JETWORKS

McDonnell F-101 Voodoo

Parkjet

Photograph shown is the real aircraft.

2nd Generation Fighter / Bomber

Construction Guide

Voodoo History

The McDonnell F-101 Voodoo is a supersonic jet fighter which served the United States Air Force (USAF) and the Royal Canadian Air Force (RCAF).

Initially designed by McDonnell Aircraft Corporation as a long-range bomber escort (known as a penetration fighter) for the USAF's Strategic Air Command (SAC), the Voodoo was instead developed as a nuclear-armed fighter-bomber for the USAF's Tactical Air Command (TAC), and as a photo reconnaissance aircraft based on the same airframe. An F-101A set a number of world speed records for jet-powered aircraft, including fastest airspeed, attaining 1,207.6 miles (1,943.4 km) per hour on 12 December 1957. They operated in the reconnaissance role until 1979.

Delays in the 1954 interceptor project led to demands for an interim interceptor aircraft design, a role that was eventually won by the B model of the Voodoo. This required extensive modifications to add a large radar to the nose of the aircraft, a second crew member to operate it, and a new weapons bay using a rotating door that kept its four AIM-4 Falcon missiles or two AIR-2 Genie rockets hidden within the airframe until it was time to be fired. The F-101B entered service with USAF Air Defense Command in 1959 and the Royal Canadian Air Force in 1961. US examples were handed off to the USAF Air National Guard where they served until 1982. Canadian examples remained in service until 1984.

Designers Notes

The Voodoo along with the other three 'Century Jets' made quite an impression on me as a child growing up.. the F-104 Starfighter interceptor often stole the headlines with its rocket-like shape whereas the Voodoo is one of the planes that is often forgotten and certainly isn't a common choice to make as a radio control model.

Chosen by Tobias Gaus as a Jetworks Prize winner its great to see this bird come to life again,

Available as a single 64 or 70mm EDF, or pusher prop.

Their are various nosecones and canopies available within the plans to help you create your favourite version,

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-baloons 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!

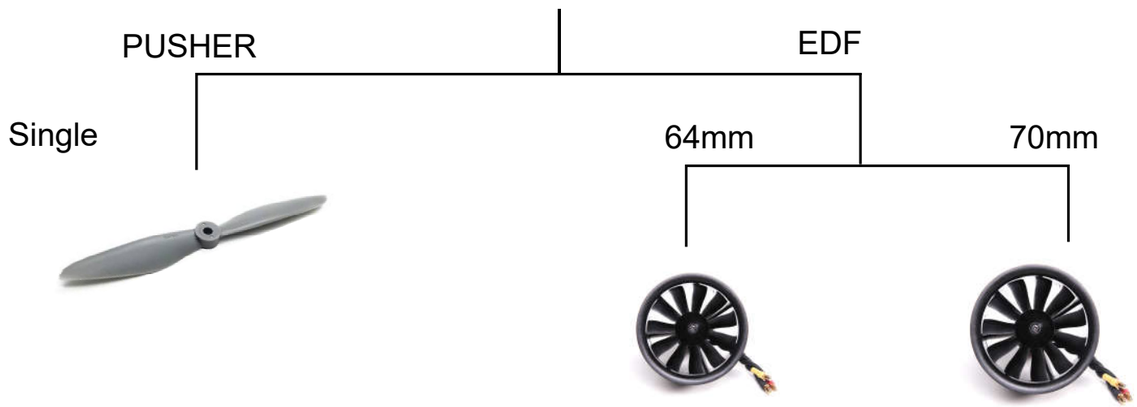
Tapes
> For holding parts tightly together whilst glue sets
- Low tack masking tapes

> For leading edges, hinges, general strengthening
- 3M Gift tape (Purple - not green one!) - I prefer lightweight plastic hinges.

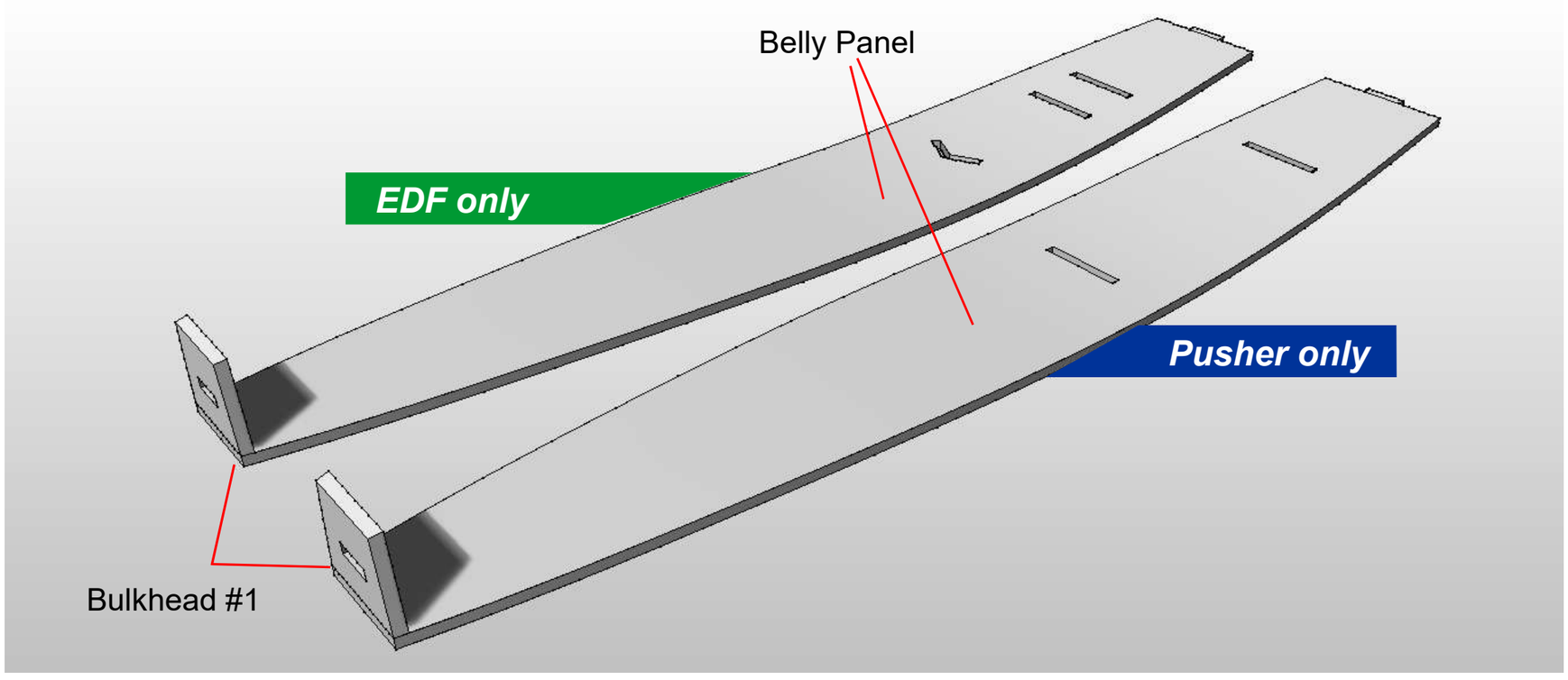
Cutting parts
1. Print the plans,
2. Cut around each part using scissors - allow a border of approx (1/4") 6mm
3. Use either 3M spray mount or a very light coat of 3M 77 to the back of the parts and stick in an economical layout on the Depron foam.
4. Using a safety rule and craft knife over a cutting 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.

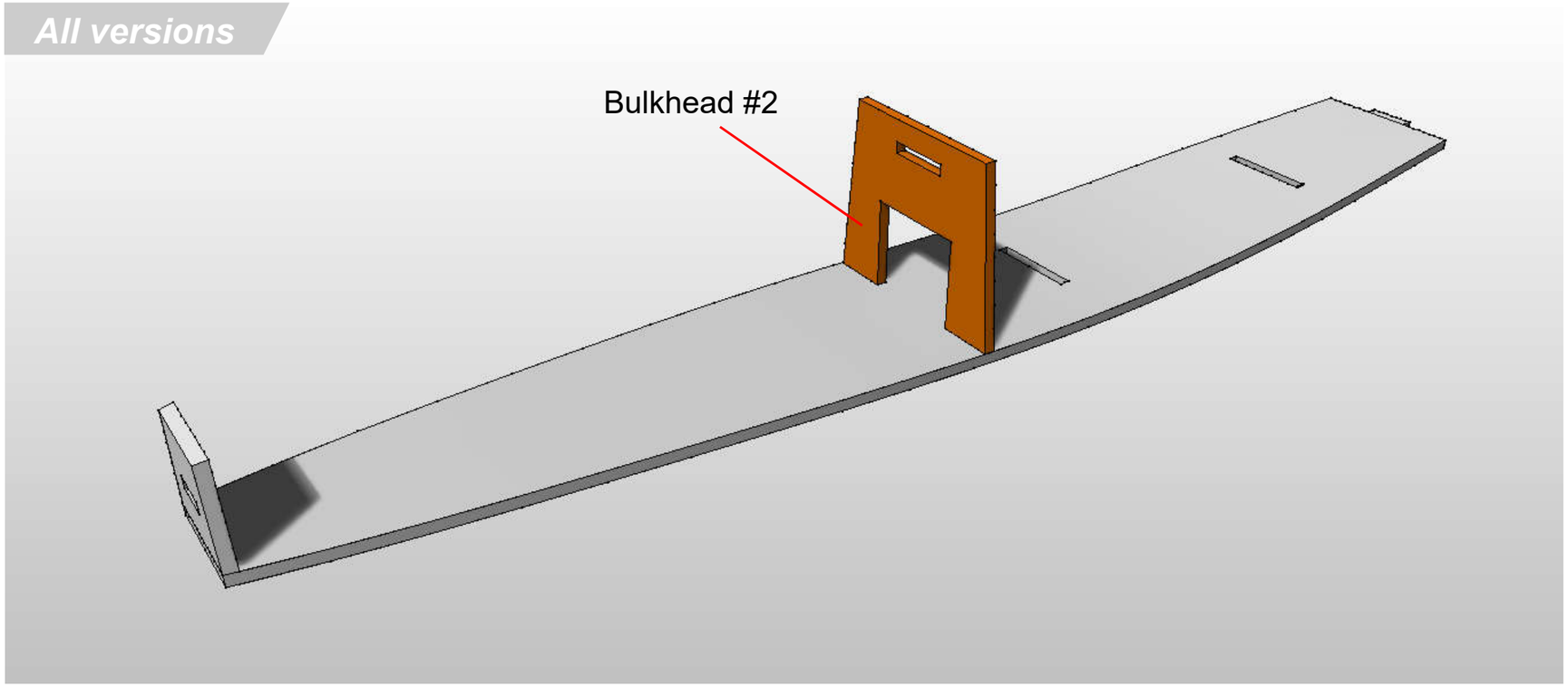


Choose your prefered variant and its powertrain.



Cut out the **Belly Panel** to suit your preferred Powertrain option.

