



**Eurofighter
Typhoon**
Parkjet



Typhoon History

Arguably the best 4th Generation Aircraft in the world, The Eurofighter Typhoon is a twin-engine, canard-delta wing, multirole fighter. Designed and is manufactured by Alenia Aermacchi, Airbus Group and BAE Systems.

The aircraft's development effectively began in 1983 with a multinational collaboration among the UK, Germany, France, Italy and Spain. Disagreements over design authority and operational requirements led France to leave the consortium to develop the Dassault Rafale independently.

The first prototype of the Eurofighter made its first flight on 27 March 1994. The aircraft's name, Typhoon, was adopted in September 1998; the first production contracts were also signed that year.

The Typhoon entered operational service in 2003. The type has entered service with the Austrian Air Force, the Italian Air Force, the German Air Force, the Royal Air Force, the Spanish Air Force, and the Royal Saudi Air Force. The Royal Air Force of Oman and the Kuwait Air Force are export customers, bringing the procurement total to 599 aircraft as of 2016.

The Eurofighter Typhoon is a highly agile aircraft, designed to be a supremely effective dogfighter in combat. Later production aircraft have been increasingly better equipped to undertake air-to-surface strike missions and to be compatible with an increasing number of different armaments and equipment including Storm Shadow and the RAF's Brimstone. The Typhoon saw its combat debut during the 2011 military intervention in Libya with the Royal Air Force and the Italian Air Force, performing aerial reconnaissance and ground strike missions. The type has also taken primary responsibility for air-defence duties for the majority of customer nations.

Designers Notes

The Typhoon is always a show stopper at the airshows, and I wanted to build an RC model of it. So myself and two other friends decided to build a bigglesjet version. We had such a lot of fun with them, but eventually crashed them from too much daredevil flying.

I chose to do my own version of this awesome plane from scratch as I wanted to make it a little larger, draw it in CAD so I can CNC cut the parts, and also I am a sucker for scale, so I made my design much closer to the original plane. I chose a different build philosophy and made the plans adaptable to make either a Pusher or 70mm EDF version.

Both planes fly really well, and are a bundle of fun. I have cad models of various parts for 3d printing if people are interested.

It's a good idea to be conservative with the throws on the model as its control surfaces don't need much to control it.

If you enjoy this model, please send me a donation via Paypal for \$10 to clicketyclarkstone@gmail.com. It took loads of hours of work! :)

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Construction

Before you start.



Adhesives

- > For the majority of construction :
 - UHU Creativ for Styrofoam (also called UHU POR)
 - 3M 77 Spray adhesive.
- > For wing spars and motor mounts :
 - Epoxy. (5 and 15mins cure times are the most convenient) micro-balloons can be added to reduce weight.
- > For servo's / and quick grab :
 - Hot melt glue gun - Caution if the glue gets too hot it will melt foam - test first!

Tapes

- > For holding parts tightly together whilst glue sets
 - Low tack masking tapes
- > For leading edges, hinges, general strengthening
 - 3M Gift tape (Purple - not green one!) - I prefer lightweight plastic hinges.
- > For decals
 - Coloured parcel tapes (strips taped to waxed paper & cut out)

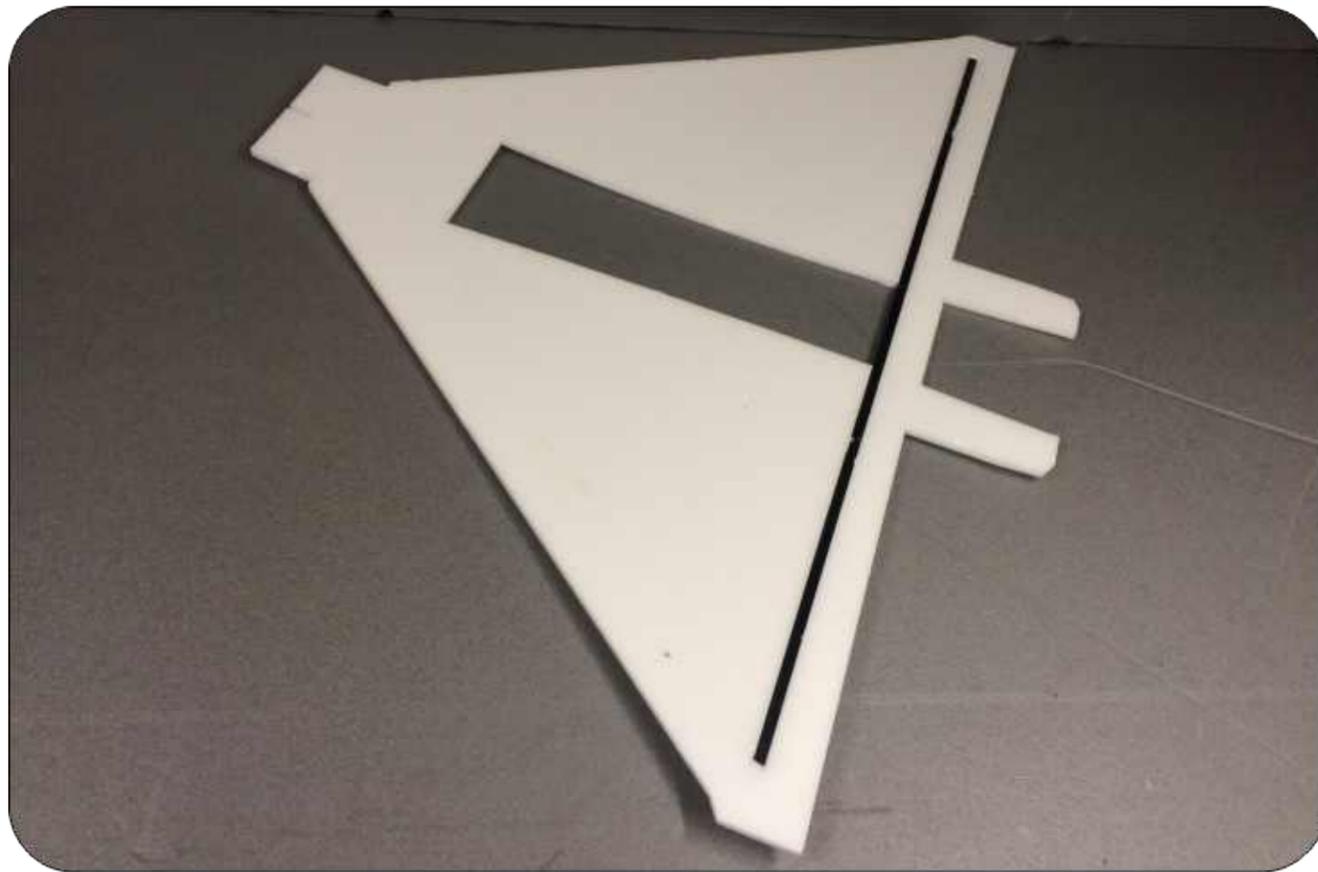
Cutting parts

1. Print the plans,
2. Cut around each part using scissors - allow a border of approx (1/4") 6mm
3. Use either 3M spray mount or a very light coat of 3M 77 to the back of the parts and stick in an economical layout on the Depron foam.
4. Using a safety rule and craft knife over a cutting mat - important! use a fresh blade otherwise it will drag and spoil the foam. (I find the stanley knife perfect) make the straight edge cuts, then the curved parts freehand.
5. Once the parts are cut-out, keep the template stuck to the part until just before needed to help identify the parts.
6. After use, I find it helpful to keep all the used tempates in case replacement parts need making. (the glue eventually dries and they don't stick together!)

IMPORTANT Wherever the plans call for marking guidelines onto the depron, please ensure that you do otherwise it can cause problems later on. I suggest you use a Sharpie Fineliner to transfer the lines.

Glueing parts together.

1. Ensure a really good fit - this will reduce the amount of adhesive used. The Bar Sander is a great tool for this.
2. Follow the adhesive instructions closely.
3. Use ordinary steel head pins to help keep the parts located whilst epoxy sets.
4. Use objects as weights such as paperweights to apply pressure whilst adhesive sets.
5. Use masking tape to apply pressure whilst adhesive sets. Also use masking tape to along the slots for the wing spars whilst gluing the carbon rod spars into the wings. This prevents the glue protruding and gives a nice finish.

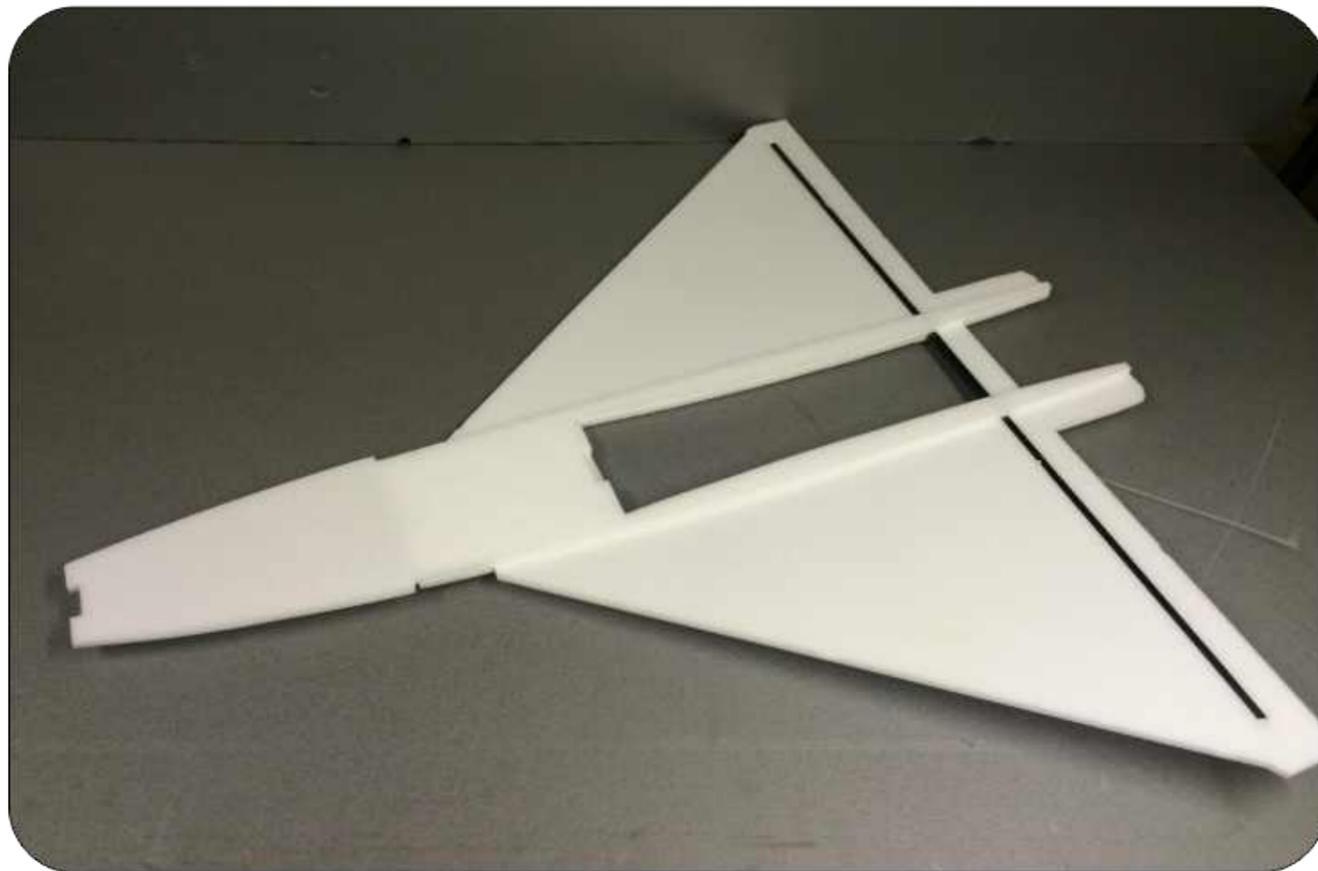


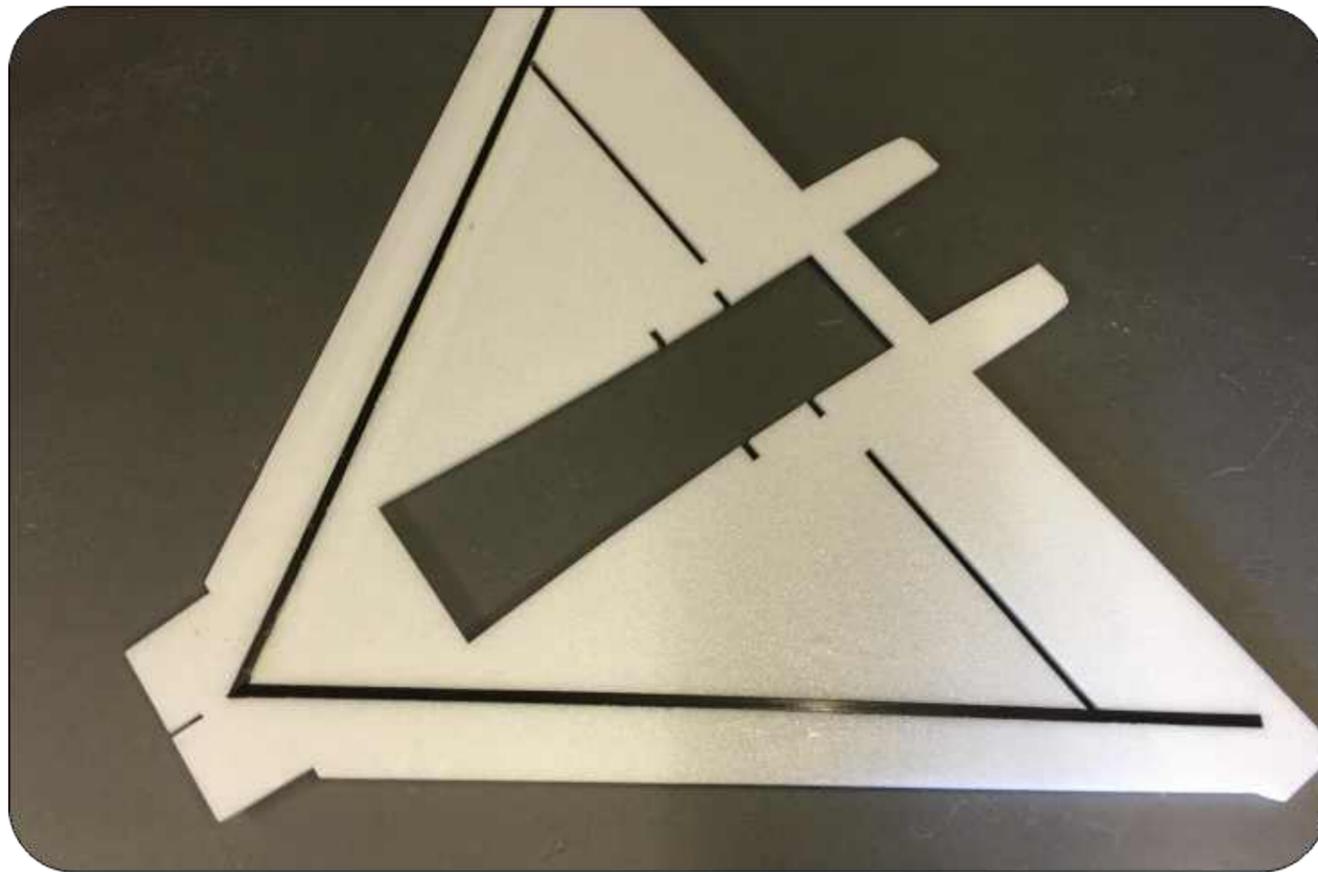
PUSHER VERSION ONLY

Glue 6mm carbon tube into the slot in the wing panel (Part 1) as shown. Use masking tape to get a neat finish.



Attach forward fuselage base (part 2) to wing.



