The MicroSlice V1.0 Build Manual

http://thelittlebox.co

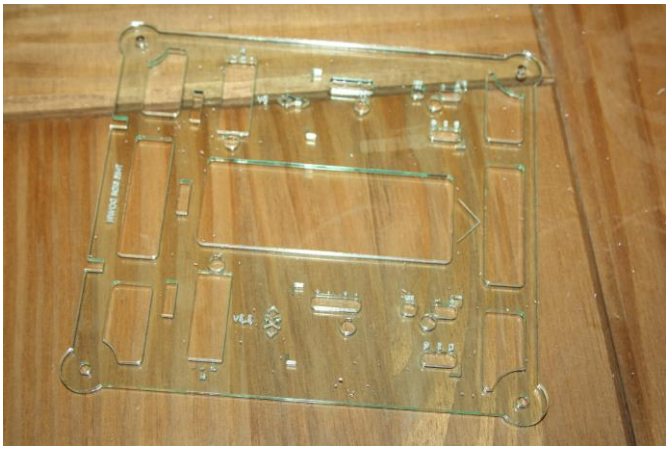
Thank you for purchasing the MicroSlice mini laser cutter & engraver, you'll have a great time building, and using it!

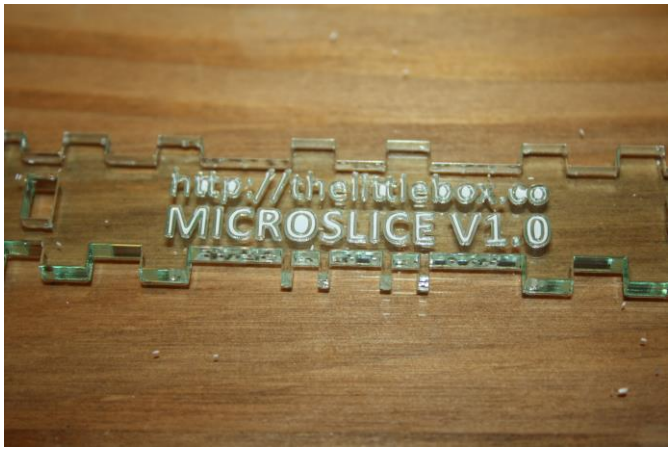
Before you can start you'll need to make sure you have the required tools, and a safe place to work. As a tip; use a toughened glass cutting board as your work surface, that way you can't stick your MicroSlice to your work area.

You'll need the following;

- Soldering Iron.
- Sharp Knife.
- Mini Clamps.
- Needle-Nose Pliers.
- A Set of Allen Keys.
- Various Screw Drivers.
- 10mm Heat-shrink.
- 4 x 50mm M3 Bolts.
- A set of Needle Files.
- PVA Wood glue or Tensol 12 Acrylic glue.
- Ribbon Cable, you can use an old FDD or HDD cable.
- DuPont .1" pins, male and female.
- DuPont .1" pin cases with 1, 2, 3, & 4 connections.

To begin prepare your MicroSlice parts, smooth down any rough edges with sandpaper, and if you have an acrylic set remember to remove the protective film before assembly.

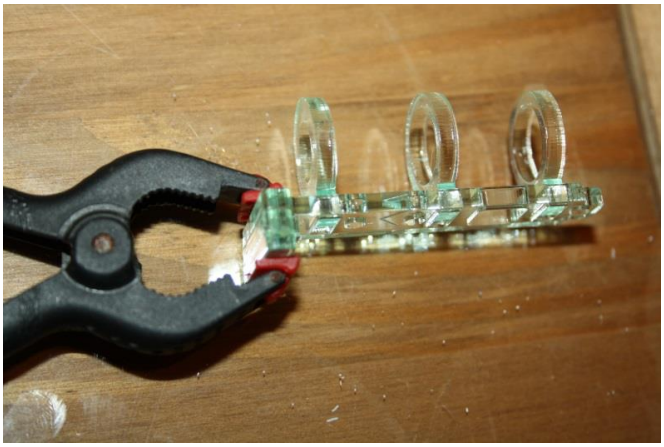




You'll find that around the lettering the protective film is harder to remove. Use the tip of a blade to coax the film free. Don't rush it as you run the risk of scratching the plastic's surface.

