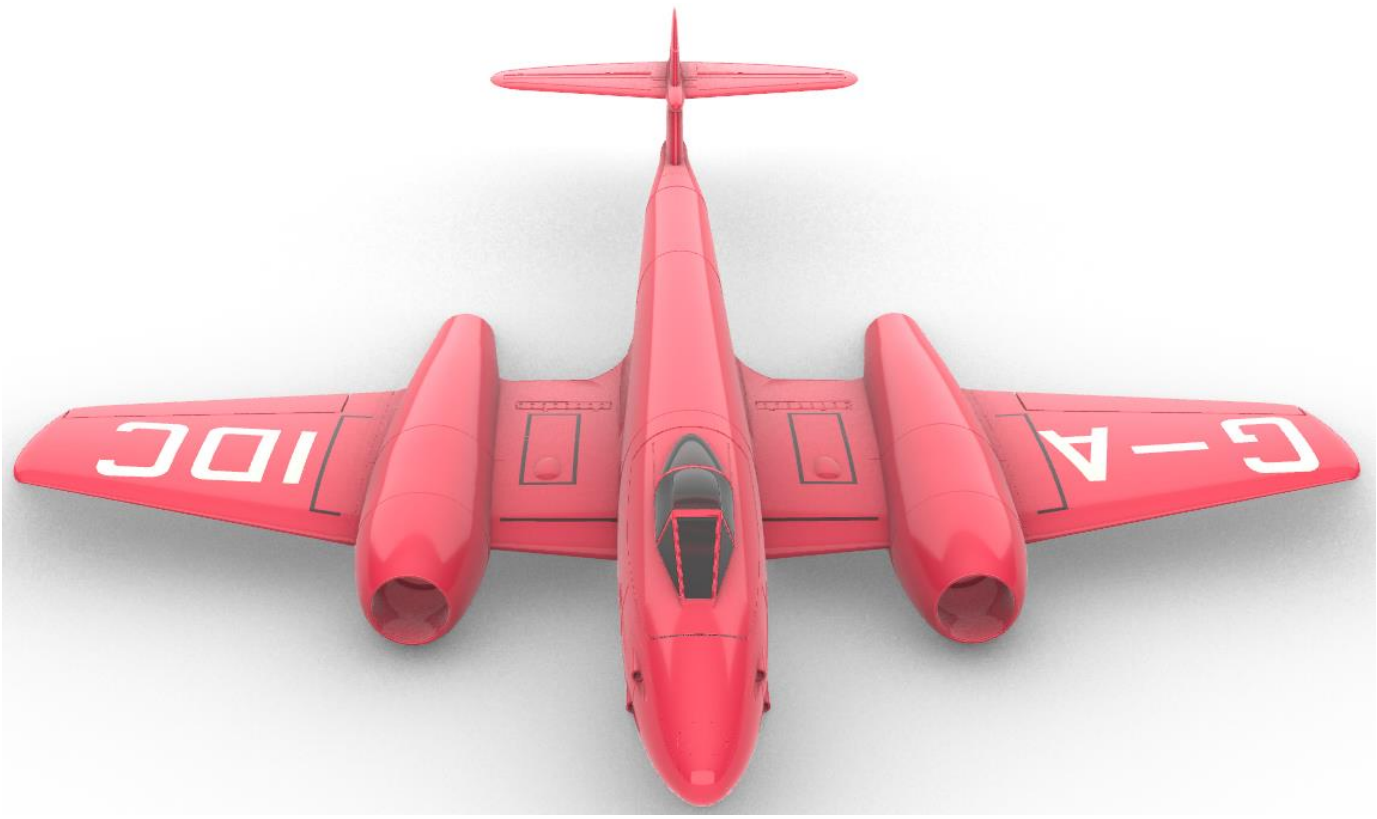


SCALE	1/18.8 (approximately)
WINGSPAN	600mm (23.6 inches)
LENGTH	615mm (24.2 inches)
FLYING WEIGHT	444g (15.6 ounces)
WING AREA	123 SQ IN
WING LOADING	18.2 OZS/SQ FT
EDF	QX-motor 30mm EDF x 2
LIPO	3S x 650mAh (prototype) to 1300mAh
PRINT TIME	31 HOURS (approximately)

Gloster Meteor F.Mk.4 G-AIDC

Gloster's 1946 civil Meteor F.4 demonstrator *G-AIDC* was the first civilian-registered jet aircraft in the world.

NOTES ABOUT THE DESIGN PROCESS AND PRINTING OPTIONS:

This model is a 60% scaled version of Phil Bendeich's original 50mm Meteor. Some parts have been changed where appropriate, such as the removal of the carbon spars for the wings, which are not necessary in this size model.

The Gloster Meteor F.Mk.4 30mm EDF files include G-code files and .3MF files for all parts, sliced on the free Prusa slicer (version 2.5.2).

In the first instance, the G-code files should be generic enough to give acceptable results when loaded directly on a cartesian printer with at least a 200 x 200 x 200mm build volume, with direct drive or Bowden extruder, but individual results may vary.

Alternatively, the Prusa slicer is easy to use to load the corresponding part .3MF file as a project, and to change any applicable settings that are not working for your specific print job. These parts have not been tested in other slicers and Prusa slicer should be used. Except for the motor mount, bungee hook which is in normal PLA, all parts are printed from LW-PLA.

The LW-PLA components were printed with 3DLabPrint PolyLight 1.0 LW-PLA which gave excellent results. E-Sun PLA+ was used for the PLA part and can be recommended. Other filaments may require a small adjustment to print temperatures and/or extrusion multiplier to give similar results.

Design methodology:

This model has been designed so that all components are solids and are printed with an outer skin and internal infill. Depending on variables such as nozzle condition, extruder condition, bed temperature sensor accuracy, filament condition etc. it may be necessary to tweak some of the print settings to give the best results. The .3MF files when loaded as a project into Prusa slicer will populate the Print Settings, Filament Settings and Printer Settings with the generic values generated by the designer, as well as loading the component STL file.

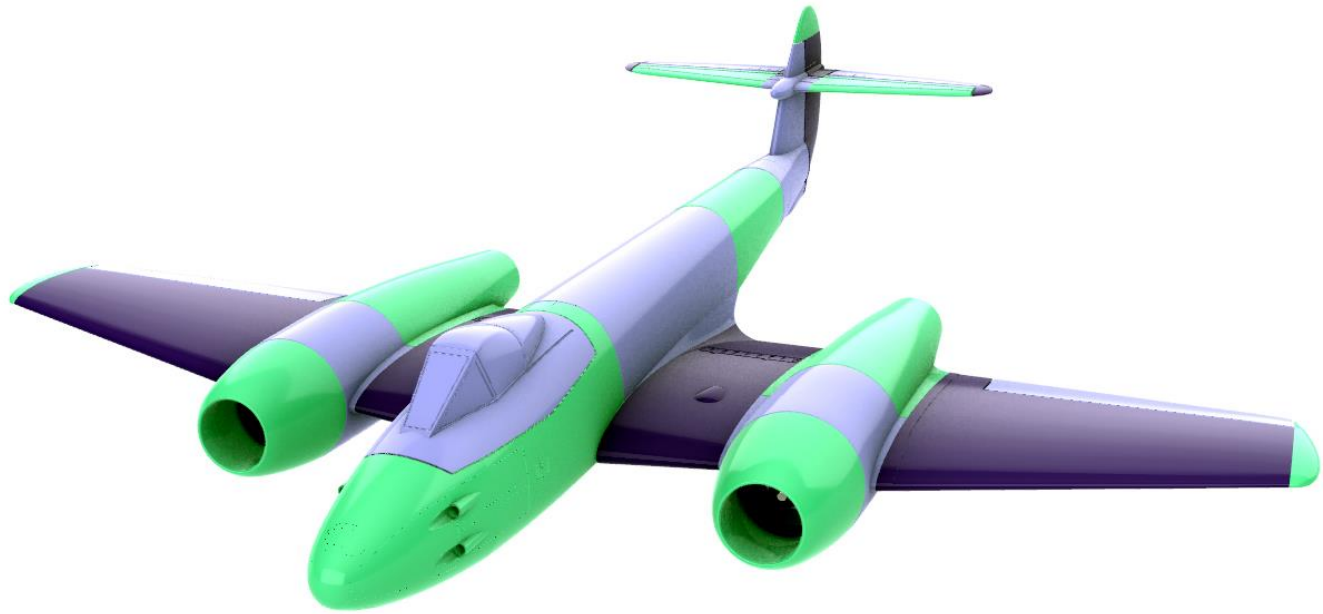
The drop down "Printer Settings" menu can be used to load the default settings specific to your printer (such as prime line G-code etc.) Additionally, any changes that you make in the Print Settings menus or Filament Settings menus can be saved (if desired) under another name from the "Save current…." icon option adjacent to the drop-down menu boxes at the top left of the Prusa window.

