Laser Cutter Inductions

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~~REVEAL~~

Laser Cutter Inductions

In this induction you will learn how to safely operate our Rayjet300 Laser Cutter, making something to take home.

You will learn how to operate the machine, how to identify problems and what to do when problems occur.

This induction was prepared by Dan Cook in 2016

Requirements

- Participants must be over 16 years of age
- Enclosed, flat footwear must be worn at all times
- Please register for a State Library of Queensland patron account before you arrive. You will
 need an account to complete the induction, assessment and make bookings for the equipment

What's a laser Cutter?

- Motorised mirror on an X, Y axis
- 100W Carbon Dioxide Laser
- Infrared follows VECTOR line work
- Can cut paper, card, wood, and acrylic
- Metal: can be etched only
- Wood: must check with the supervisor first
- Other Materials: see supervisor

Is it dangerous?

- Yes
- Fire Danger
- Laser Radiation
 - Burns
 - Blindness
- Safety Interlocks
- No user serviceable parts

Before you start



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- Ask the supervisor to use the Laser Cutter
- Specify the material you want to cut... and the size
- Always ask the supervisor "Do we have a **HOT WORK PERMIT**?"
- No cutting can be done until the hot work permit is in place
- To stop the machine: Press the pause button or simply ift the lid...¹⁾

Measure Twice, Cut Once!

- You know the size of your
- design, yes?
- You'll need it!



It is critical that you know both the material thickness and the size of your material. Find out. Write it down.

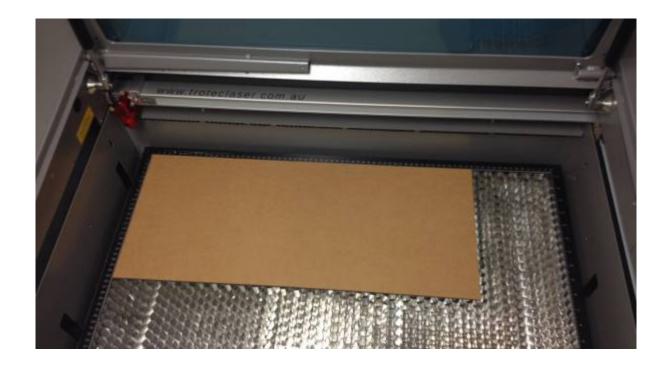
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Inside the machine



Let's start

Place your material in the top left corner of the honeycomb





Position the laser head

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Check the focal distance

07.jpg 08.jpg 09.jpg

- Take the focus check
- device and place
- carefully into the
- channel on the side
- of the laser head...
- It'll balance there.
- Don't drop it!

Raise the bed... Carefully...

10.jpg



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11.jpg

As the bed approaches the head, use individual button clicks to move the bed up until it JUST touches the focus device, either knocking it off or causing it to move.

Put it back where it lives!

12.jpg

Inside the front ledge of the machine!

Position the laser

13.jpg 14.jpg

Position the laser at the top left of the material to be cut. Do NOT adjust the height....

Shut the lid

15.jpg And move to the PC to setup the software

Open Corel Draw

16.jpg

Corel Draw

17.jpg

Object Properties

Colour Palette

Workspace

Toolbar

Menu bar



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Select File > 'New from Template'

18.jpg

Choose 'edgetemplate.cdt' Template

19.jpg
File > Import
20.jpg
Select your file
21.jpg
Place the file in the top left corner
22.jpg
File is imported
23.jpg
Use the selection arrow
24.jpg This is used to select items within the program.
Use it to select the entire image by click-dragging a box over it.
Cut paths MUST have a RED Hairline
25.jpg
Check all cut lines are OK
26.jpg They should be a RED HAIRLINE
Add some text
27.jpg





255

SLQ Wiki	10/15	Laser Cutter Inductions
255		
Green		
0		
255		
0		
Grass Green		
0		
153		
51		
Forest Green		
0		
102		
51		
File > Print		
29.jpg		
Go to 'Preferences' first		
30.jpg		
Setting up the Laser Cutter		
31.jpg		
Fire or fail!		
	vill cause a fire. Or a print fail and you still have	, for the materials
	vill cause a fire Or a print fail and you still pay	Tor the materials
fire.png		
Setting up the configuration		
32.jpg Selected Material		