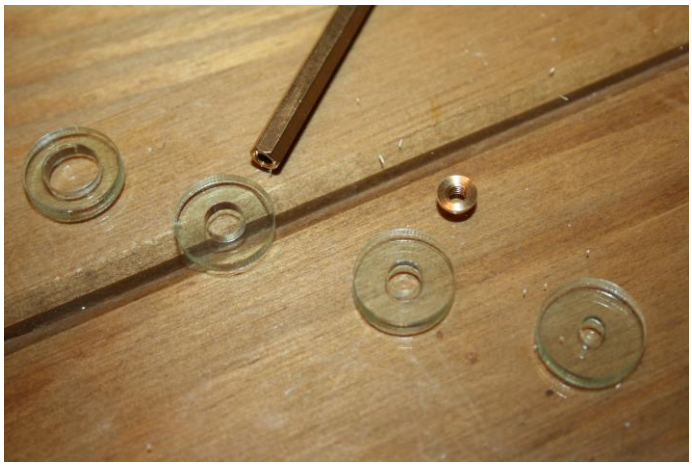
Check all the parts are there and that none are broken.

The Cutting head bracket is easy to assemble, and a good starting point.

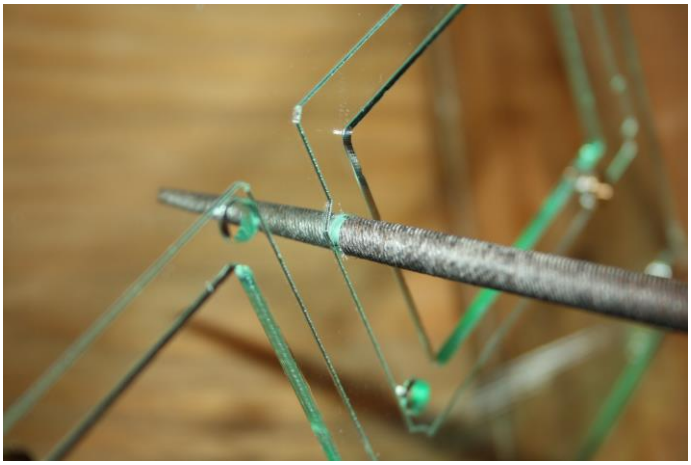


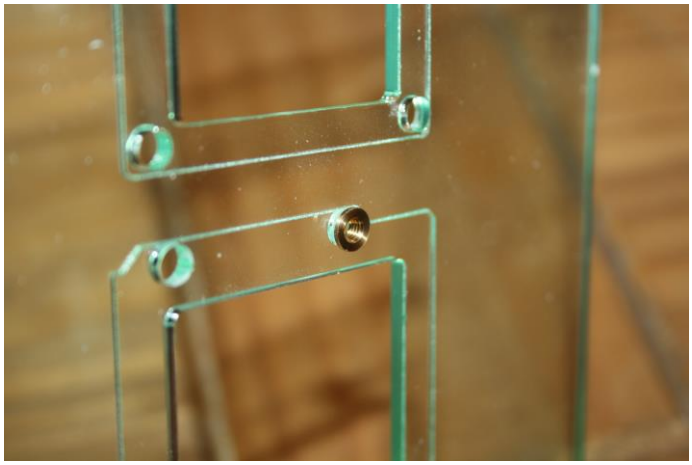
Gather the parts together. Make sure the bracket-back is laid flat with the arrow on the top side. Glue the three tabs to the bracket-back. Make sure the tab with the smallest diameter hole is glued next to the T of the bracket-back. The two spacers glue onto the rear of the bracket-back; they will be used to trip the end-stop switches.

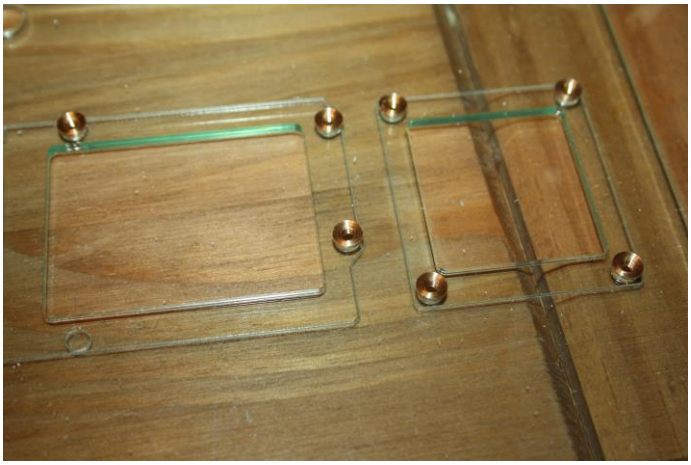
The Lower Deck is more complicated. Firstly sort out the four different types of circular pieces. There will be four which the Brass Stand-Offs will fit through, four which four Microbarb Brass Inserts will fit, four very large rings, and the rest which have a 3mm hole through.



Fit four M3 Microbarb Brass Inserts into the matching for circular parts. Do not use excessive force or they may break. If you need to you can widen the hole with a needle file.





