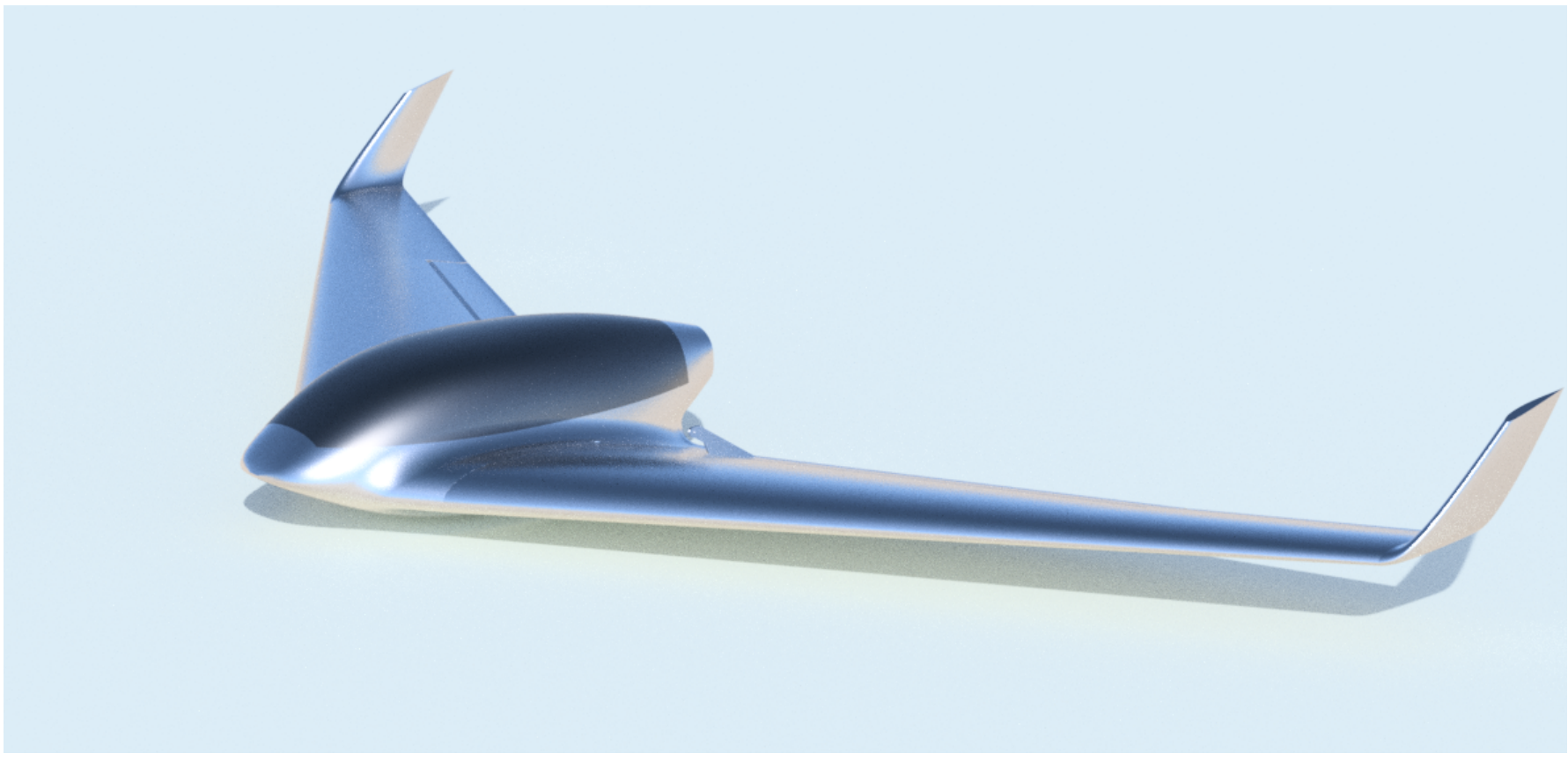
rc3Dprint

MICRO

PEREGRINE

FLYING WING



PRINTING AND ASSEMBLY INSTRUCTION BOOK

THANK YOU

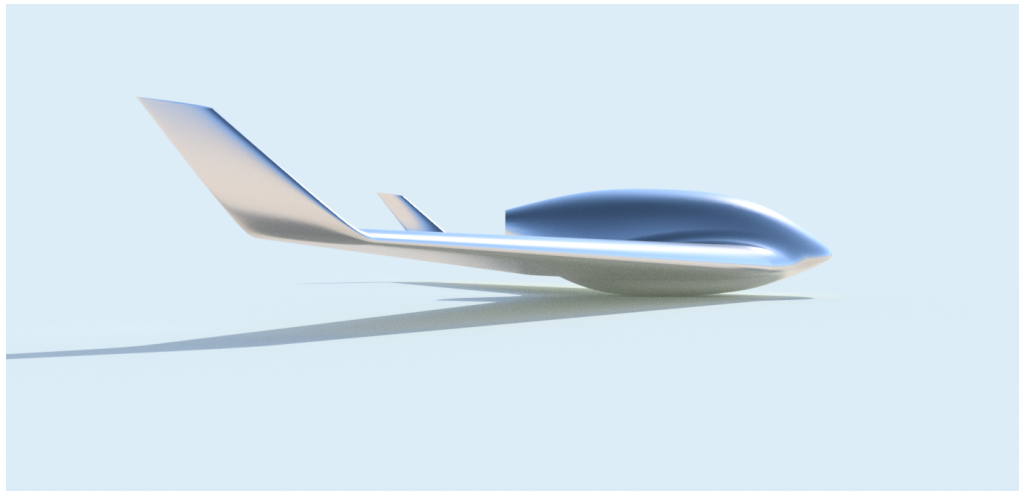
Thank you for downloading this Micro Peregrine flying wing. These models take many hours of work to make available to you so please don't share the STL files with others. Send them to www.rc3print.com where they can download the models themselves. This enables me to continue to develop new models to make them available for download.

This document aims to help you print and assemble your aircraft. Our designs are made to be simple, this model is designed explicitly with LW-PLA in mind, so it incorporates carbon tube spars. If you print it from regular PLA it will obviously be heavier and you should take this into account.

3D printers often have many differences so you may need to tweak settings to get the best results.

Included in the document you will find Cura profiles and layouts for each part and assembly instructions. Most of the components in the design are *solid bodies*, this has some advantages over hollow bodies in that you can adjust some settings such as wall thickness, infill percentage, etc. As such we recommend using Cura to slice the files though it is not required for this model. The walls of these solid bodies are single line 0.4mm thickness to reduce weight. As you are printing and assembling the model yourself we take no liability for damage or loss resulting from your use of these files. Please fly responsibly and follow all local laws.

Share your results on Instagram, Facebook, or by email and tag @rc3dprint for discount codes on future orders.



PARTS LIST

REQUIRED

I used UMX electrics, specifically from the UMX Cessna 182, for this model however you can use any lightweight rx/esc and servos you like. Below is my setup.

RX ESC and integrated servo - EFLA5864

SPMA3065 Programming cable

LIPO 2S 7.4v - EFLB2802S30

Prop adapter (long) - EFLU1168

Prop 5x2.5 - EFLUP050275

Motor BL180 3000Kv - EFLUM180BLB

2 x Micro linear throw 2.3g servos (SPMSA2030L)