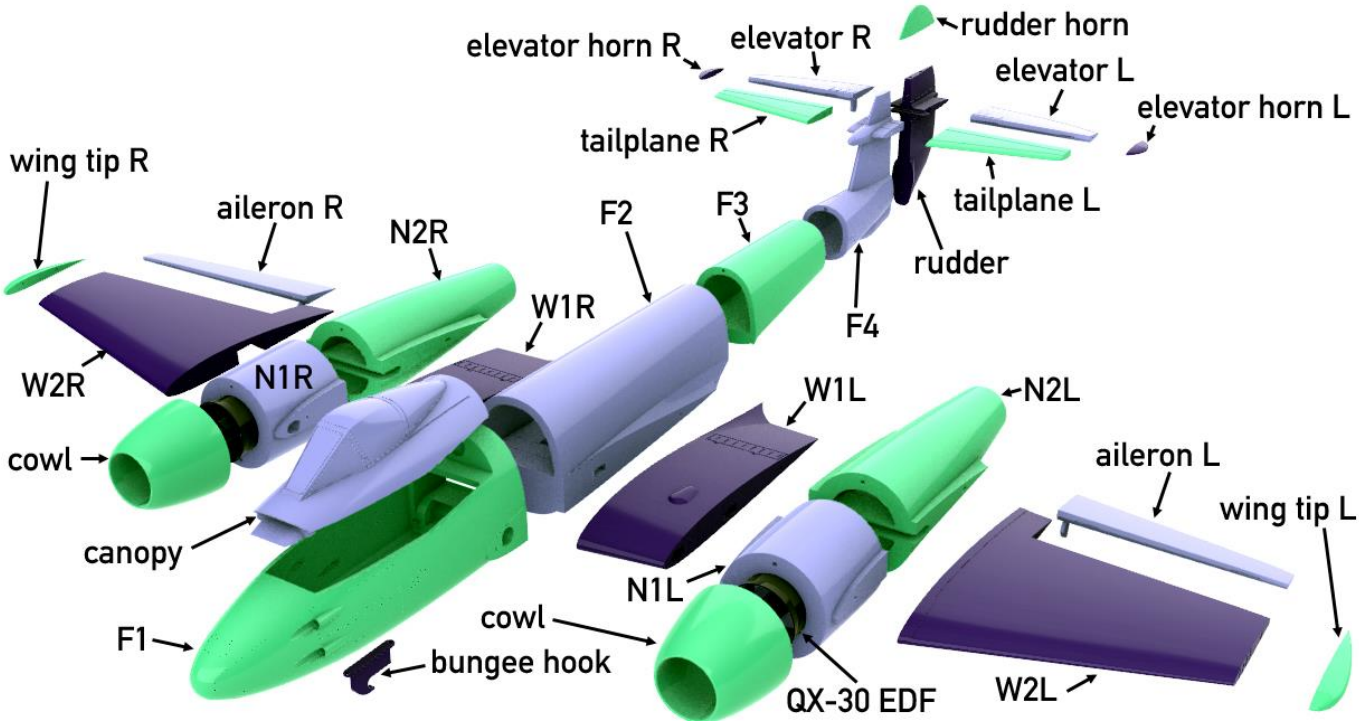
For this model, gyroid infill seems to work best on fuselage components, and cubic infill for the wings. Feel free to play around with the settings to achieve the balance of strength vs skin support that you are comfortable with!

By default, a small amount of part cooling fan is used on all parts. If necessary, better layer adhesion may be achieved with the fan off, if the print result is acceptable in other respects.

LW-PLA parts should be printed one at a time. Weights and times are just a guide, but should be close to default file values, and are conservative giving strong parts. Weight saving may be achieved at the discretion of the builder. The default setting (for most parts) is an extrusion of 0.6 and infill 3% Gyroid for the fuselage and 4% Cubic for the wings).

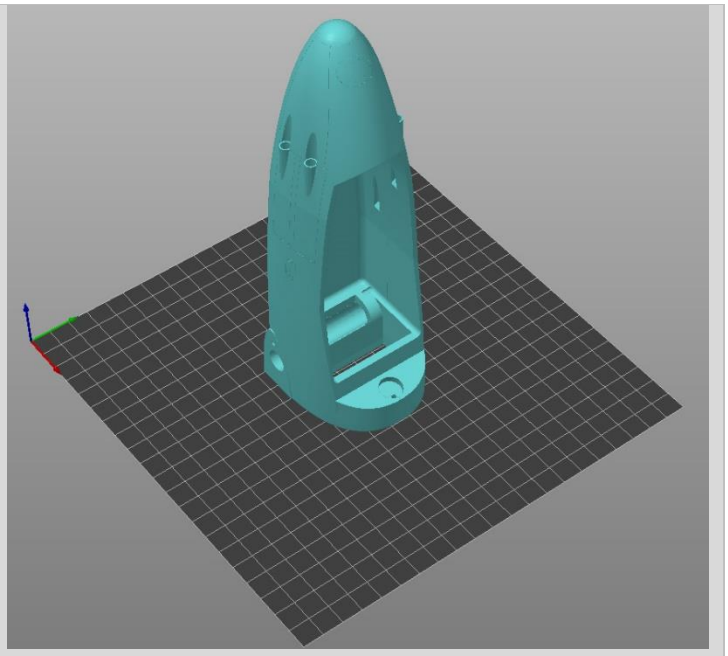
Before printing you can choose between either of the 2 canopy options – LW-PLA (solid with infill) or PLA (hollow – 2 perimeters). See page 21.




elevator horn R
elevator R
rudder horn
elevator L
elevator horn L
tailplane R
tailplane L
wing tip R
aileron R
N2R
F2
F3
rudder
W1R
F4
W2R
N1R
W1L
N2L
cowl
aileron L
wing tip L
canopy
N1L
cowl
F1
bungee hook
QX-30 EDF
W2L