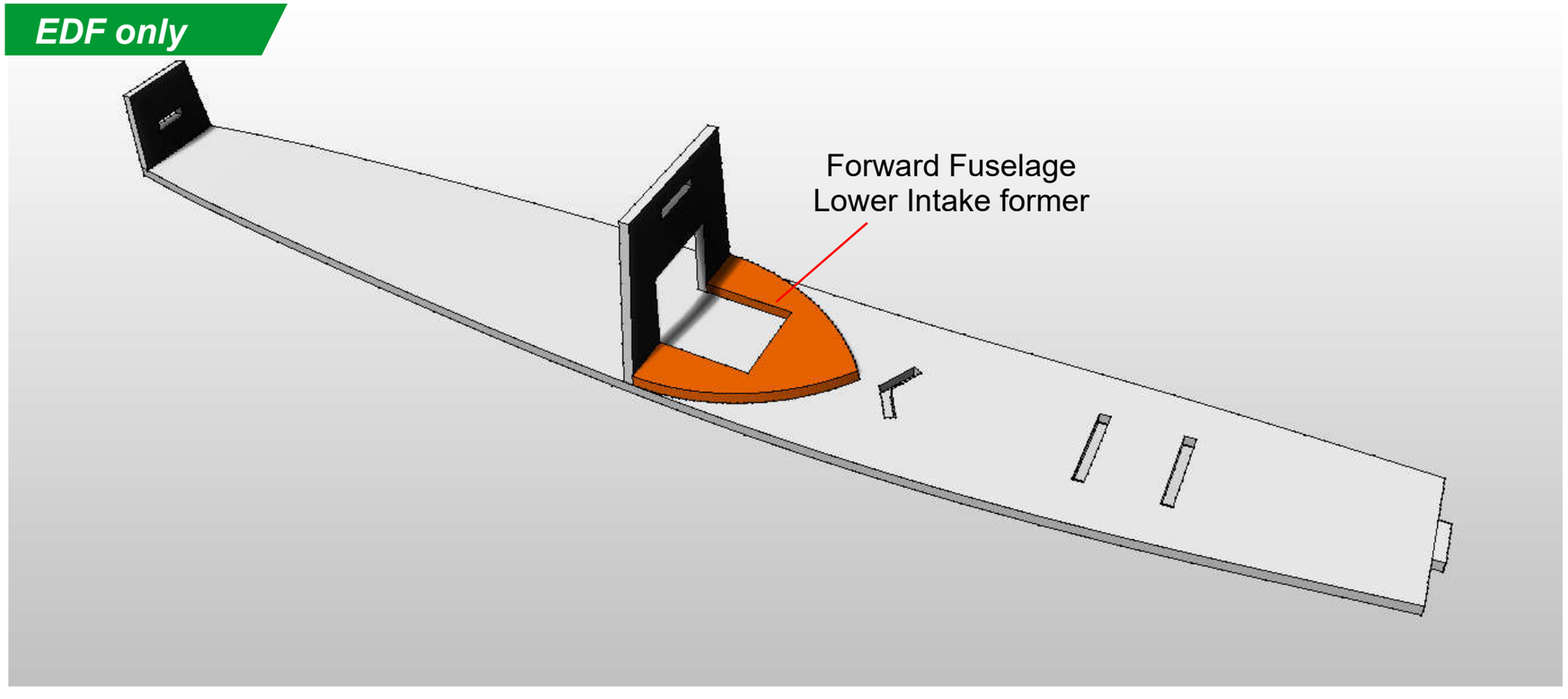
All versions



From the plans, mark the location of **Bulkhead #2** on the upper side of the Belly Panel.

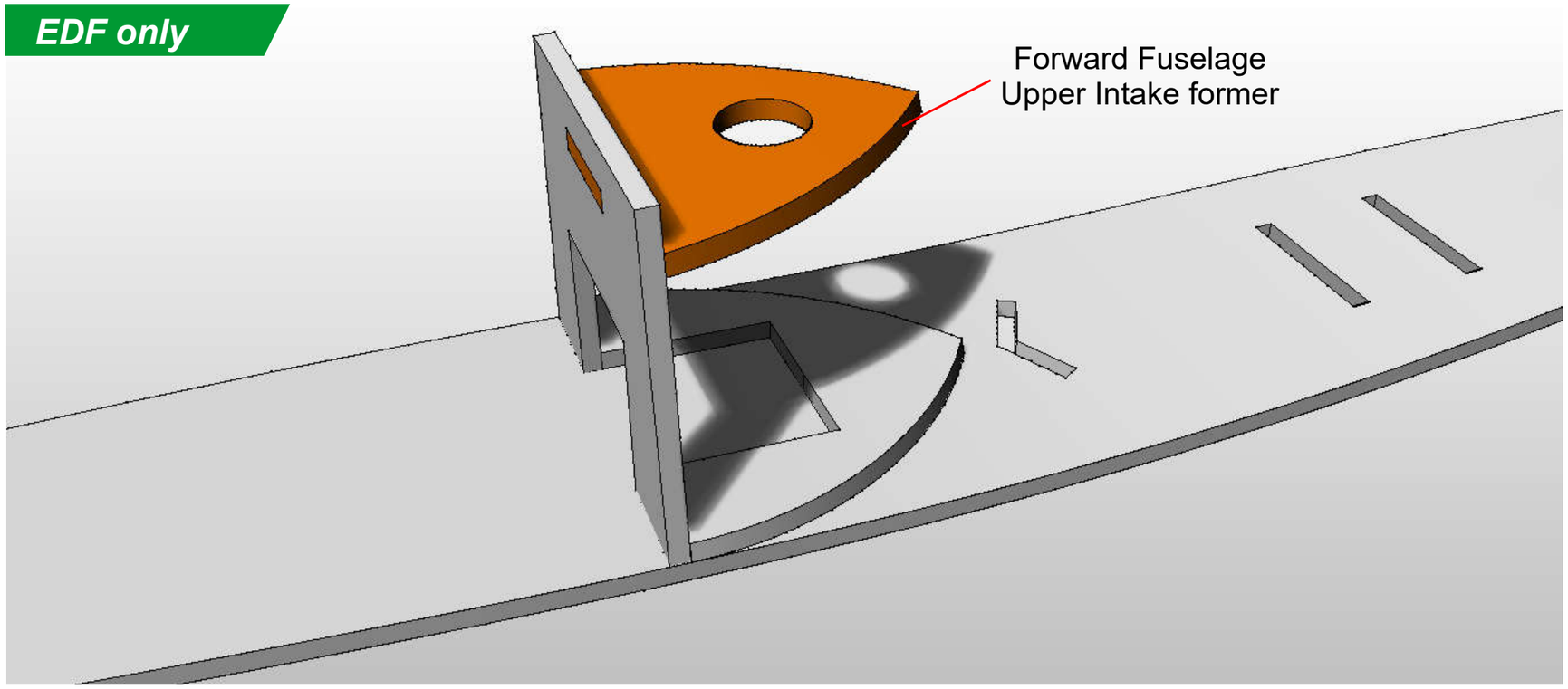
Glue in place.

EDF only



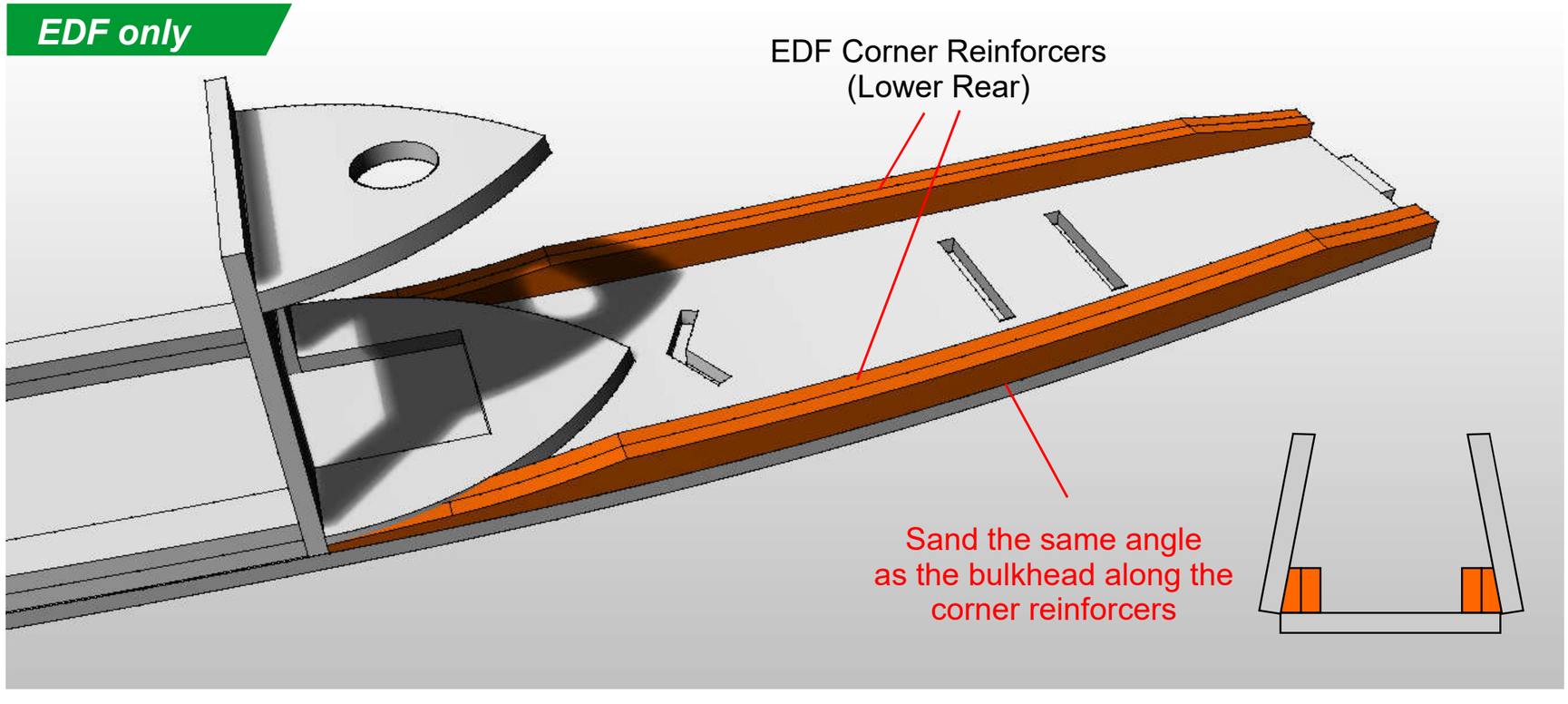
On the EDF version, glue the **Forward Fuselage Intake Former** in place against Bulkhead #2