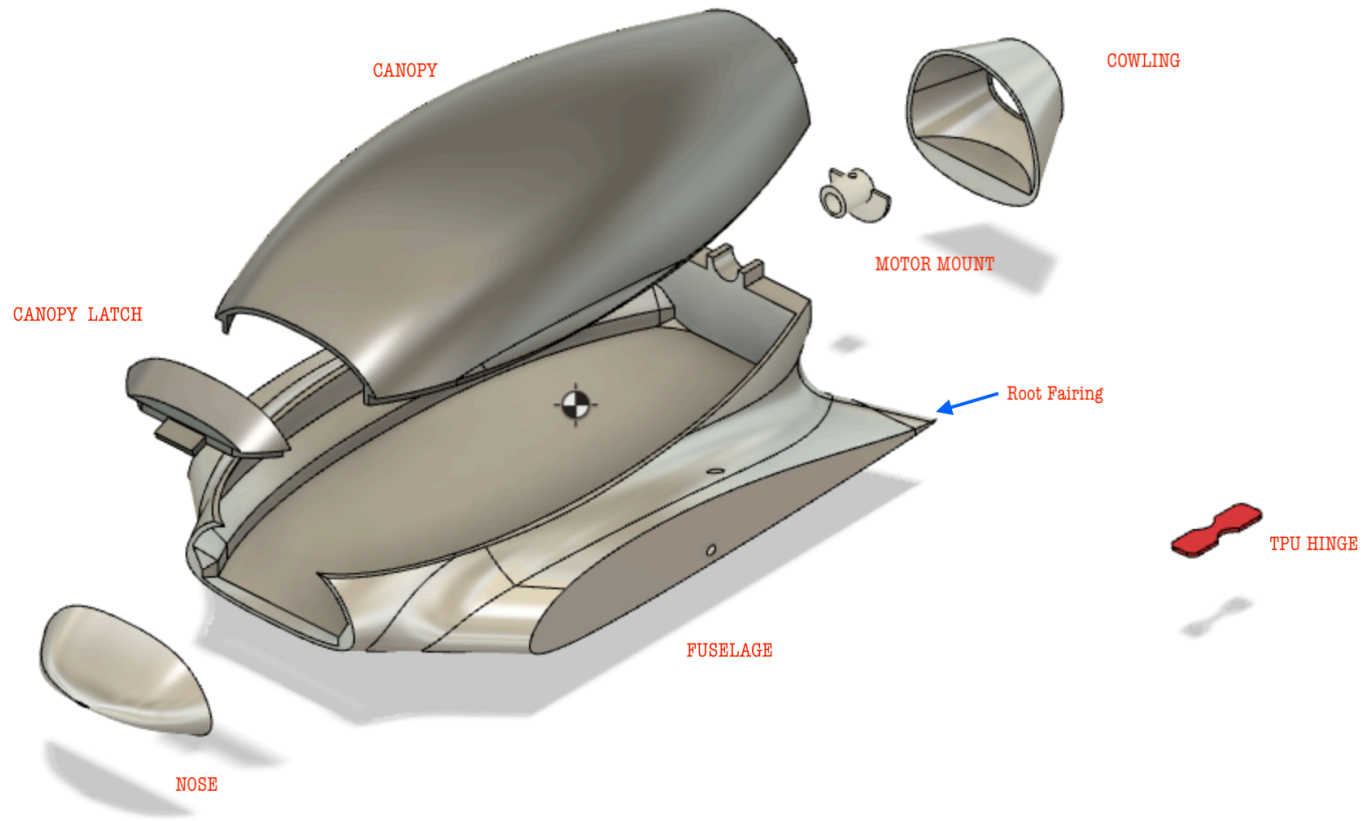
LW-PLA from Colorfabb

0.5mm piano wire

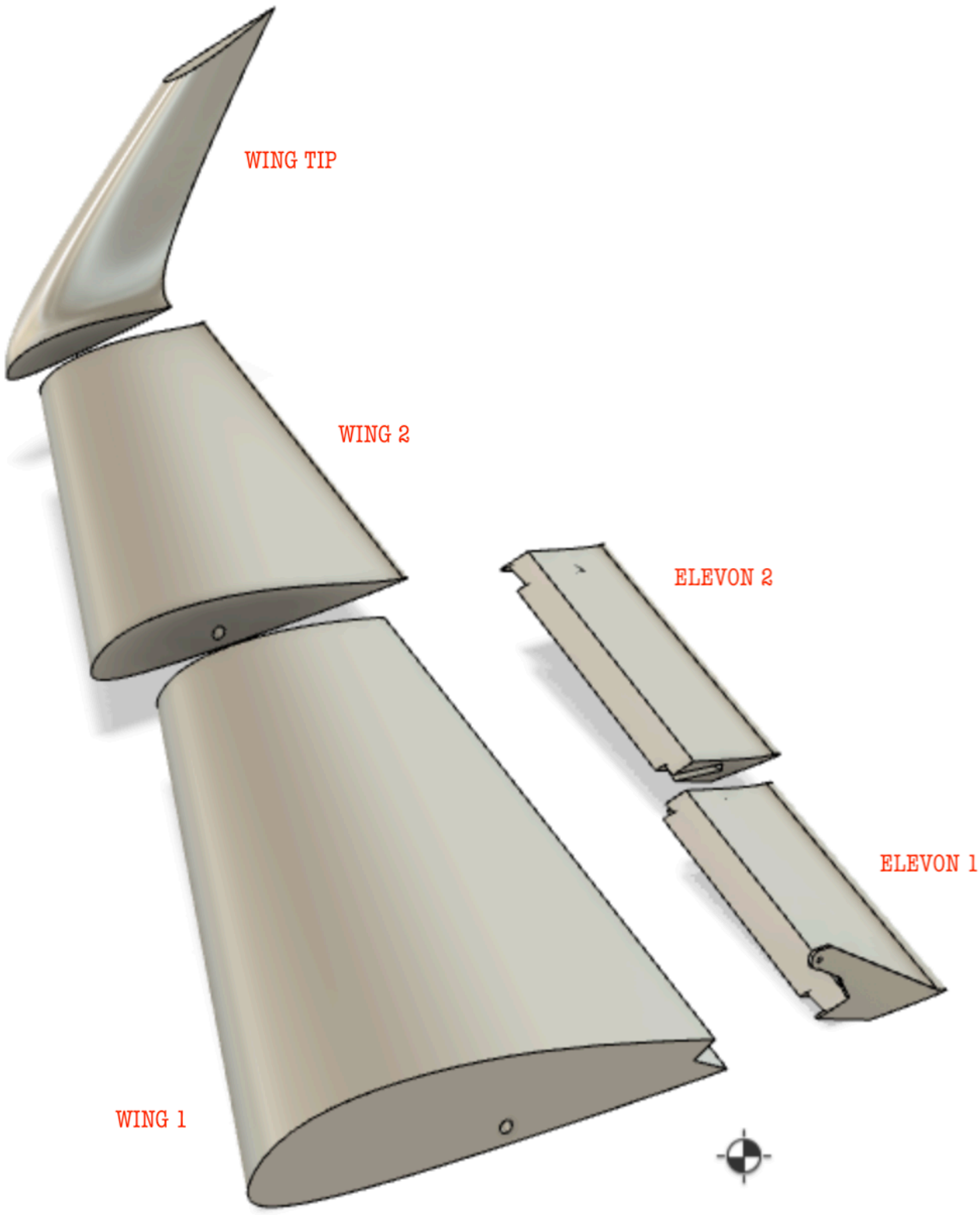
2mm Outside diameter carbon tube - 2 x 380mm 1 x 340mm