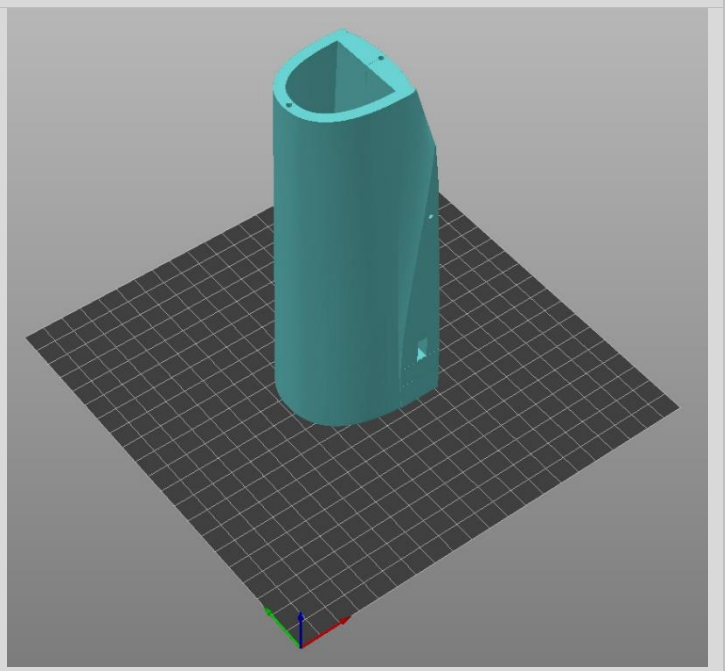
PART F1

- LW-PLA
- Print weight: 22.08g
- Print time: 3hr 36 mins



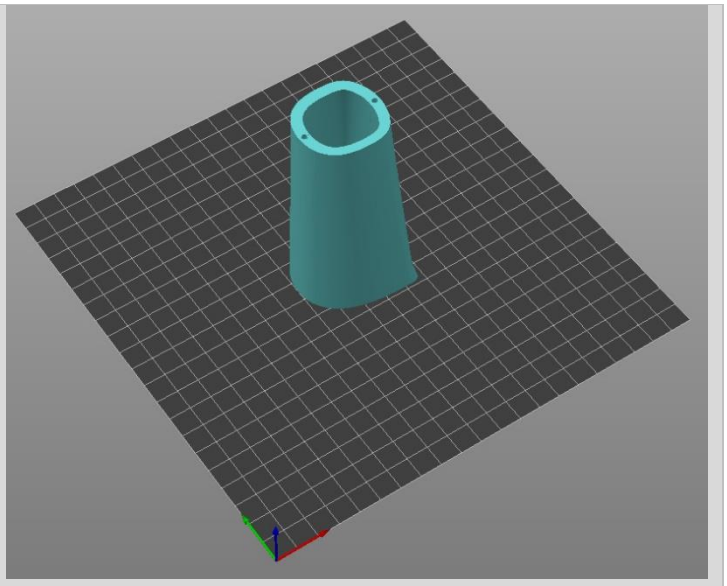
PART F2

- LW-PLA
- Print weight: 22.93g
- Print time: 3hr 11min



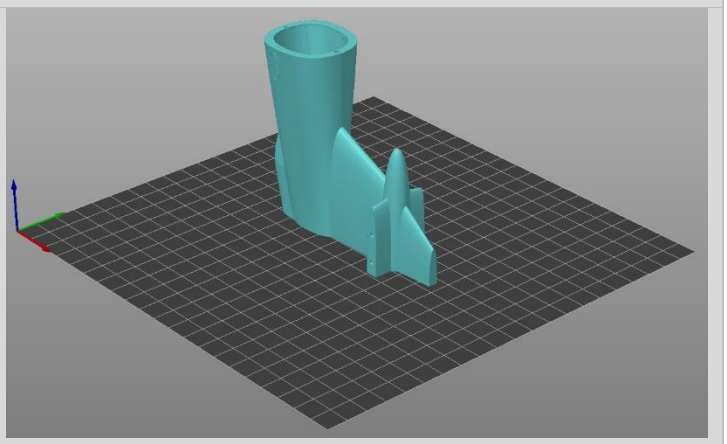
PART **F3**

- LW-PLA
- Print weight: 8.36g
- Print time: 1hr 26min



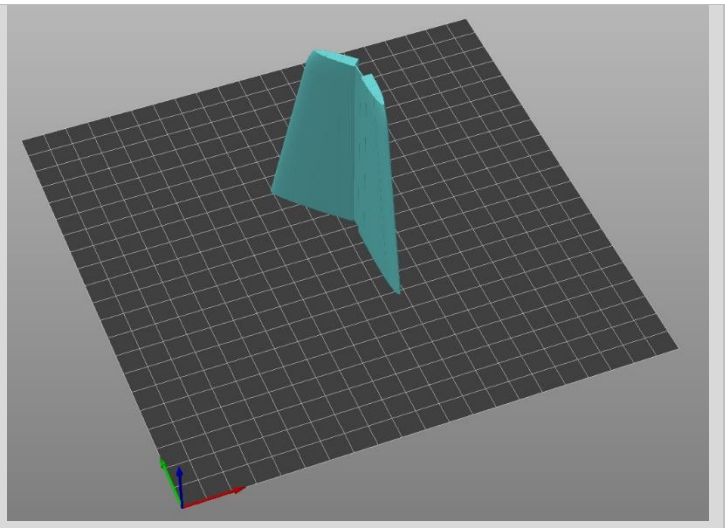
PART **F4**

- LW-PLA
- Print weight: 10.25g
- Print time: 1hr 47min
- Note: support added in .gcode and .3mf files on RHS of fin for servo cutout



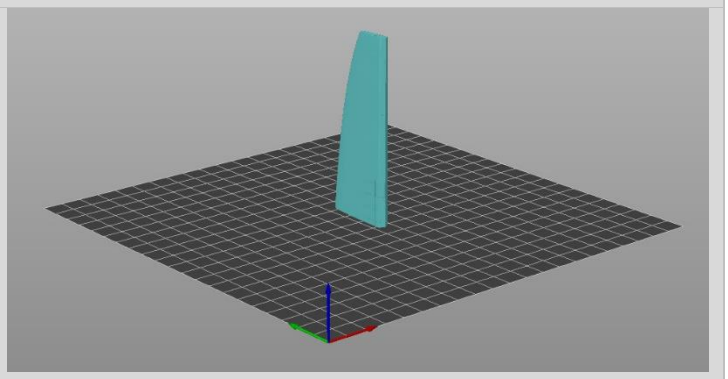
PART **tailplanes**

- LW-PLA
- Print weight: 5.49g
- Print time: 1hr 8mins
- Brim included in .3mf and .gcode files



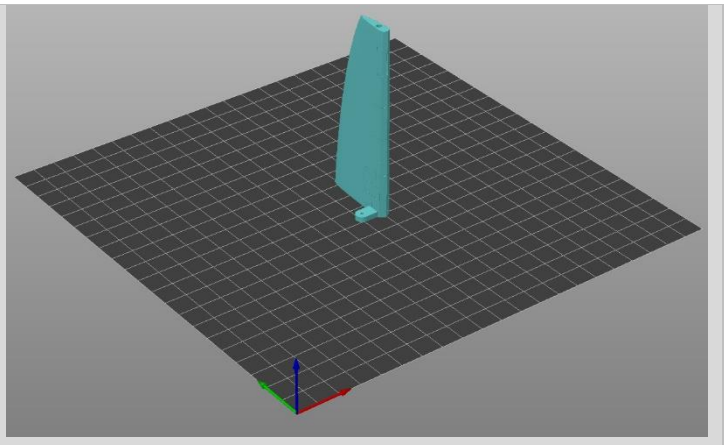
PART **elevator L**

- LW-PLA
- Print weight: 2.43g
- Print time: 29 min
- Brim included in .3mf and .gcode files



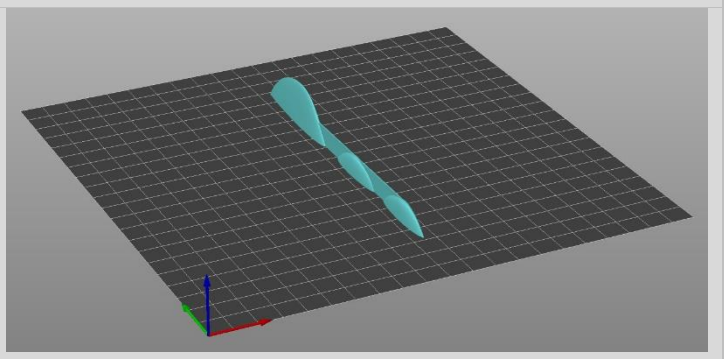
PART elevator R

- LW-PLA
- Print weight: 9.55g
- Print time: 2hr 35min
- A brim may be necessary if print bed adhesion is not good