EDF only



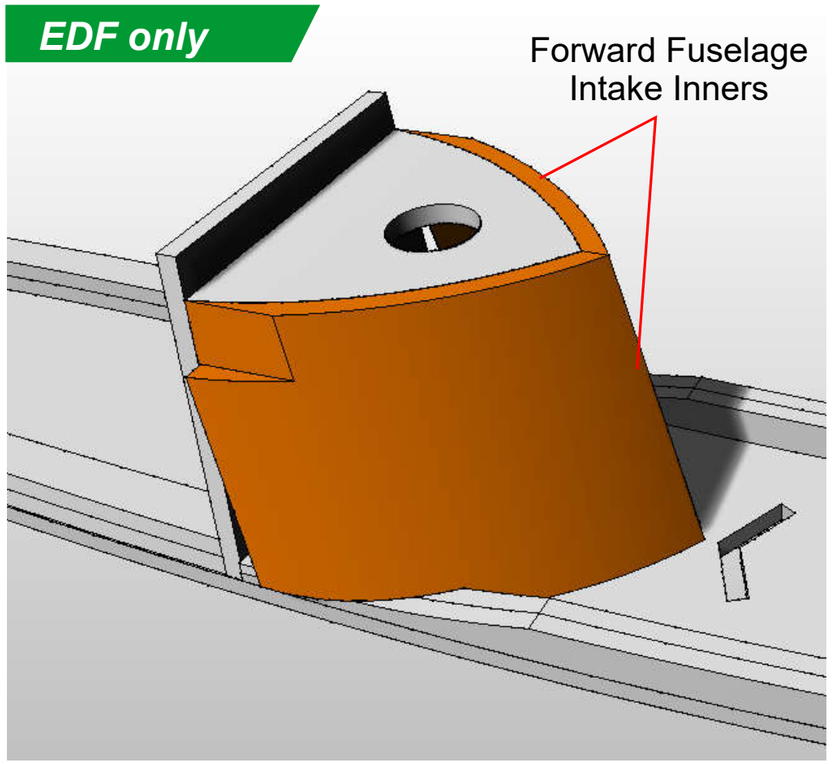
On the EDF version, glue the **Forward Fuselage Upper Intake Former** onto Bulkhead #2

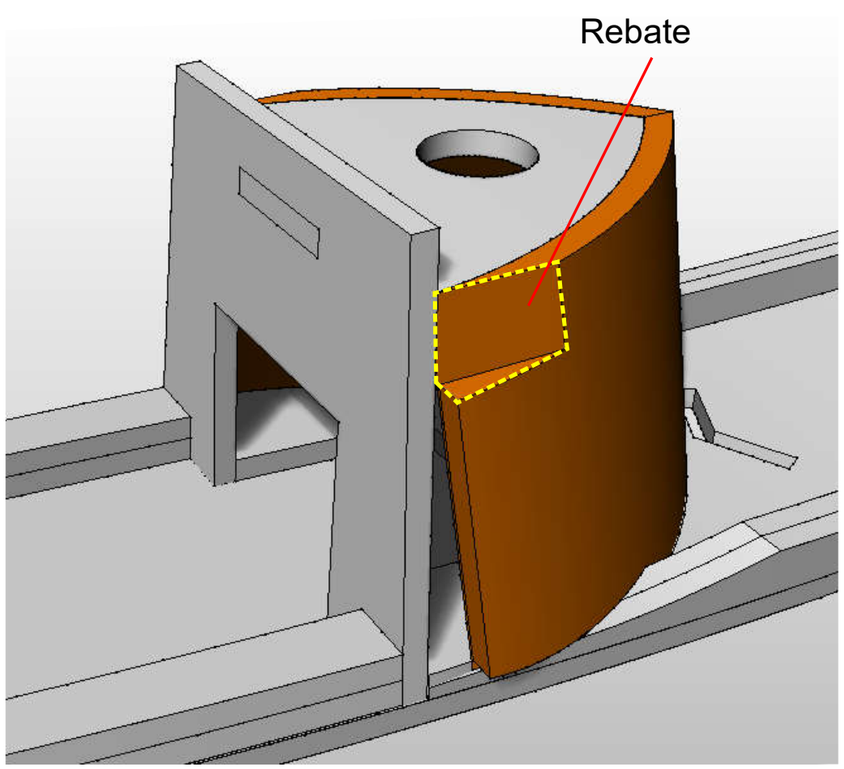
EDF only



On the EDF version, use the four EDF specific **Lower Rear Corner Reinforcers**, trimming around the Lower intake former as shown.

EDF only

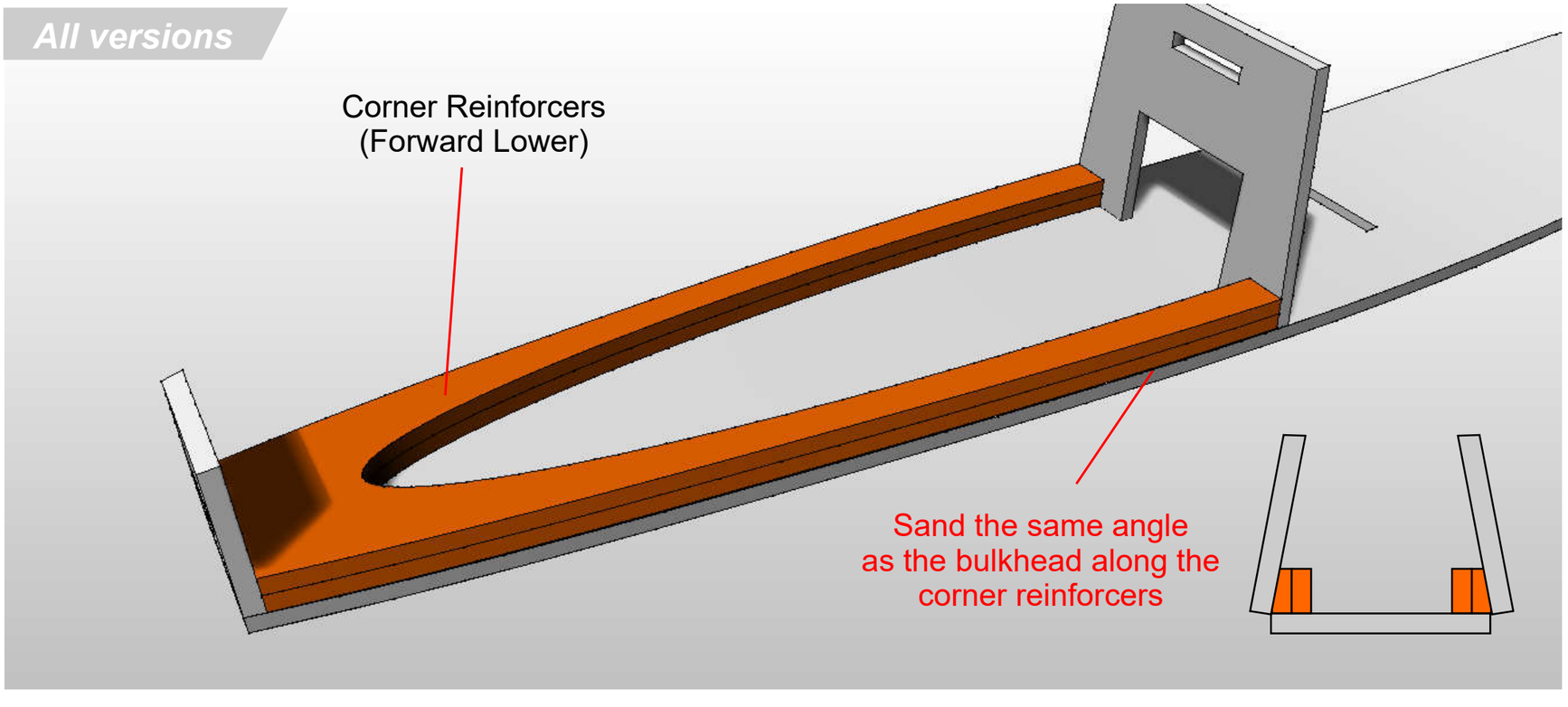




Pre shape the **Forward Fuselage Intake Inners** to match the shape perfectly by curling over a table edge.

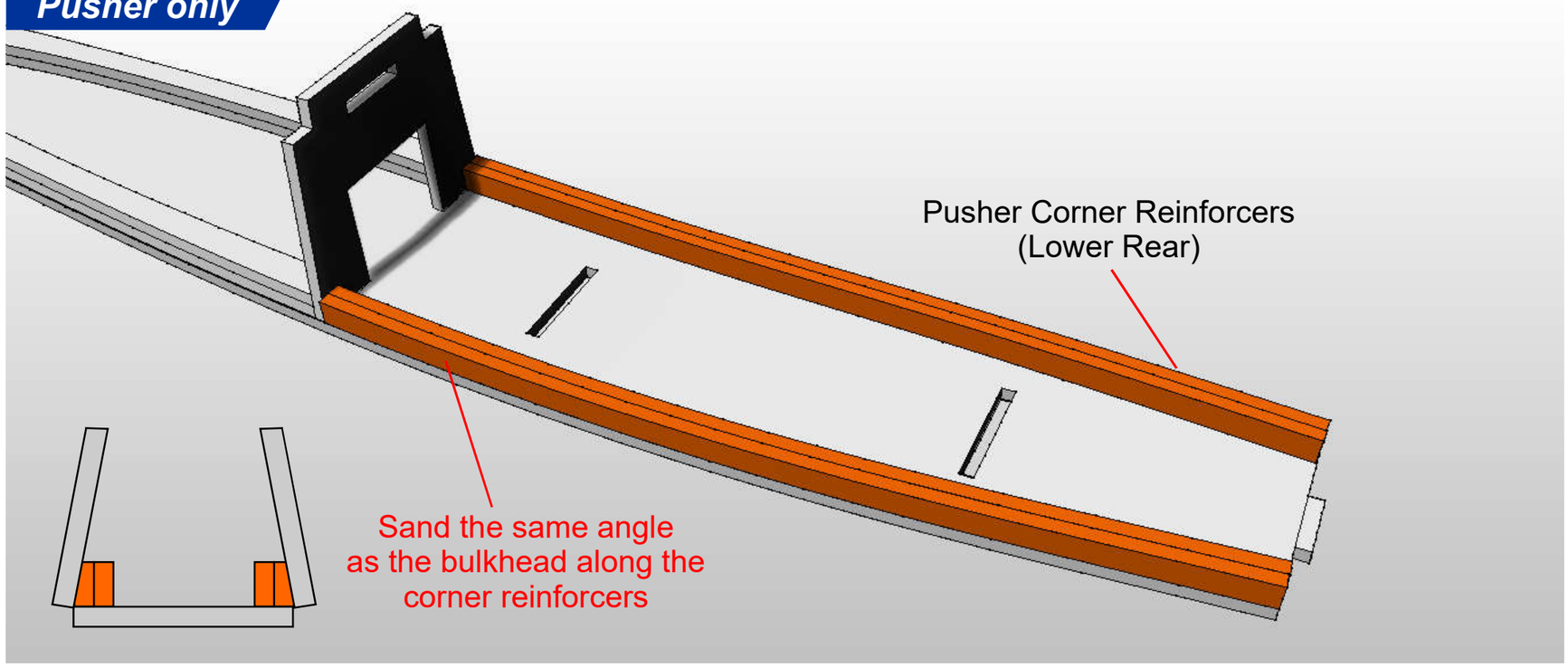
Glue in place then using a knife trim away the rebate.