INCLUDED STL. FILES

FUSELAGE



WING



SPECIFICATIONS

Wing Span & Area

701mm span

Flying Weight

117g

Wing Loading

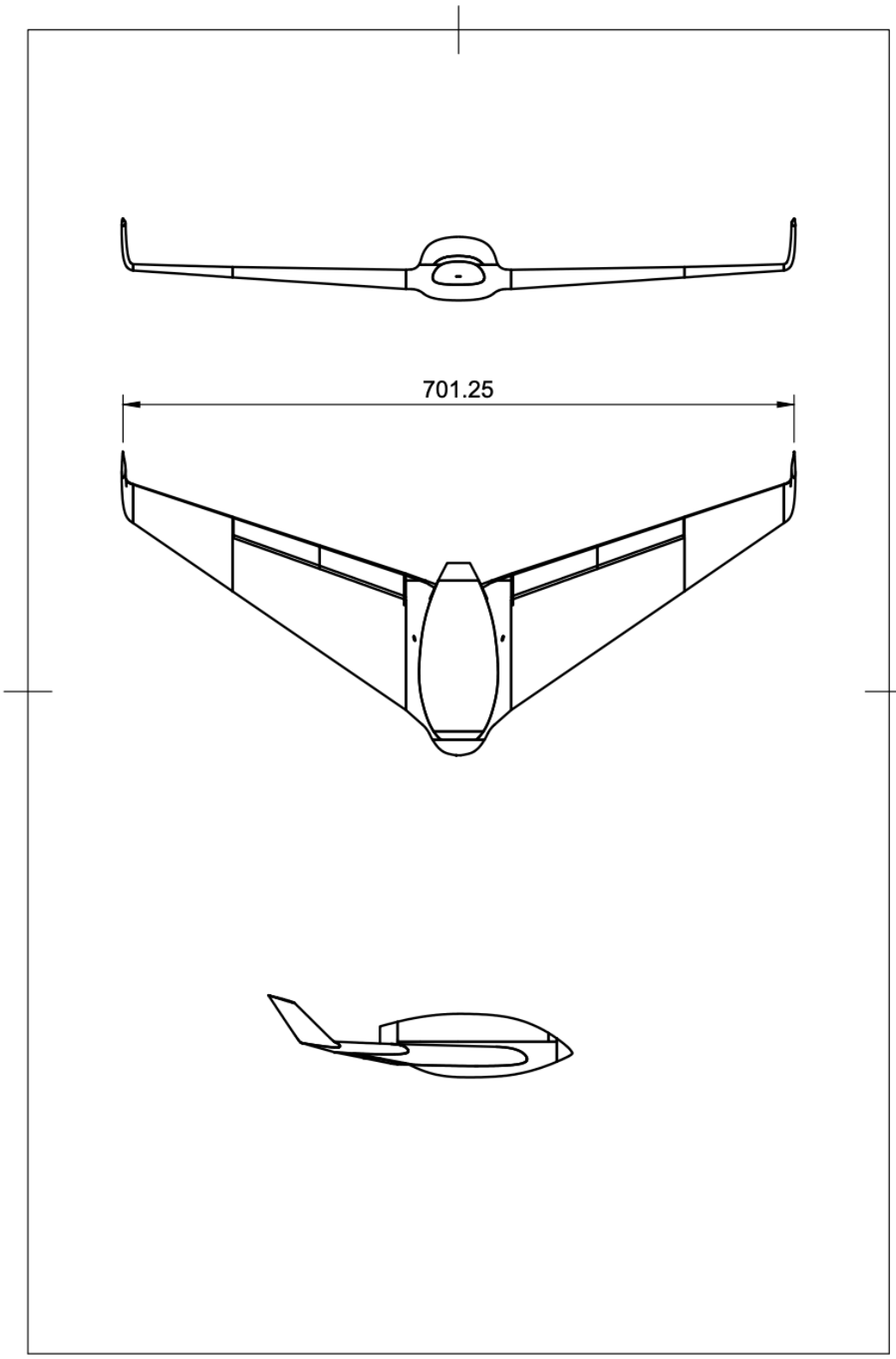
16.9g/dm 5.6oz/sq ft

Wing Cube Loading

6.5

Channels

3



Centre of Gravity - **15 mm**

behind spar at the fuselage join. Indent on the wings.

PRINTING PROFILES

* If printing in LW-PLA from Colorfabb we recommend following the calibration process suggested by the manufacturer regarding nozzle temp and flow, below are suggestions

LW-PLA PROFILE

Save this profile as LW-PLA. Changes to generic 'Low Quality' PLA profile.

Layer height	**0.24mm**
Wall Thickness	0.4mm
Wall line count	1
Top/Bottom Pattern	Lines
Infill Density	3%
Infill Pattern	Cubic
Flow	50%*
Printing Temperature	240C*
Build Plate Temperature	60C (optional)
Fan Speed	20% Maximum
Generate Support	No
Build Plate Adhesion	Brim or Skirt

PLA AND TPU PROFILE

You can use your standard settings for the parts printed in TPU and PLA, as they are not structural.

A WORD ON RETRACTIONS

With regular PLA a common problem is under extrusion at layer change - to fix this increase the setting *extra prime amount* in Cura.

With LW-PLA it is recommended to switch retractions OFF since trying to retract the foaming filament can cause problems. If you need to fix under extrusion you can still use the method above but will need to turn retractions ON and set the retraction distance to 0mm.

ASSEMBLY

1. **THROUGHOUT THE BUILD, ADHESIONS SHOULD BE CAREFULLY REMOVED AND FACES TO BE GLUED TOGETHER SHOULD BE SANDED FIRST TO ENSURE GOOD CONTACT. THIS IS CRITICAL. TIME TAKEN HERE WILL ENSURE YOUR AIRCRAFT IS STRONG.**

FUSELAGE

- Glue to the two fuselage pieces together, the main piece and the nose piece

WINGS

- Cut your carbon tube to size, you can then build your wing around this. The tube doesn't have to be glued in place however, this is so that it is easier to remove it incase you have a crash and want to use it again. Because of filament blobs and expansion you will need to carefully clear out the ends of the holes for the carbon rod in the wing pieces.
- Starting from the root build the wings sections up using the carbon tube to help with alignment. You want to be able to keep the tube free so that you can position it for the end pieces. Don't worry about the ailerons yet.
- Glue the winglets onto the ends of the wings. Clean up the holes for the TPU hinges in both the aileron and wings.
- The carbon spar can now slide into the fuselage and the wings glued on. TAKE CARE TO ALIGN THE WING CORRECTLY.
- Glue together the aileron pieces, careful not to have any glue fill up the hinge space.

- When gluing the hinges into the wings you can line the aileron up with the wings to give enough space for the hing to move. The front of the hinge should be about 1mm away from the wing.

MOTOR MOUNT

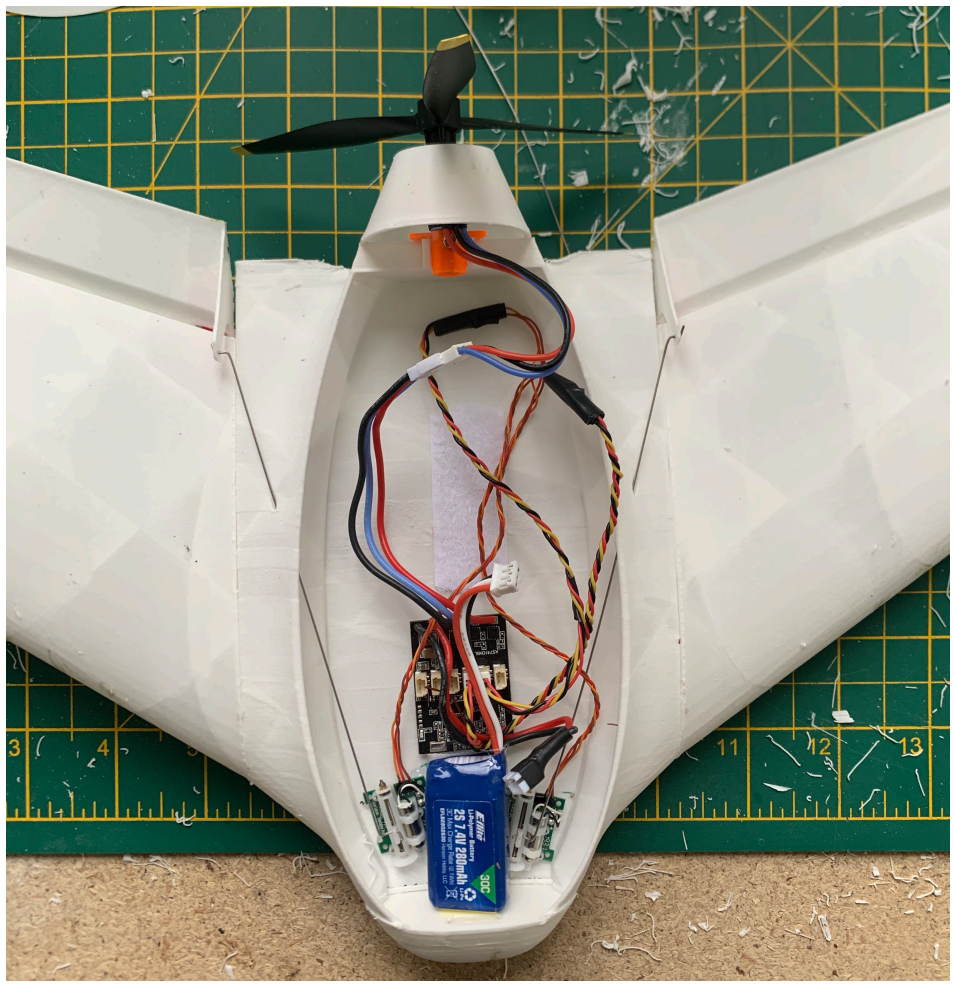
- The motor mount is glued onto the aft firewall of the fuselage, make sure the hole for the mounting screw is facing up. Insert the motor and secure with a screw.
- Different types of motor can be mounted onto the firewall if needed.
- As the motor is mounted above the drag line you want to make sure the motor is mounted with the motor angled up towards the tail a few degrees. This is built into the PLA motor mount assuming it is mounted correctly (screw hole up).

COWLING AND CANOPY

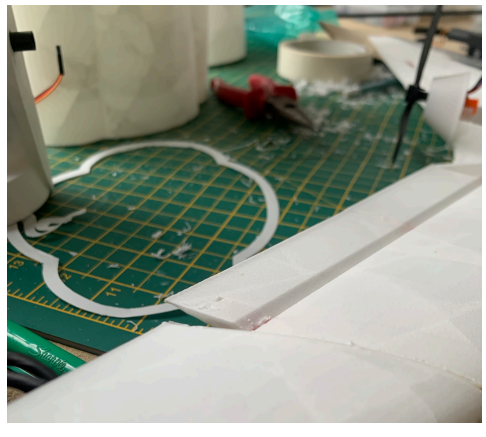
- Glue together the two canopy sections. Clean the print at the nose section around the latch so that it will fit.
- Glue the motor cowling in on to the firewall.
- To fit the canopy, have the plane face you, touching your stomach. Place the front latch of the canopy into position and gently squeeze from the back. You can ease the two rear latches under the firewall. To remove you do the same only gently ease up the middle of the canopy edges.