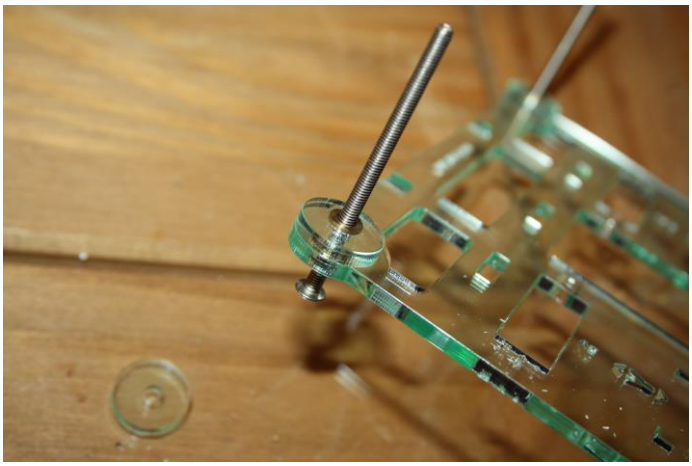
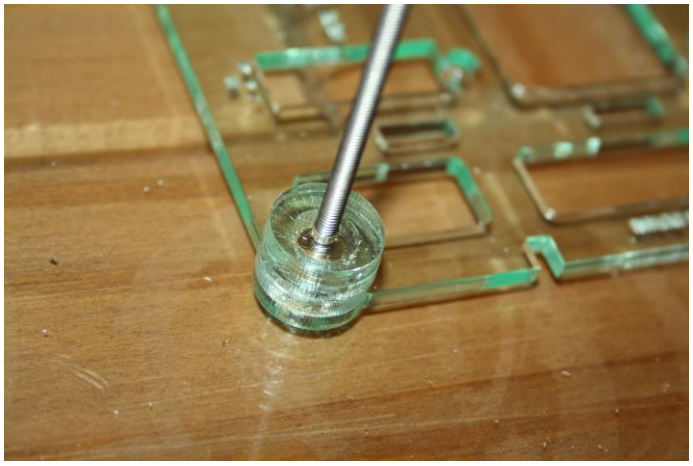
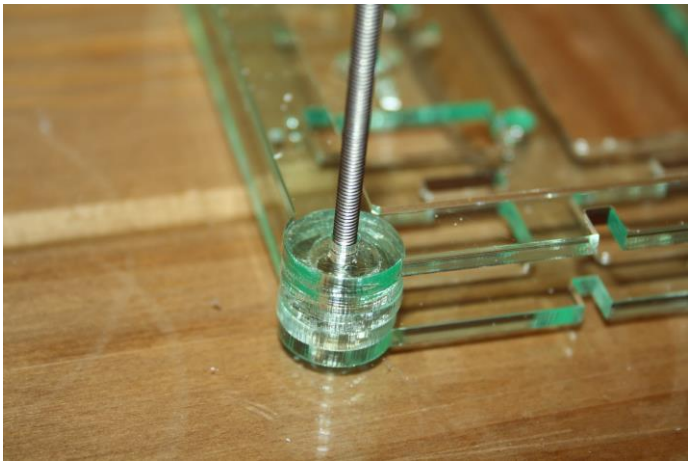


Fit another seven Microbarbs into the lower deck's bottom layer. Make sure to put the Microbarbs in from the underside of the layer. The outlines for the Arduino UNO & the dual relays should be facing up.

Take one of the circular parts with a Microbarb pre-inserted, thread a 50mm M3 bolt through from the top of the lower deck's upper layer. The bolts should go through from the side **which does not have THIS SIDE DOWN** etched into it i.e. in from the top.

Onto the bolts screw on the circulars with the M3 Microbarbs, make sure the lip of the insert is not touching the upper layer, if it is take it off and turn it over.

DO NOT GLUE THE CIRCLUAR PARTS TO THE UPPER LAYER.

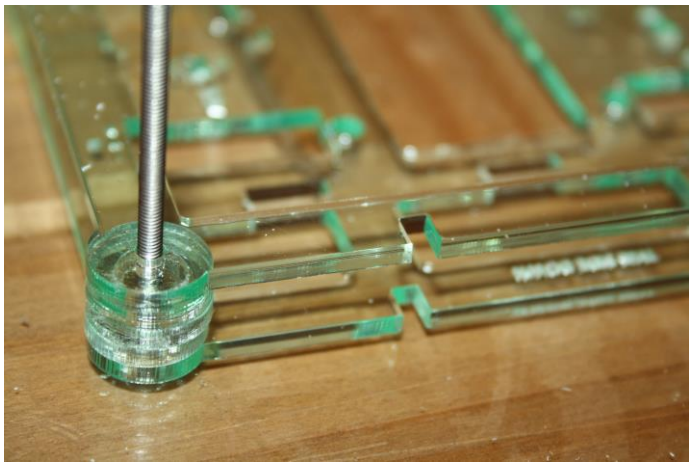





Behind the circular parts with the brass inserts glue on one of the four rings (The circular parts with the largest holes). On top of that glue a single normal circular part (3mm hole). Make sure each corner has three layers of circular parts glued together.