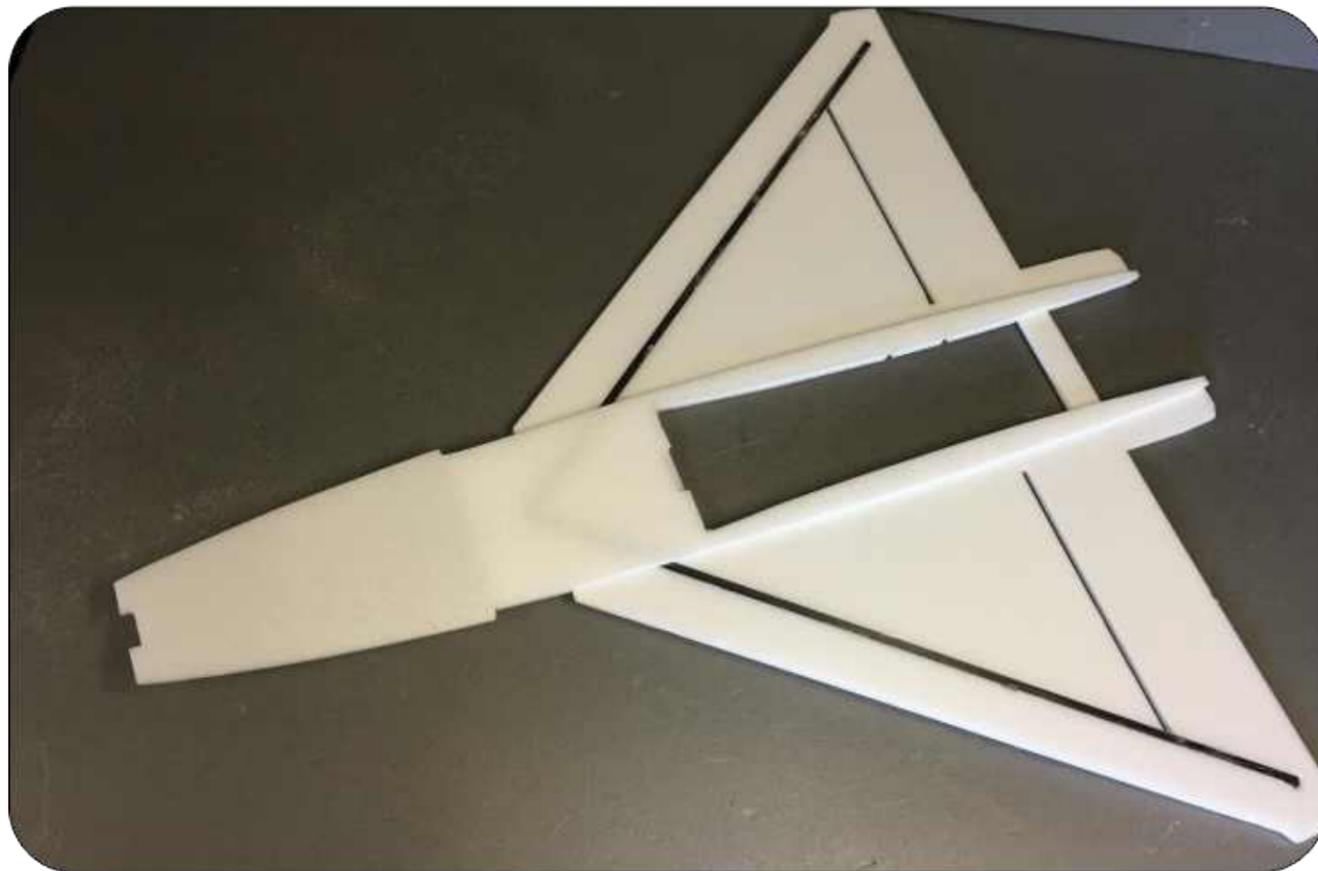


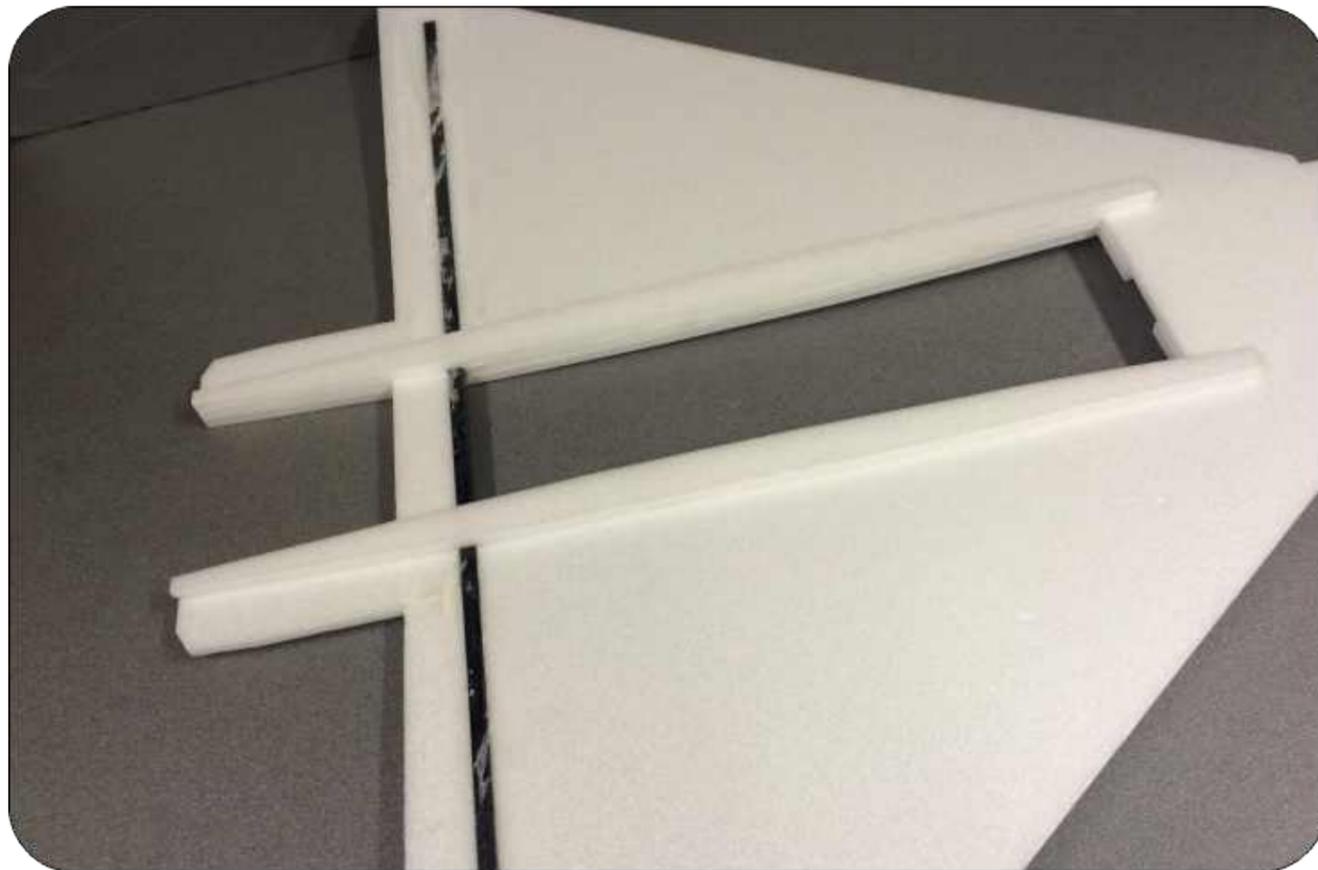
EDF VERSION ONLY

Glue 6mm carbon tube into the slot in the wing panel (Part 1) as shown. Use masking tape to get a neat finish.



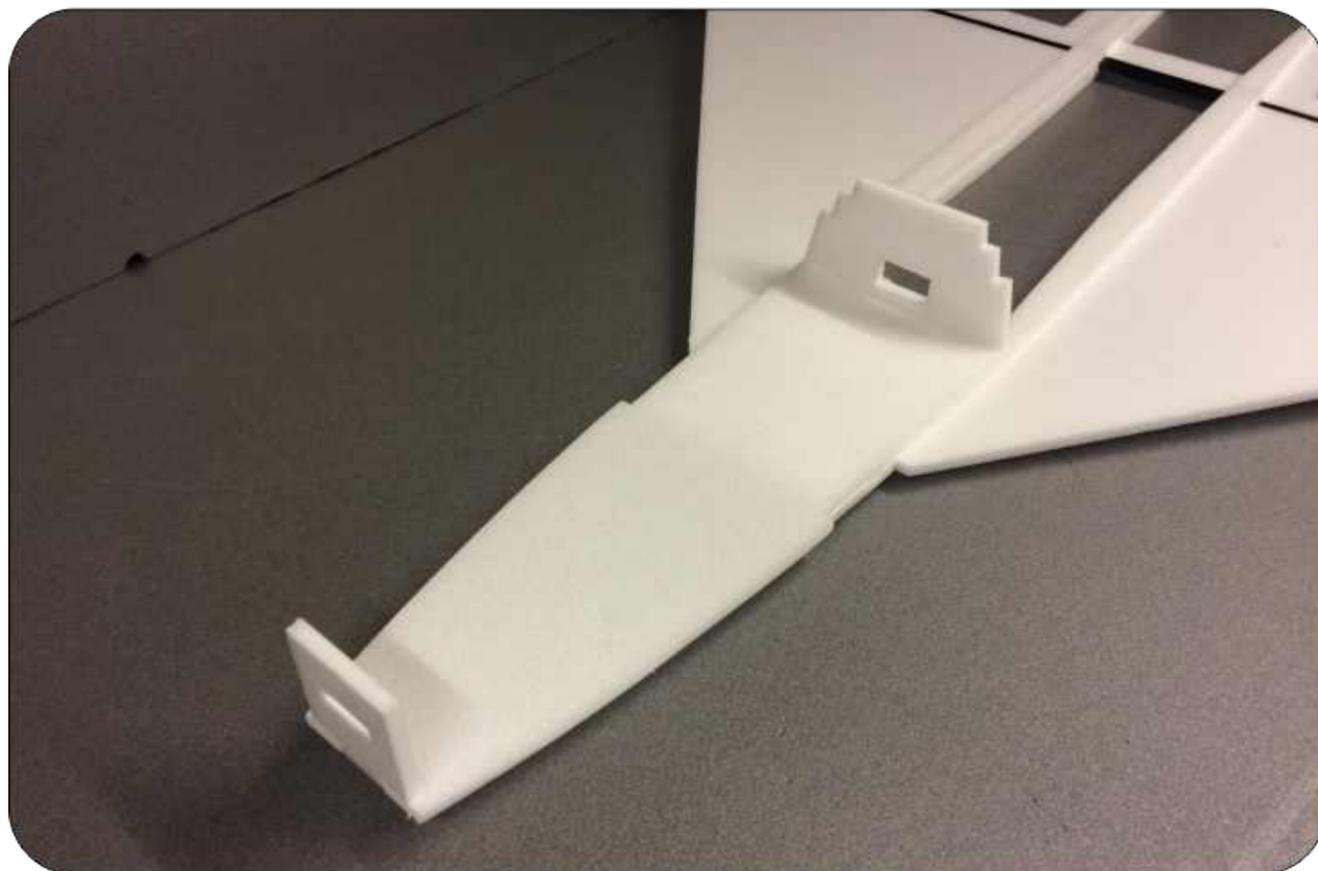
Attach forward fuselage base (part 2) to wing.





BOTH VERSIONS

Attach support strips (part 3) to underside of wing.

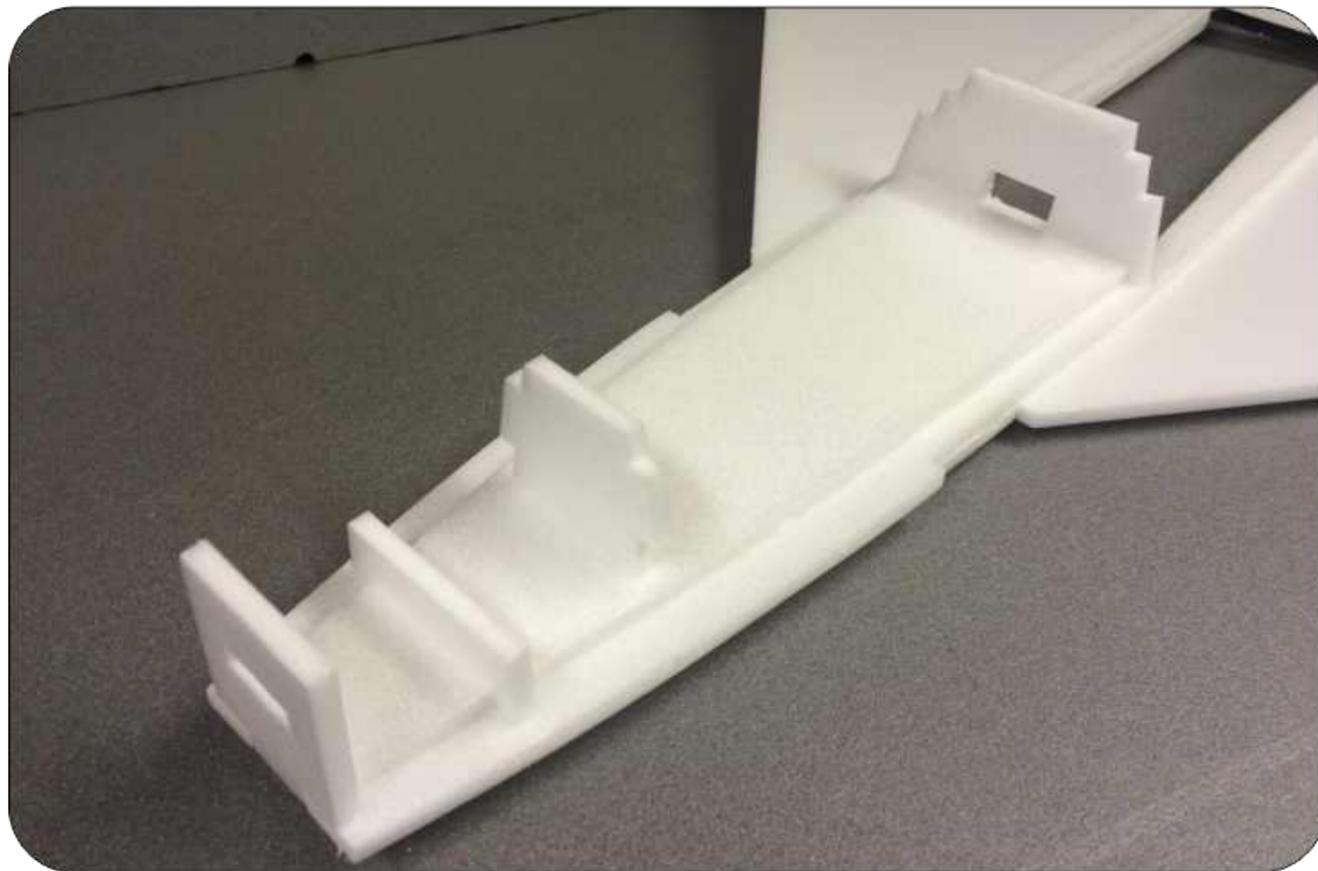


Insert Bulkhead 1 (part 4) and 3 (part 5) into assembly.



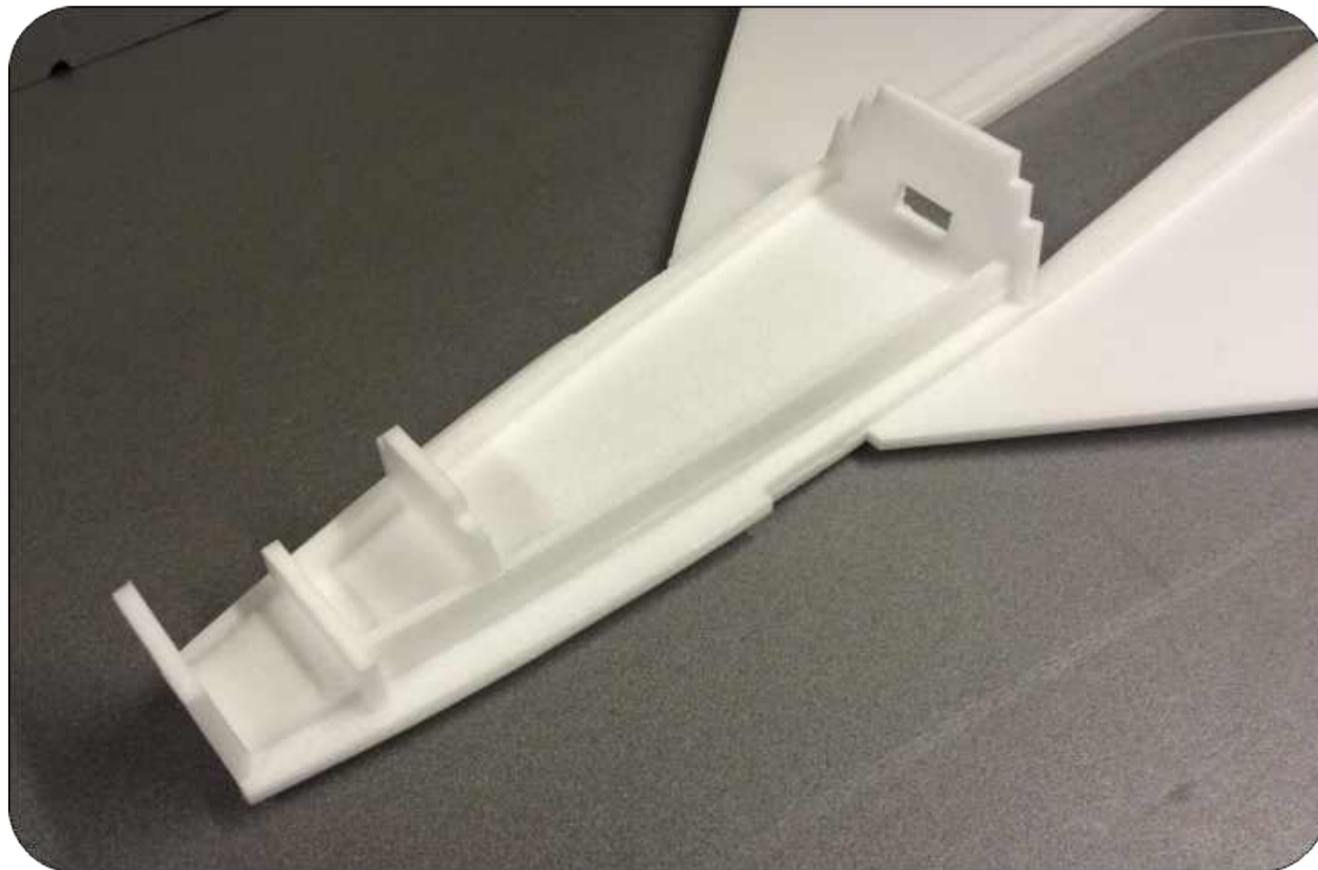


Insert Inner fuselage belly (part 6) into assembly.

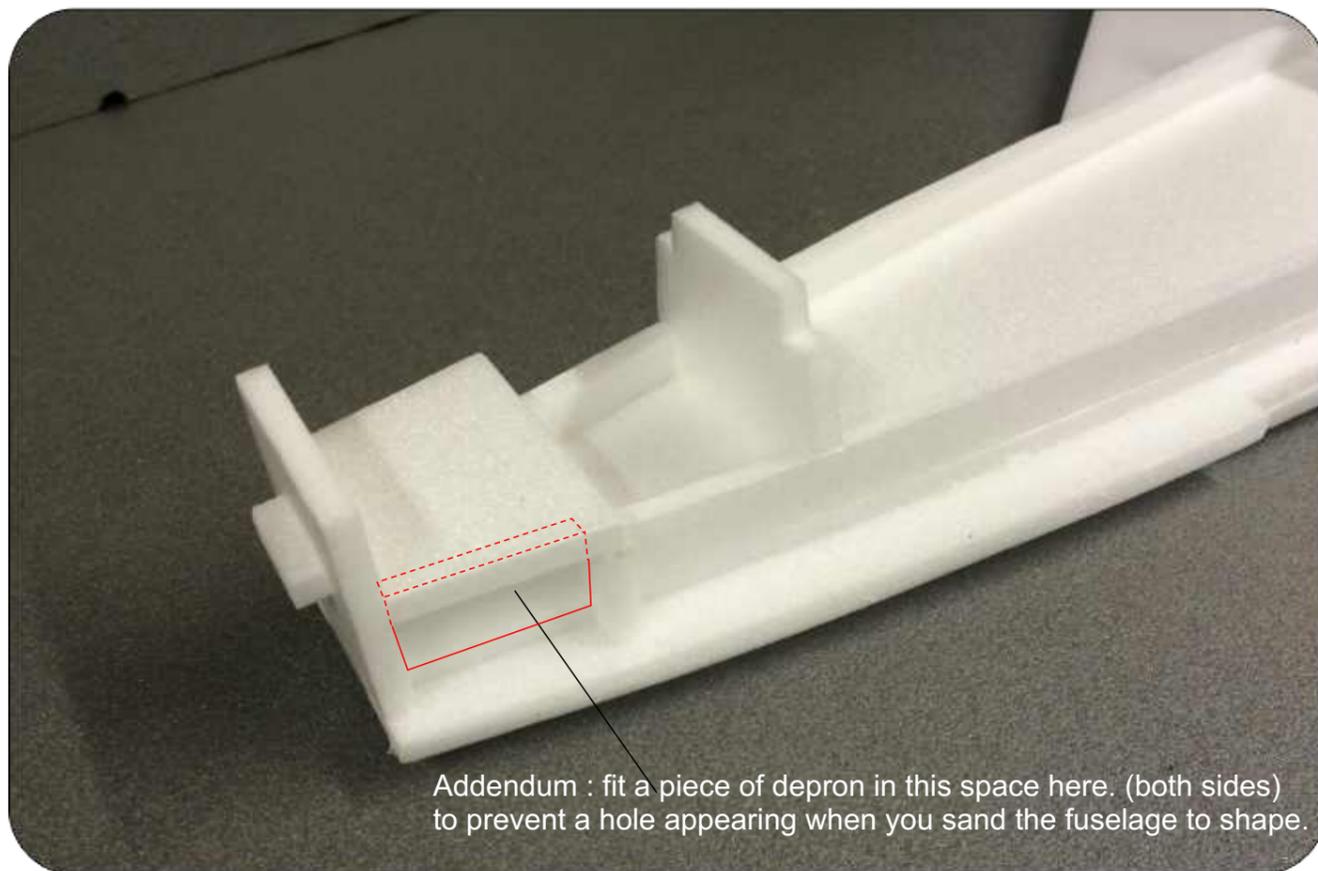


Insert Bulkhead 2 (part 7) and Canard Bulkhead (part 8) into assembly





Insert lower fuselage strips (Part 9) into assembly.



Insert Canard Lower servo tray (part 10) into assembly.