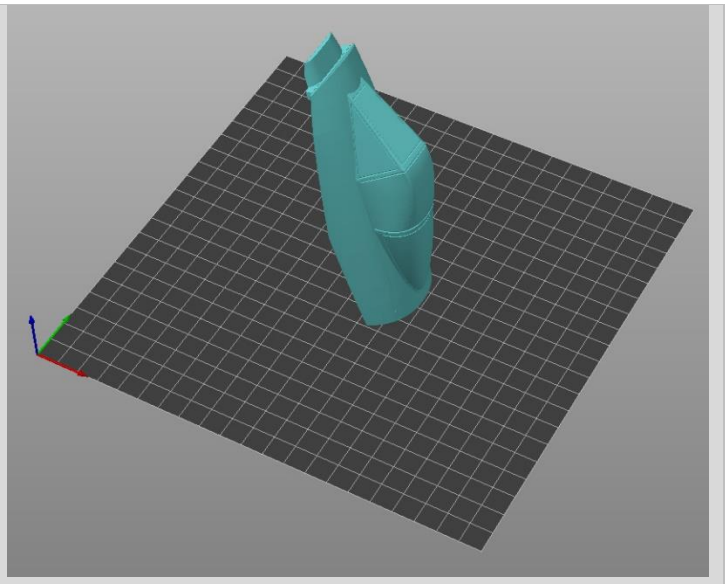
PART elevator and rudder horns

- LW-PLA
- Print weight: 1.21g
- Print time: 15min



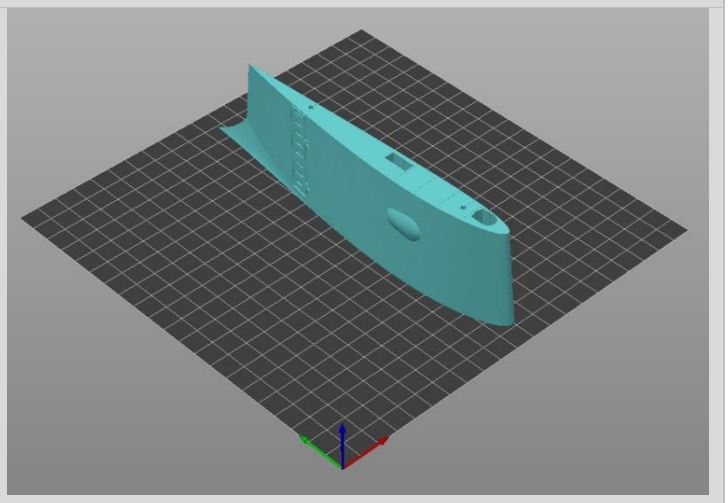
PART **canopy**

- LW-PLA
- Print weight: 6.88g
- Print time: 1hr 11min



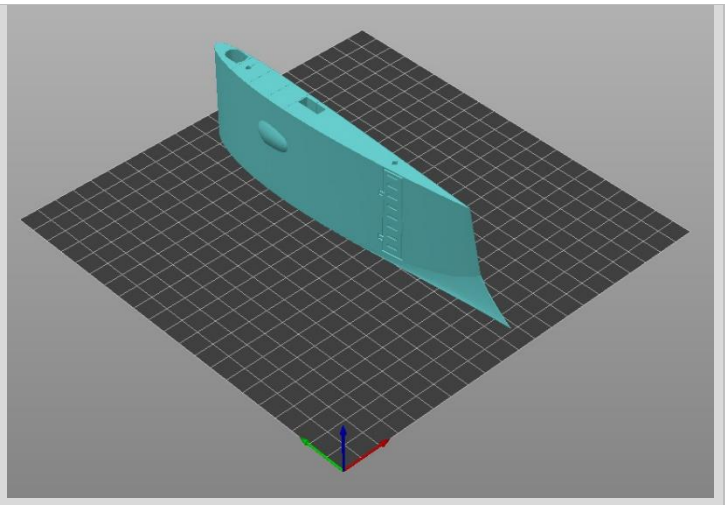
PART **W1L**

- LW-PLA
- Print weight: 12.01g
- Print time: 2hr 21min



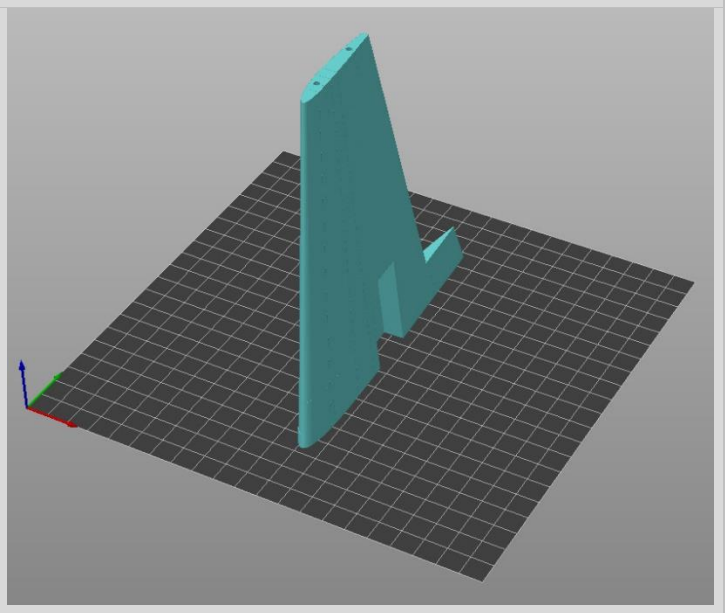
PART W1R

- LW-PLA
- Print weight: 12.01g
- Print time: 2hr 21min



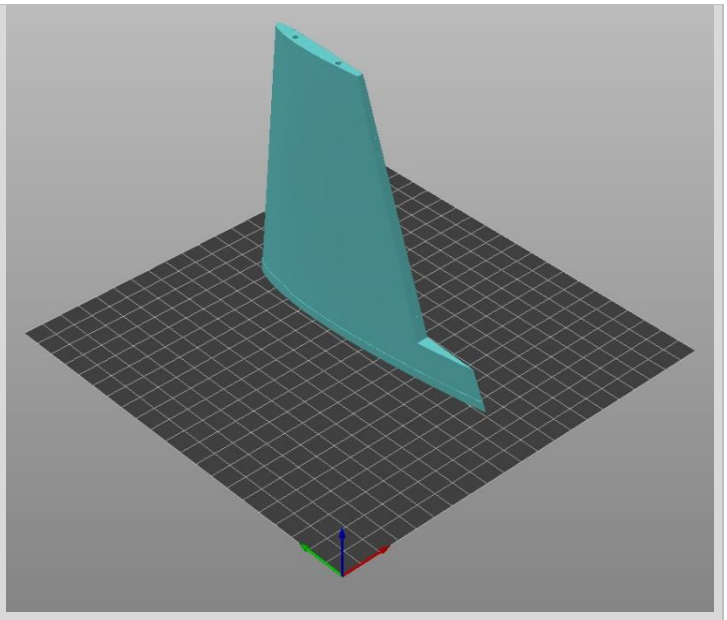
PART W2L

- LW-PLA
- Print weight: 12.45g
- Print time: 2hr 02min
- A brim may be necessary if print bed adhesion is not good