MOUNTING RC EQUIPMENT, SERVOS AND CONTROL RODS

- This is the ideal layout of Rc equipment.



- Servos first. I attach the control rods to the elevons first, cut and bend the servo ends of the rod in the right position, forward in the fuselage. I then make sure the servos are centred, affix them to the control rods and fix them to the fuselage using a dab of hot glue in each corner. It is important when fixing them that the control surface is the the correct position, 5 degrees up.



- For the Rx I mounded it on some spongy servo tape.

- I affix the battery with sticky velcro.

PROGRAMMING

If you are using the Cessna 182 UMX board (EFLU5864) then you will need to reprogram the board for elevon mixing. Whilst this can be achieved inside your transmitter, the AS3X will interfere with your controls, I.e. a sensed pitch will be corrected with what it thinks is the elevator and cause a roll!?

Using the SPMA3065 cable and the Spectrum programming software you can easily create the mixes, one for roll and one for pitch.

You will need to create a plug for the programming cable as the one on the adapter is the wrong size. I simply use a spare micro servo plug.

Plug into the the programming port on the rx. The orange wires should always be to the antenna side. Connect the usb to your PC and plug in the models battery.

I won't go into AS3X tuning here, there is plenty of information from those more knowledgeable than me online. I have the AS3X gains turned off.

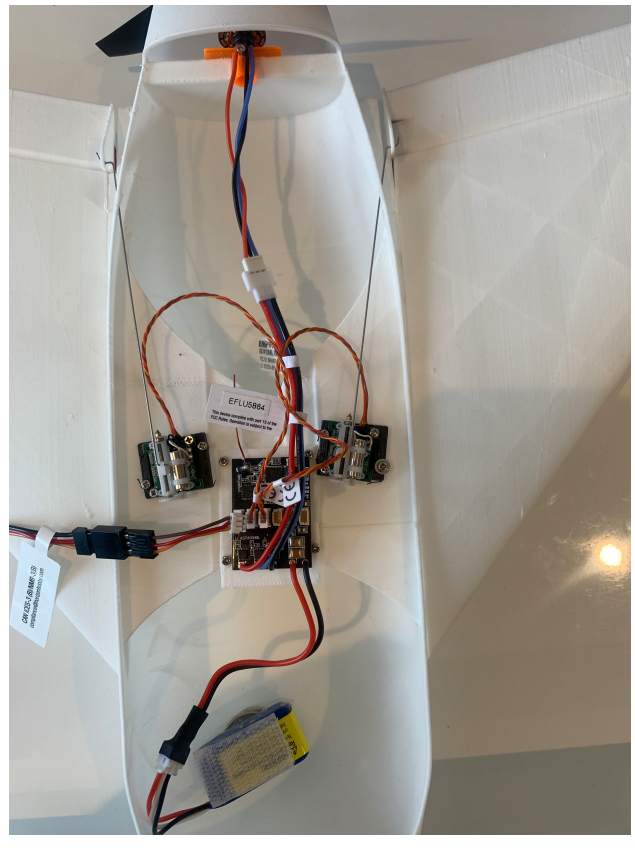
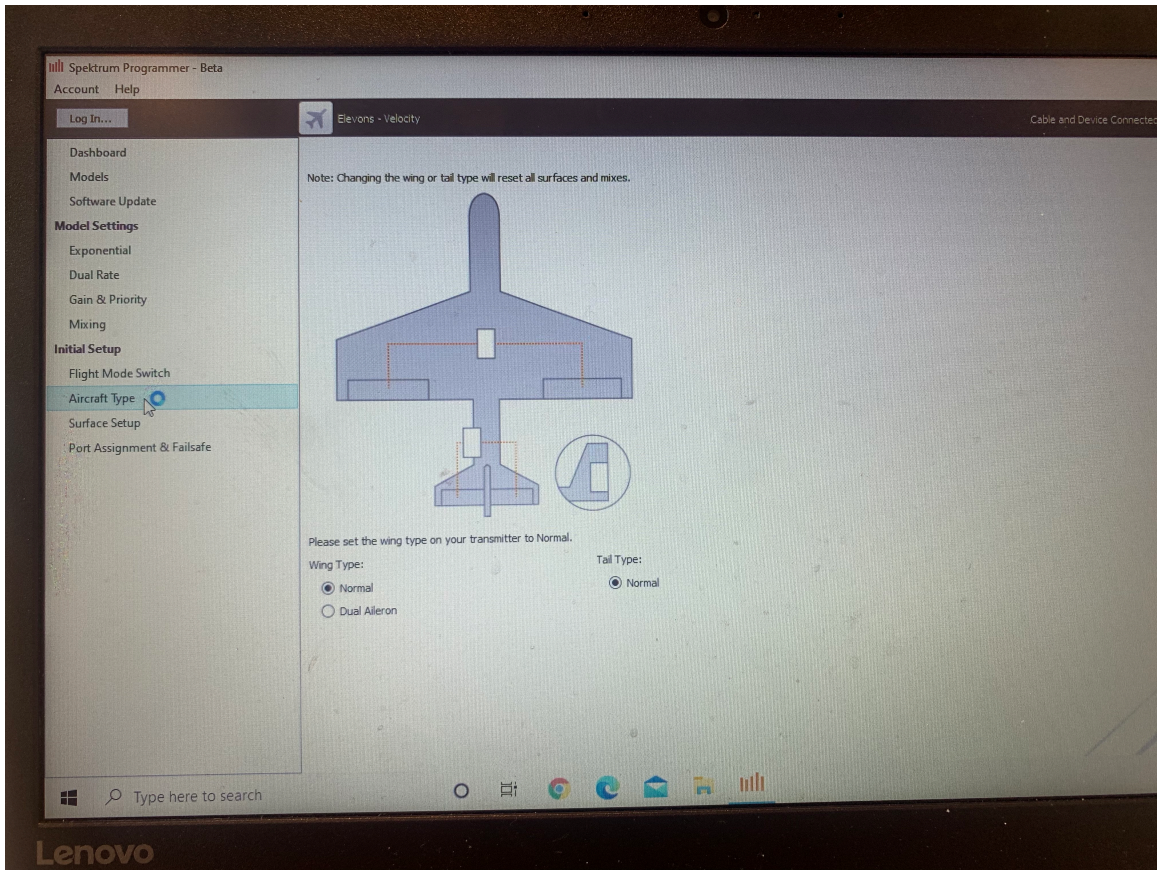
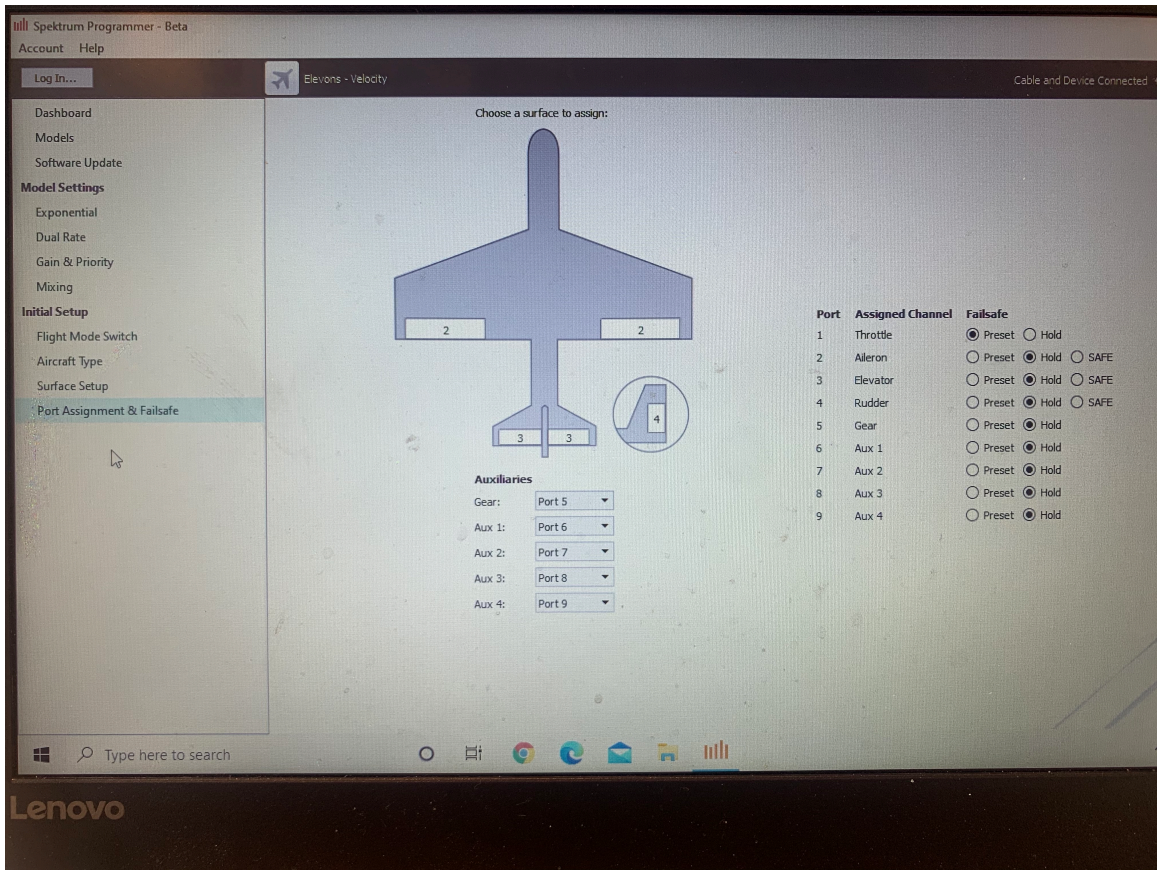
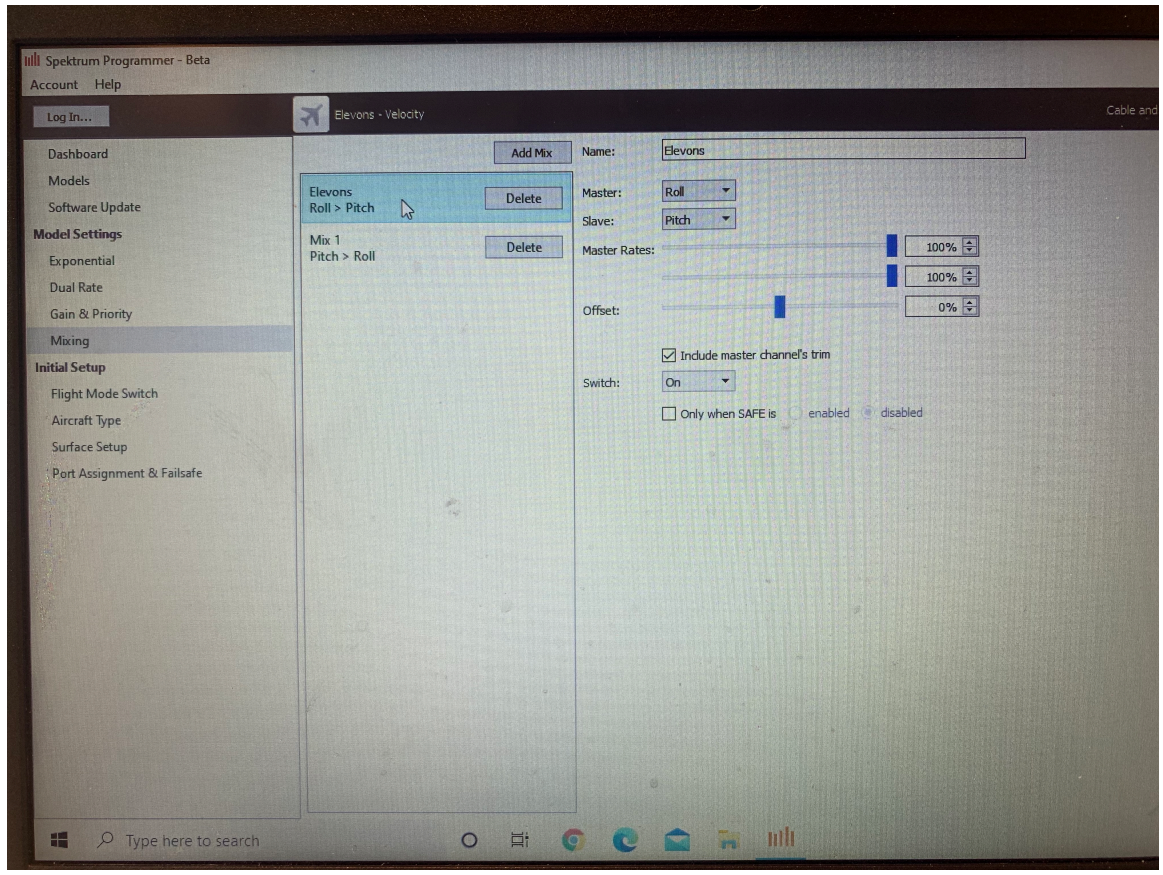