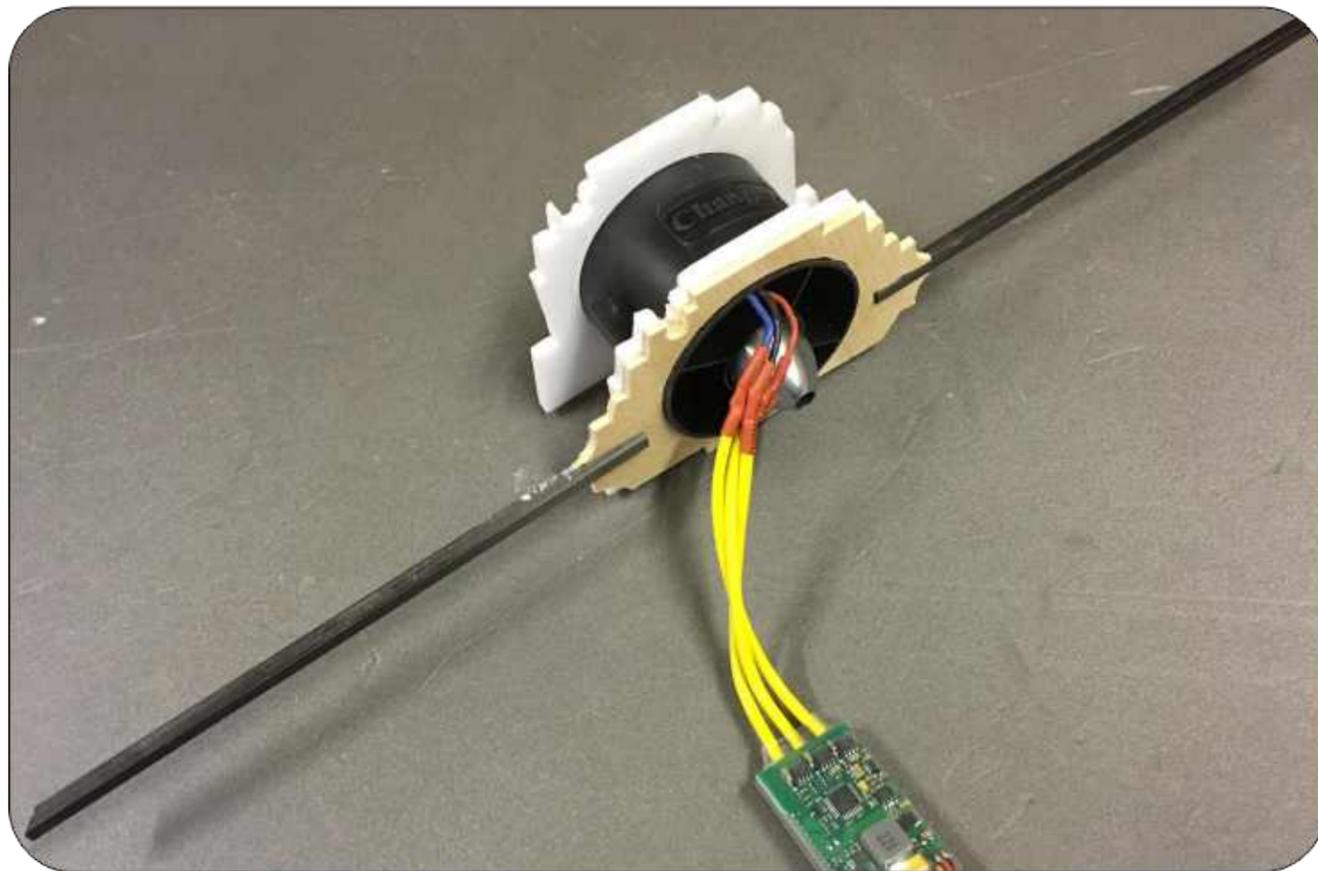
Addendum : fit a piece of depron in this space here. (both sides)
to prevent a hole appearing when you sand the fuselage to shape.





EDF VERSION ONLY

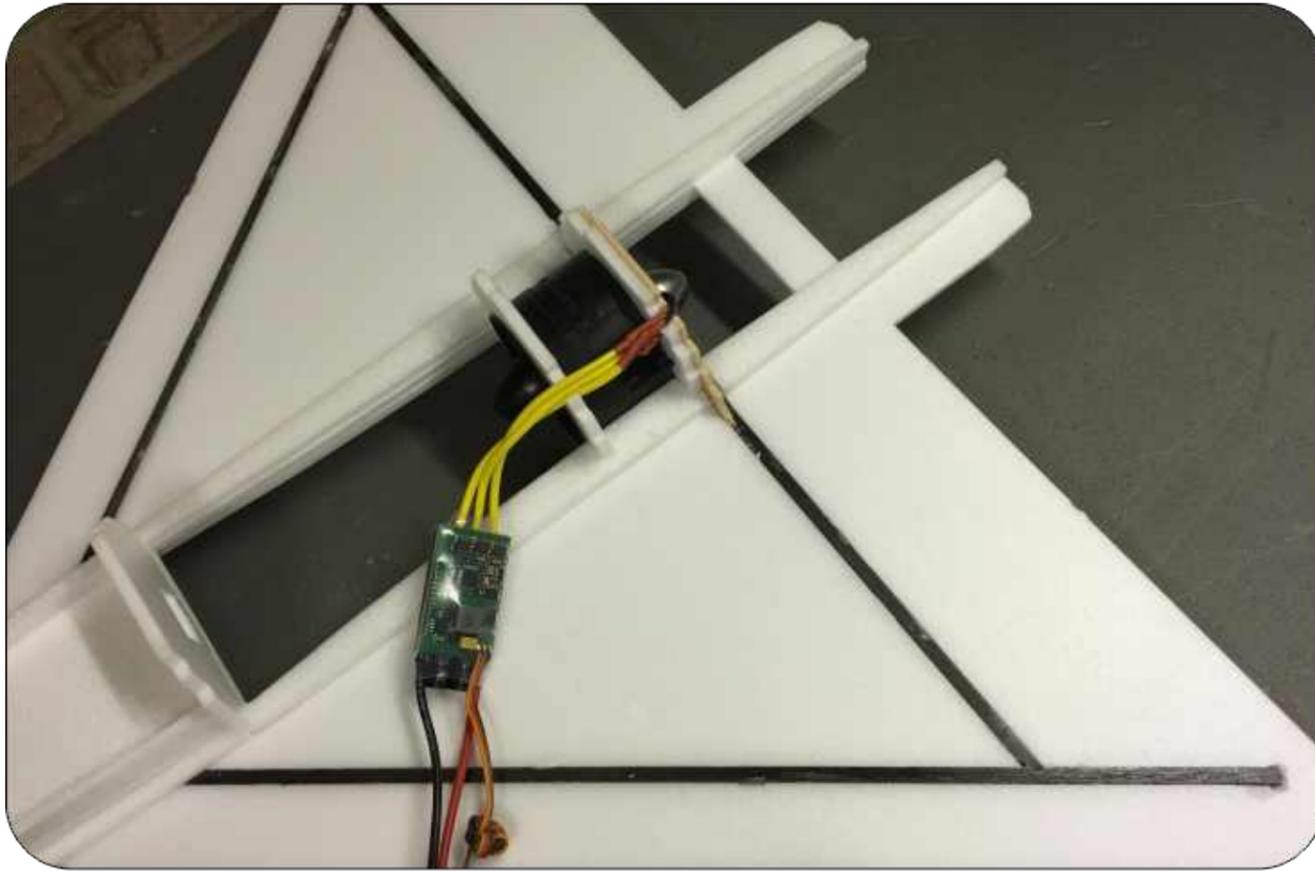
Cut out the EDF mount in 3mm lite ply.



Glue the rear Depron edf mount and lite ply mount together, then test fit both depron and Wooden EDF mount parts around your EDF unit

- making modifications in order to suit your EDF unit.
Test fit the Carbon spar into the plywood slots.

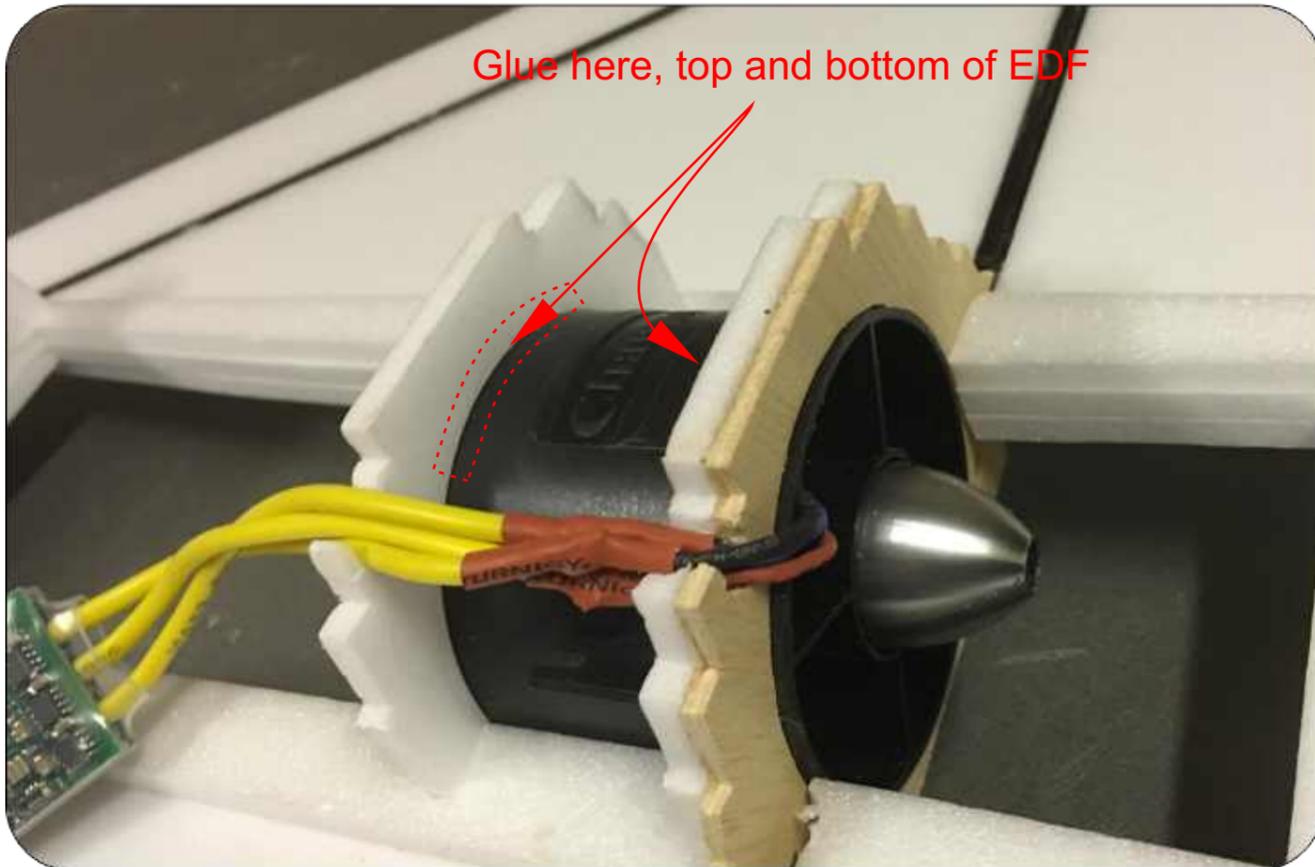




EDF VERSION ONLY

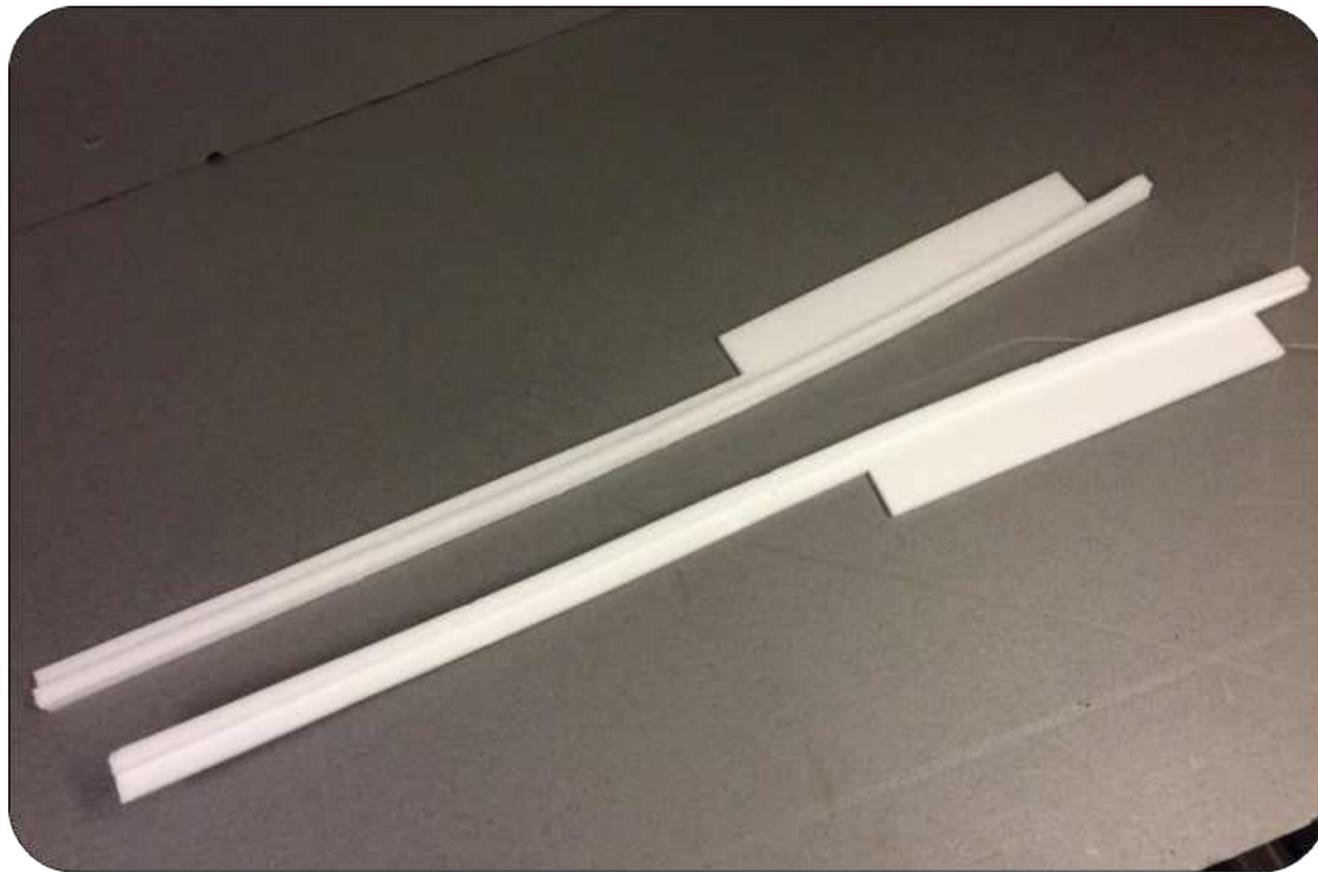
Test fit the EDF/spar assembly into the wing assembly. Using Epoxy, glue the spar into the Plywood.

at the same time epoxy the spar into the wing and also the EDF mounts to the wing.

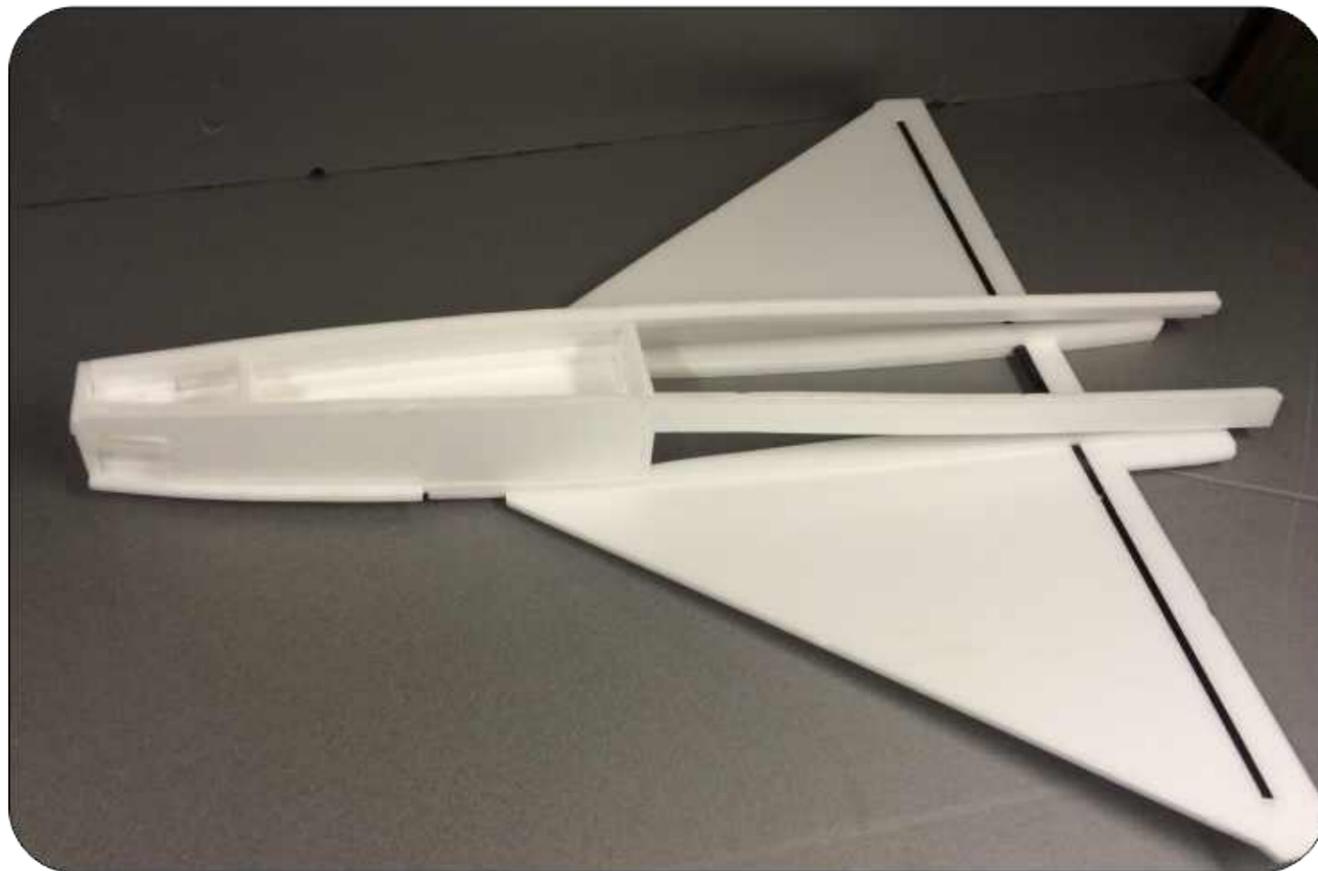


Hot melt the EDF into the mount.

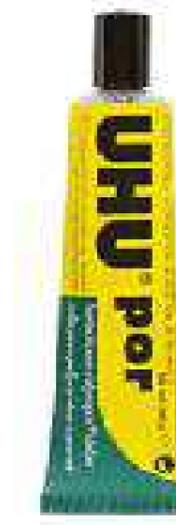




Glue curved fuselage pieces 12 and 13 together



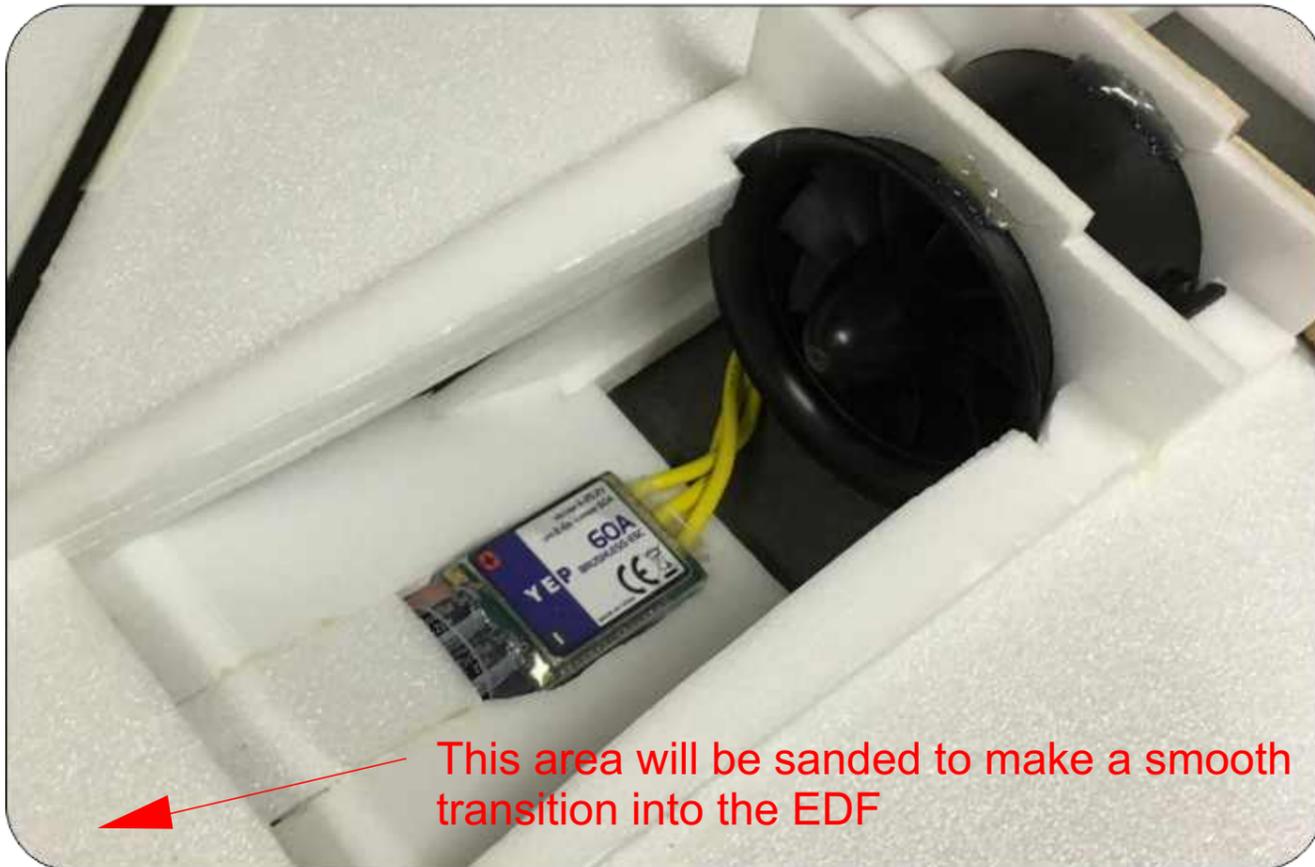
Attach the two side assemblies onto the main assembly.