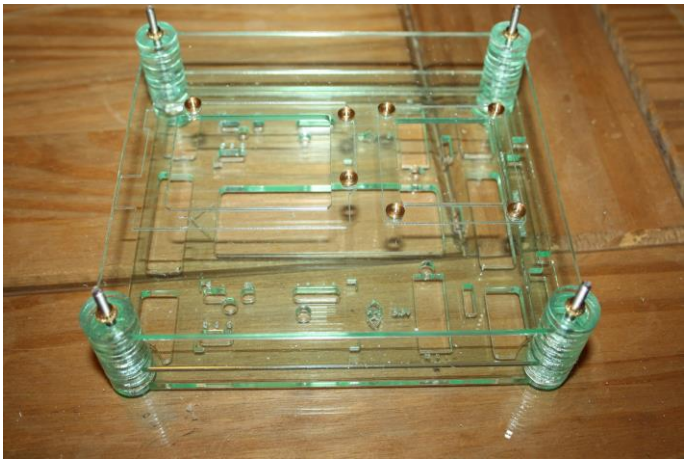
Once all four corners have three layers, glue on the large U shaped layer. Make sure the Notches are towards the rear of the MicroSlice near the relay board. The notches should match up with the upper layer. There should be a gap where the Arduino UNO is to go on the lower layer.

Set aside four circular parts (3mm hole) for use later on in the build.

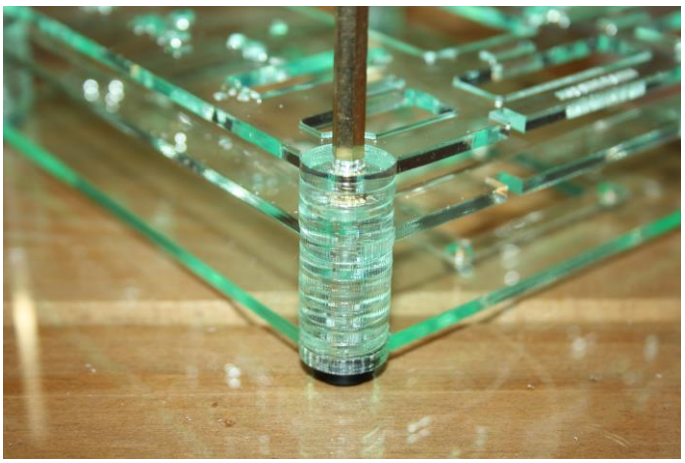
On top of the U shaped layer build up an equal amount of circular parts on each corner.

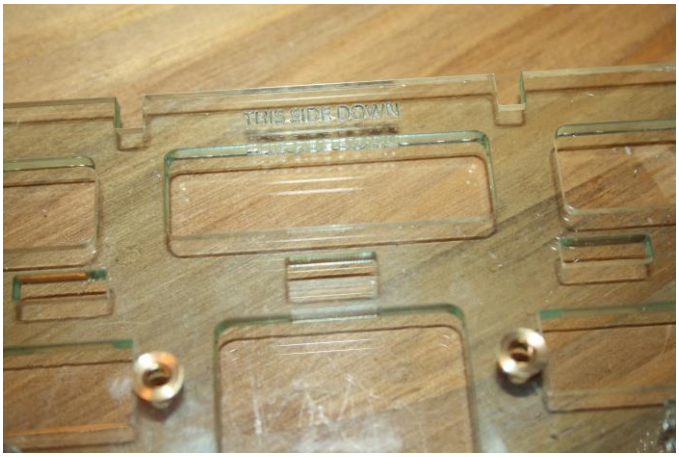


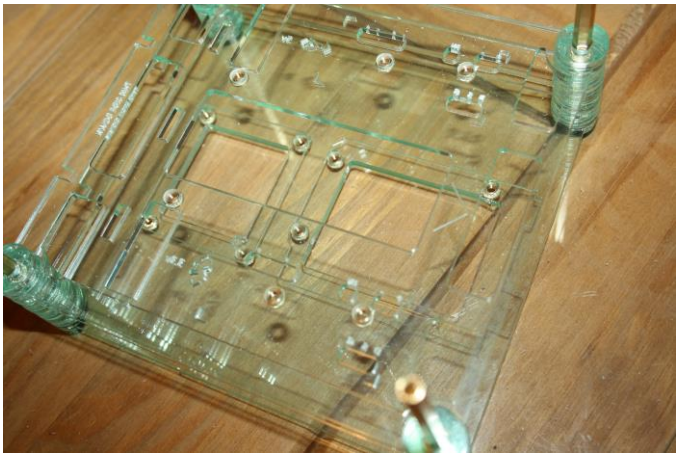
Once all the circular parts have been glued on fit the bottom layer of the lower deck. Centre it onto the assembly. Net place the four remaining circular parts over the M3 bolts and clamp them down with a Microbarb brass insert. Allow the glue in the assembly to set.