Image shown is from the Micro Velocity XL

To set up the elevon mixing follow the settings in the screenshots



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Account Help
Log In...
Elevons - Velocity
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Models
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Model Settings
Exponential
Dual Rate
Gain & Priority
Mixing
Initial Setup
Flight Mode Switch
Aircraft Type
Surface Setup
Port Assignment & Failsafe
Add Mix
Elevons
Roll > Pitch
Delete
Mix 1
Pitch > Roll
Delete
Name:
Elevons
Master:
Roll
Slave:
Pitch
Master Rates:
100%
100%
Offset:
0%
Include master channel's trim
Switch:
On
Only when SAFE is
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disabled
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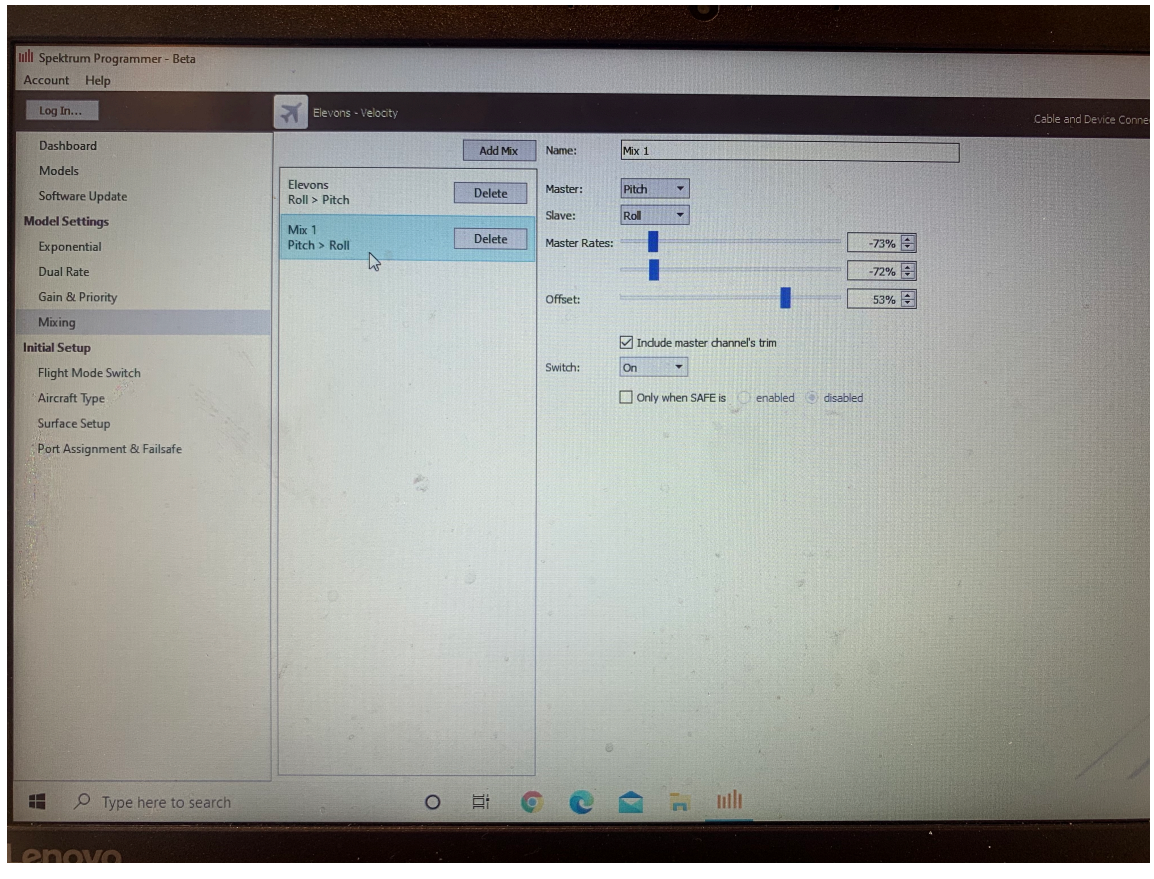
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Mixing
Initial Setup
Flight Mode Switch
Aircraft Type
Surface Setup
Port Assignment & Failsafe
Add Mix
Elevons
Roll > Pitch
Delete
Mix 1
Pitch > Roll
Delete
Name:
Mix 1
Master:
Pitch
Slave:
Roll
Master Rates:
-73%
-72%
Offset:
53%
Include master channel's trim
Switch:
On
Only when SAFE is
enabled
disabled
Type here to search

ADVICE FOR MAIDEN FLIGHT

Make sure the control surfaces are moving correctly! The battery should be positioned such that it won't move, I tend to use sticky velcro for this.