EDF VERSION ONLY

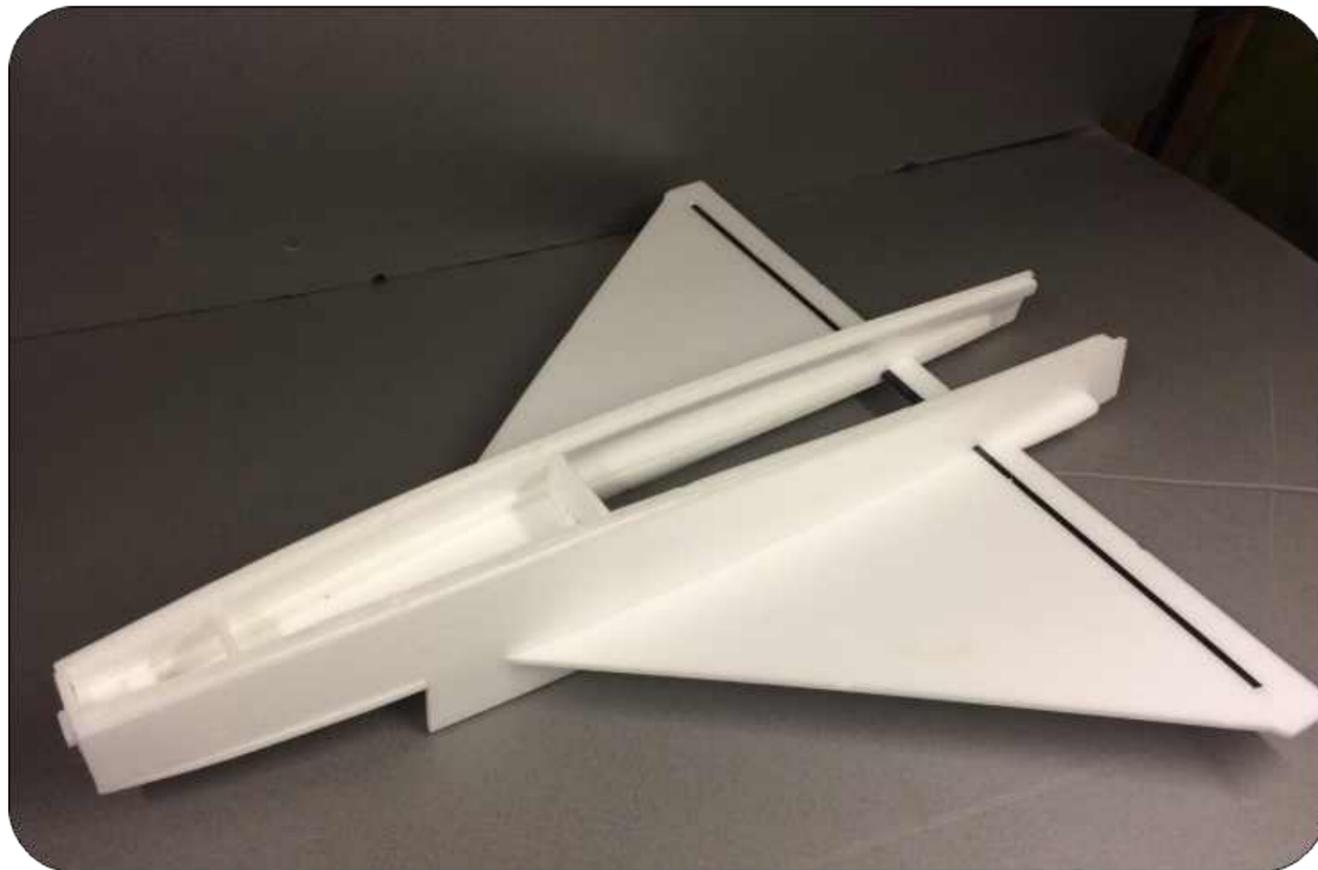
Test fit the EDF ESC mount into the fuselage. Glue in place with UHU por. Then cut a hole to suit your ESC, then hot melt it to fit as shown.



View from below.

remember to include the EDF bell mouth.





Cover the bonding surfaces with Glue, and slide the the fuselage sides (part 14) onto the assembly. They should be leaning over slightly as per the shape of the bulkheads.



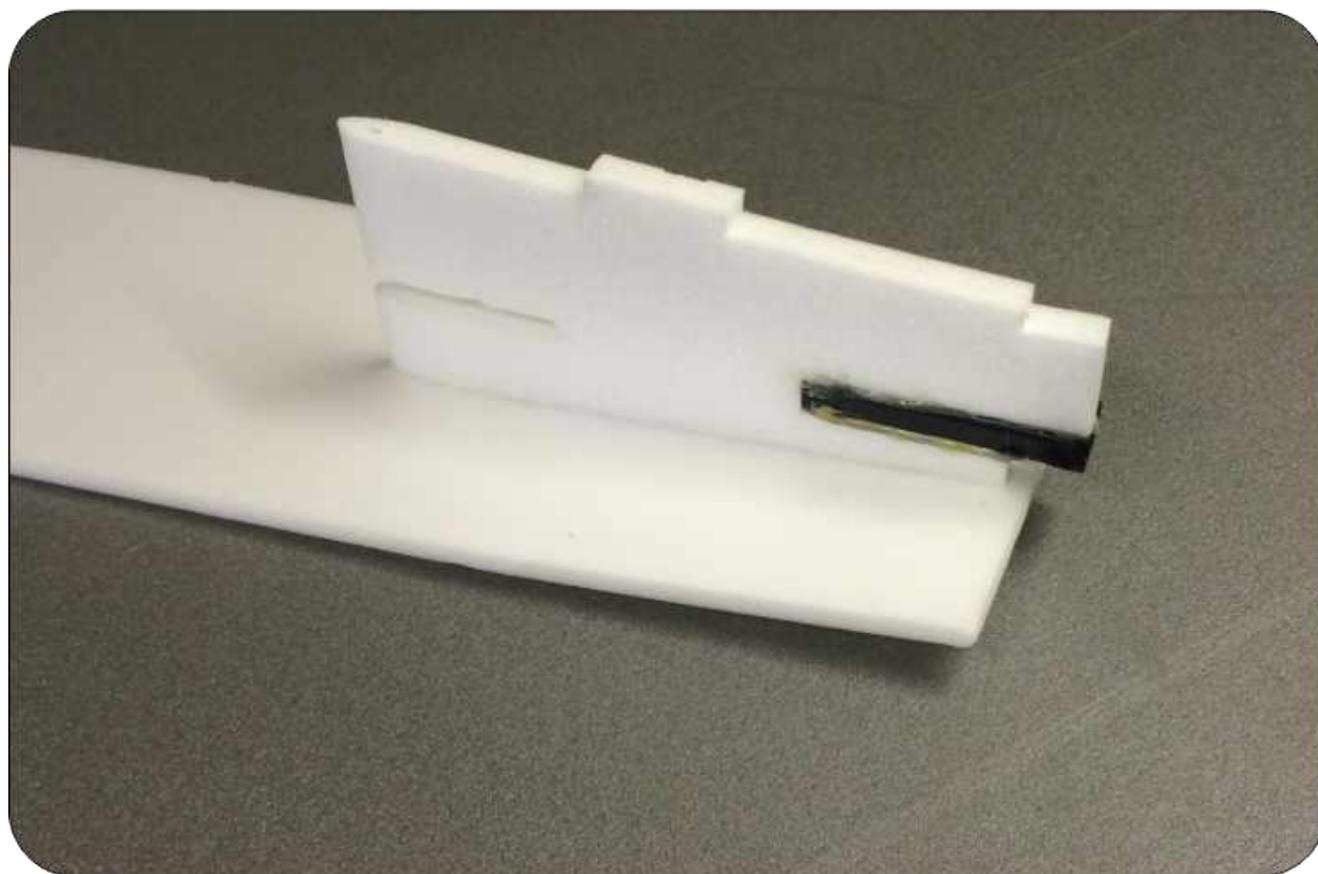
Shape the underbelly to match the plywood air intake piece.

Careful use of a heat-gun will help, but practice first on scraps of depron until you are confident with the technique.





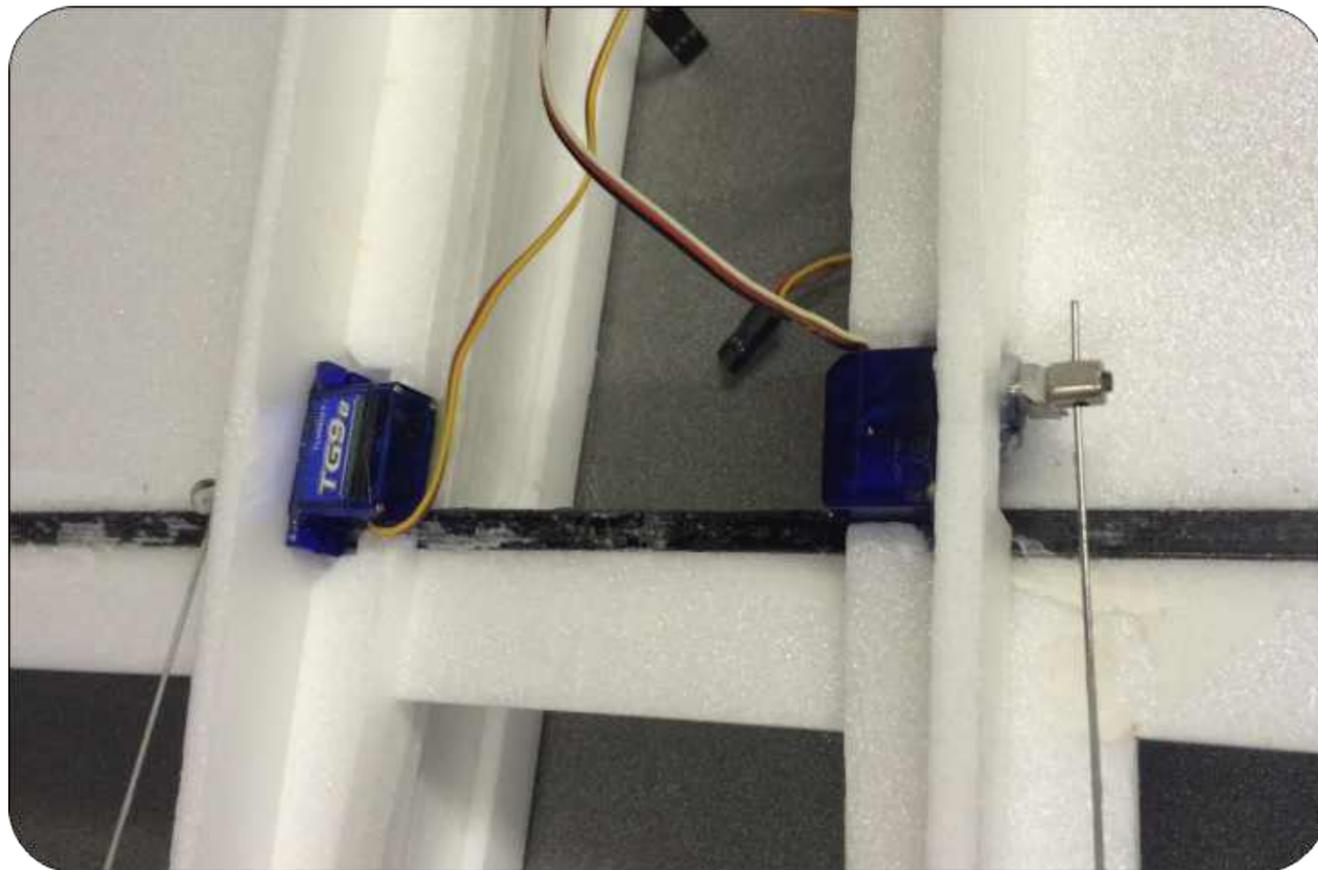
Glue the 3mm ply leading edge protector to the front of the curved panel. (3d printed equivalent shown here)



THIS STEP - PUSHER VERSION ONLY

Gently curve the belly panel to match the pusher motor mount. Holt melt a plastic stick mount in place.



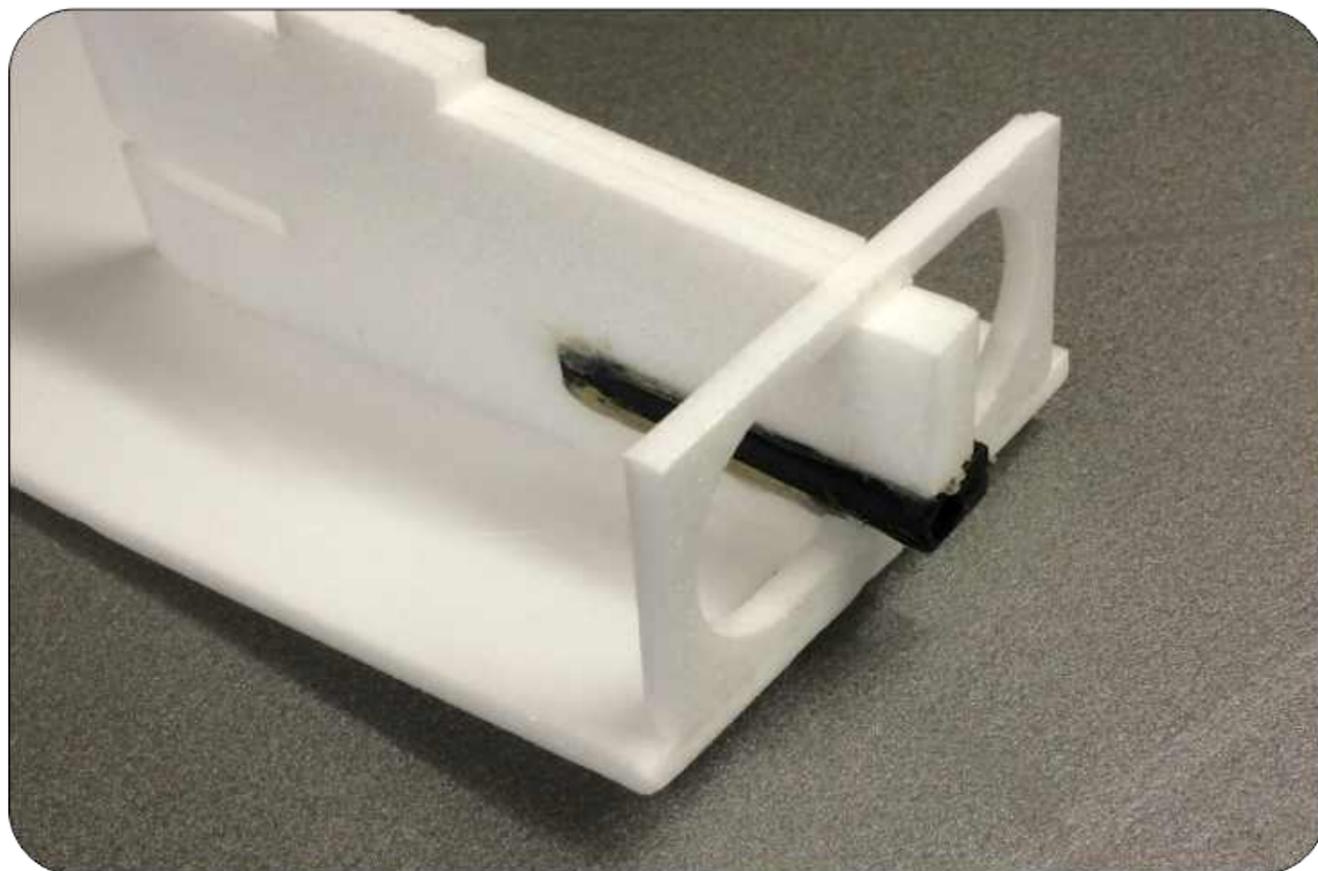


Glue in the two 9-11g servos with hot melt glue
(I prefer digital, metal gear variety)



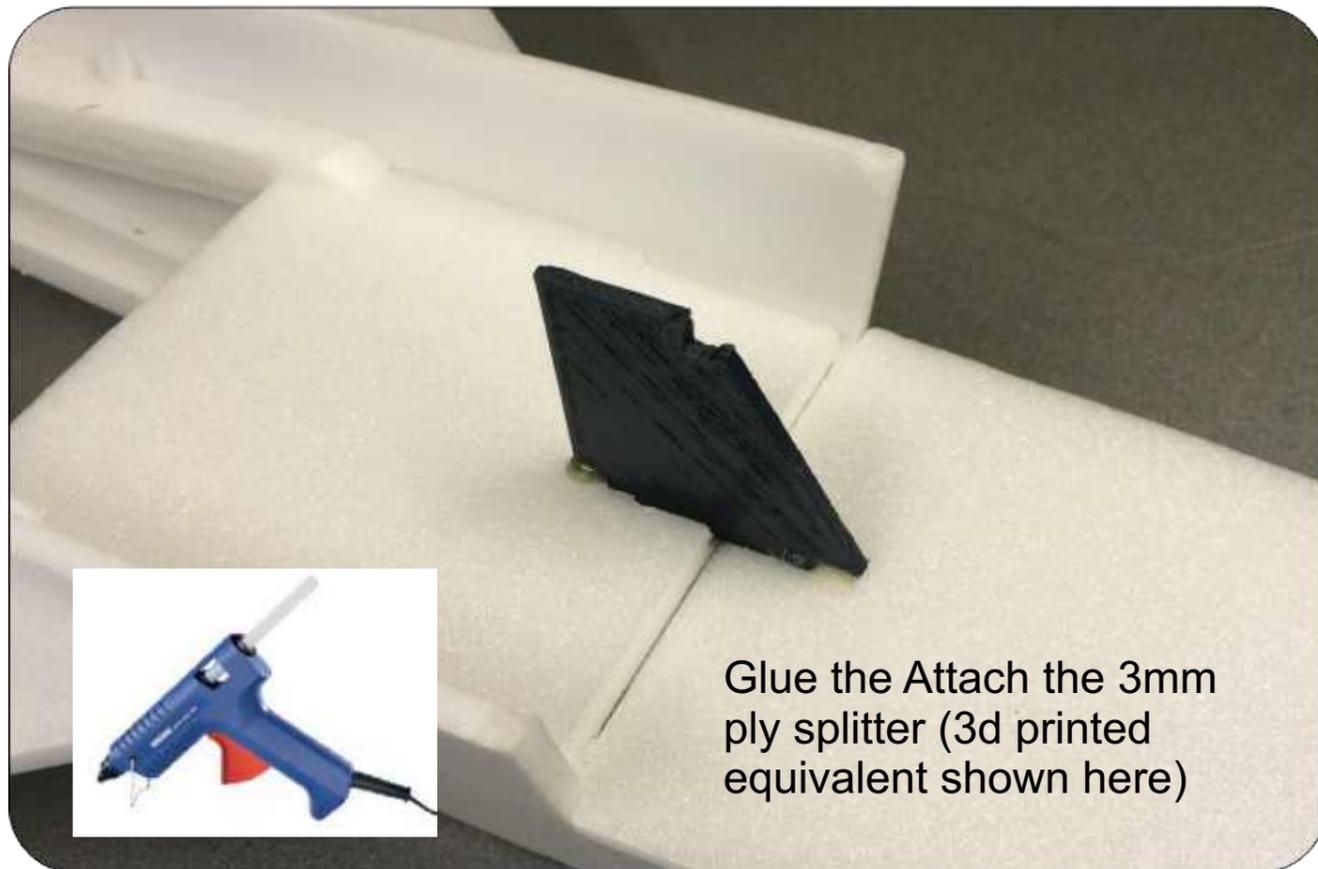
THIS STEP - PUSHER VERSION ONLY

Attach the exhaust bulkhead (part 17)