Once the glue has cured undo the Microbarbs and remove the M3 bolts. The upper layer should come free leaving four pillars with a Microbarb insert in each. To finish the lower deck fit rubber feet to the underside. Attach the top later to the lower deck and screw in the brass stand-offs, glue the four matching circular parts to the upper layer using the brass stand-offs as a guide. Be sure to have the upper layer with the correct side down.

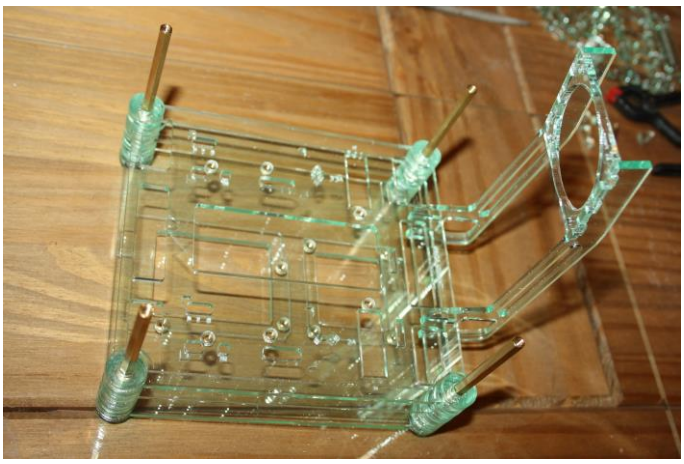




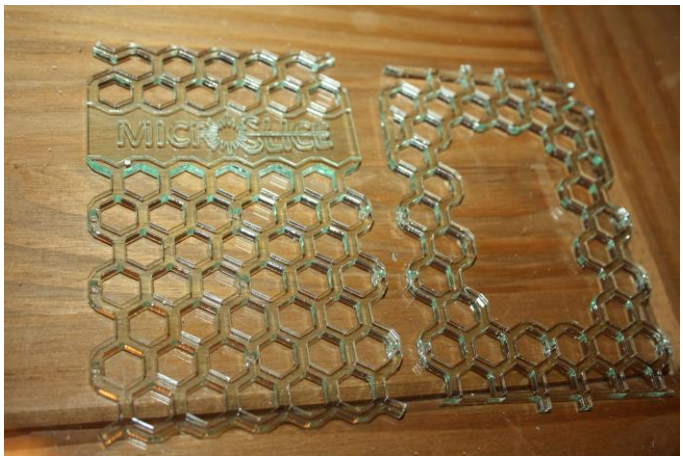


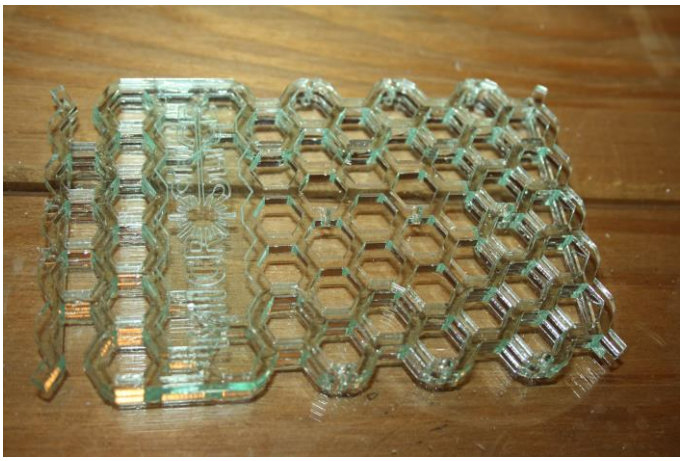
Remove the upper layer and fit Microbarb Brass Inserts into the remaining holes.

Build the fan bracket, reassemble the lower deck to check it all fits together.



The Cutting Table must be kept flat while the glue cures. Make sure the two line up as closely together as you can. Later we'll fit the neodymium magnets used to keep materials still on the cutting table.