All versions



Glue the two **Corner Reinforcer (Forward Lower)** pieces in place.

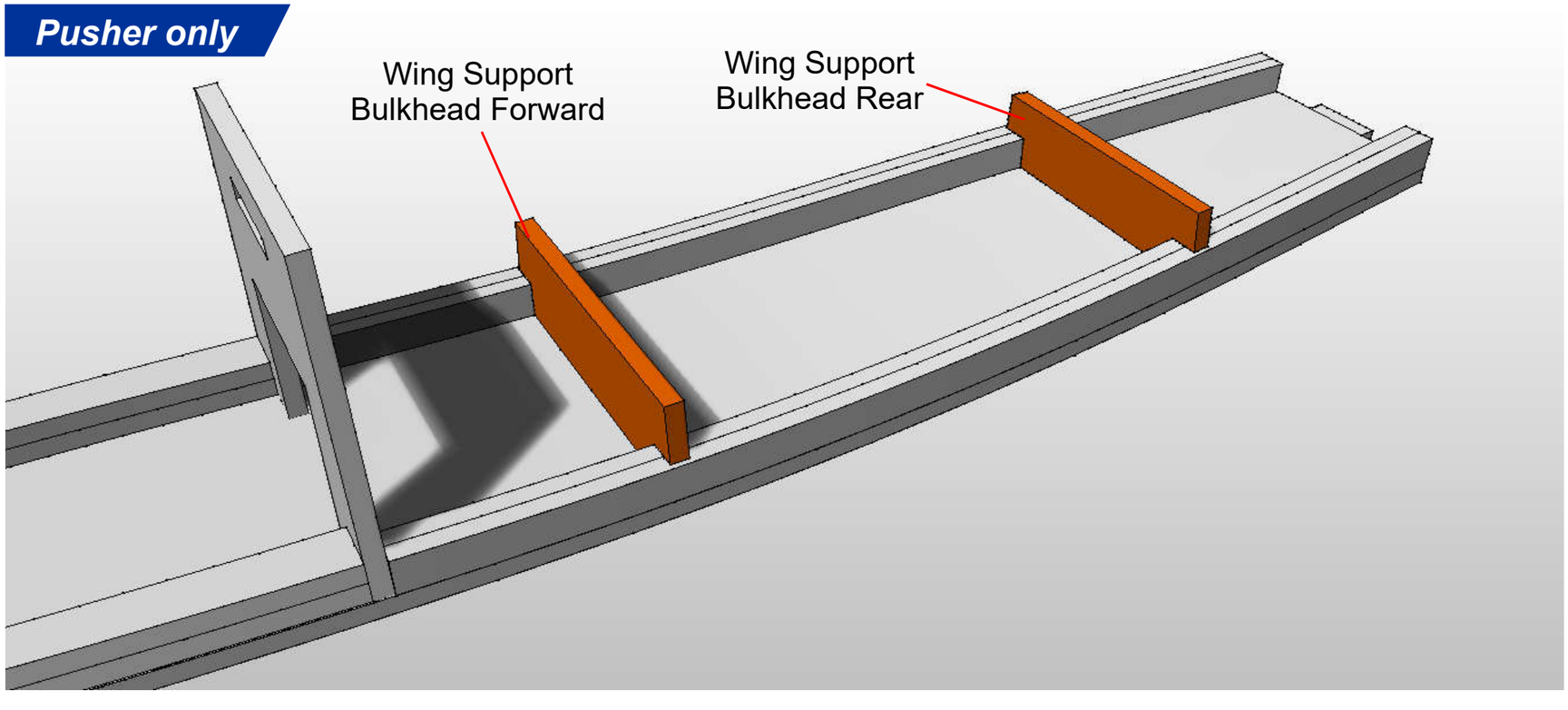
Pusher only



Pusher only

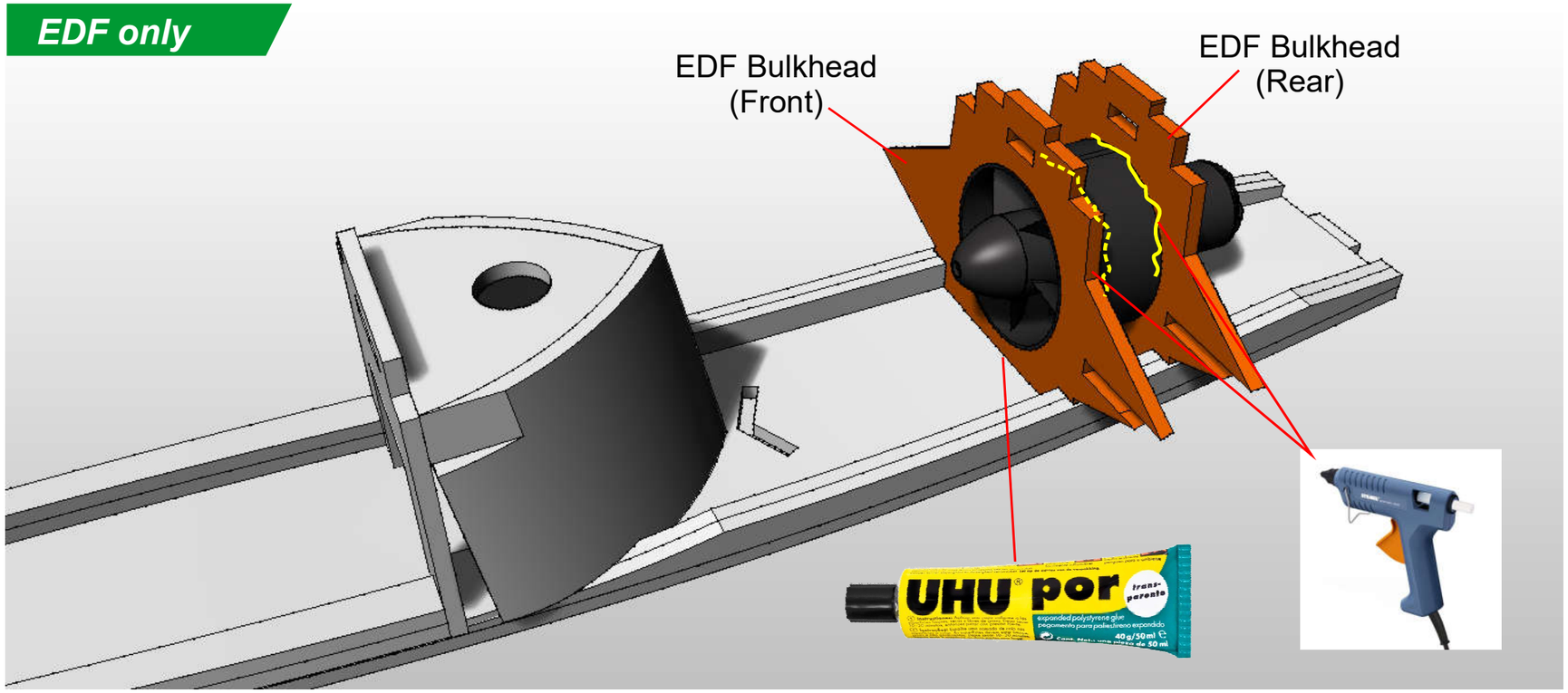
Glue the four **Corner Reinforcers (Lower Rear)** in place

Pusher only



Glue the two **Wing Support Bulkheads** to the assembly

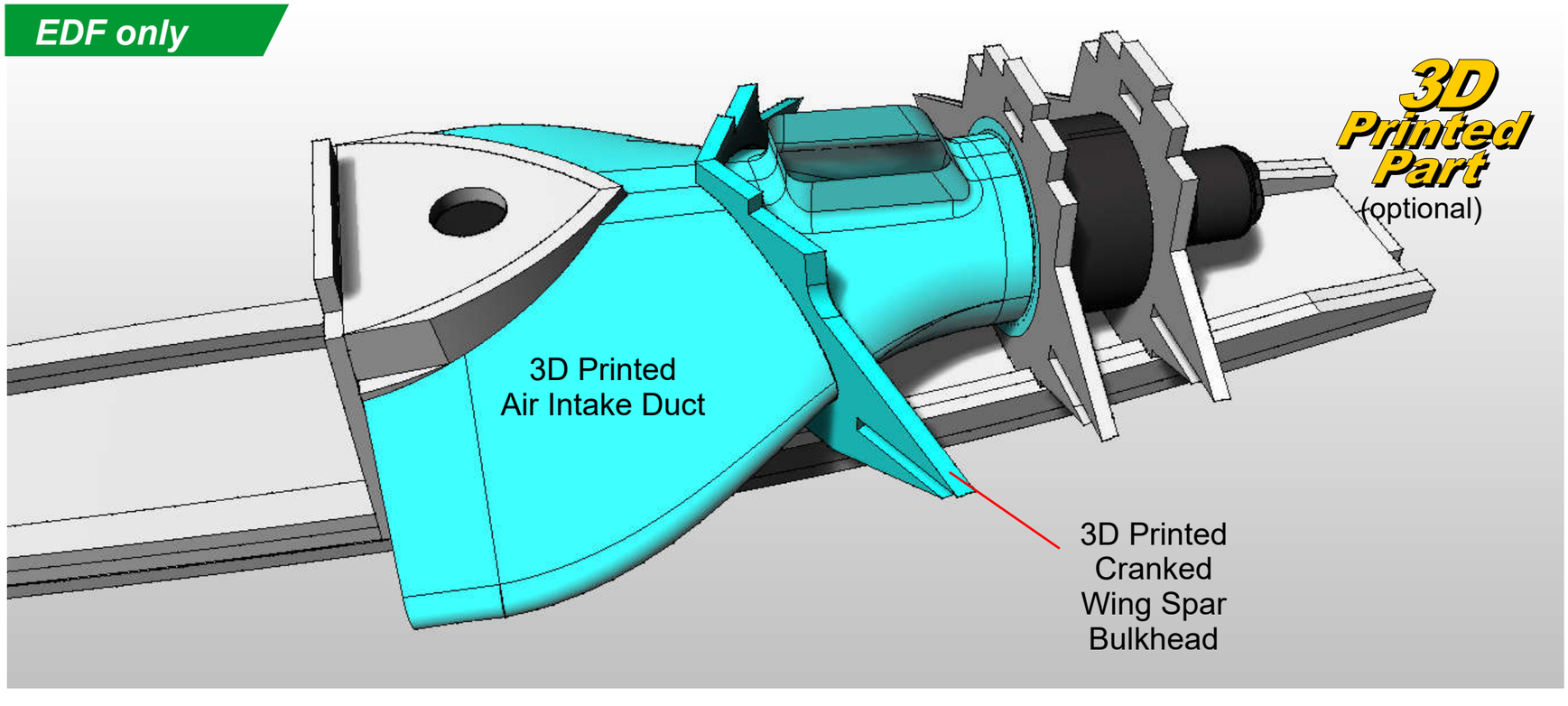
EDF only



Trim the EDF bulkheads to accommodate your chosen EDF unit. Glue the Bulkheads in place using UHU Por.

