Fabrication Lab Equipment Proposal

SLQ Wiki Fabrication Lab 2026/04/13 00:51

Fabrication Lab Equipment Proposal

Daniel Flood I am comfortable with following this through with the following caveats;

1. I would need to see a timeframe for implementation and it's implementation before the end of the fincnaical year (or very close to it). This would need to be a hard timeline. I do not want this dragging on. I understand that there are unknown unknowns and if that comes into play, this is life. People getting bored with the project and leaving it half finished is not an option.
2. I would need the full OHS workup before anyone turns anything on. There will need to be a risk mitigation strategy in place for the testing and building process.
3. I would need an accurate price list of all components.
4. I would need a breakdown of what the machine can and cannot do.

Peter Musk

1. The timeframe is mainly down to you (since I expect you might do most of the work, though I would encourage you to enlist as many HtE folks as you trust)
2. The OHS stuff is down to me (as Edge WHS officer), and I will get on to that asap.
3. The pricing I will leave to you, since you have a good idea of what you want to build .
4. The performance is also something you could dot-point (though I am happy to help with the drafting)

End of financial year seems a long way away, but it will come quick.

1) Timeframe

- 1 week(2 working days) for initial mill setup and evaluation.
- Parts list for test version 2 weeks after initial mill setup.
- Test version evaluation finished 4 weeks after parts arrival. (2 weeks build, 2 weeks testing)
- Final parts list 2 week later.

Assuming no major problems, minimal stolen time and help from Hayden.

2) OH&S

1. Common
    - Sharp tooling
    - Noise
    - Unsecured materials

1. Manual Mill
    - Machine needs to be used while operational

1. CNC
    - Automatcic starting

- Safety systems not in place initally

3) Pricing

Core machine:

Budget option:

3) Performance

Byron notes. Proposal for justifying the machine:

The biggest one: People keep asking for it. Just about every time the CNC gear is brought up, 'can it cut metal' is nearly always one of the first questions and I'm sick of saying 'no'.

It would be nice to have experience and be able to show, then allow, people to use a machine such as this. Plus giving libraries, schools something to play with and experience to evaluate if the machine is suitable for their own needs.

The second, internal reason, is part of the Precious Plastics project. Peter has needed to make custom brackets, gears and hardware just to get the project off the ground. Between the welder and a machine like this, we can make this happen quicker and solve more problems quicker without having to get custom parts made.

This is something that the mill, unmodified, can used for right away with only minimal experience. Fully CNCed with basic tooling we can even make things like metal gears as well as customize cheap ones to suit.

The ultimate goal with regard to the PP project would be able to make completely custom things, such as dies for the extrusion machine.

And of course it can be used for making parts for the xcarve, Multicam and other machines around the place.

Two machines as an option. There are others, but these are easy to get anywhere in Australia plus are on sale until the 18th (Friday:)

Hello.

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I've talked to Hayden and others about this and have come up with an agreed apon plan.

The first machine we were looking at. https://www.machineryhouse.com.au/M649

Around $1000. Complete mill for the price and one that can be recommended as the 'budget' option if the next model up cannot be justified.

After some talking however, we propose getting this machine instead:
https://www.machineryhouse.com.au/M650

It's a bit more pricey, also on sale. However is a more powerful machine with twice the bed size that will allow for some interesting options later on(Machining a number if parts at once).

plus its a more capable machine right out of the box. Everything we do to it will be relevant with the previous one, allowing for two options for other libraries. Larger or smaller.

The machine has a number of upgrade options for the future, allowing for accuracy improvements.

While it can be used as intended out-of-the-box, the goal would be to CNC it on a budget!

We should be able to do it for under $500 all in and get started for something closer to $150-200.

I plan to use the controller boards from the xcarve to test the machine and see what we can do. Upgrades can come later.

Software is exising gcode senders. A spare PC and VCarve pro.

For reference. This is the factory CNC kit:
http://www.redfoxmachinery.com.au/product/cnc-kit-bf20-complete/

And one approach from Make: https://makezine.com/projects/cnc-mini-mill-conversion-kit-hardware/

Other examples can be provided if required.

While some parts can be ordered now, I'd rather wait until we have the mill before ordering the CNC parts unless they should be ordered along with the XCarve upgrade parts.

Parts list to CNC ourselves:

4x 57h76m-2804a https://www.robotdigg.com/product/1115/Nema23-0.9-step-angle-stepper-motor

4x 8 to 8 https://www.robotdigg.com/product/229/Ball-Screw-Flexible-Coupling-8mm

Assorted pulleys and such:

https://www.robotdigg.com/product/1129/Low-profile-2GT-Pulley-60-or-72-tooth-for-9mm-belt

https://www.robotdigg.com/product/1128/Low-profile-2GT-30,-32,-36,-40-tooth-pulley-for-9mm-wide-belt

* Tooling, work holding and accessories: *

One or both of these are required, ideally both.. Clamps are more versatile. Vice is much easier.

https://www.machineryhouse.com.au/C0955 https://www.machineryhouse.com.au/V104

All these can also be brought from Machinery House, but are cheaper from here:

https://www.aliexpress.com/item/9pcs-ER32-Spring-Collets-MT3-M12-ER32-Collet-Chuck-Morse-Taper-Holder-For-CNC-Milling-Lathe/32797196608.html

https://www.ebay.com.au/itm/New-20-pcs-4-2-Flute-HSS-Titanium-Tin-Coated-Square-End-Mill-Set-316-34/152758884899

We can build a table cheaply that will contain all the control gear for it now that we have a welder, or just use it right on a workbench for now. We can use flood rather than spray coolant for minimal cost.

* PPE *

Existing PPE equipment is suitable for this machine once safety protocols are worked out.

Eye protection, cut resistant gloves and under some conditions, maybe hearing protection are all that are required.

Once machine is fully CNCed, close-able doors and an enclosure can be built with interlocks that will preclude all PPE except for gloves as the machine is then only used remotely.

Thank you.

I'll be in on Tuesday and Thursday. I'm happy to talk about this.