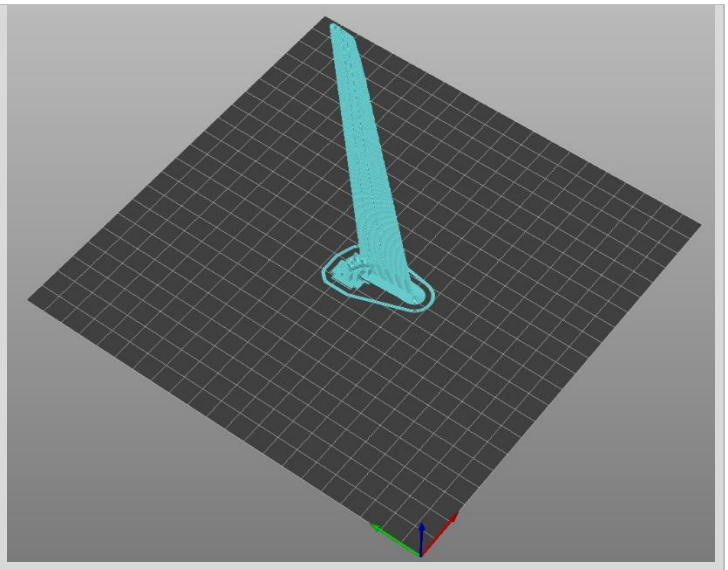
PART W2R

- LW-PLA
- Print weight: 12.45g
- Print time: 2hr 02min
- A brim may be necessary if print bed adhesion is not good



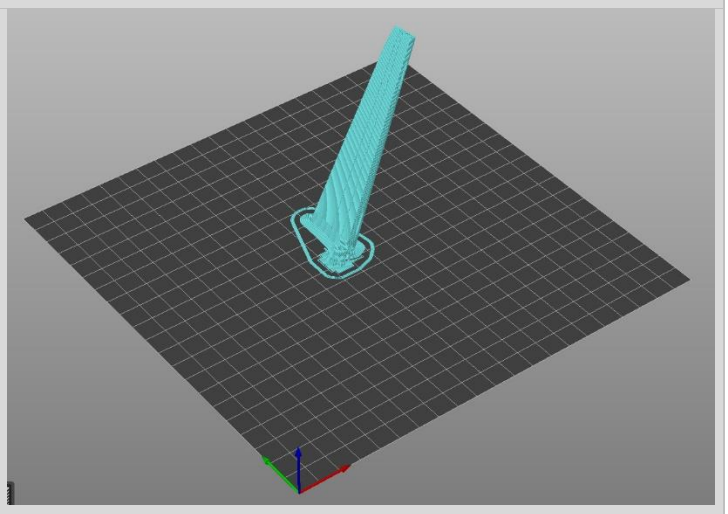
PART aileron L

- LW-PLA
- Print weight: 2.02g
- Print time: 37mins
- 8 bottom layers preset in G-code and .3MF files
- A brim included in files along with support for the horn



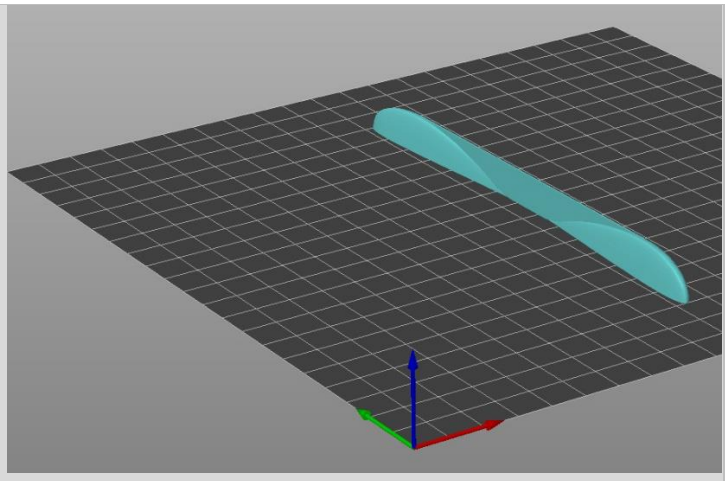
PART aileron R

- LW-PLA
- Print weight: 2.02g
- Print time: 37mins
- 8 bottom layers preset in G-code and .3MF files
- A brim included in files along with support for the horn