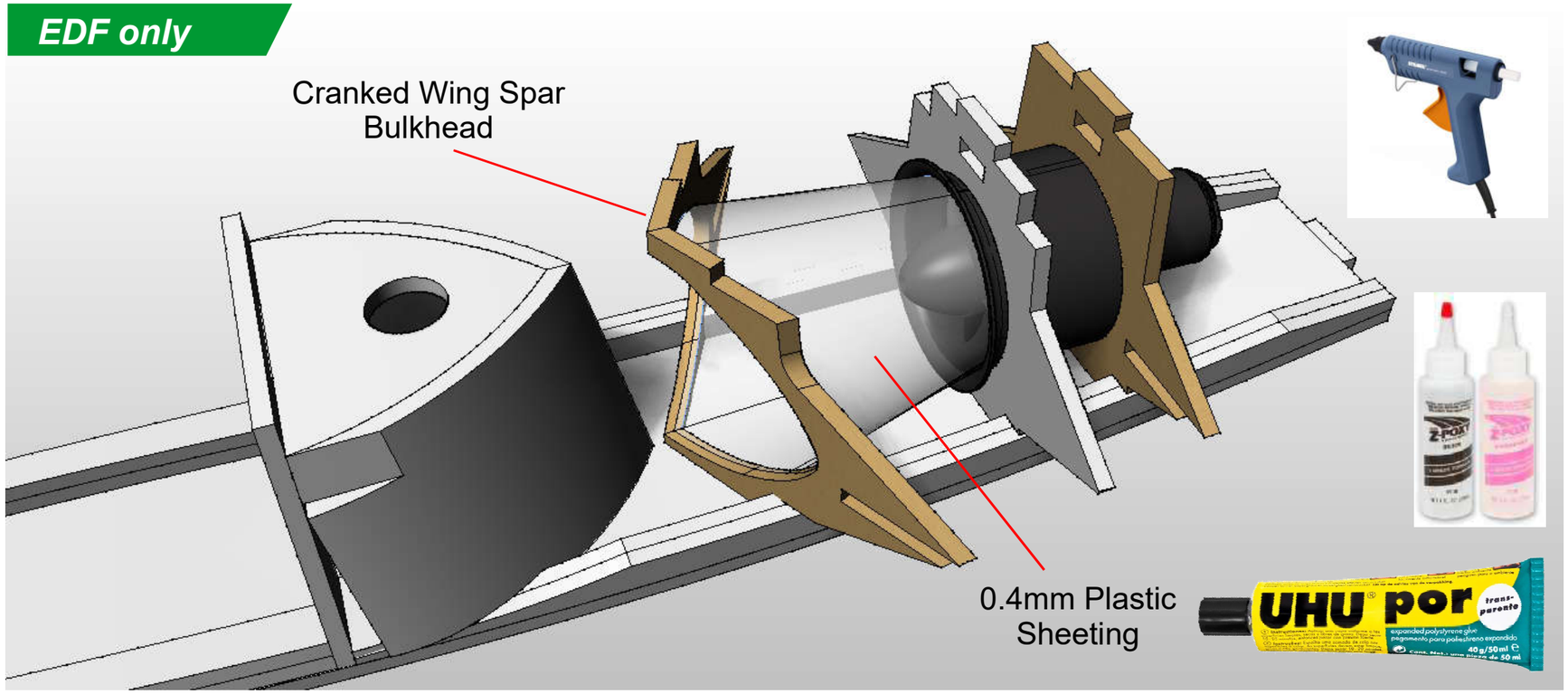
Glue the EDF bulkhead to the bulkheads using Hot melt glue along the inside corners.

EDF only



3D printed Intake assembly. (optional)

Loosely fit the **Cranked Wing spar bulkhead** pieces around the **Air intake duct** then lower all parts into the fuselage. Glue the Wing Spar bulkhead into the chevron shaped slot, at the same time glue the lip of the duct to the forward EDF bulkhead.

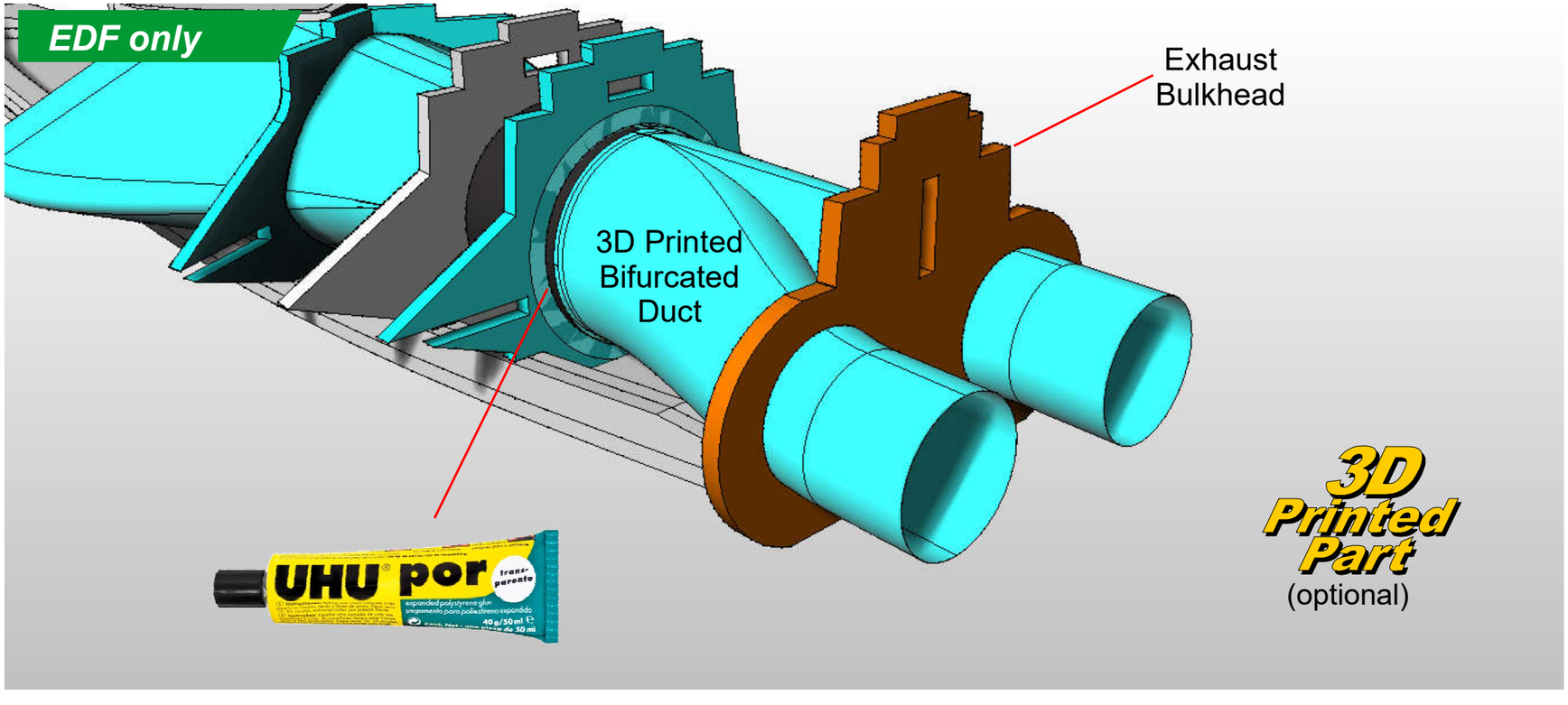


Non-3D printed Intake assembly.

Using epoxy, Glue the two 3mm lite ply template parts together to make the two 6mm **Cranked Wing spar bulkhead** pieces.

Glue into the chevron slot in the fuselage using UHU por.

Trim the 0.4mm plastic sheet to fit, and glue in place as shown using hot melt glue. Ensure a smooth airflow into the intake ring by positioning the edge of the duct on a tangent.



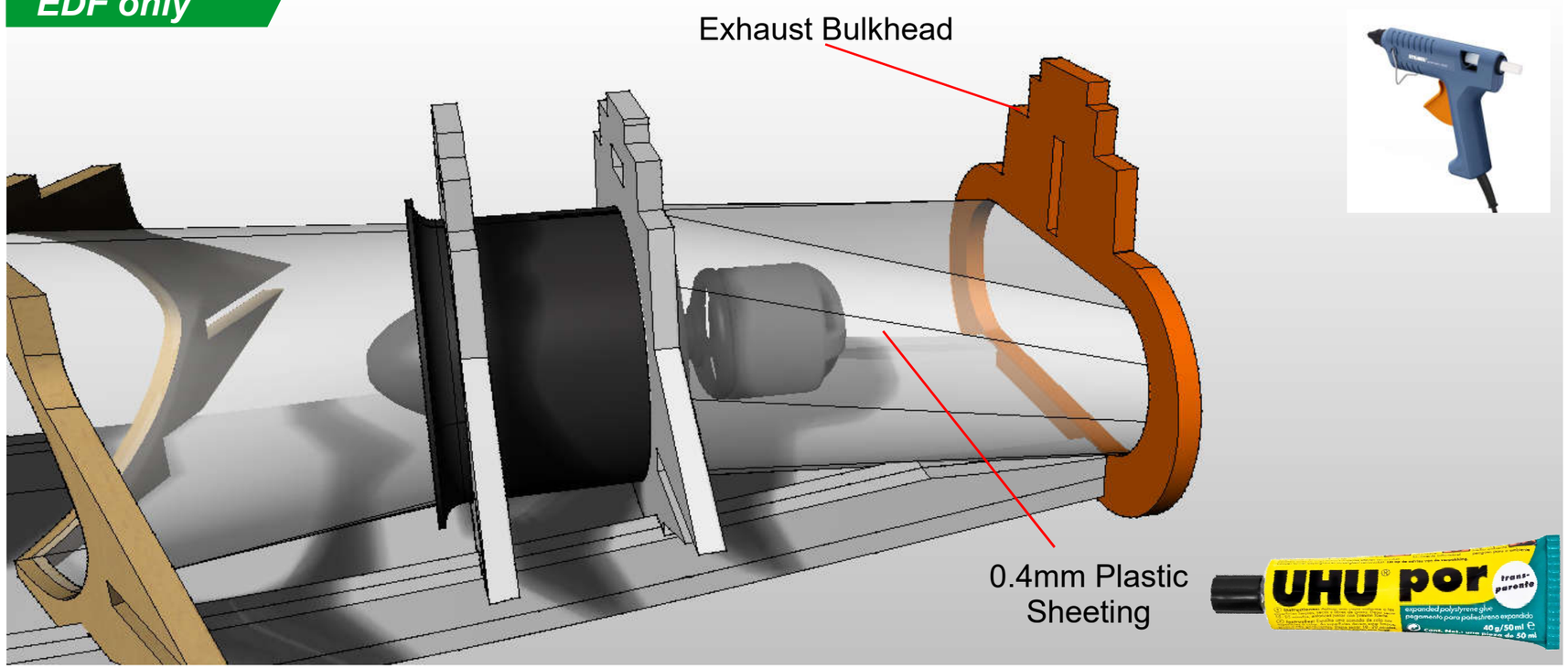
3D printed bifurcated duct assembly.