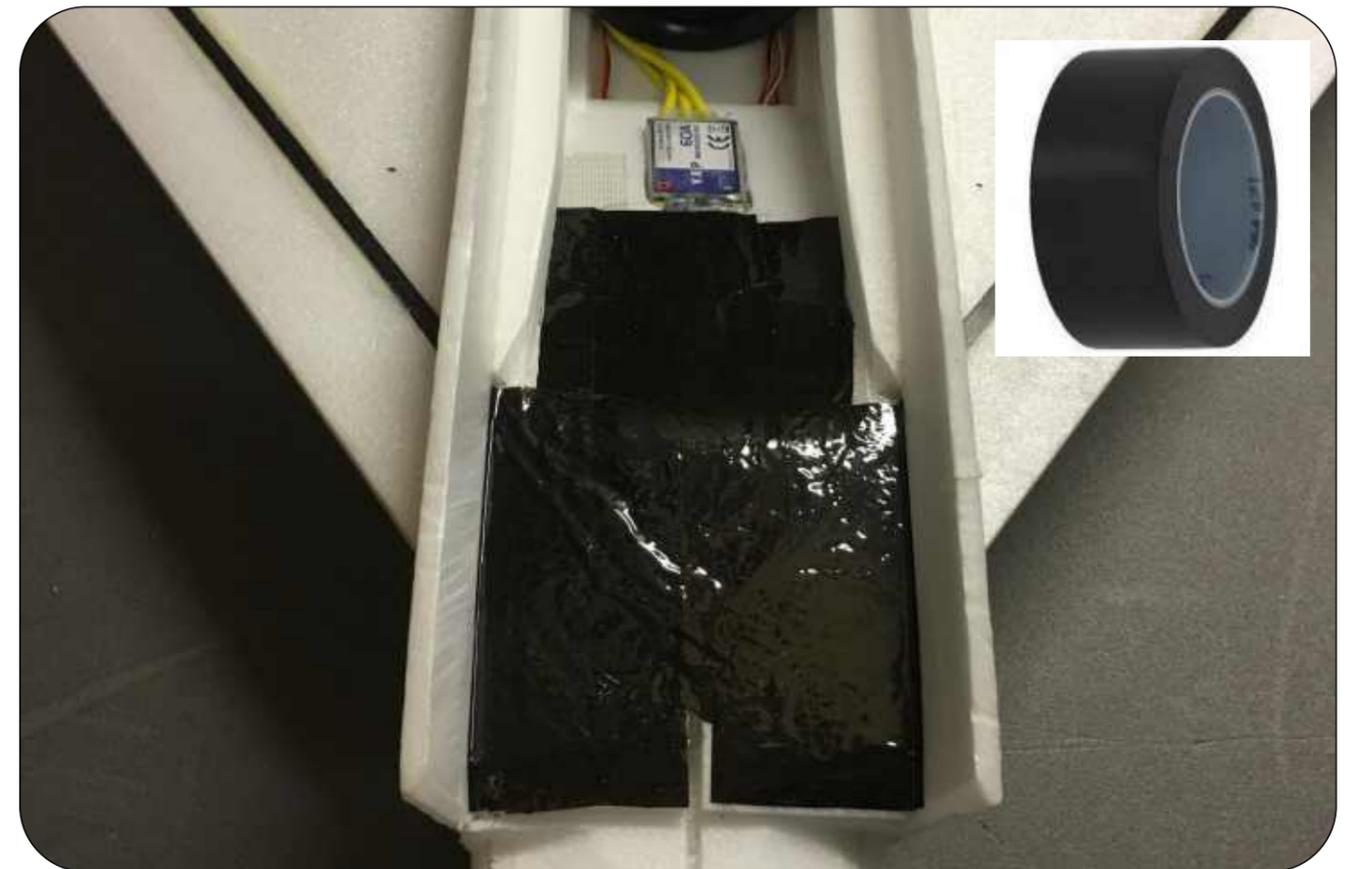




Cut out a slot in the belly panel for the splitter to slot into.

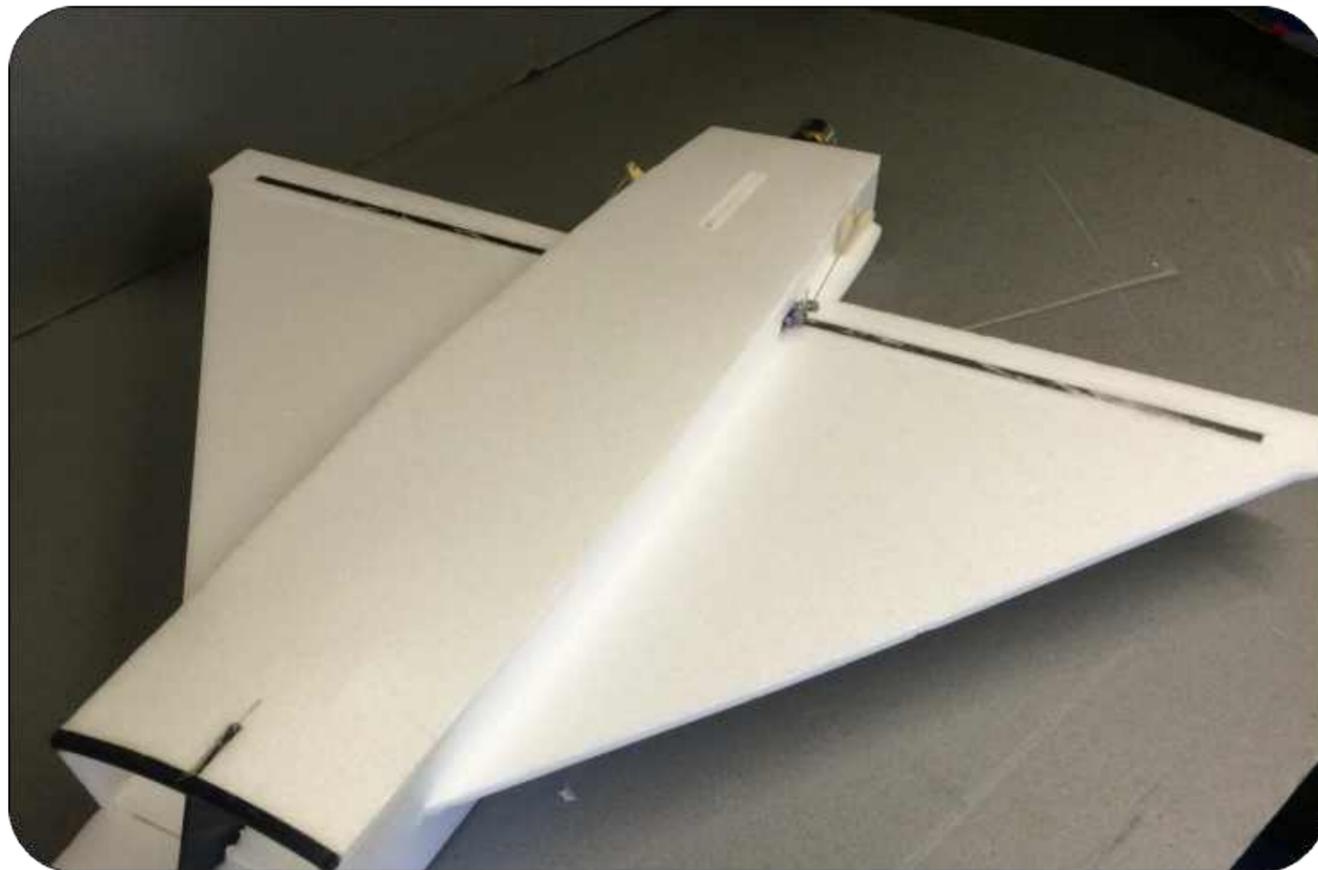


Glue the Attach the 3mm ply splitter (3d printed equivalent shown here)

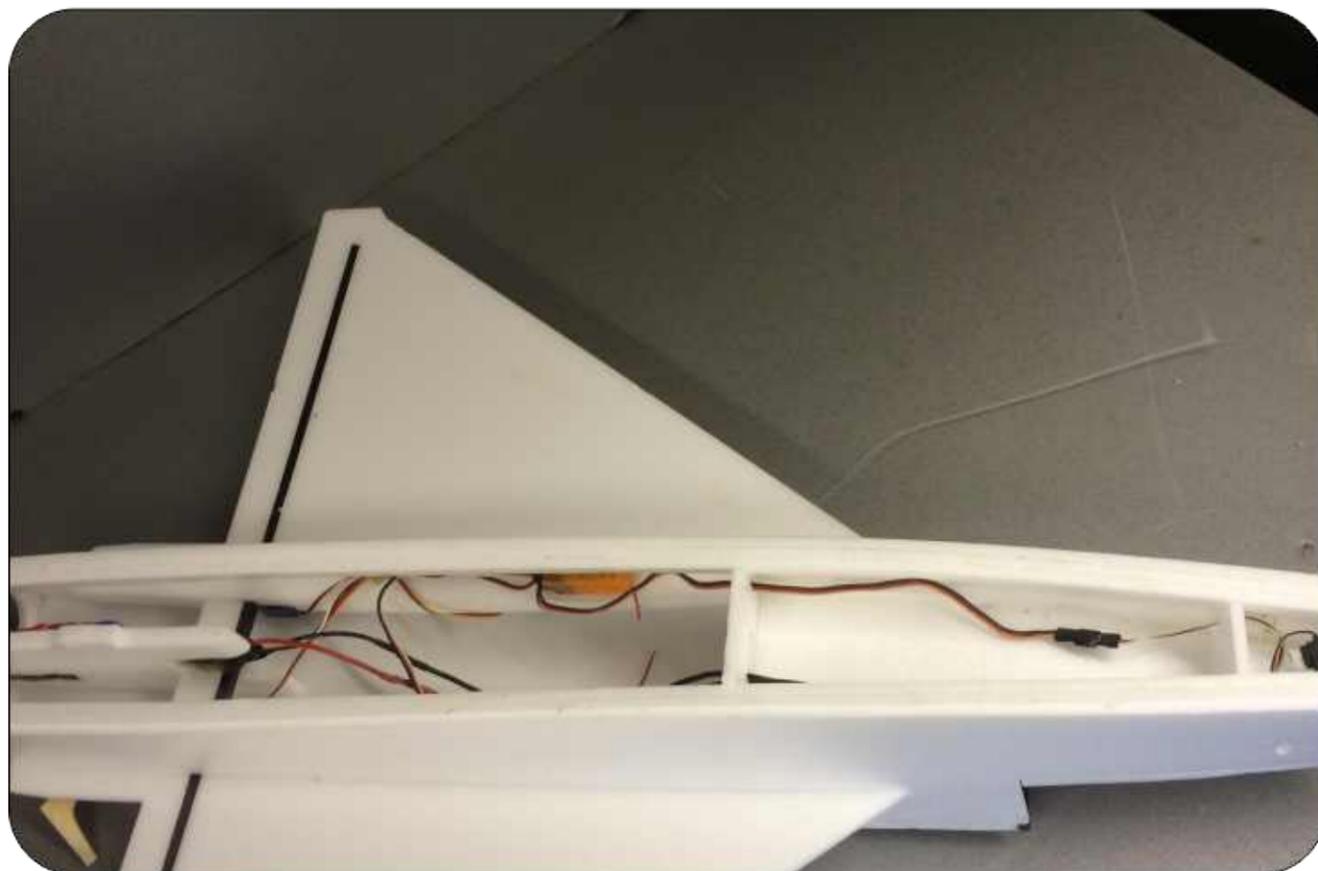


EDF version, sand smooth the transition into the EDF, and apply parcel tape to reduce surface drag.

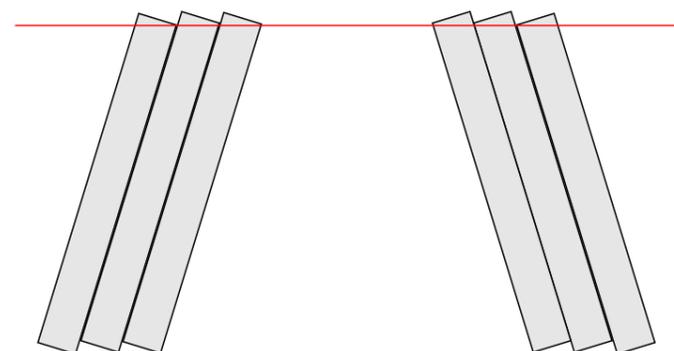


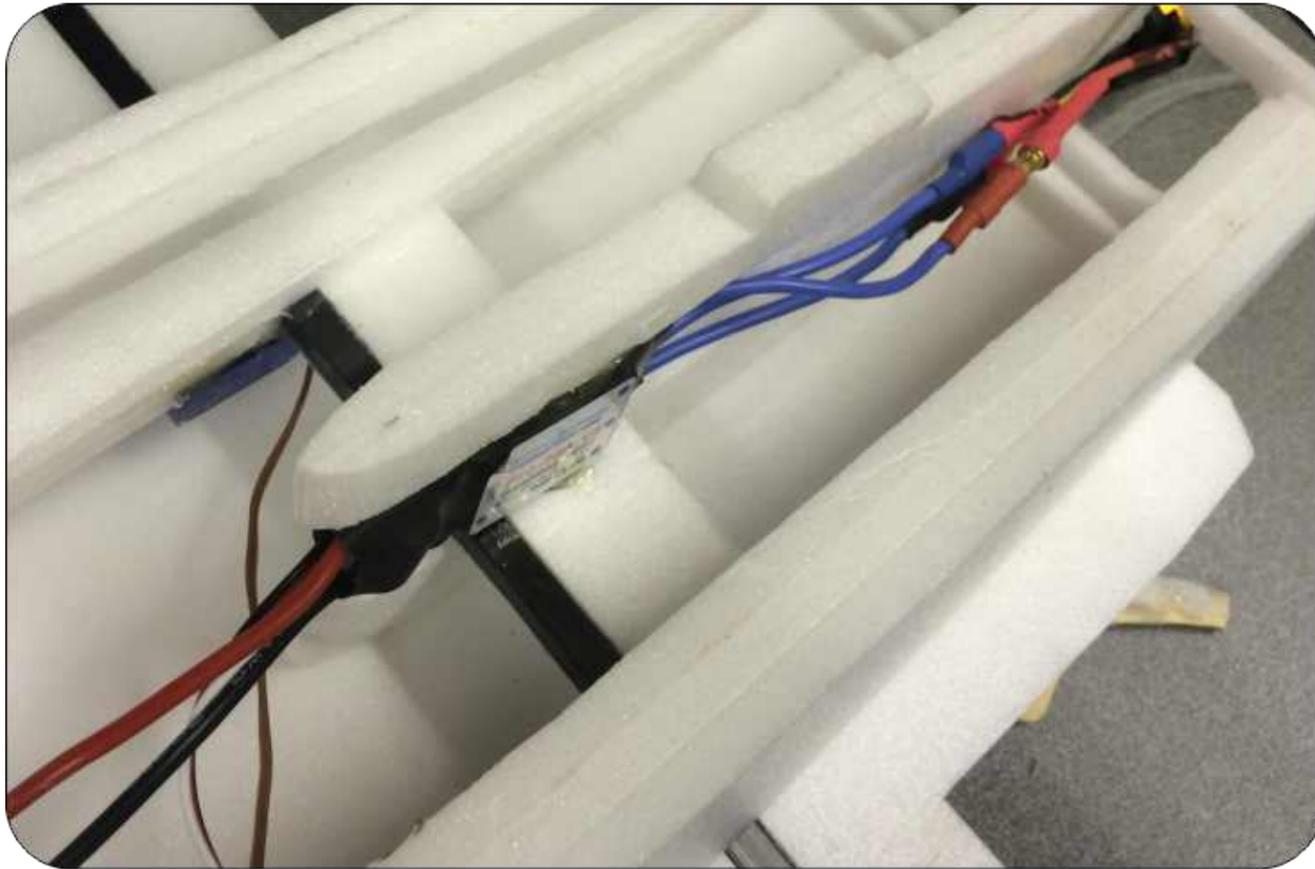


Attach the belly assembly to the main assembly.



Run the electronics through the fuselage, then sand the top smooth using a straight edge in preparation of the top piece to fit.





THIS STEP - PUSHER VERSION ONLY

Recess the Speed controller into the Motor mount panel as shown. Glue in place.



If you have access to a 3d Printer, contact me on RC groups for the CAD data.





Attach the elevons.

Step 1. mark out the locations of the hinges and slice using a scalpel.



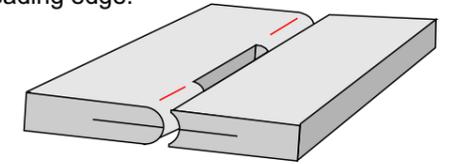
Step 3. Apply water mixed with lightweight filler to the sanded edge of the elevon. This will help give a better surface for painting later.



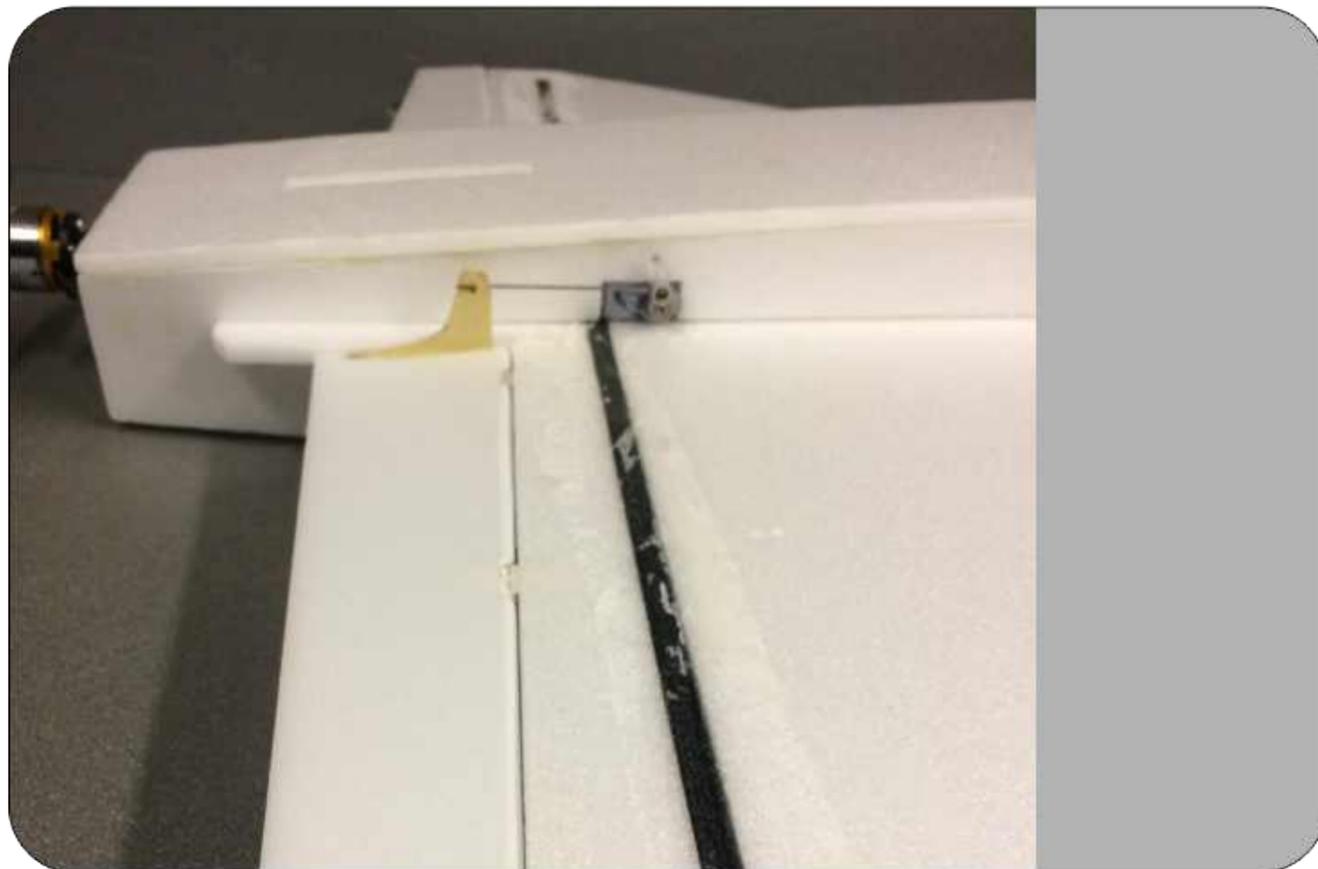
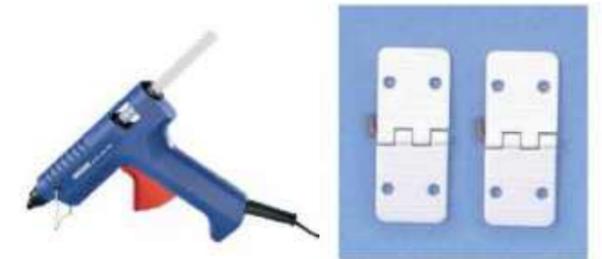
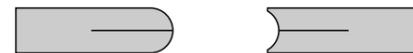
Step 2. Sand the leading edge of the elevon to a half-circular shape, and recess the wing by dragging a 6mm carbon tube down the end a few times with a bit of pressure.