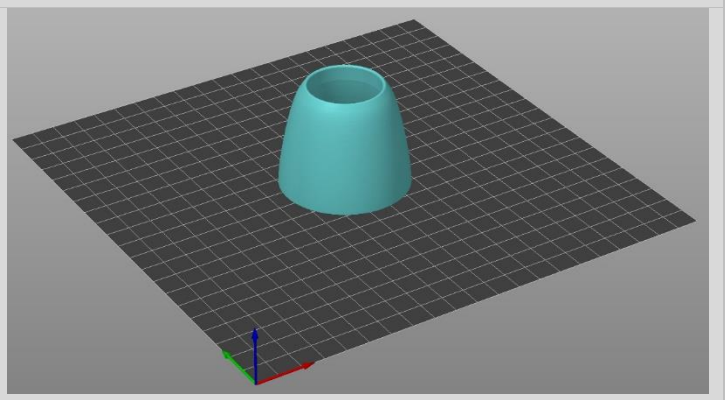
PART wing tips

- LW-PLA
- Print weight: 1.35g
- Print time: 15mins



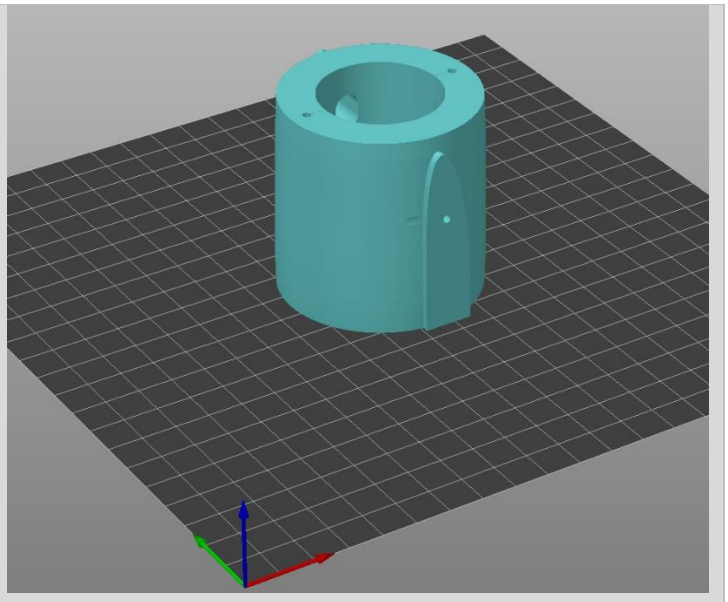
PART cowl

- LW-PLA
- Print twice (L & R)
- Print weight: 5.46g
- Print time: 46min



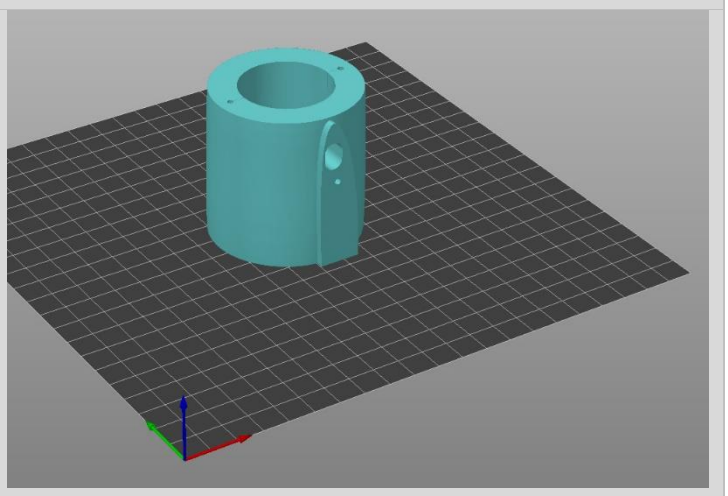
PART **N1L**

- LW-PLA
- Print weight: 10.96
- Print time: 1hr 20min



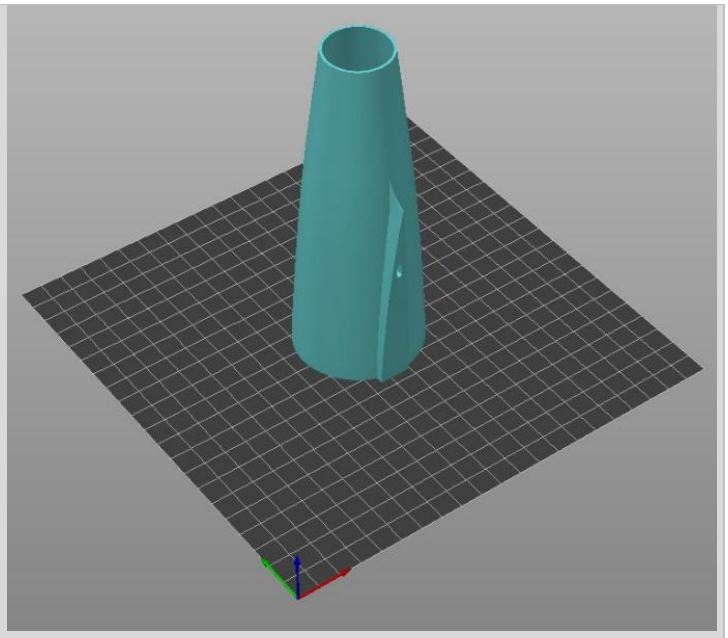
PART **N1R**

- LW-PLA
- Print weight: 10.96g
- Print time: 1hr 20min



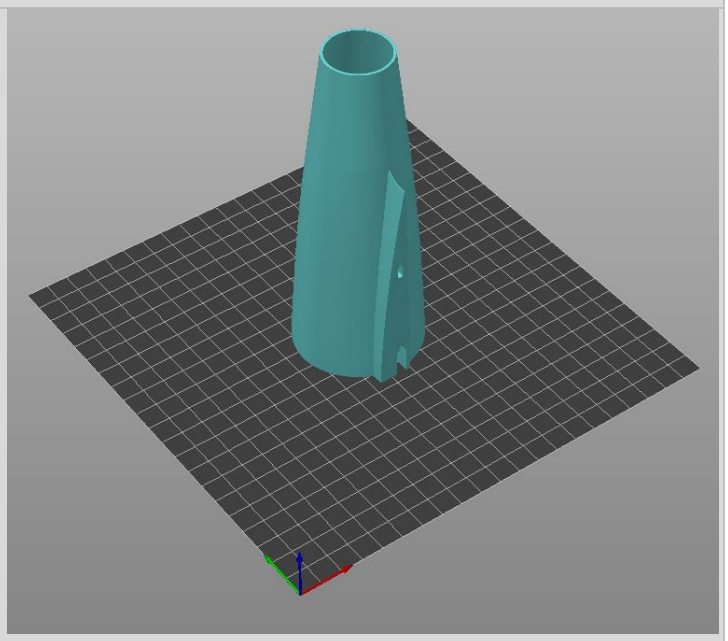
PART **N2L**

- LW-PLA
- Print weight: 14.98g
- Print time: 2hr 21min



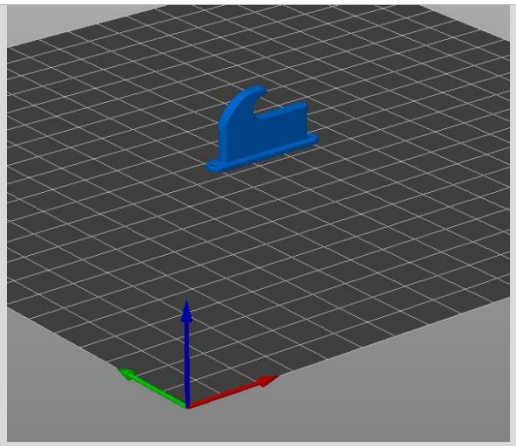
PART **N2R**

- LW-PLA
- Print weight: 14.98g
- Print time: 2hr 21min



PART bungee hook

- PLA or PLA+
- Print weight: 1.77g
- Print time: 14min



PREPARING THE PARTS FOR ASSEMBLY

LW-PLA parts will need a little cleaning up in places with a sharp blade and/or sandpaper before assembly. Note that the colour of the material changes (goes lighter) when sanding deeply and can highlight the underlying structure. At the expense of a slight increase in weight, a coat or two of water-based polyurethane evens out the colour and gives a significant increase in strength to the skin.

Adhesive choices: All parts are printed from LW-PLA. Clear Gorilla Glue is a good alternative to the normal CA and accelerator for joining LW-PLA parts. One advantage of Gorilla Glue is that it remains slightly flexible (although more than strong enough) which makes replacement of damaged parts easier. A sharp blade can be relatively easily sliced through joined parts, compared to CA joints. Five-minute epoxy also works very well on LW-PLA to LW-PLA joints.

For hinging the control surfaces with CA hinge sheet, clear Gorilla glue or 5-minute epoxy works extremely well, and can be recommended, as it gives time to position the parts, and is gap filling. There is also far less likelihood of accidentally fusing the control surfaces to the main structure, when using a glue *other* than CA.

The assembly order for this model is a little unusual as the wiring for the motors and aileron servos needs to be inserted first.

NACELLE & WING ASSEMBLY PART1

- **The most important thing is to note that the wiring for the motors and servos is very difficult or impossible to reach if not inserted in place before major assembly begins! The assembly order suggested here worked for the prototype. If a different order is used, ensure that wiring is in place before irreversible assembly occurs!!**

- Note: all parts use 1.75mm filament alignment pins cut to size to align parts when gluing.

- Refer to exploded parts view on page 5 of this manual and the photo below for part location. Start by gluing nacelle parts N1L to N2L and N1R to N2R. Important! The cowl is not glued at this stage.

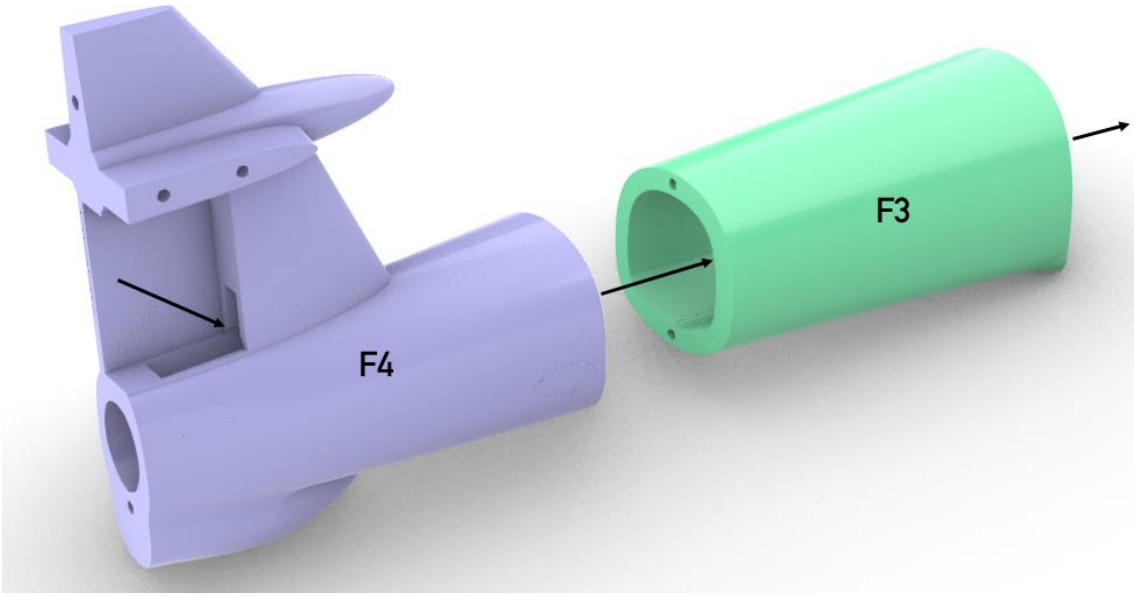
- Glue parts W1L and W2L to the left nacelle assembly, and W1R and W2R to the right nacelle assembly.