Using a soldering iron, make an exit hole for your EDF motor wires to exit out of your duct.

Glue the flange to the rear EDF bulkhead.

Slide the **Exhaust bulkhead** over the duct and glue to the belly panel. Don't glue to the duct until the fuselage is more complete to ensure good alignment.

EDF only



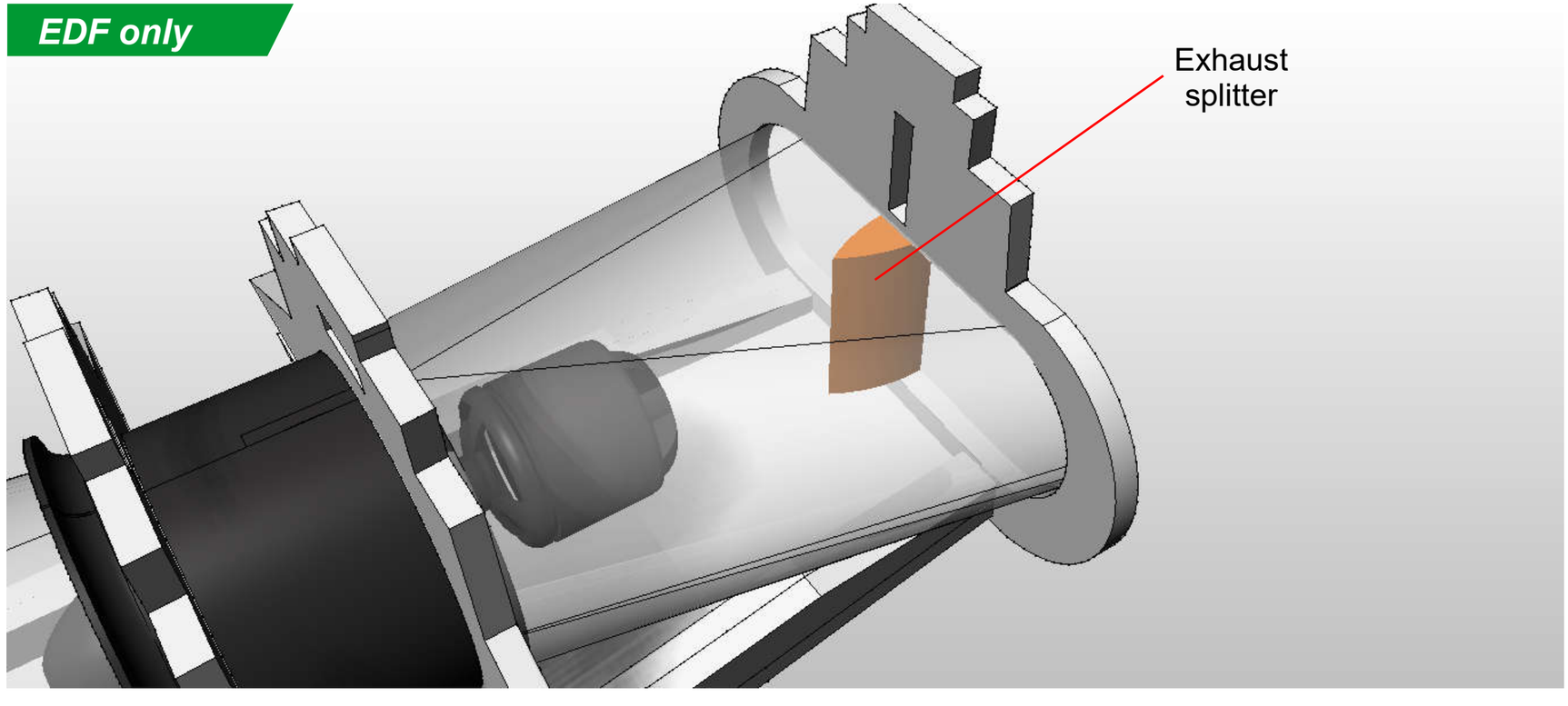
Non-3D printed Thrust tube assembly #1.

Trim the 0.4mm plastic sheet to fit, and glue in place as shown using hot melt glue. Use scrap foam to help support the tube around the EDF exit.

Use a soldering iron to melt your EDF wire exit through the tube.

Slide the **Exhaust bulkhead** over the duct and glue to the belly panel. Don't glue to the duct until the fuselage is more complete to

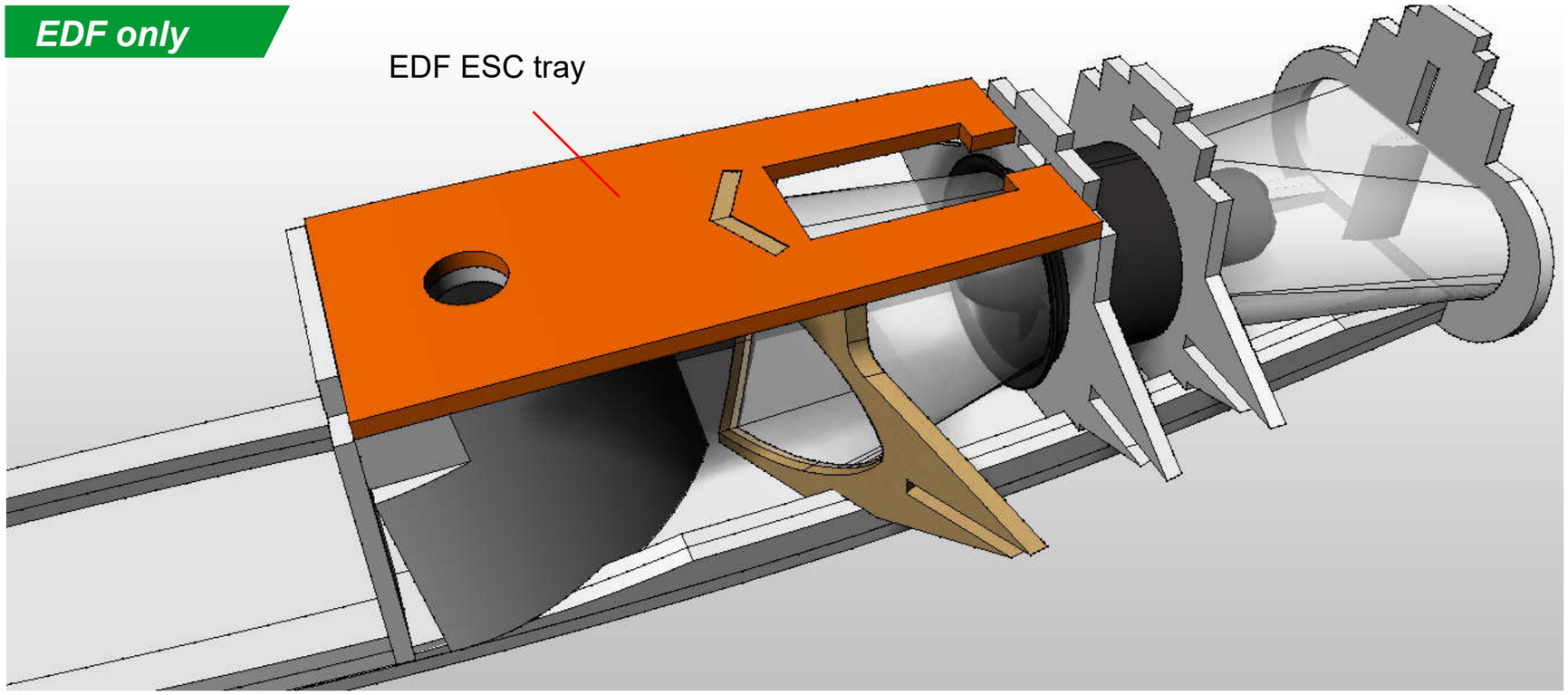
EDF only



Non-3D printed Thrust tube assembly #2.

Glue the two pieces of the **Exhaust Splitter** together, shape to create a smooth 'bullet' shape, then carefully align on centreline and glue into the duct as shown.

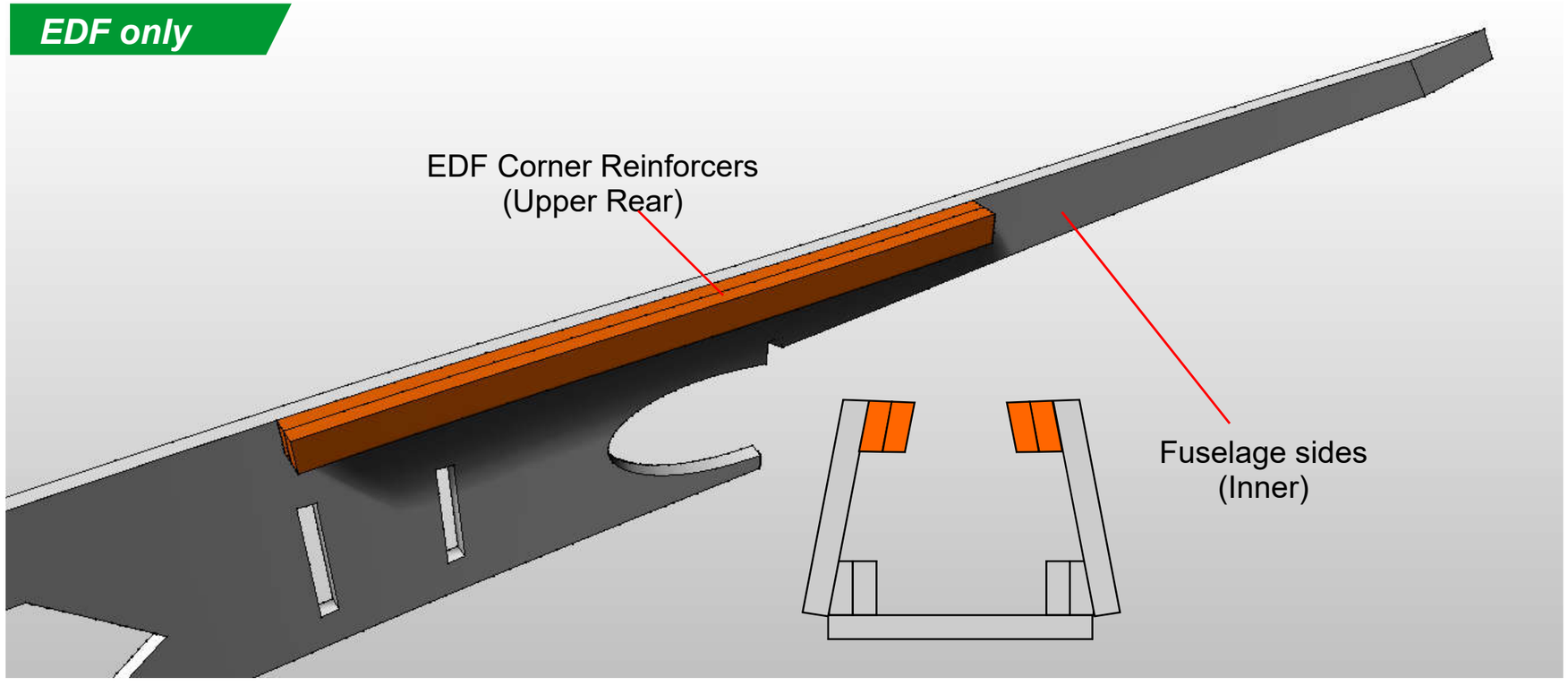
EDF only



Perforate the top of the intake duct to allow airflow to the ESC, then glue the **EDF ESC tray** in place on all EDF versions as shown.