Check the CG. Check the CG again! For your maiden flight the CG should be located around 15mm behind the spar at the wing to body join, there is a small indentation on the wing at this point. After a successful maiden the CG can be moved back, theoretically put to another 20mm.

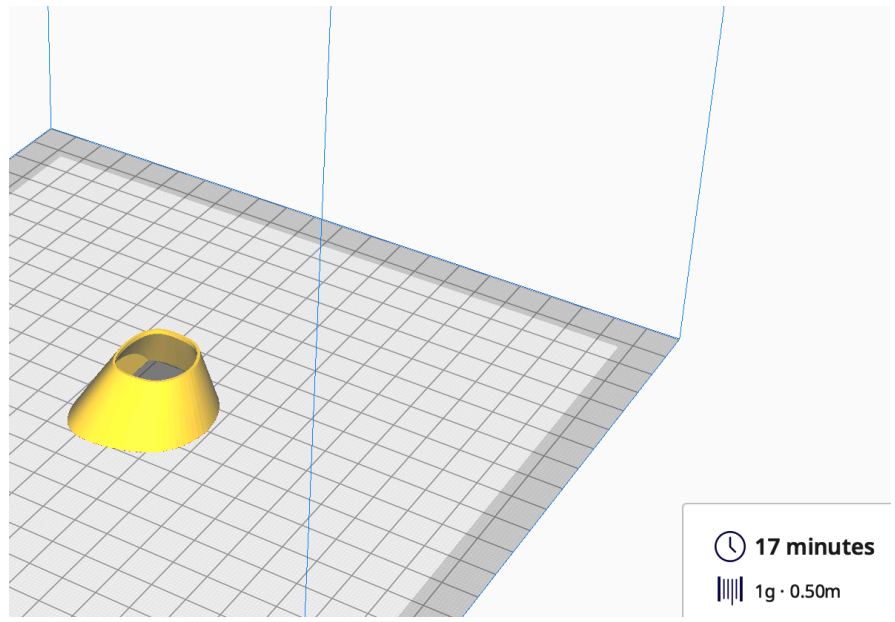
If hand launching, be careful of your hand on the prop, you can launch holding the front of the wing root rather than the fuselage to keep your hand clear. The aircraft has a strong pitch down tendency at low speeds so launch with the motor on full power with a good 45 degree launch angle. You may need to hold a bit of up elevon until it is up to speed. For the maiden it is advisable to have a friend help, long grass helps swell.

Have fun!

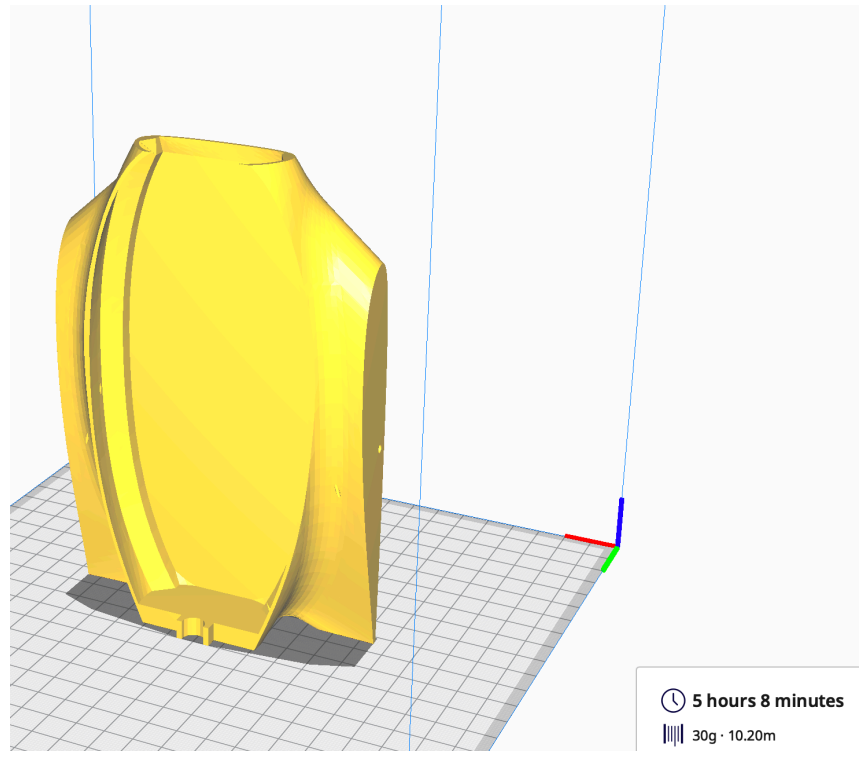
CURA COMPONENT PLACEMENT

COWLING

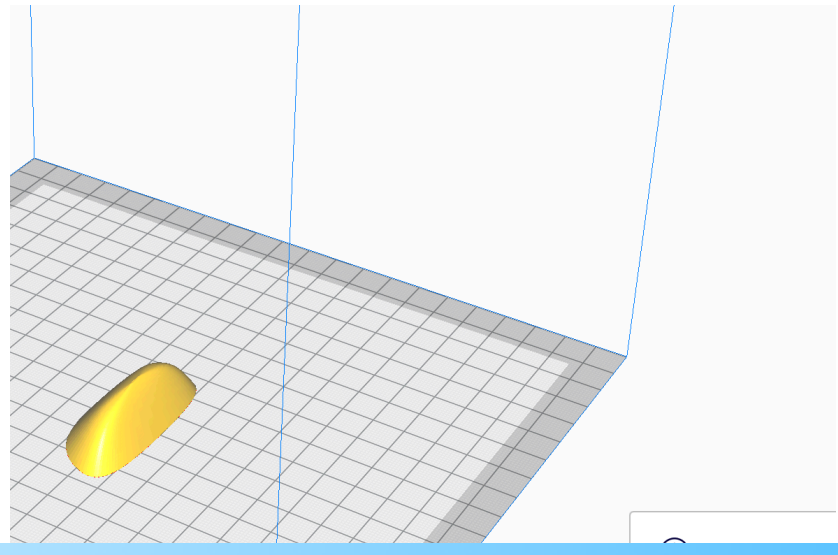
Unique settings for this part:
“Spiralize outer contour”



