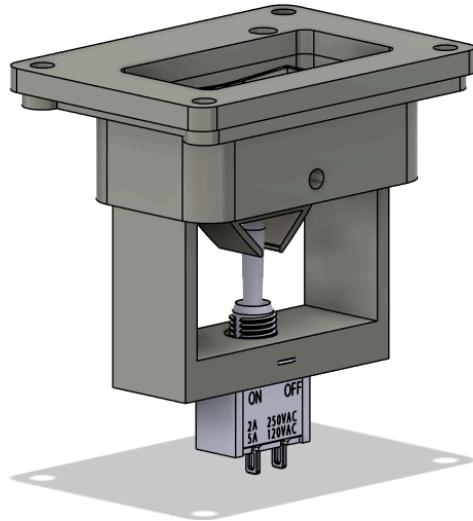


# MAKING THE ELT

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## Bill of Materials

- Printed Parts
- 2mm metal rod/ toothpick (can be used as your switch hinge) x1
- SPDT switch (ON OFF ON) x1
  - 3mm Red LED 5V x1
- Arduino nano/uno/mega 2560 x 1
  - (Optional) - Hot Glue
- 8x M3 Bolts or self tapping screws at a length of 8mm or longer

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- Alternatively if you're mounting to a panel:  
4x M3 Bolts: Panel thickness + 3mm.

**Example - If my panel was 10mm thick  $10 + 3 = 13$ mm bolt length will be the necessary size.**

# PRINT INSTRUCTIONS

## Print Color

### Intending to laser engrave text onto the front face

Print the faceplate in white filament or the filament choice you want to have showing underneath. Note here that backlighting using this method will not be possible, I would recommend going with an acrylic faceplate instead if you intend to try backlighting.

### Not intending to laser engrave text onto the front face

Print in black to provide the least work for you.

## Supports

**Multi filament 3d printer users:** If your machine has multifilament capability e.g. Bambulab AMS, or Prusa MMU2-3, then you are able to have a better internal layer as you can set your top Z distance to 0 and make your raft interface PLA if your part is made out of PETG, or PETG support interface if your part is PLA.

Example: [\(8\) Using pla as support material with petg #3dprinting #bambulab - YouTube](#)

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It's pretty overkill as you don't really see the bottom layers once the switch is installed but do as you fancy.

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Print all of the parts in the most economical way possible, none of the parts are majorly complex to print. Preferably print all of the parts in black and white. None of the parts need support with the correct print directions.

# ASSEMBLY INSTRUCTIONS

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## Sanding (optional)

In order to sand 3d printed parts, some quick tips:

- If you are sanding PLA you have to be careful about heat.
- Sand in a circular motion across the entire face.
- Ensure to wash your part off before viewing as dust can hide the layer lines that exist.
- Make sure to wear proper PPE when sanding, as small particulates from prints are toxic.
- Coats of primer help in hiding layerlines, sandpaper a bit, add a primer coat, and repeat.

I personally use a small circular sanding bit connected to a drill. This works well for materials like PETG and ABS which have a higher melting point but with PLA you are likely to overheat and melt the material before sanding it correctly.

I start out with a grit of 80, and sand until the majority of large layerlines are missing (or if you are using a textured bed like I was in the pictures below, until the face is smooth enough to where the texture from the bed is mostly invisible). Once this happens I quickly hit it with a sand of 240 for any smaller marks and to prepare a good grit for paint to stick to the surface of the material. Note this is only the first layer of paint, and we will come back to sand more if required so if there are any layerlines still visible that you are unable to get rid of that is fine.

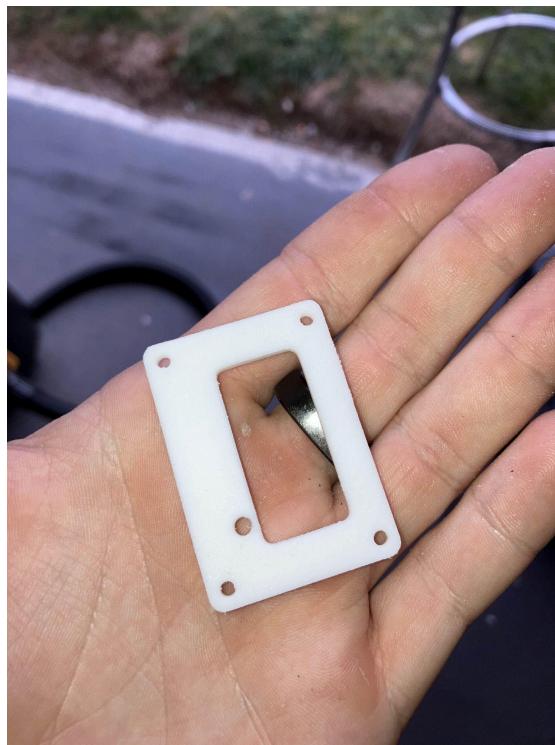
No Sanding Bed Texture



80 Grit Sanded



240 Grit Sanded



It is also to note that black will show layerlines FAR more than white, I will show an example of black parts compared to the white parts seen above.

Black Parts



200 grit sandpaper



1200 grit sandpaper

Here is a great example video going into more detail on how to sand, fill, prime, and paint parts that helped me when I was a beginner.

Example Video: [Finishing 3d prints: How to sand, fill and prime 3d printed parts \(youtube.com\)](https://www.youtube.com/watch?v=Finishing 3d prints: How to sand, fill and prime 3d printed parts)

### Painting (optional)

The easiest method of painting 3d printed parts is aerosol spray paint, and that is the method I am going to use. As I live in New Zealand the option for filler primer is limited, however for filling gaps in layerlines filler primer is the best paint for the job, as it is a much thicker paint than regular paint and primer.

I am personally using a can for rust-oleum ultra cover paint + prime gloss black, I prefer to use matte black for all of my parts as I do think I get a better finish with matte but I ran out.



Here is a picture of an assembly line of parts being spray painted, of course a good mix of sanding and painting will provide the best results. The video above for sand/fill/priming parts is a good exemplar video for this there is not much to say apart from above, it is just using regular spray paint after-all.

I personally repeat the sanding and painting process until all the layer lines are invisible and I have a grit level of 2000 and above that I am happy with.

## Vapor Smooth (optional)

(Warning this method uses flammable and toxic Acetone)

An alternative to painting is Vapour smoothing parts made out of ABS using Acetone

Example: [Easy method of vapor smoothing abs \(youtube.com\)](https://www.youtube.com/watch?v=HgjyfzXWVJU)

This can be done for various parts across the ELT, most notably would be the switch and the faceplate. I will only be doing the switch, however the process is basically the same for the faceplate.