Step 4. Cut away the area where you want to put the hinge (as shown) in order to get the axis of the hinge to the centre of your half circular leading edge.



Step 5. Using the mini graupner hinge, glue in place using small blobs of hot melt glue. start by glueing the hinges individually into the elevon, then all together into the wing. (dry fit a few times to ensure you can fit them into the wing before the glue starts to set)



Glue the lite ply control horns in place as shown.

This model doesn't require large movements to control it.

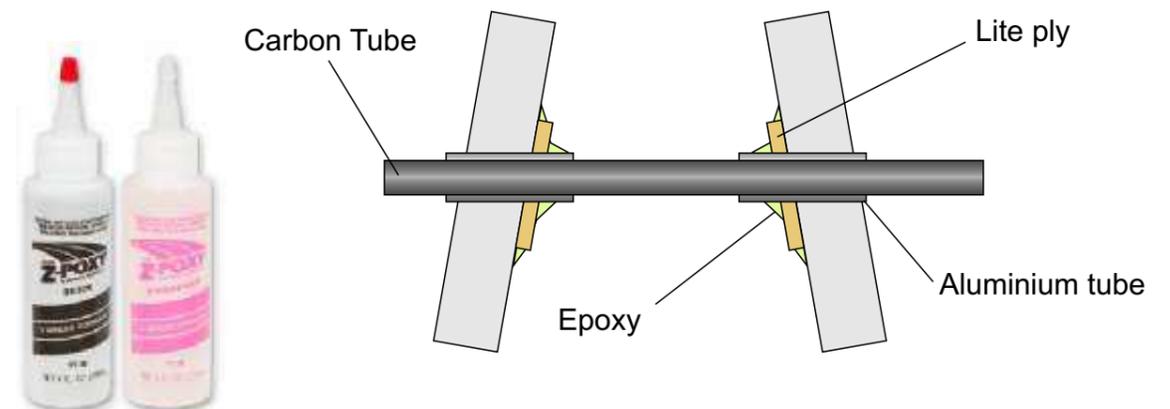




Connect the lite ply horns to the servo horn using control link stoppers, to allow for adjustment later.

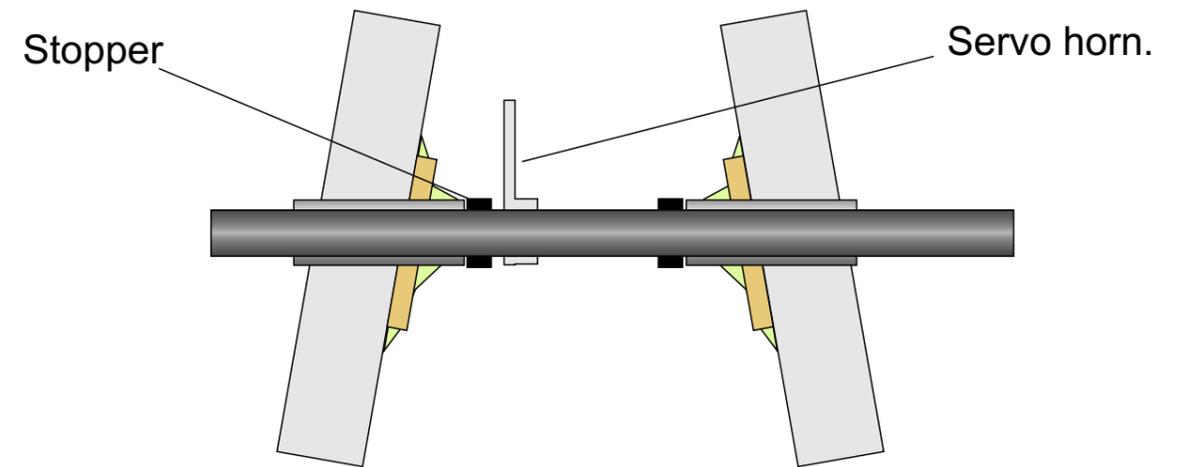


Create the assembly below using the carbon tube to keep everything aligned while the glue sets.





drill out prop adapters and a servo horn to fit around the carbon tube as shown. Then connect your servo as shown in the photos.

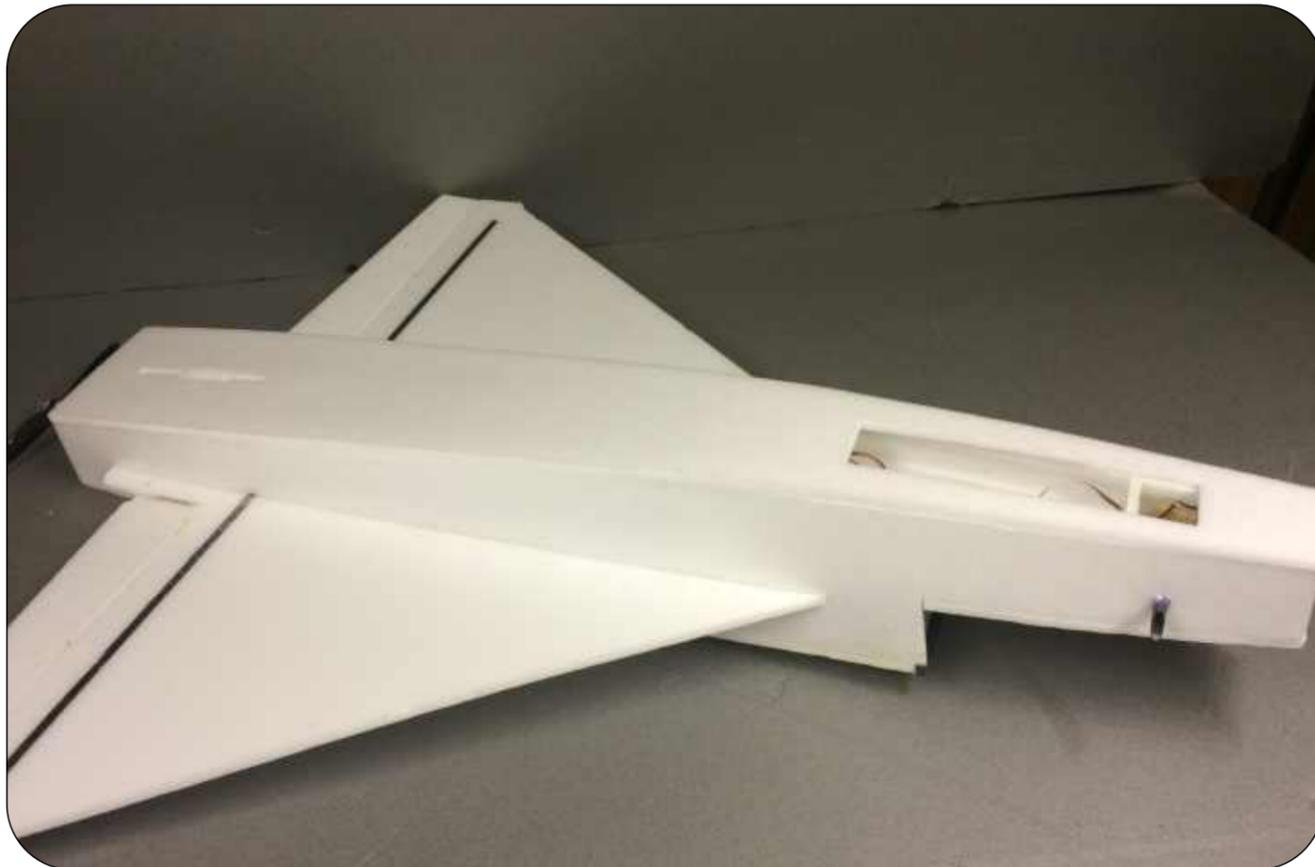
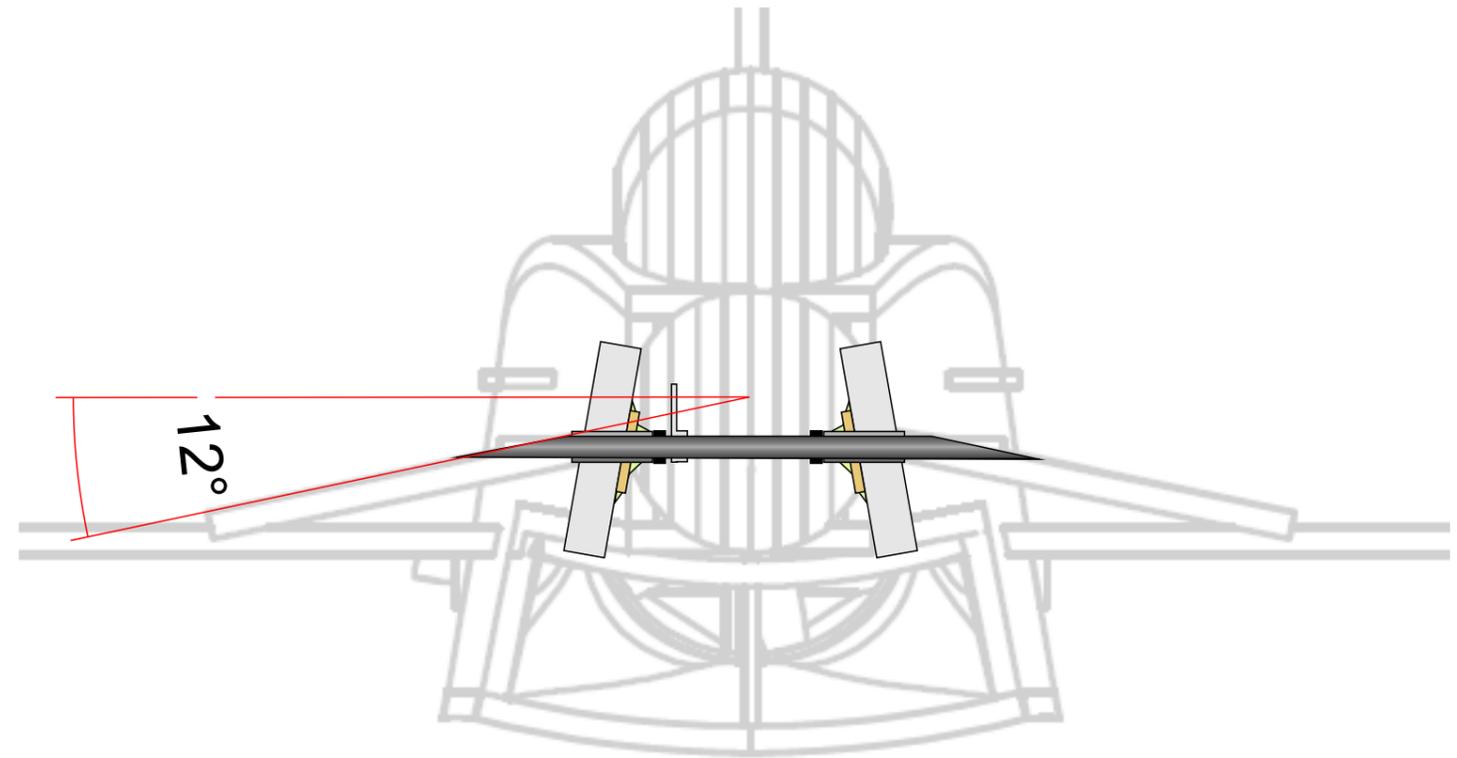


At the end of your build when the servo as set up and the canards are correct, Glue the servo horn in place to prevent it from slipping.



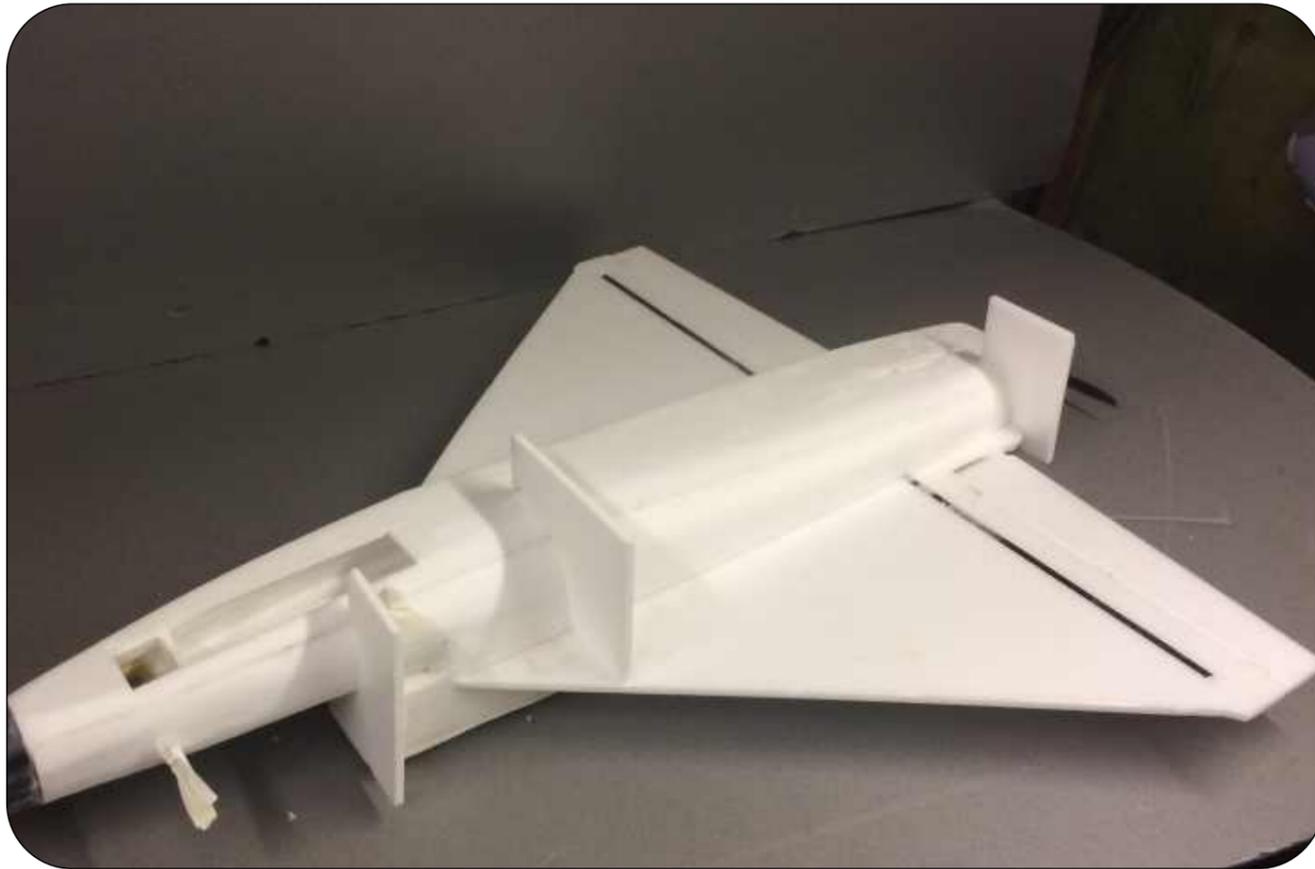


Sand the carbon tube to match the canards as shown.



Attach the Fuselage top (part 19) to the main assembly.





Carefully shape the fuselage using the templates.

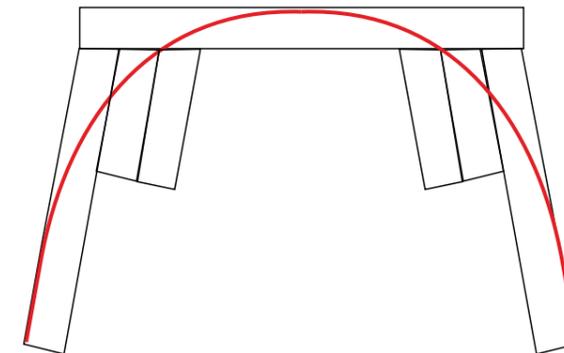
I find the following steps are the best way to get to shape quickly and painlessly

Using a retractable knife to reveal a long edge, then slice the bulk of the corners off.

Use a palm orbital sander like the Black & Decker mouse to get the majority of the rest of the foam to shape.

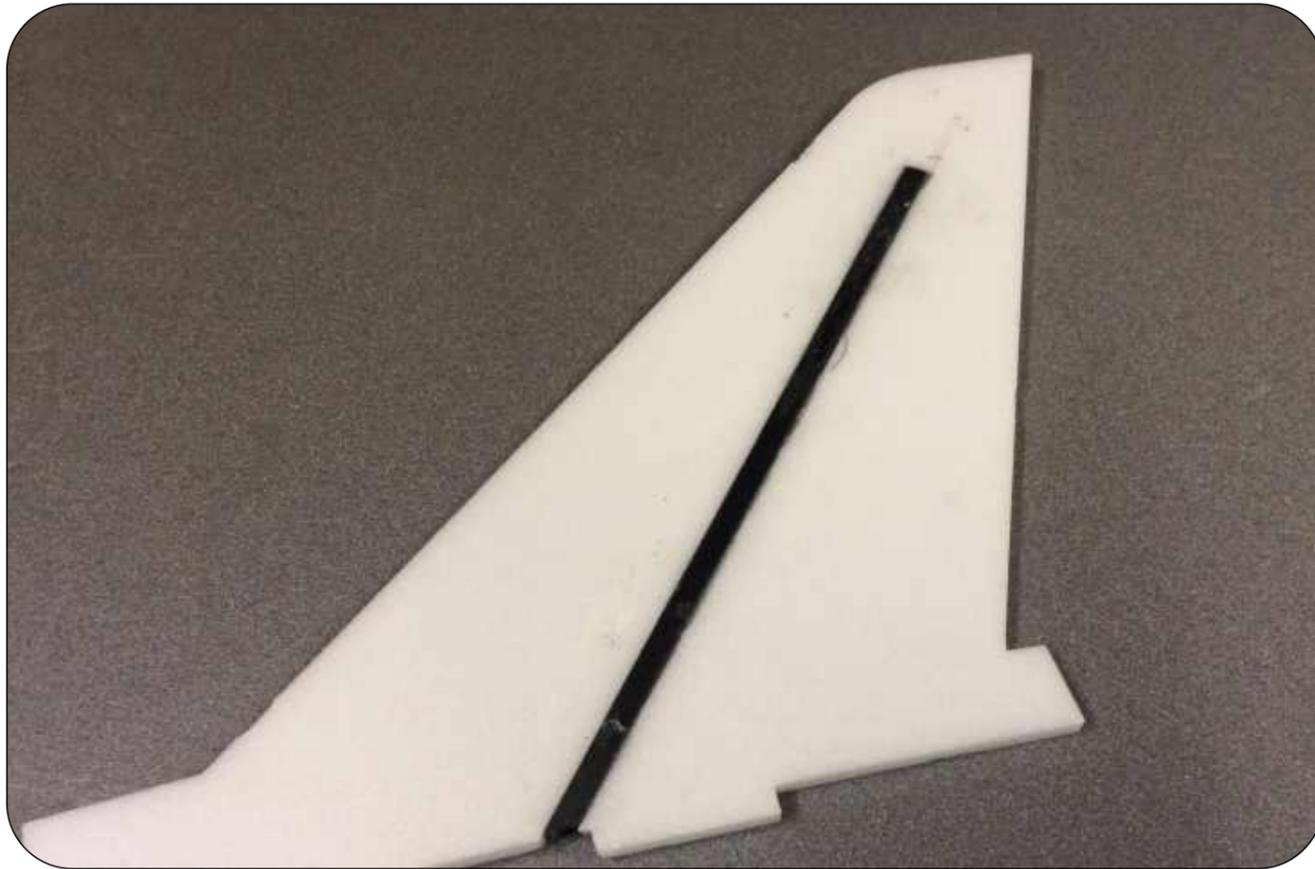
Then carefully work the foam using sandpaper and a block, starting at 120 grit until about 200 grit.