FUSELAGE

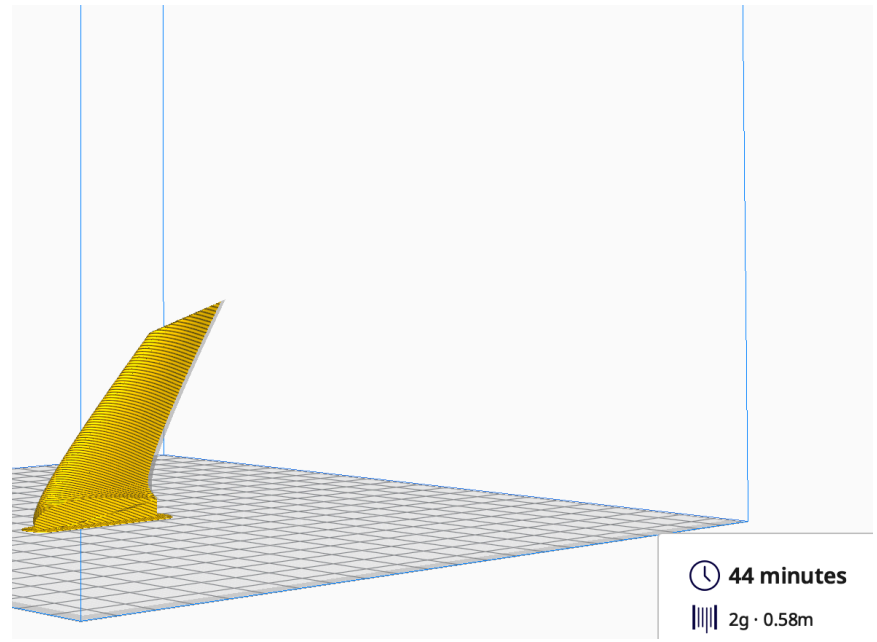


FUSELAGE NOSE



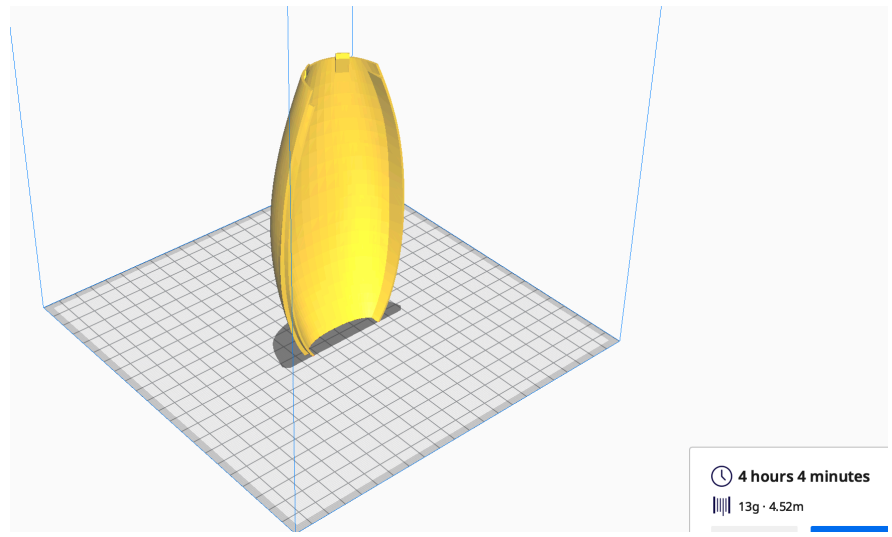
WING TIP

Unique Setting: Import to build plate in its default position and enable supports.



