're unsure.

8. Click JC then Print to send job to the laser driver (Job Control)

9. Click Print in the print dialog and open JC (glowing on the taskbar)

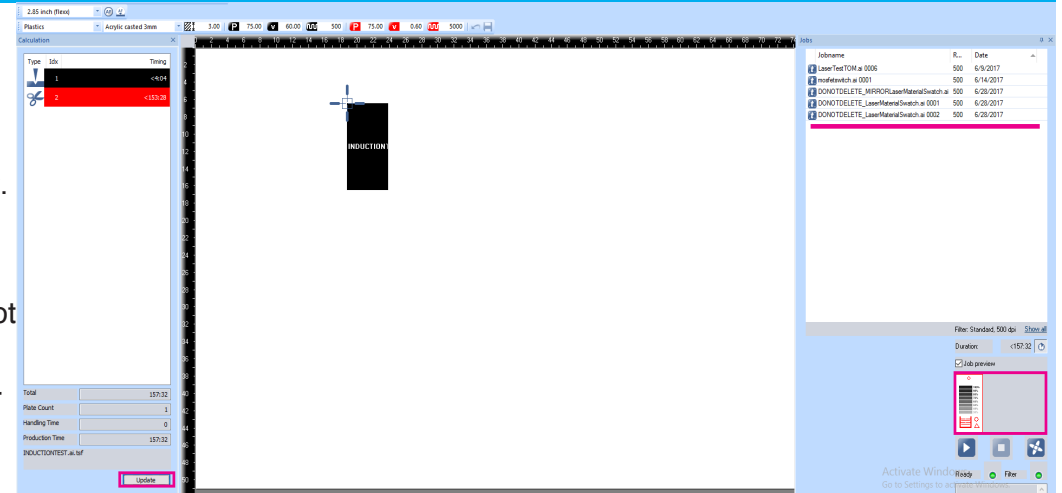


How to run a job on the laser cutter


Part 3. Job Control & Preparing/Running the Laser

JC displays the 'plate' (laser bed), the print queue and the laser position. Once prints have been sent to Job Control they are placed in a print queue. If you have named them correctly you should be able to find them easily. If you cannot see your job refer to the troubleshooting section of this document.


Click your print to see if cut/etches have transmitted correctly - you should see your black (halftone) etches and red cut lines in the preview. If you cannot see red cuts or etched art please refer to the troubleshooting section of this document. Click 'Update' to see cutting time. Student's may not use the laser for over 1 hr a day without prior approval from technical staff.

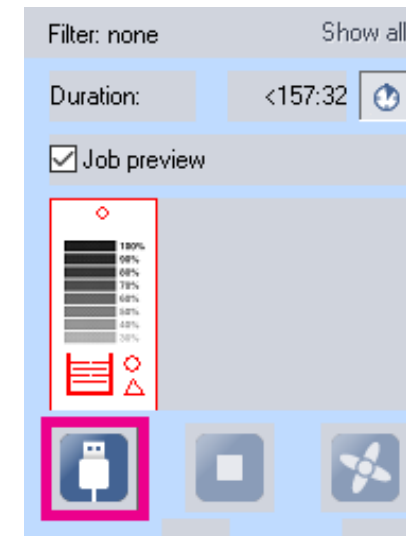


Operating the Laser

1. Turn on the laser using the key provided by a MakerSpace Staff or Laser Mentor
2. Click the USB button in JC to connect the computer and laser.
3. Ensure the bed is lowered before placing materials in the laser. Smooth the material so that the surface is as even.
4. FOCUS the laser by positioning the laser dot over your material using the laser keypad. Once positioned press both the up down buttons (which say "AF" between them) simultaneously. The laser head will skip forward during this process. This is normal. It is also possible to manually focus the head using the focusing tool.
5. Close the laser cutter door.
6. Move the laser dot over the material to the top right or left corner of your cutting job by using the keypad. You should see this reflected in real-time cross-hairs on JC.
7. Drag your job from the print queue to snap to the cross-hairs. Use the eye symbol  in JC to preview your artwork and its relative positioning.
8. Double check the correct material is selected in JC. You can only use one material per plate.
9. Press the 'Play' button to run the machine.
10. After your job is complete WAIT for the extraction system to automatically switch off BEFORE opening the door. This will ensure fumes and particles are extracted and filtered.