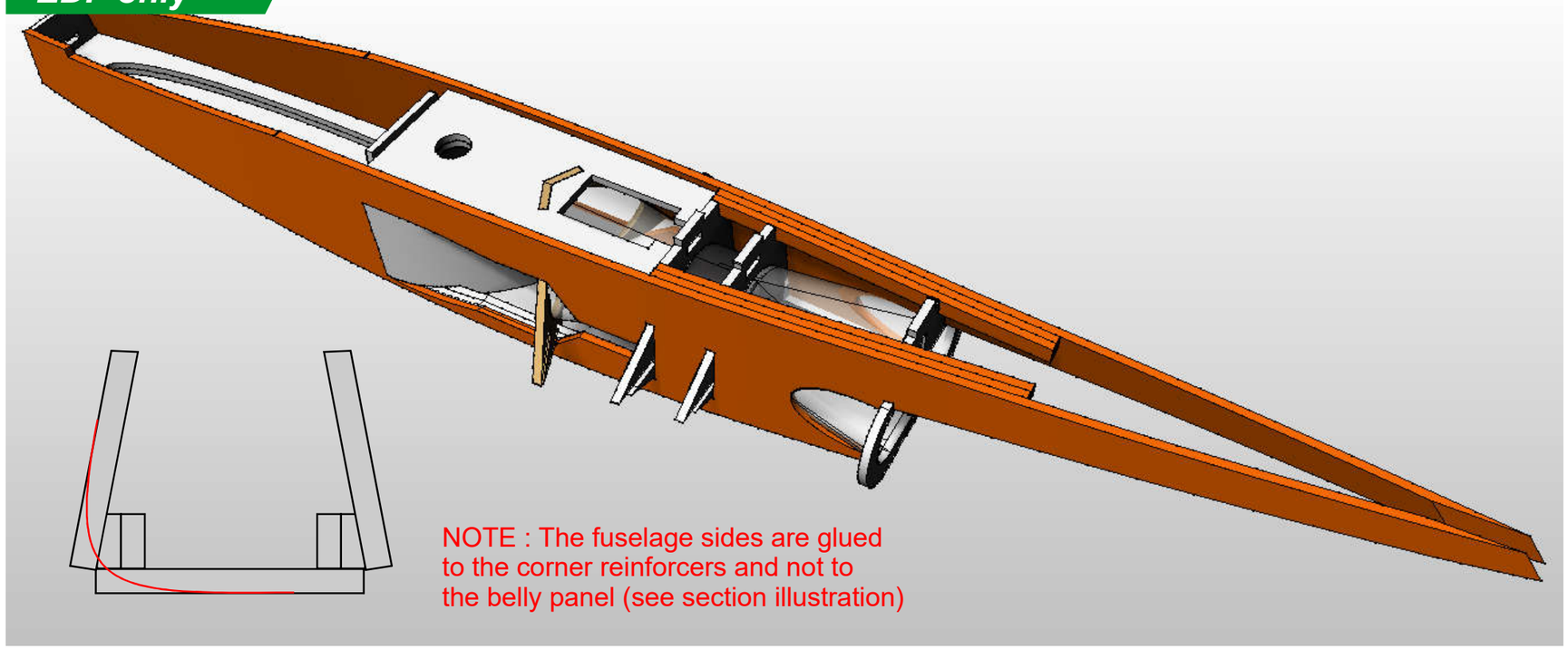
Please note that the slots in the EDF bulkheads are for passing your motor wires through.

EDF only



As marked on the plans, Glue the **EDF Corner Reinforcers (Upper Rear)** together, then in place on the inner face of both fuselage sides.

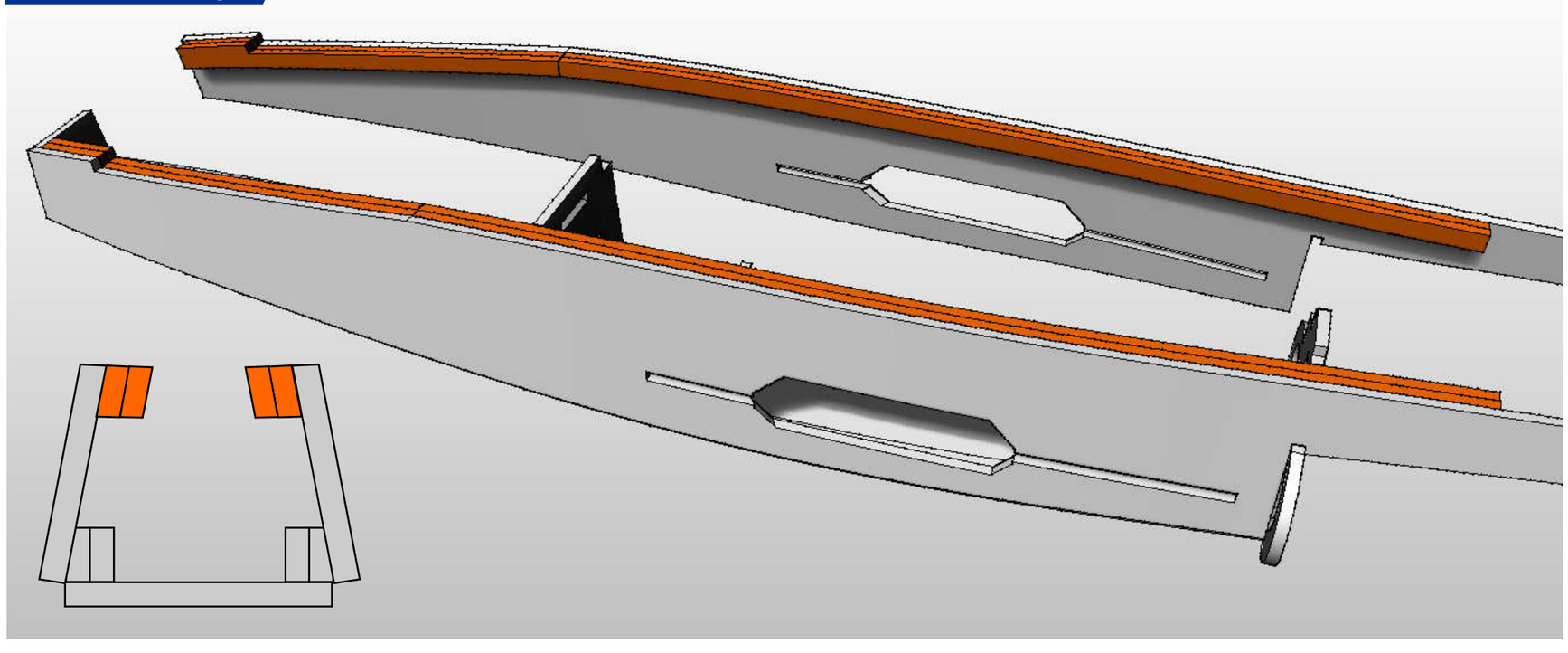
EDF only



If required, sand the fuselage side assemblies to fit nicely around the exhaust duct, then glue to the fuselage as shown.

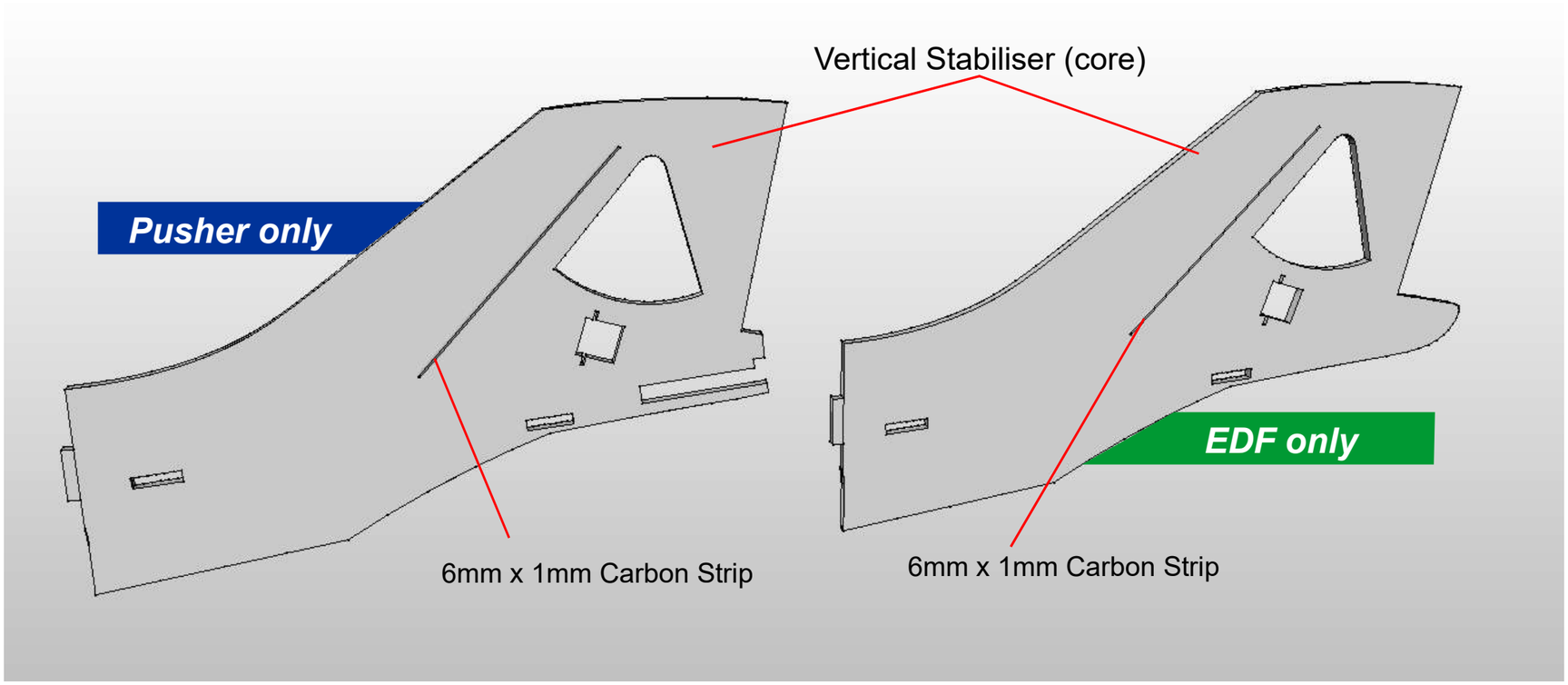
Ensure a smooth transition from the fuselage sides onto the Forward fuselage intake inners