The model has been designed to take lots of foam off until the shape is reached.

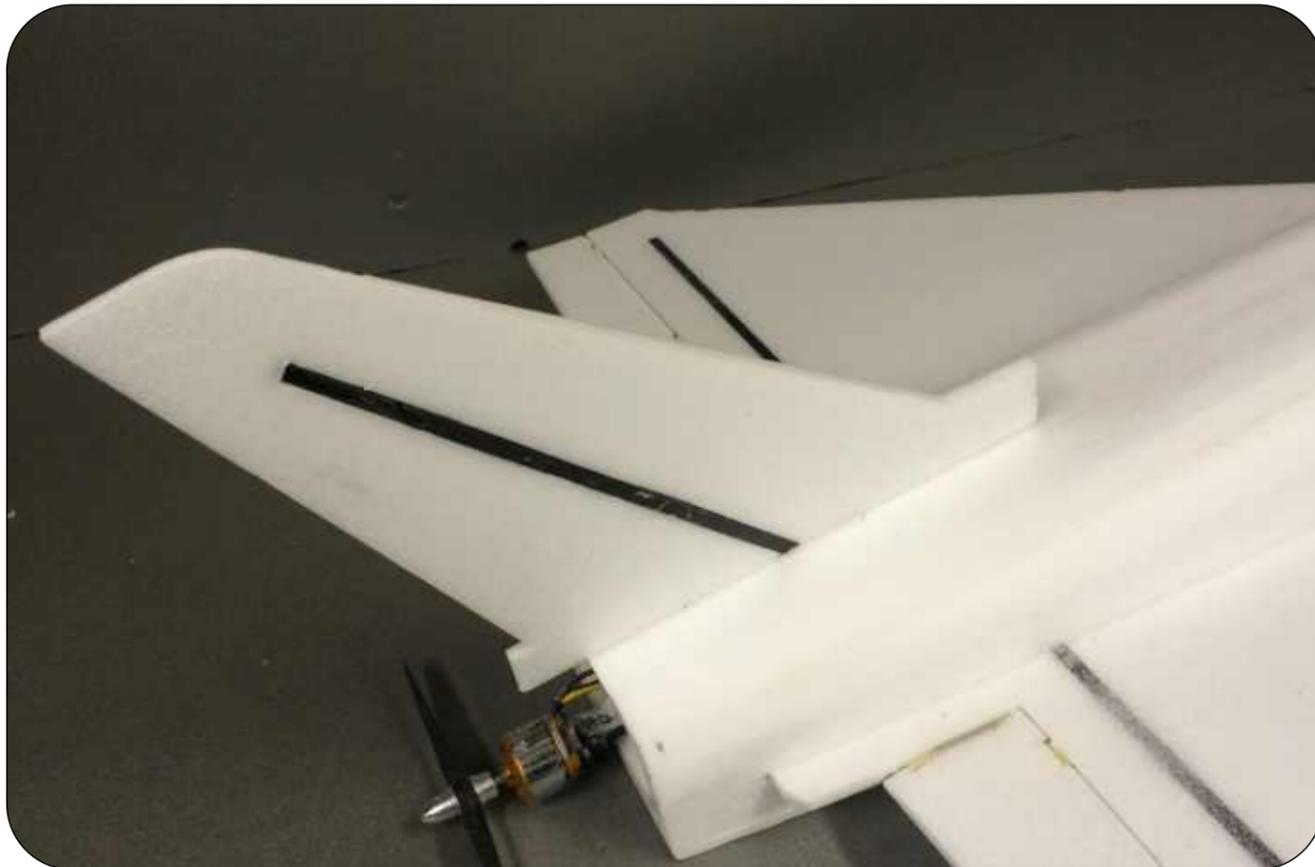


Assemble and attach the turtledeck innards (part 22)





My depron was slightly bent, so I decided to straighten and reinforce the Vertical Stabiliser (part 21) using a carbon spar. This is optional, and it will fly fine without.



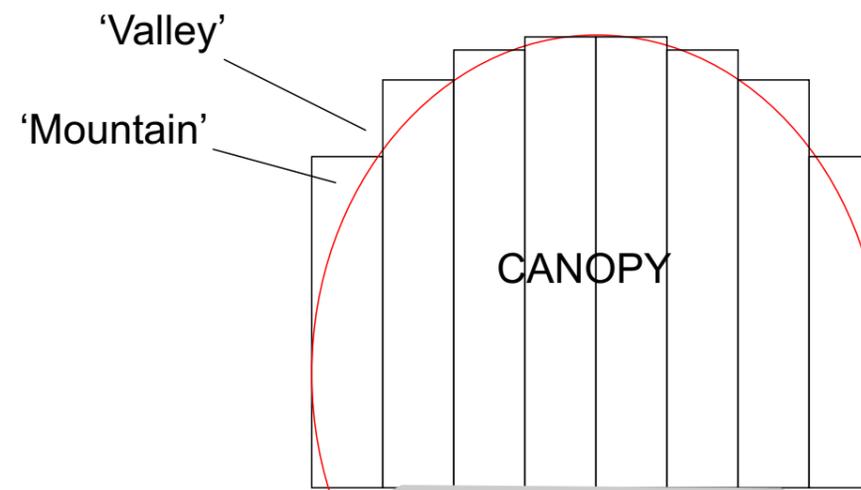
Attach the Vertical Stabiliser (part 21) to the main assembly





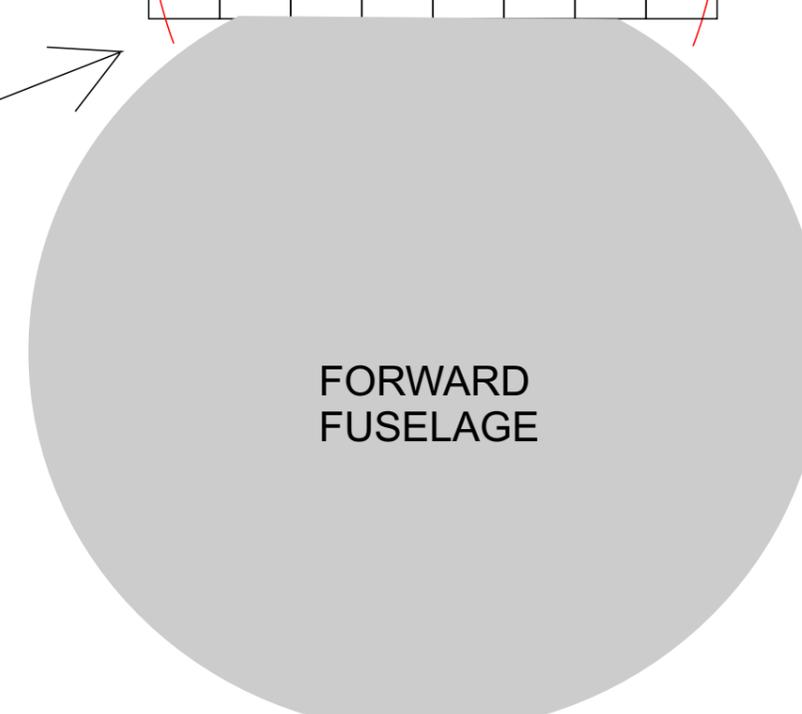
If you want a scale appearance, Before you cut out the canopy parts, consider adding 7mm on the two outer pieces (not the elliptical piece) downwards in order to better fit the shape of the fuselage. (see diagram below)

Glue the canopy parts together using UHU por.



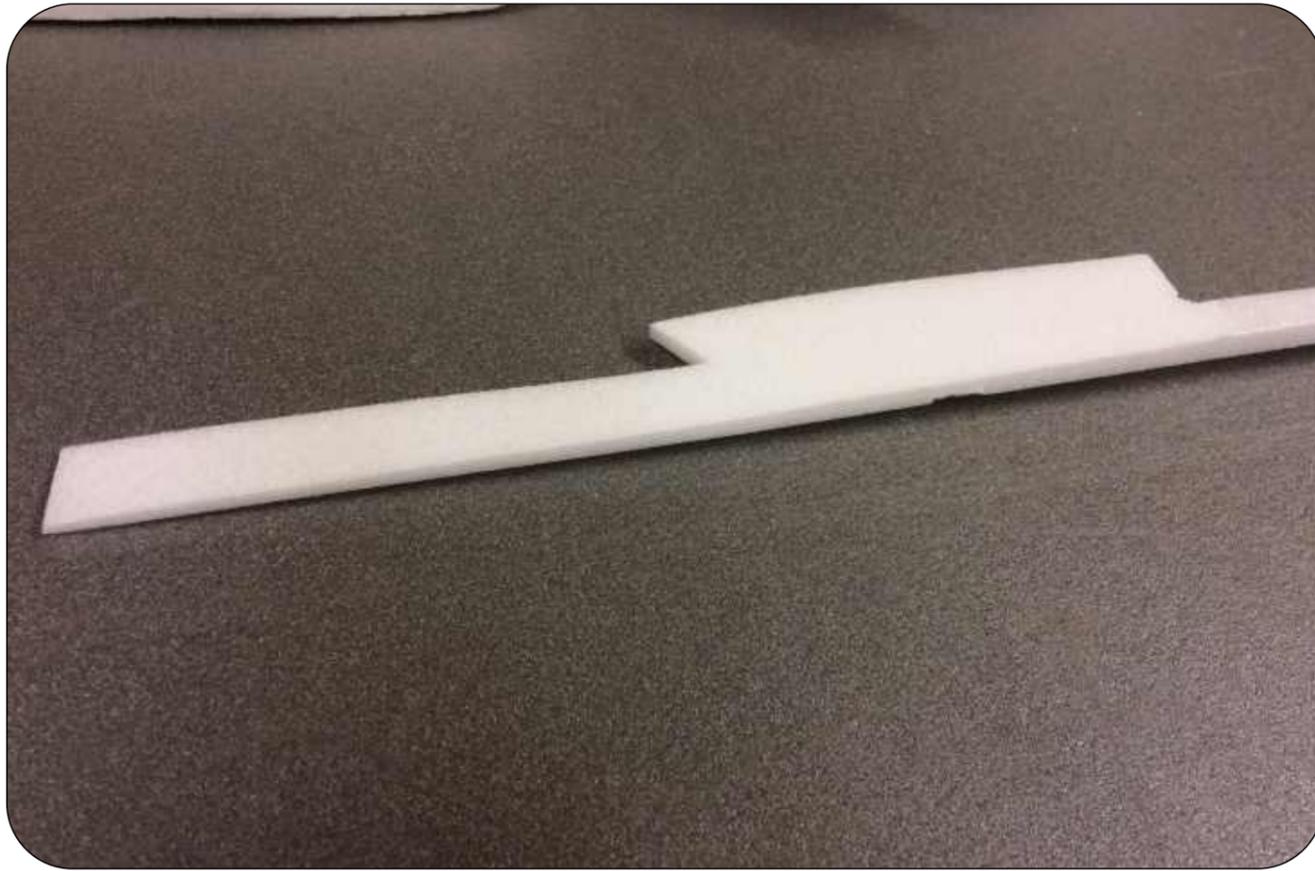
Schematic illustration (not to scale)

consider extending the canopy to fill this gap.



Sand the 'mountains' down until the 'valleys' are met.



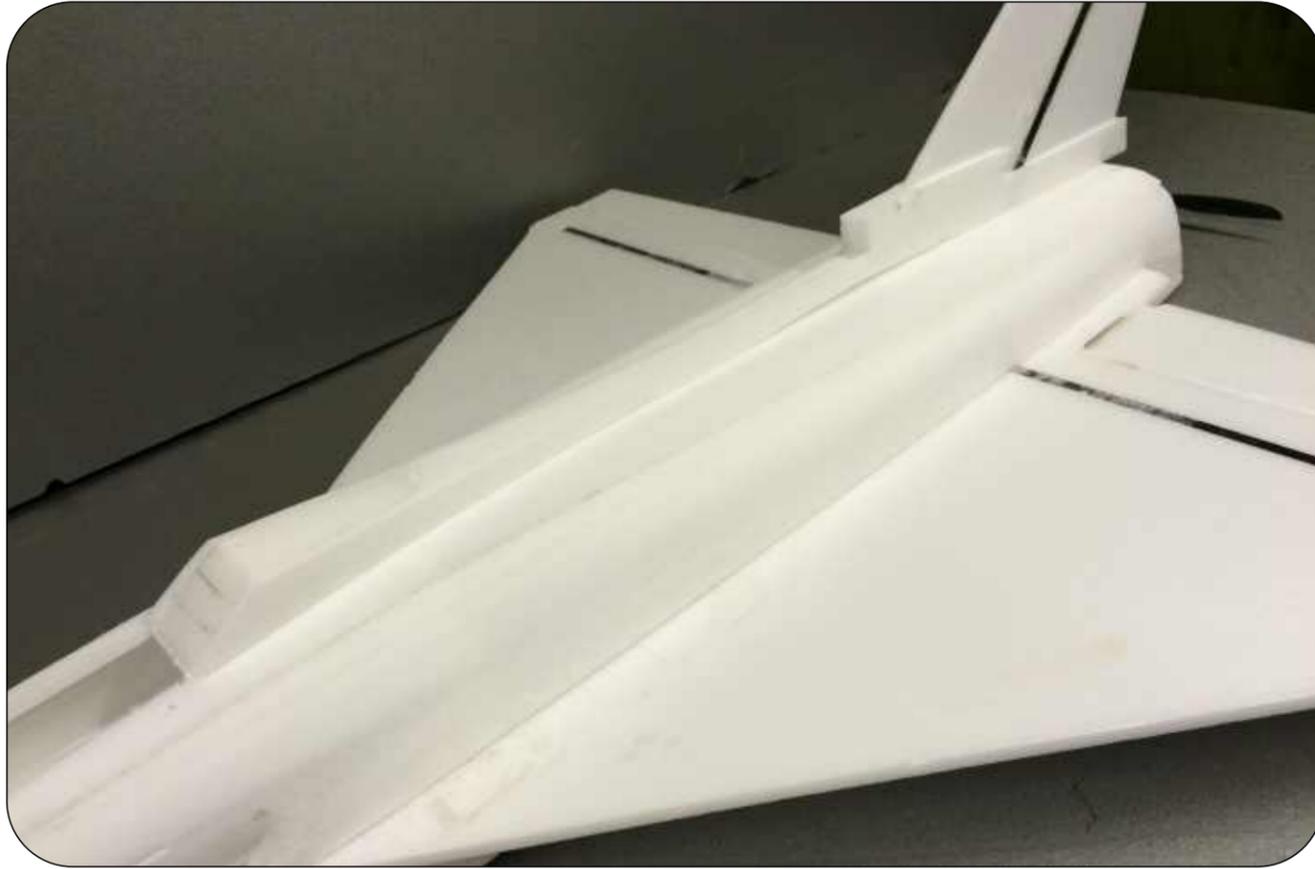


Sand the 6mm to around 2-3mm thick towards the rear, and by looking at a photograph of an actual plane, shape the top parts to look like the photos.



Glue to the turtledeck innard assembly (part 22), then onto the aircraft.





Flatten the top of the turtledeck innards (part 22) to match the side pieces as shown



Mark the turtledeck with the shape of the canopy as shown.





Sand Turtledeck to match the canopy as you have marked.



Curve the splitter with a heatgun,

Sand the leading edge, and cut a slot in the trailing edge.





Glue together the nosecone pieces, and sand away the 'mountains' until you are left with a smooth nosecone (below)

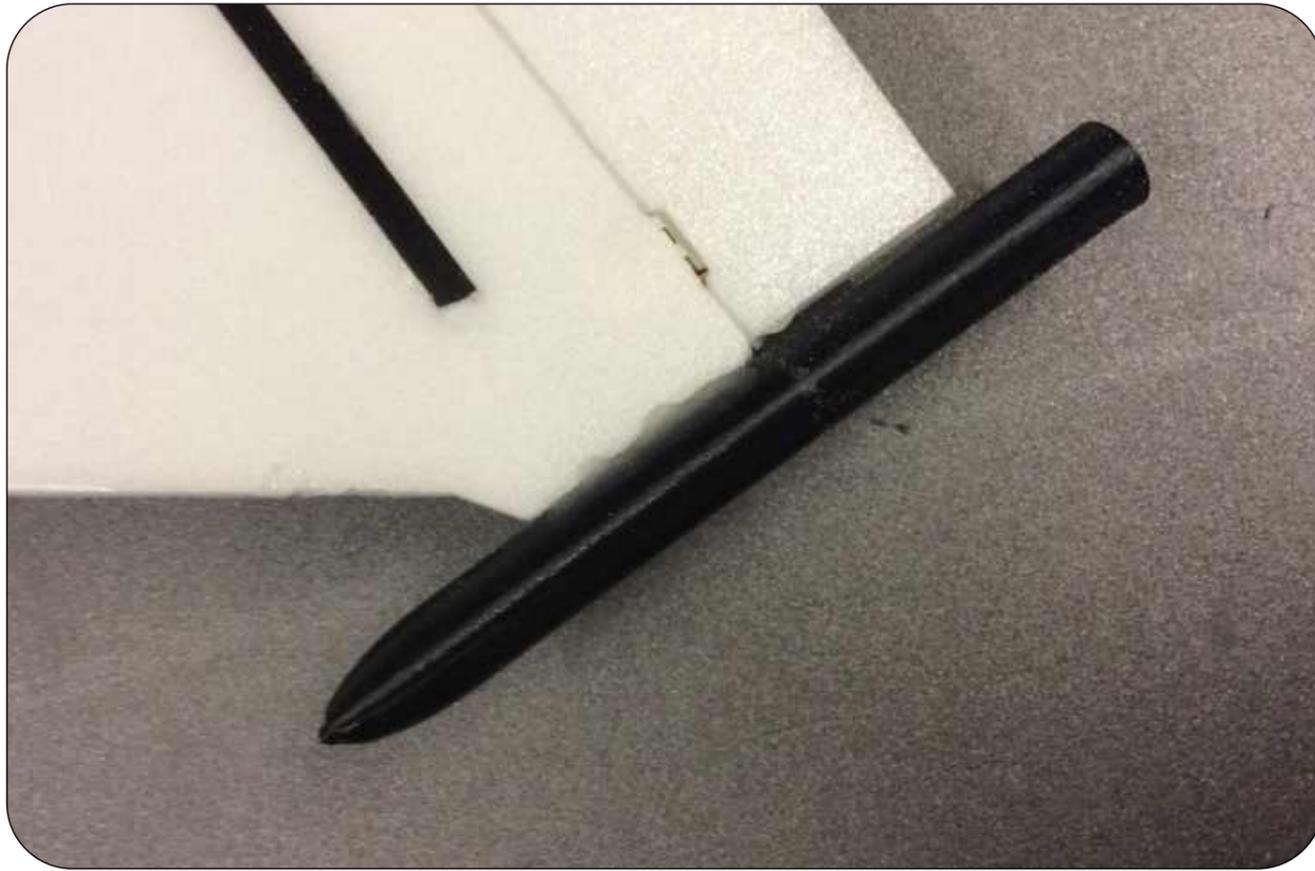




Prepare the Canards. Taper the trailing edges and apply lightweight filler/water mix to close the pores.