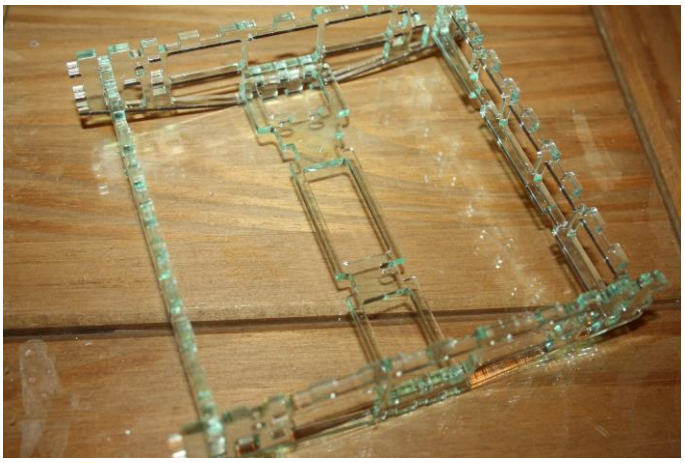


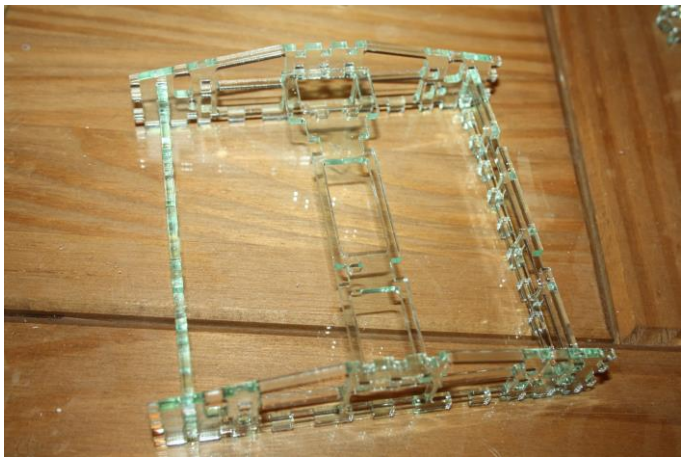


The Upper Deck supports the gantry. It is best to familiarise yourself with the technicalities of assembly before applying glue.

To make sure that the parts all fit together correctly I advise building the upper deck in one sitting, without allowing too much time for the glue to dry. Some parts are a tight fit so you will need to be able to jiggle things around to get them to fit!

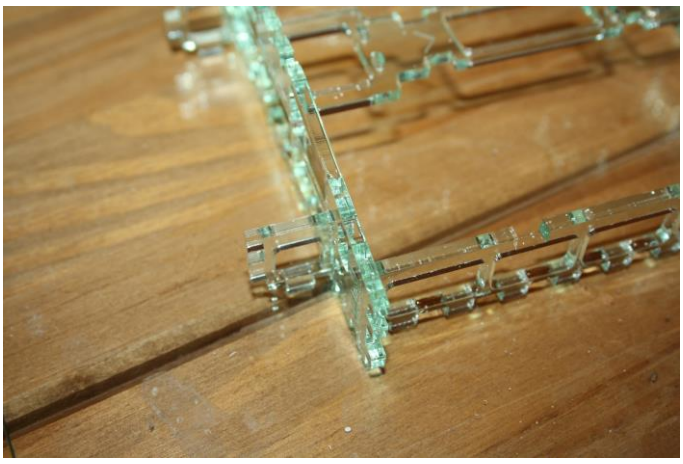
Begin with the central spar on which the Y Axis motor mounts. Check the correct orientation with the arrow on the top side and pointing towards what will be the front of the MicroSlice. The spar plugs into the two inner braces, and then two outer beams fit between those. Dab glue along each adjoining edge and press to fit together.

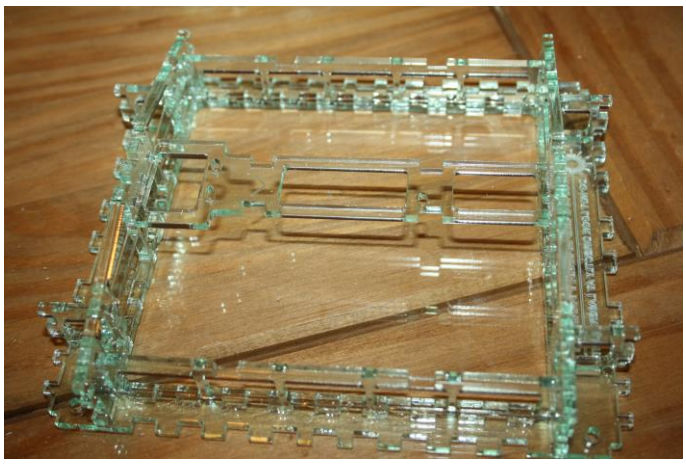




Two brackets fit on each beam. After the brackets are in position you can fit the assembly to the top deck…..