Notes

- You can run your job again using Ctrl-A > Ctrl-R > and then Play. You may also run the cut line again by right clicking and choose "run cut lines again"
- If you are positioning using a jig you can use job marker  to make sure jobs register to this position.



In the event of an emergency

Part 4: Emergency Shutdown Procedures

In the event of a fire or excessive fumes where there is risk of damage to people or equipment, the operator is responsible for shutting down the laser cutter and taking steps to ensure the fire/fumes does not spread.

1. Turn the key to stop the laser.
2. If there is a fire in the machine; leave the lid closed until you have the extinguisher/fire blanket ready. If the fire is very small (less than 30cm) and can be safely extinguished by smothering it, use the fire blanket. For larger fires use the CO2 fire extinguisher located on the wall near 3D printers.
3. If there are excessive fumes in the machine; Leave the lid closed and turn on key. Press the fan symbol on the cutter to restart the extraction.
4. Let technical staff know. There should be a MakerSpace staff member/laser mentor present at all times. Let them know that there has been an incident and assist with incident reporting if necessary. They will lock out the machine, and follow up with out-of-service procedures. If you think you've broken something or done something wrong, don't be embarrassed! It's more important that you let a staff member know so that the machinery can be reinstated and policy can be updated.
5. Let security know. In the event of a fire or risk of serious injury, security staff must be informed.



User agreement

Part 5: Honouring the Laser

There is a small list of things we expect of users. Honouring laser maintenance will secure your access to this machine. Failing to honour this list will result in staff disdain, equipment malfunction and revoked access.

- Lower and free the laser bed and floor surrounding the laser of debris before leaving the machine.
- Remove the cutting table to remove debris if necessary ! You must lower the bed first! Talk with a supervisor or mentor if it's your first time removing the bed!
- If you are cutting something that produces excessive fumes or flames alert staff/laser mentors so they can perform lens maintenance.
- If you notice improper function of the machine contact MakerSpace staff to diagnose the problem.
- Delete your file from the desktop/downloads/JC before you leave the space.
- Turn off and return the key return it to a staff/laser mentors before leaving the MakerSpace.



JC Errors & Fixes

“Too many jobs on the plate/job cannot fit on the plate”	Make sure the plate is clear before dropping in additional artwork. Alternatively your art-board may be too big for JC. Resize to the parameters specified in this document.
“Plate parameters cannot be found”	There are inconsistencies between the plate and your print profile. Place on plate and manually select the material in JC.
Your job is not found in JC print queue	If you have selected an irregular print resolution your print may be hidden in the queue. Select ‘Show all’ below the queue to find the print.
Print-preview displays only etch lines where there should be cuts	The most common error. Check for document colour settings, cut line colour/stroke weight, clipping masks and print resolution. If that fails try to paste into another doc and check again. If that fails ask MakerSpace staff.
The laser will not respond or there is no crosshairs on the JC plate	The laser is not turned on or connected to JC. use the ‘USB’ shaped button to reconnect.
I can’t see the plate, I can only see my job	You have double clicked your artwork in JC. Press ‘esc’ to return to the plate.
“No jobs to cut”	You need to reset your job (Ctrl-R) before rerunning a job.

Operational Errors & Fixes

\$*!@!@ lens collision, fire or excessive smoke	Stop the laser using the key. In case of fire open the lid and extinguish. In case of smoke let the extraction run before opening the lid. Contact a TO before resuming the machine.
Laser not cutting all the way through material	Check the laser is in focus and the material is flat. Run the cut lines again. If problem persists see MakerSpace staff.
Printer does not home	The lid must be closed as part of the initialisation homing process.
Air-assist is not functioning	Check with MakerSpace staff.
Etches are weaker toward edge of the material.	Check with MakerSpace staff.
I need to be more precise about my job placement. How can I achieve this?	Use drag-down rulers in JC for acquire job placement. NOTE, the laser bed must be correctly placed to use this feature accurately.