- Hinge the ailerons with strips of CA hinge sheet approximately 14mm deep x 12mm wide.

- Glue on the wing tips.

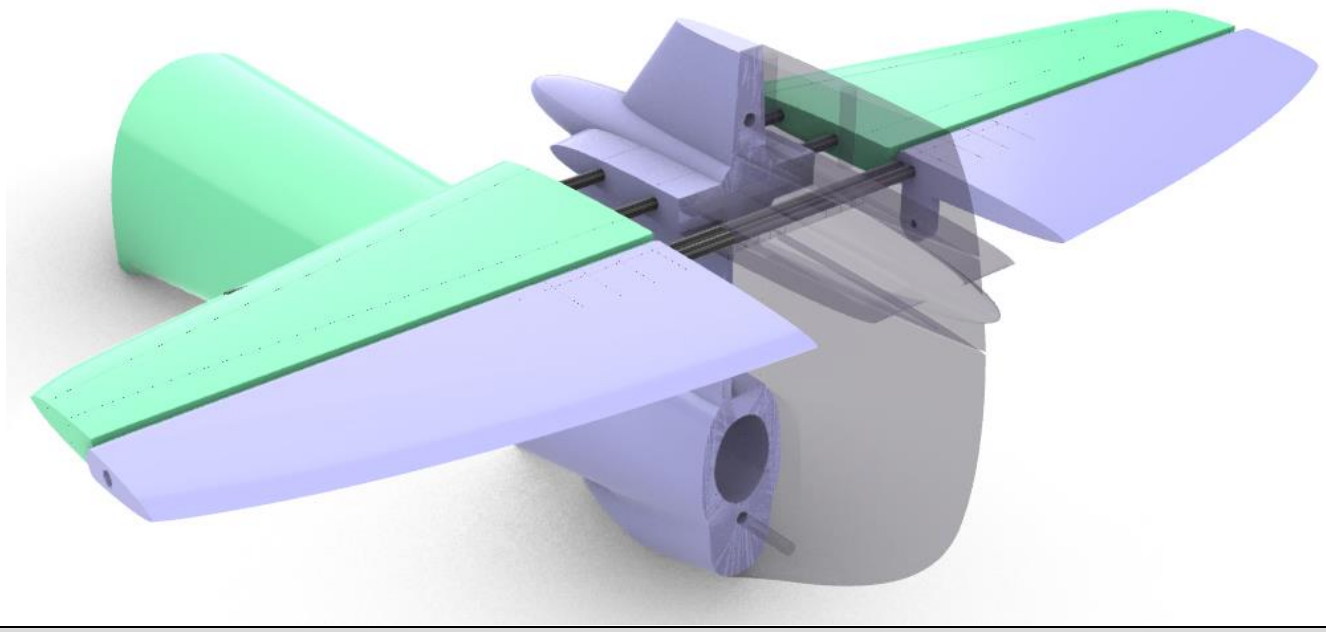
REAR FUSELAGE ASSEMBLY

- Place an elevator servo extension lead (long enough to comfortably reach the hatch in the forward fuselage) in the direction of the arrows through F4 and F3, then glue F4 and F3 together.



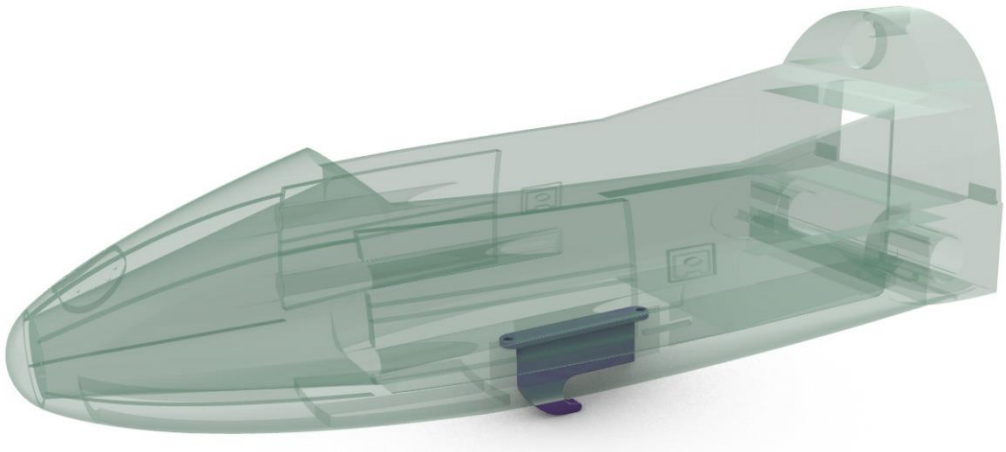
NACELLE & WING ASSEMBLY PART2

- Cut motor extension wires oversize (3 per side) and feed through N1 and W1 (L&R) into F1 and out into the equipment area. See photo on the previous page for this and the next steps.
- Feed aileron extension leads through each wing half and then through holes in F2. Carefully feed through into F1. Feed the elevator extension lead through F2 then F1 to the equipment area. Note: at this stage F1 and F2 are not glued yet, and the F3/F4 assembly is also separate. When satisfied with position of all wires, glue F1 to F2 and F2 to F3/F4 assembly
- Glue wings to the fuselage.



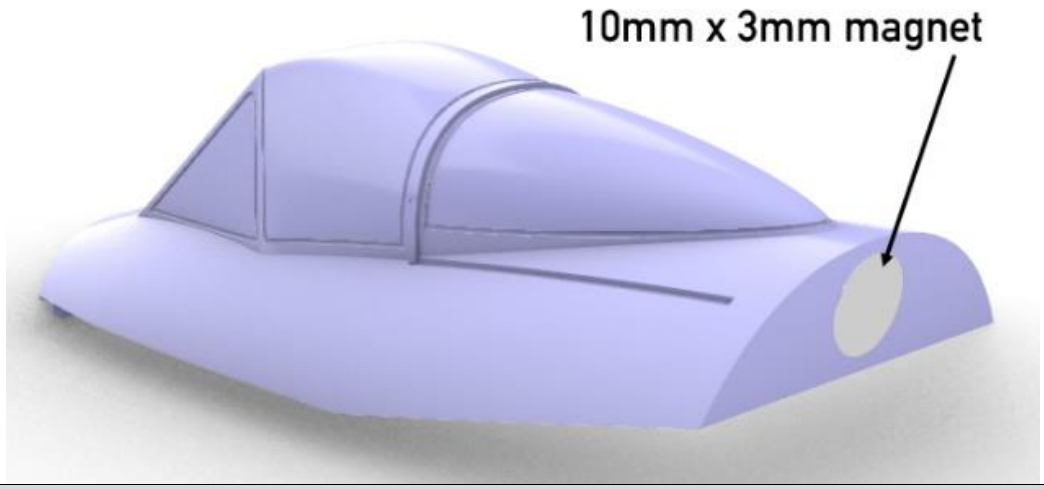
Tail ASSEMBLY

- Cut 1.6mm diameter carbon rods to size for the tailplane attachment, 40mm long for front rod and 140mm long for rear. Place in the holes in F4 but don't glue yet.
- Hinge the elevators to the tailplane halves with CA hinge sheet approximately 9mm x 18mm.
- Cut two 1.6mm diameter elevator joiner carbon rods 50mm long each.
- Coat the ends of all the carbon rods with either 5-minute epoxy or clear Gorilla glue, then carefully slide the tail halves onto the rods in F4, ensuring the elevator joiner rods are slid into place simultaneously.
- Glue the rudder in place.
- Glue the elevator horn balance and rudder horn balance into place (not shown on above diagram).
- Glue bungee hook in place (see photo below). Many thanks to Dirk Wouters from Belgium for sharing his bungee hook design! It may be screwed in place, but in this model it was appropriate to make it a fixture.