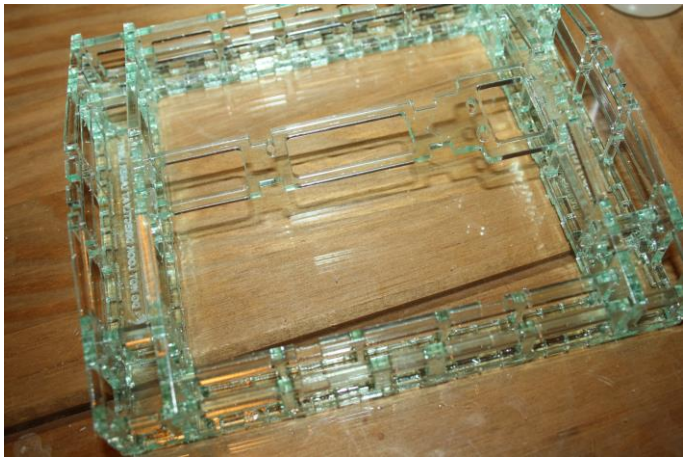
Place the top deck face down on your work surface. Dab glue between each notch along the interlacing edges. Check the arrow on the central spar faces towards the Laser warning information. Place the assembly onto the top deck making sure the slots are all correctly aligned.



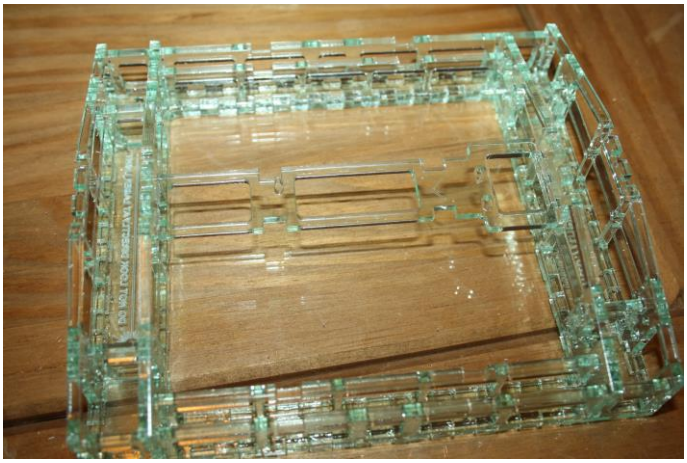


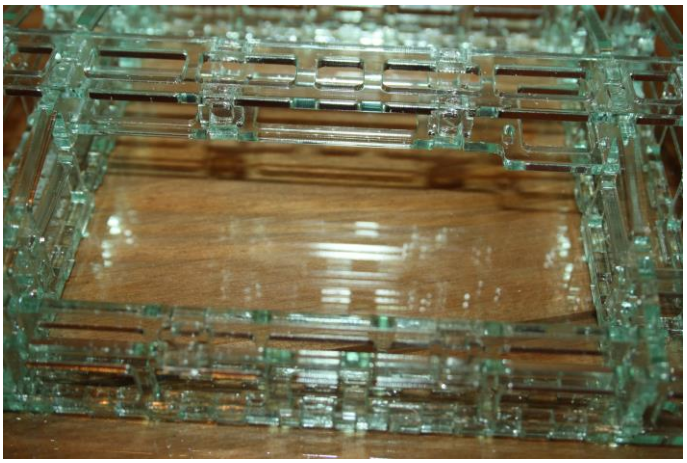
Press the parts together and ensure the assembly is flat.

Next the outer braces and beams; I find it easier to start with the side beams. Be warned that they are a tight fit, and may require some jiggery pokery. Dab glue between the interlocking edges and press-fit the parts together.

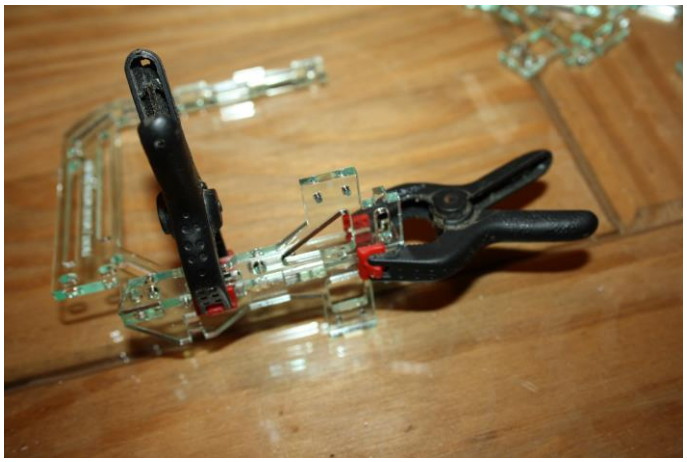


The lower spar is a tight fit too. Dab glue along the joining edges and press-fit together.