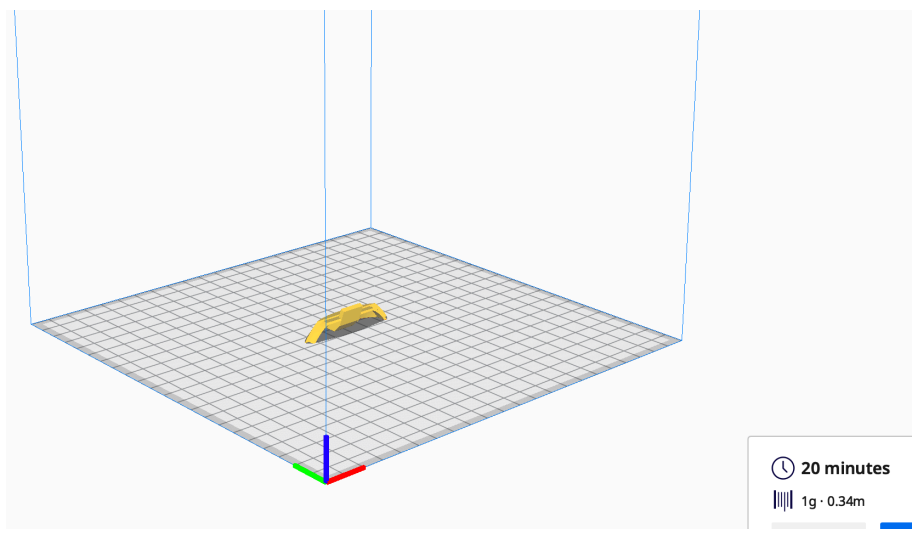
CANOPY

Unique Settings: None



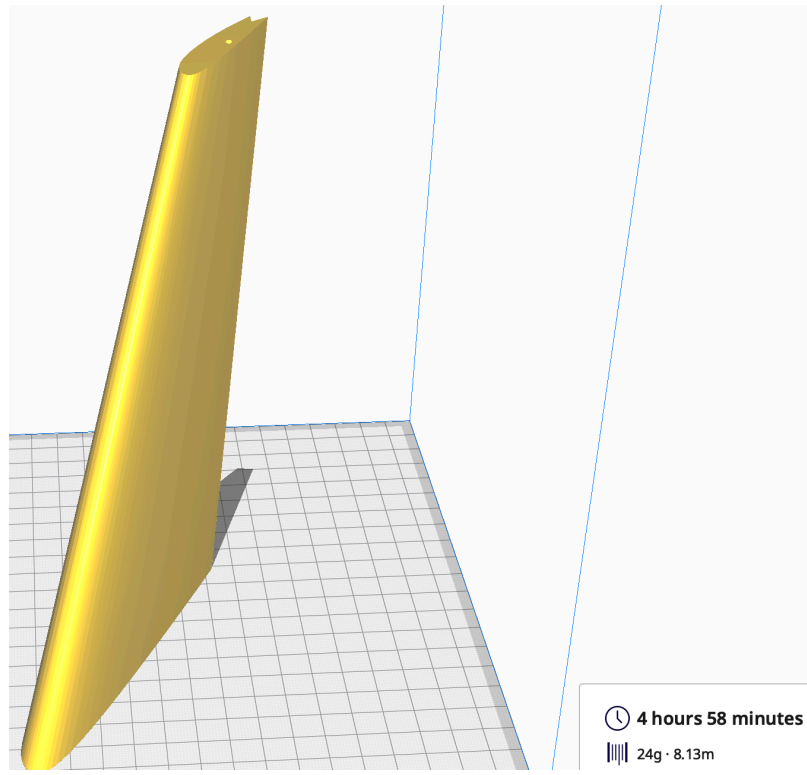
CANOPY LATCH

Unique Settings: None



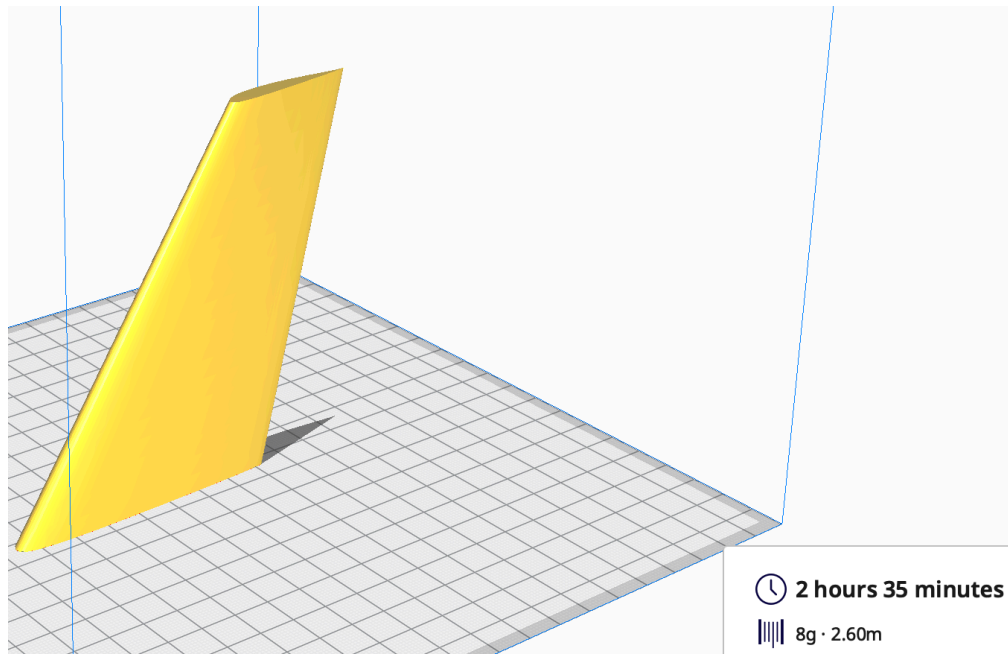
WING 1

Unique Settings: None



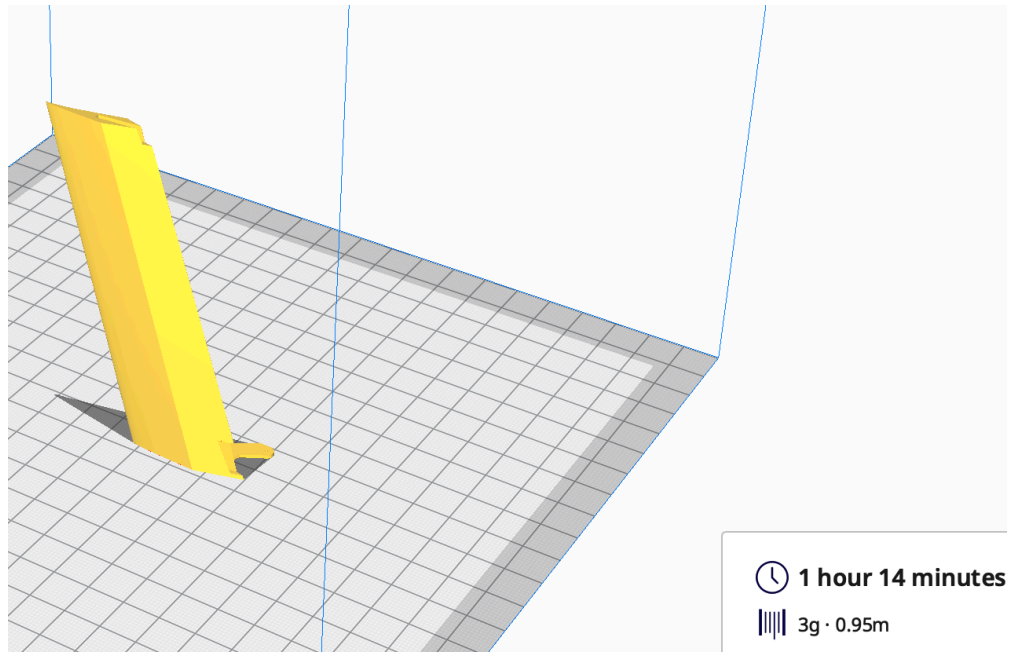
WING 2

Unique Settings: None



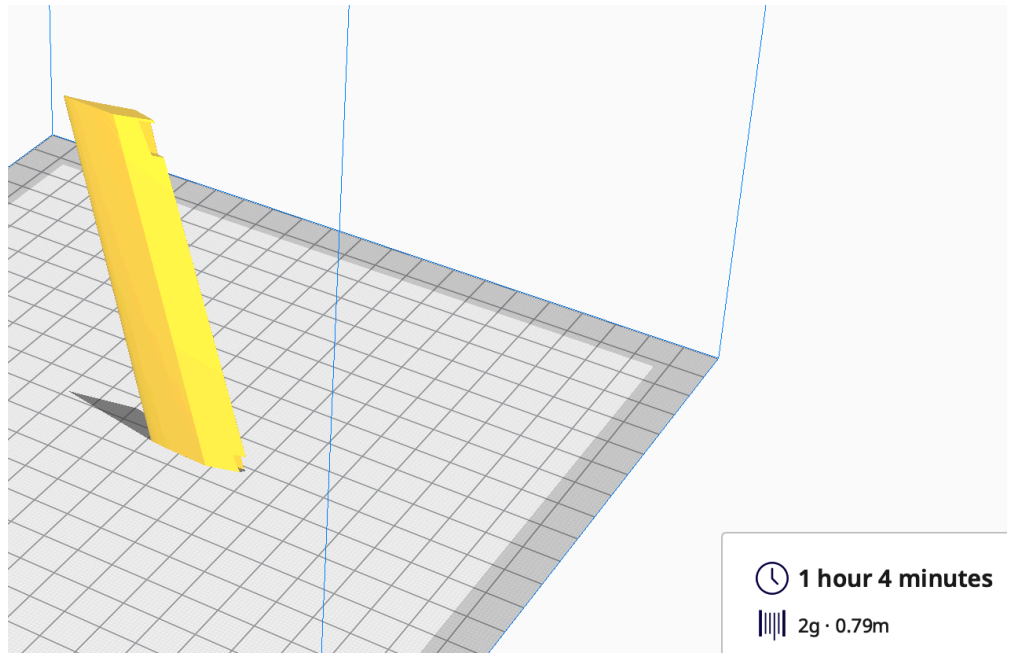
INBOARD ELEVON

Unique Settings: None



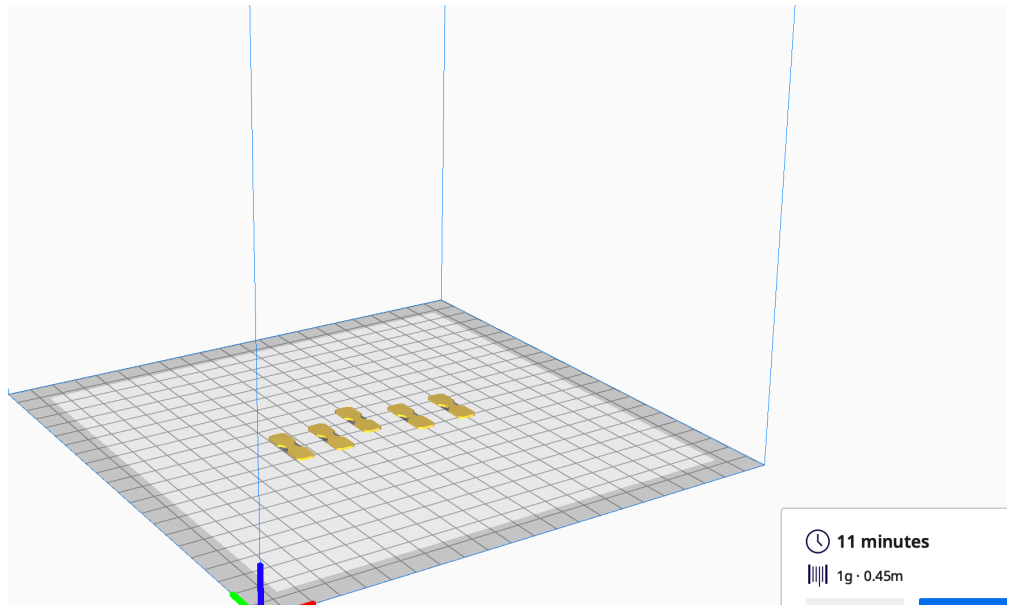
OUTBOARD ELEVON

Unique Settings: None



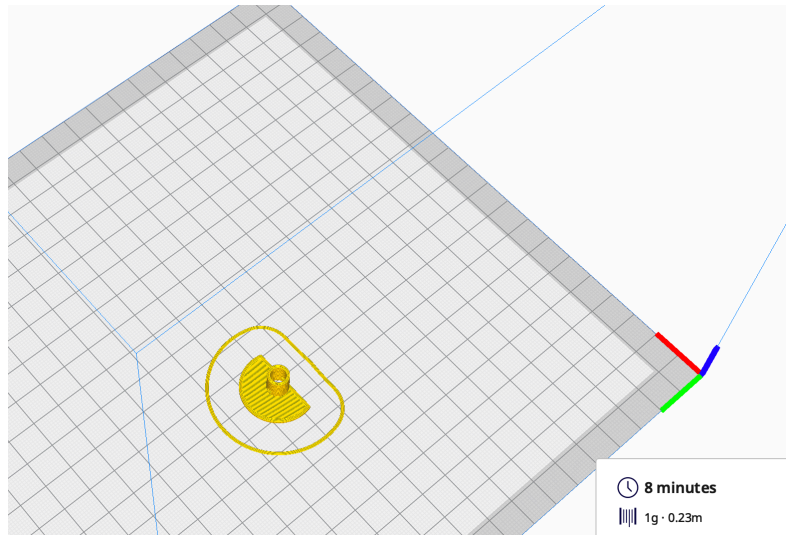
TPU PARTS

The hinges sit at a 2 degree angle when loaded into Cura. Be sure to use the place flat function to make sure they are level with the build plate.



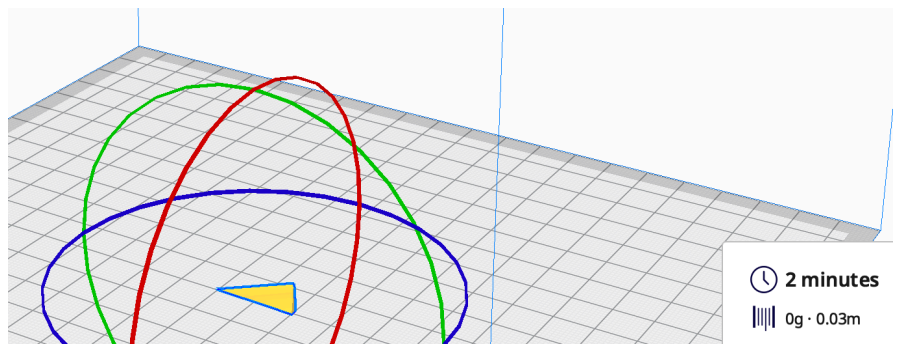
PLA MOTOR MOUNT

Print in a standard PLA profile.



R & L ROOT FAIRING

Optional parts.



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