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Materials		
Thickness		
Set the material		
33.jpg Click on M	laterial	
Select Type		
Set the Thicknes	S	
34.jpg 35.jpg		
Auto Focus is AL'	WAYS off	
	ny? This machine does not have an a ash. This is bad and will require a se	auto focus system. Switching on this setting will rvice technician to rectify.
Setup the cut		
38.jpg Always Of	N!	
Colour Select		
Power Setting		
Fine Tune		
Operation Type		
Times to repeat		
Speed <> Accur	acy	
What's wrong he	re?	
39.jpg		
Check the setting	gs	
40.jpg 500 DPI		
Verify your settir	ngs	
41.jpg Make sure	e this	



But...

43.jpg Never, ever, press this one!

When configured, hit OK!

44.jpg Leave these alone!

Send to the Print Manager

Now load the Print Manager

45.jpg Load the Print Manager

The Print Manager...

46.jpg Leave these alone!

The Print Manager...

46.jpg Select your print

Always use Move Job to Laser

46.jpg ALWAYS Check This!

47.jpg Did you check this?

Previews the operation

When previewing you should see the whole image with the colours you selected...

Press start on the laser cutter!

48.jpg 49.jpg

The Extractor



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50.jpg 51.jpg Extractor Indicator

The HEPA grade air filter will extract all smoke. Ensure it has automatically come on by looking for this light...

The print job will start!

52.jpg 53.jpg 54.jpg

Keep watch!

Keep an eye on the cut in case of fire or issues with the print Usually, all engraving starts first, then the cutting In an emergency, lift the lid to stop the cut

Complete!

55.jpg 56.jpg The laser will move back to it's home position.

BEFORE you lift the lid:

Use the keypad to lower the bed. This prevents damage to the head when removing material. Wait... at least 30 seconds for the smoke to clear

Carefully remove the work piece

57.jpg And you're done!

Make sure you remove all cut material.

If some material has dropped into the honeycomb, alert the supervisor who will remove it for you.

Final Questions

What do you do if the lens is dirty? What do you do if the honeycomb is not located properly? What do you do if the work piece catches on fire? What do you do if the machine makes unusual noises?

Files

quarter_width_quarter_height.zip

half_width_quarter_height.zip

laser cutter induction slides.pdf

laser cutter assessment record.pdf

New Laser induction Activity Dec 2019- usb stick



Background

After using the Chair design for several year it became aparent that we needed a new practical take home activity that contained some intrinsic value. Why not make a customised usb stick. The small cost of the usb stick would be outweighed by the utility of the outcome.

Process

the insides of usb were measured up with vernier Callipers and drawn up to create a template for the naked USB Board to be retained inside.

Naked Usb Template

In Illustrator, Corel Draw, Inkscape (or my case Affinity Design) this template can be combined with artwork to create a Usb Stick design that is cut out on the laser and then assembled into a sandwich of 2 or three layers around the naked usb board. 11 of these designs have been prepare for Participants to select, prepare in corel draw for cutting as a practical exercise in their laser induction.

Design Considerations

- usb connector needs to not be obstructed
- its preferable that the usb stick obstruct the *port next door*
- its preferable to us offcuts for the laser materials
- its preferable to try a couple of different techniques in the session so that participants get to see a range of techniques and use cases for the Laser and broader FL resources
- its a requirement for the timely completion of the induction that the design require a minimum of cutting and especially etching time.
- its a requirement for the timely completion of the induction that artwork is straight forward to lay out

• There is no tome in the 2hour induction for participants to make their own original design but are welcome to book and use the laser in the future.

Preprepared Artwork

Chingy
Batman
Cactus
Dachshund
Donut
Elephant
Hotdog
Kenny
Mjölnir
Rocket
strawberry_usb.pdf
Frog

St. The Edge

This requires a reset of your job - don't attempt to resume cutting