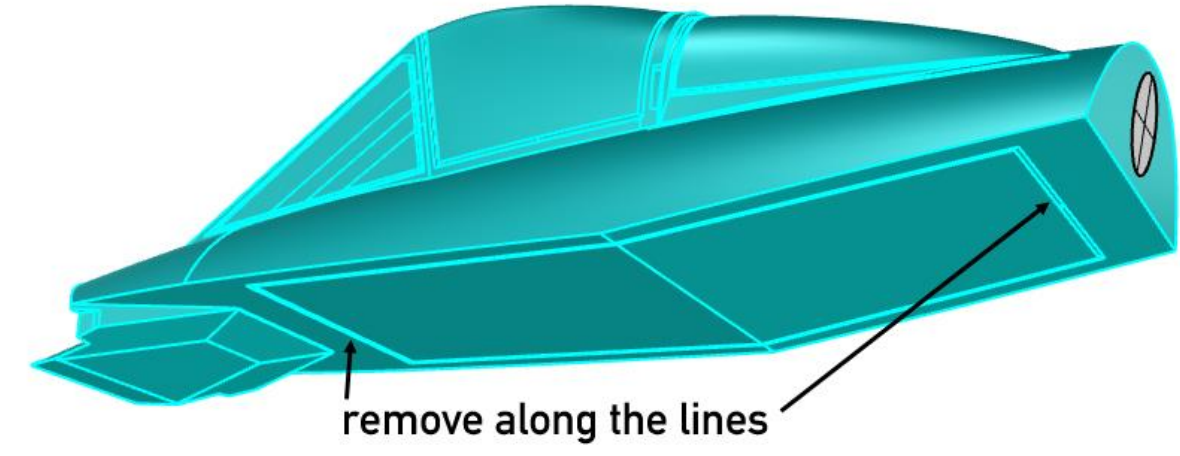
MAGNET ATTACHMENT

- Glue a rare earth magnet into the rear of canopy and corresponding location at the rear of F1. IMPORTANT! Ensure correct polarity of magnet before gluing!



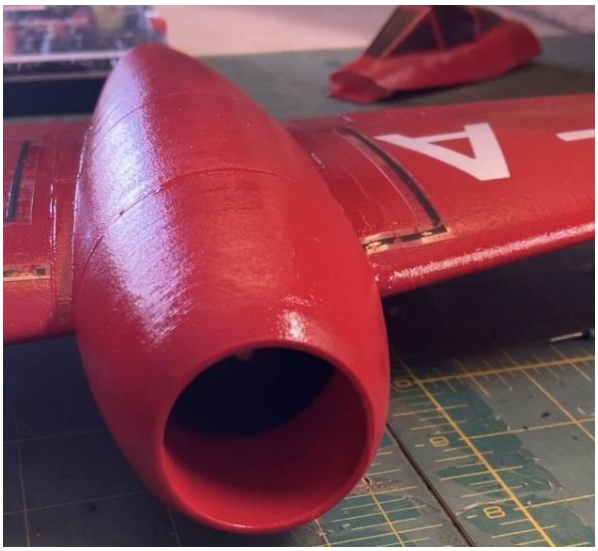
CANOPY TIP

- For extra space in the equipment area (including a bigger battery) the canopy can be printed in PLA @ 100% flow (2 perimeters) , hollow with no infill. Use normal PLA settings for your printer otherwise.
- The bottom section is removed along the engraved lines to provide more space.



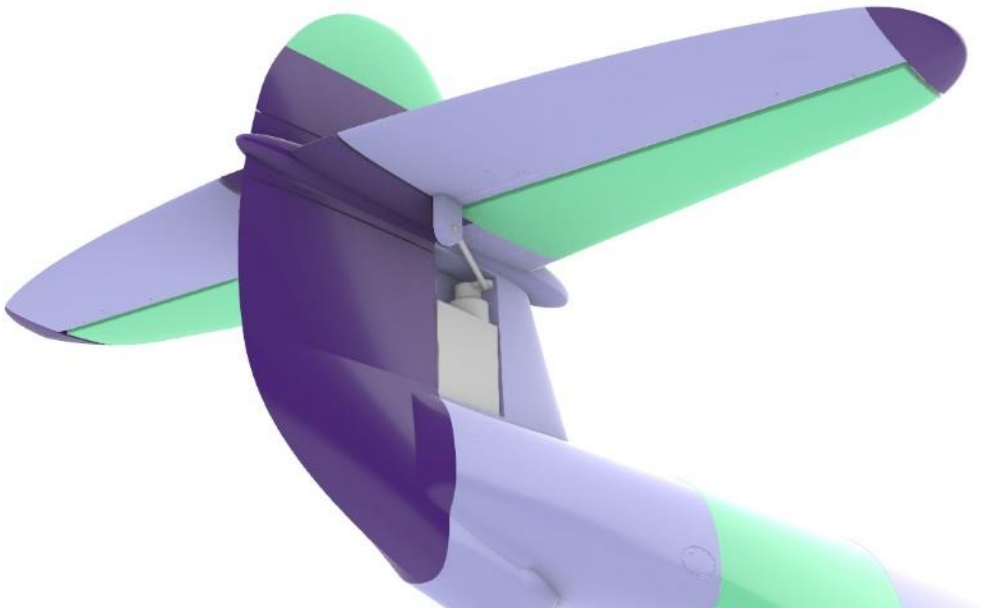
QX-30 FAN INSTALLATION

- Solder the motor wires each to a motor extension lead that is protruding through N1.
- Wrap the fan with masking tape and insert into the front of N1. Insert so that the rear of the fan shroud is 9mm into N1.
- Glue with just enough hot melt, epoxy, or clear Gorilla glue around the perimeter so that the fan stays in place but can be removed without major surgery if required.
- Glue the cowl to N1 in a similar way.



SERVO INSTALLATION

- Wrap the servos in masking tape then glue in place as shown



EQUIPMENT LOCATION

- The battery sits at the front of F1, under the ESCs.
- The wiring is untidy on the prototype, but can be made an easier fit if the hollow canopy is used
- The prototype used a separate 12Aesc for each motor, with the BEC from one esc powering the receiver and servos (red lead on other esc cut and taped). Both ESCs plugged into Y lead to throttle channel. Micro 4ch rx used.

BALANCE POINT LOCATION

- Balance the aircraft AT THE FRONT EDGE OF THE "BUBBLE" ON THE TOP SURFACE OF W1

FLYING

- Set the following control throws (all measured at the widest part of the control surface):

AILERONS – 5mm UP and 3mm DOWN. EXPO 40%

ELEVATOR – 5mm UP and 5mm DOWN. EXPO 30%

Enjoy the Meteor!

PARTS and EQUIPMENT LIST

- 3DLabPrint PolyLight 1.0 – LW PLA filament (about 200g)
- PLA (about 2g plus a small amount for clear for canopy if chosen)
- QX-motor 30mm EDF for 3s (7000kv)
- Micro 4ch receiver
- 3S x 650 mAh battery on prototype, (up to 1300 mAh may fit if hollow canopy option used)
- 12A ESC x 2 (Turnigy Plush 32 used in prototype)
- 3 x micro servos, 8mm thick. Emax ES9051 4.3g used in prototype
- 2 x servo extension leads for ailerons
- 1 x servo extension leads for elevators
- Extension wiring for motors
- CA hinge sheet
- Pushrod wire (0.8 -1.2mm diameter)
- small or micro clevises to suit pushrod wire
- Medium CA
- Accelerator for CA
- Clear Gorilla Glue
- Hot melt glue
- 2 x rare earth magnets 10mm diameter/3mm thick

OTHER RESOURCES

RCGroups thread:

https://www.rcgroups.com/forums/showthread.php?4434827-Gloster-Meteor-f-4

First flight video:

https://www.youtube.com/watch?v=kEBAN-04RkI

DOCUMENT AMENDMENT LIST

8 JUNE 2024	VERSION 1.0	ORIGINAL ISSUE