Glue into place using epoxy - ensuring the 12 degree angle is maintained. Ensure no glue gets near the aluminium tubes!



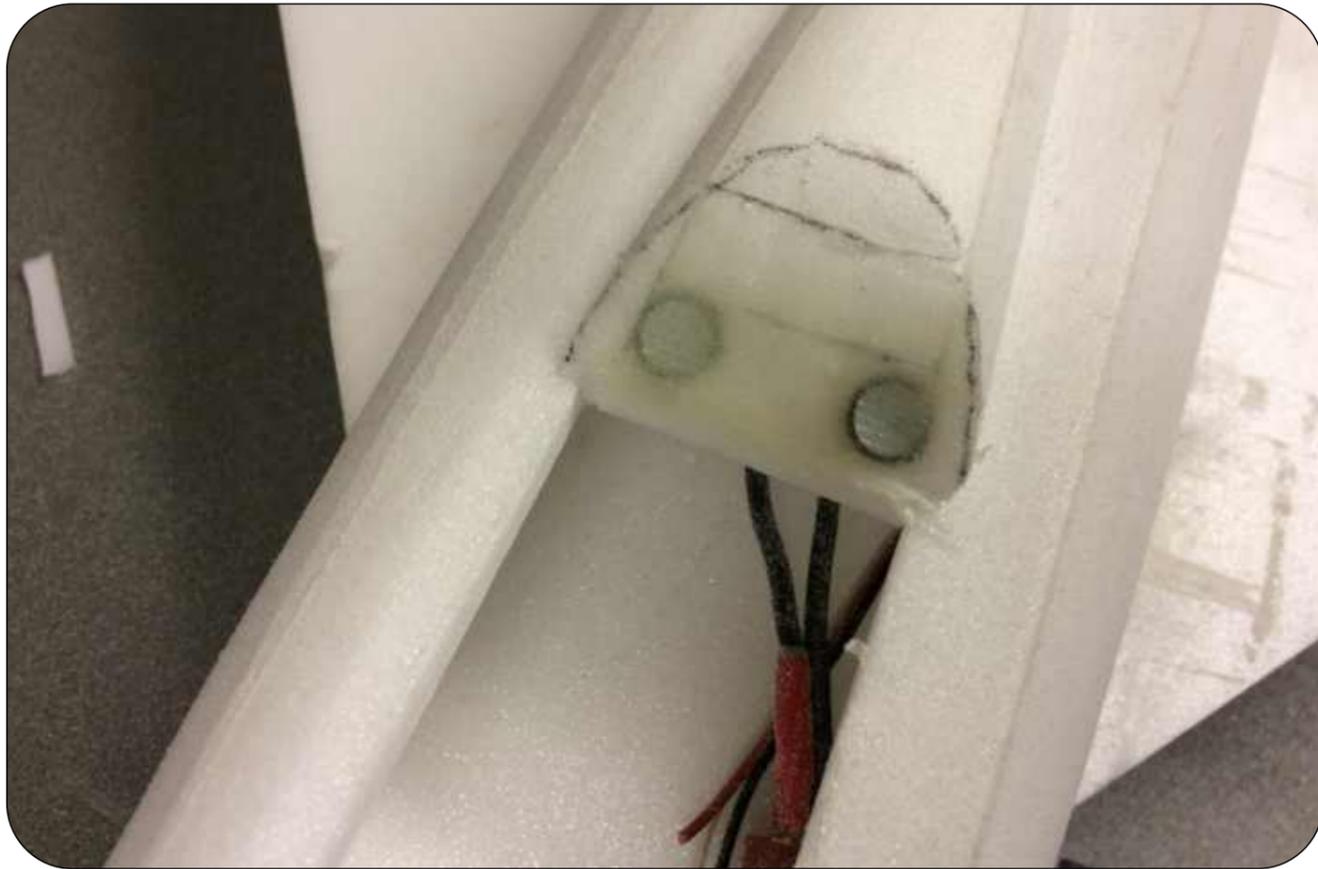


Glue the wing pods on using epoxy - note that the port and starboard pods have a different shape.

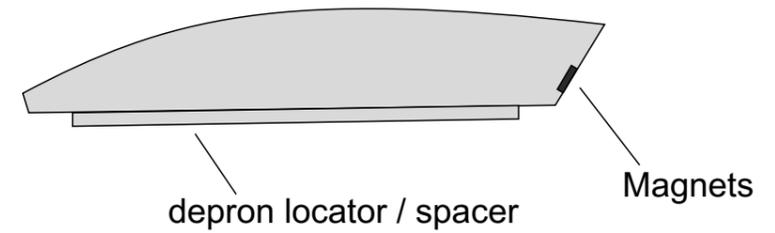
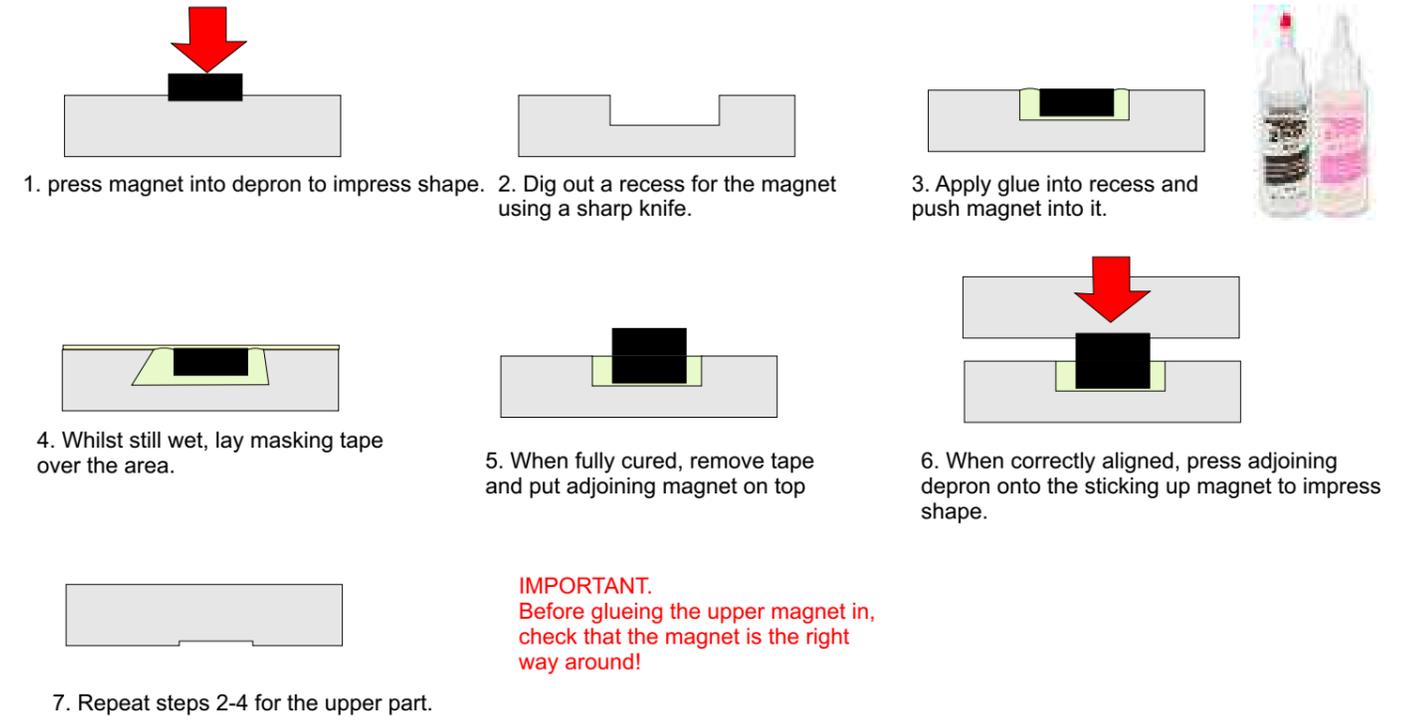
Either make from Balsa or 3d print.

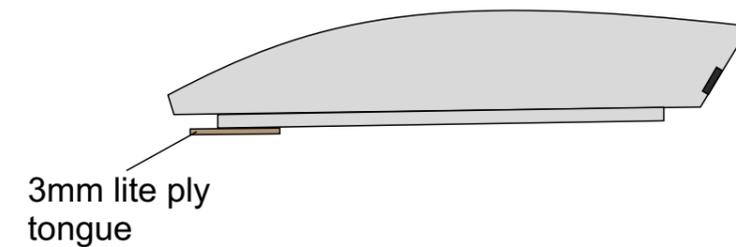
Trim the elevons to ensure clearance.



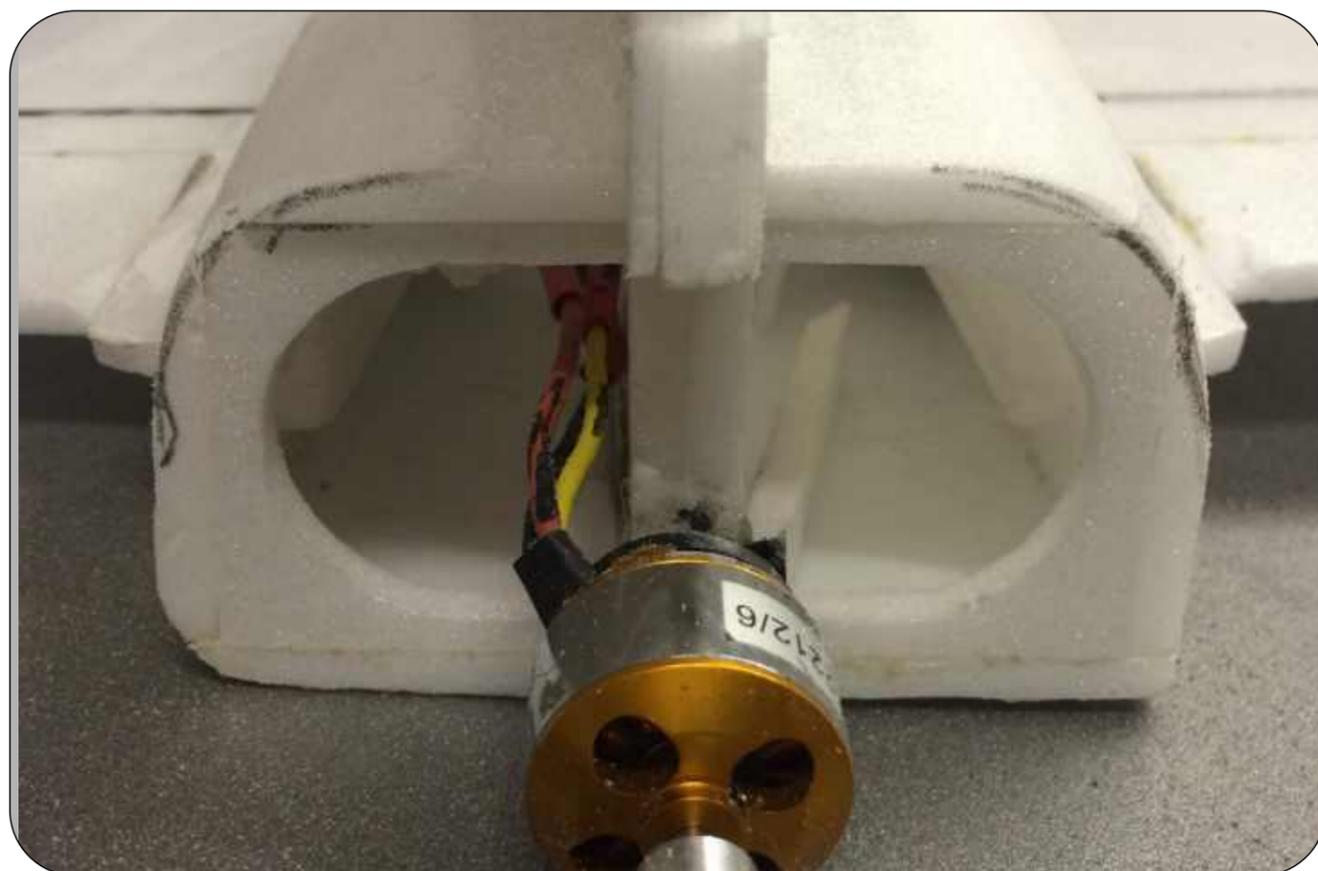


Rare-earth Magnet attachment process





Create a 3mm lite ply lip at the front end, and 2 rare earth magnets at the rear end..

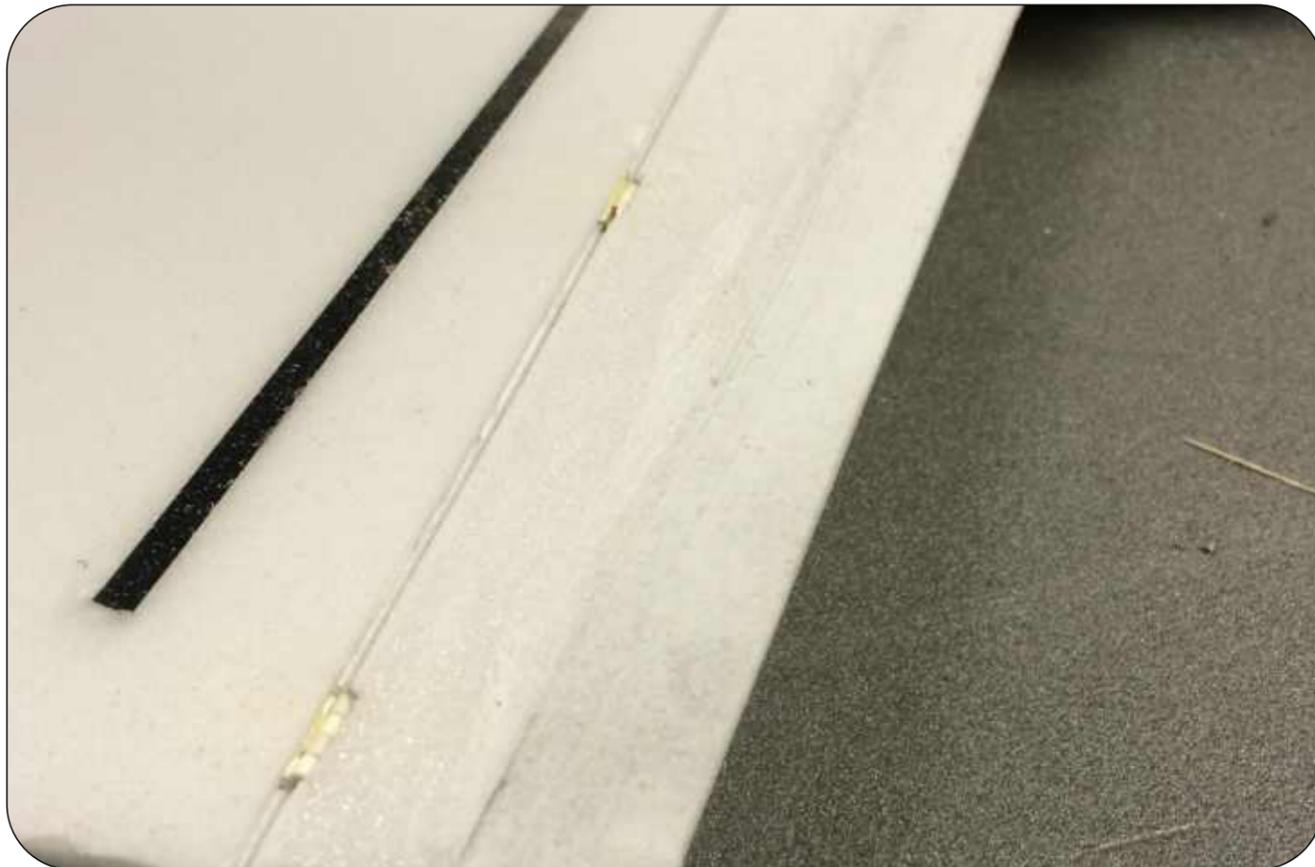
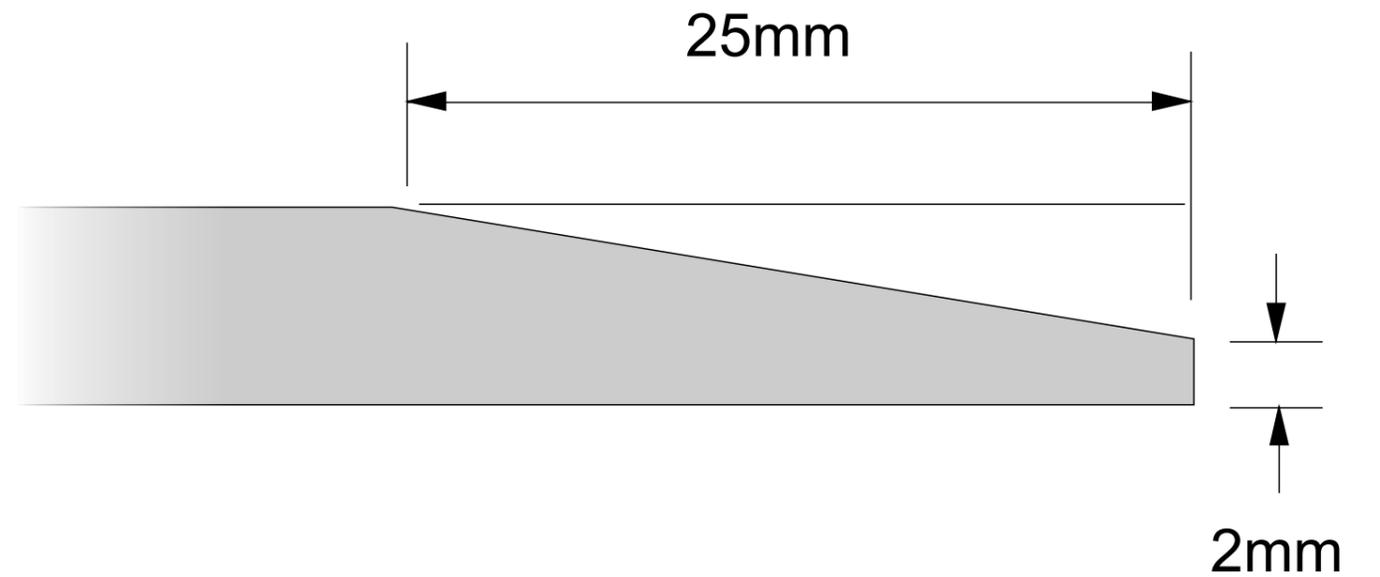


Fix the motor securely to the motor mount.





Slice away the corners of the trailing edges and then sand smooth.



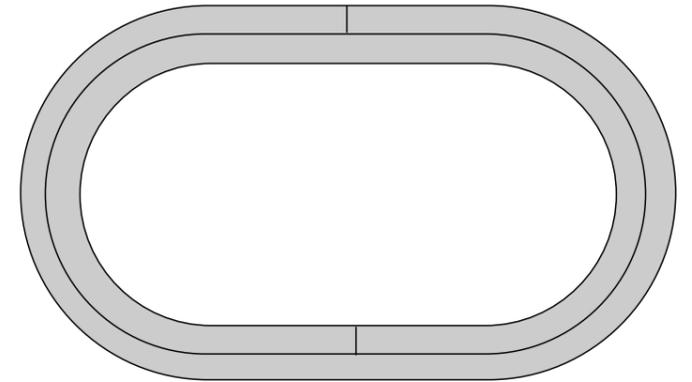
Rub lightweight filler mixed with water into the open pore to make a paintable surface and the strengthen.





Create the exhaust by using 2 x 3mm grey depron wrapped around the jig. Use masking tape on the inside to help keep the ends together on the inside layer. Use UHU por between the layers.

Alternatively you can use 3d printed parts





Glue the exhaust onto your model.

As an alternative to depron, you can use 3d printed parts to give a more realistic effect.





After fixing the exhausts, Sand the rear fuselage around the exhausts to match the shape, top and bottom.



Congratulations! Your model is complete.

For painting and finishing information, please refer to the finishing guide.



Use photo's to help shape
Your model to represent
the real plane



Eurofighter Typhoon