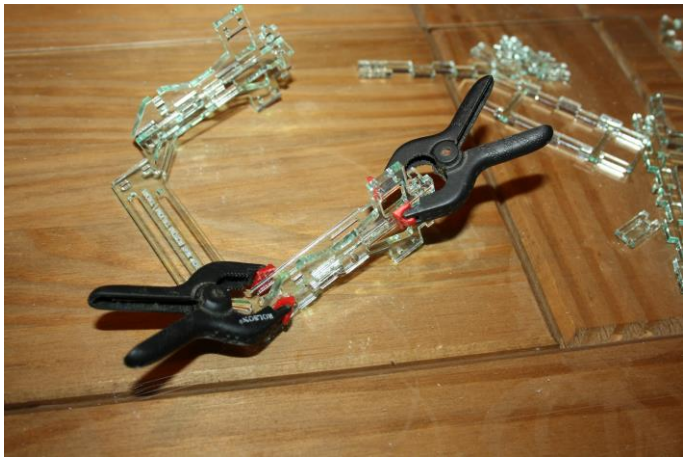


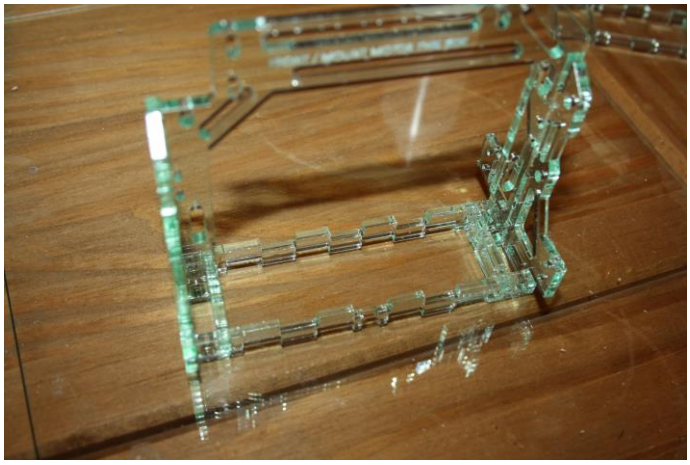


The Gantry. The important point is to make sure the parts are in the right orientation. The arrows on the outer side-supports point towards the front, the same side on which the motor for the X Axis is bolted.

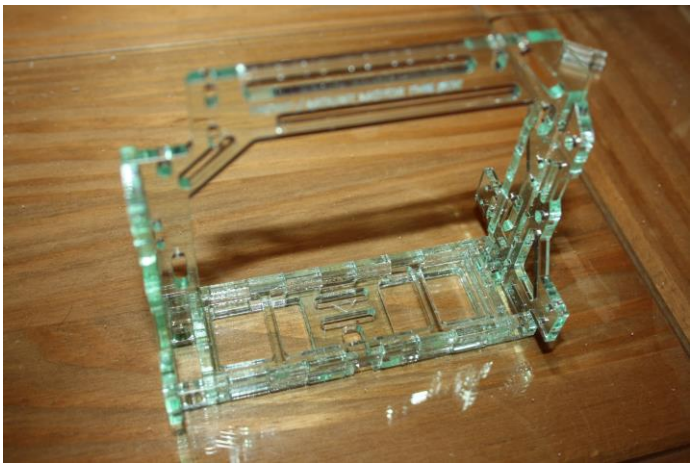


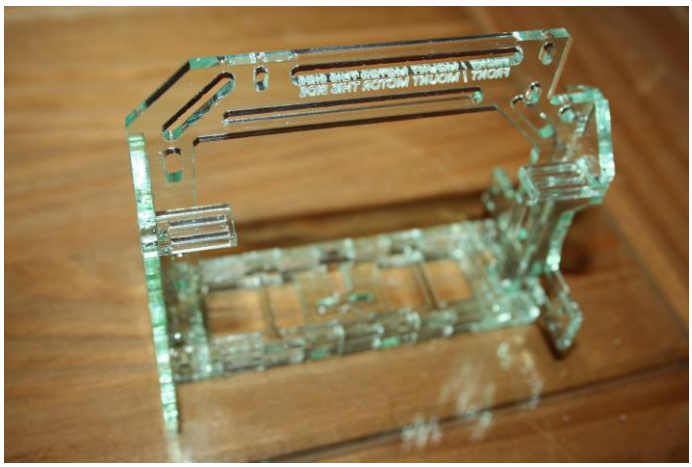
You'll want to try and do this all in one sitting before the glue dries to make sure the gantry is square and not crocked. The two outer side-supports are glued to the cross-brace first, then the smaller inner side-supports. The two thin beams need to be the right way round; there should be three gaps at the top, and four at the bottom with the small opening at the front. The beam with the opening is marked with **front**, this part must be glued to the front of the gantry assembly.





The lower panel has a cut-out making space for the Y Axis motor. The arrow on this panel again points towards the front. The cut-out should match up with the gap on the front beam. Glue the lower panel in place and then glue upper panel in place after. Check the gantry is square and leave the glue to cure.





To finish the gantry glue the two cable guides to the side-supports behind the cross-brace.

That’s it!

For this section anyway. Next we’ll begin to add the hardware before wiring the MicroSlice.