Pusher only

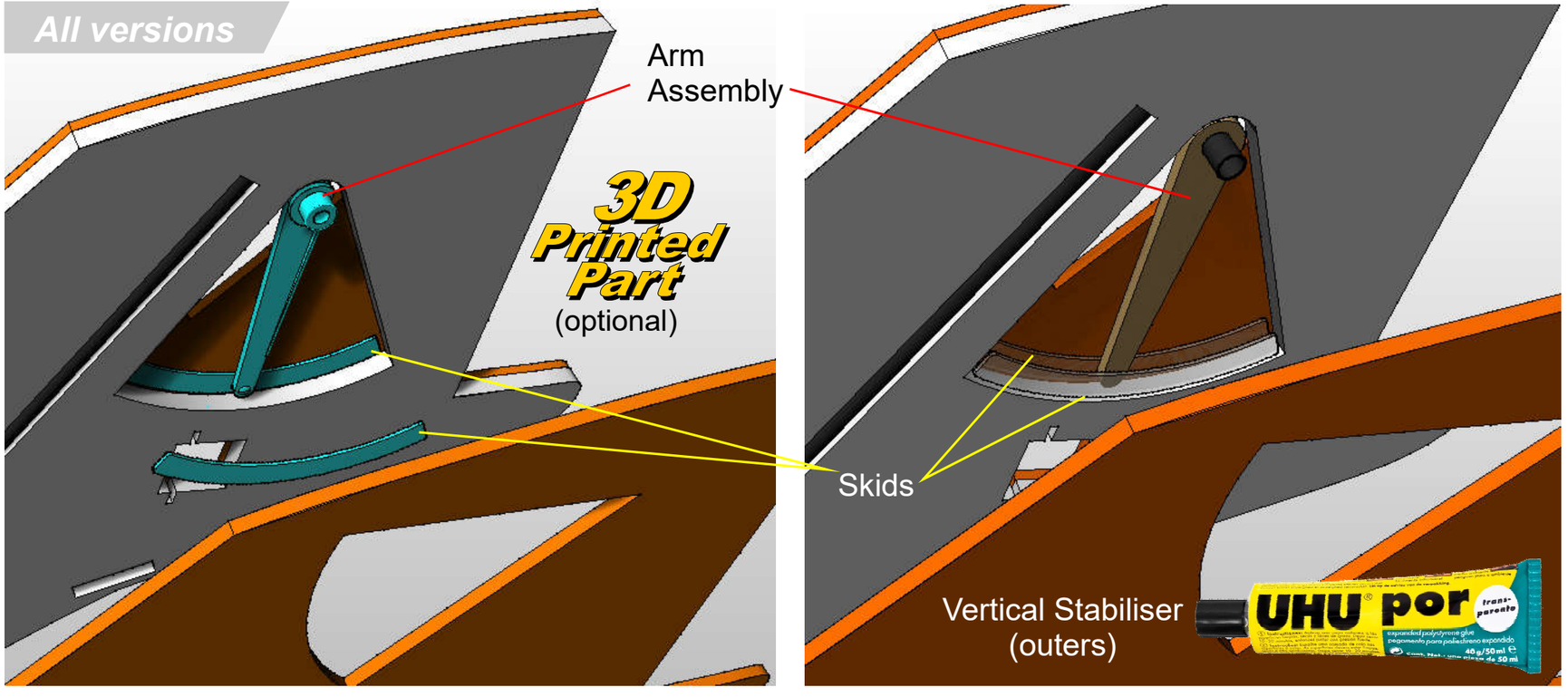


PUSHER VERSION

Sand to shape, then glue the **Pusher Corner Reinforcers (Upper)** to fuselage sides, and then onto the fuselage as shown.



Choose the correct **Vertical Stabiliser (core)** for your chosen powertrain. Using epoxy, glue a 6mm x 1mm carbon strip into the foam.

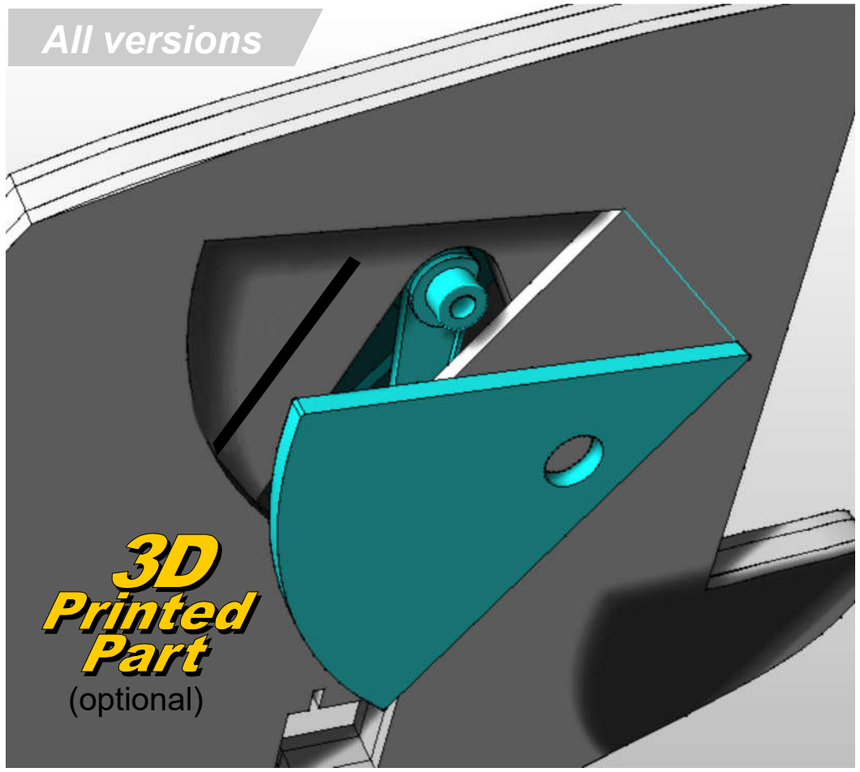


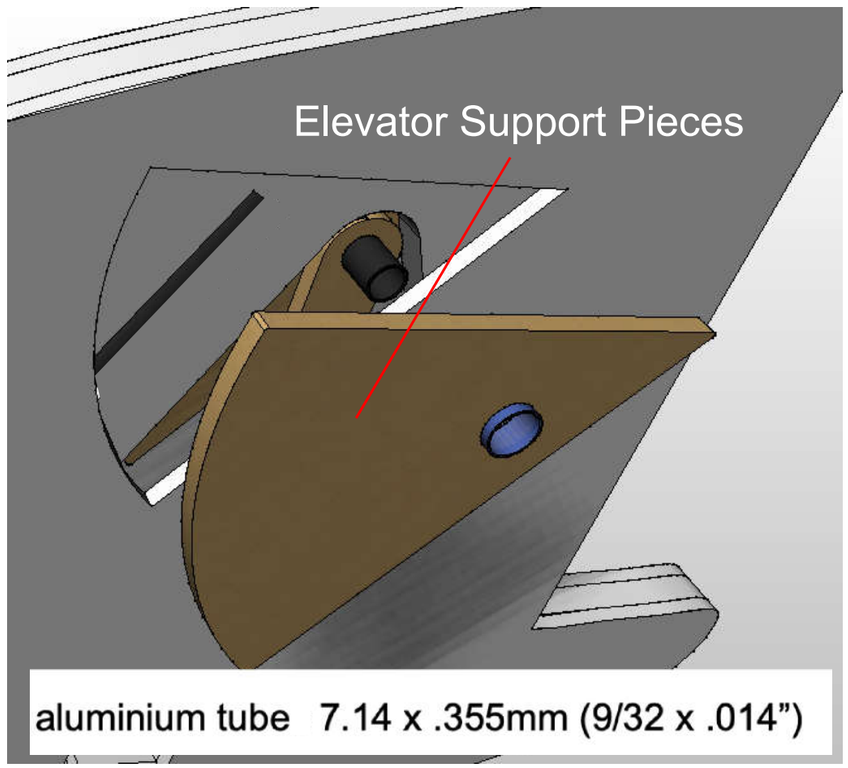
Either using 3d printed parts or liteply/carbon. Construct the **Elevator stabiliser arm assembly**.

Glue the plastic **skids** to the inside face of the 3mm Vertical Stabiliser (outer).

Encapsulate the arm between the pieces, then glue the **Vertical Stabiliser outers** onto the core applying glue to the core side to avoid getting glue into the mechanism

All versions

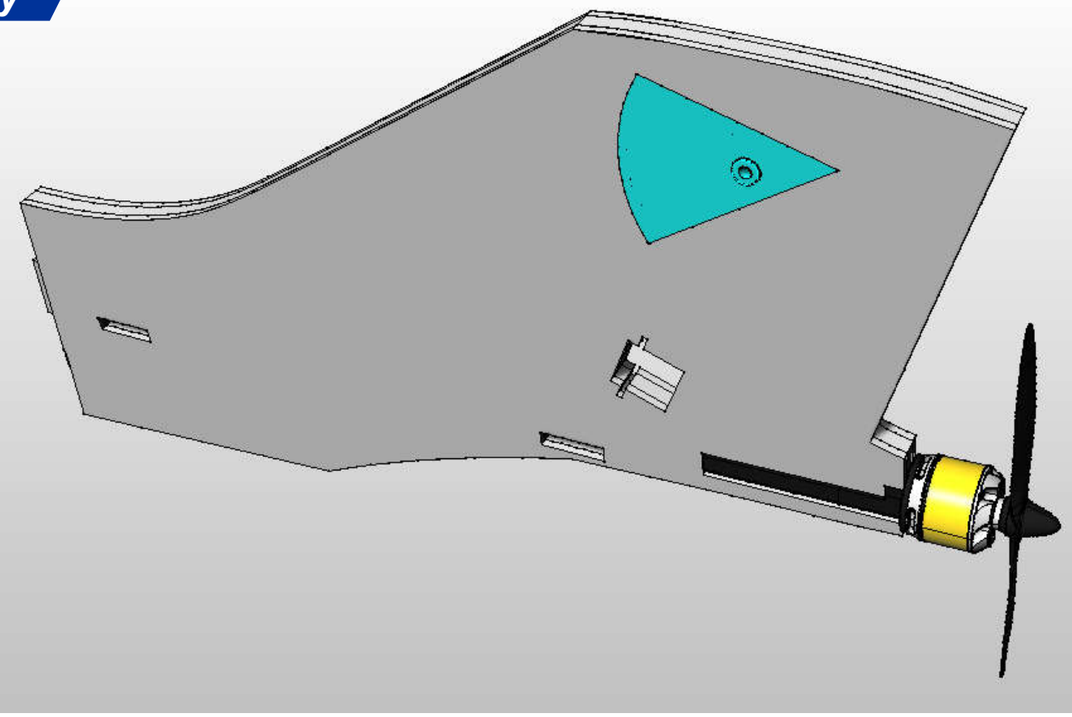




Either 3D Print or fabricate the **Elevator Support Pieces** using 3mm lite-ply with aluminium tube glued in with epoxy as shown.

Apply glue to the Vertical stabiliser (core). Align the Stabiliser mechanism with the holes in the support pieces, then glue in place.

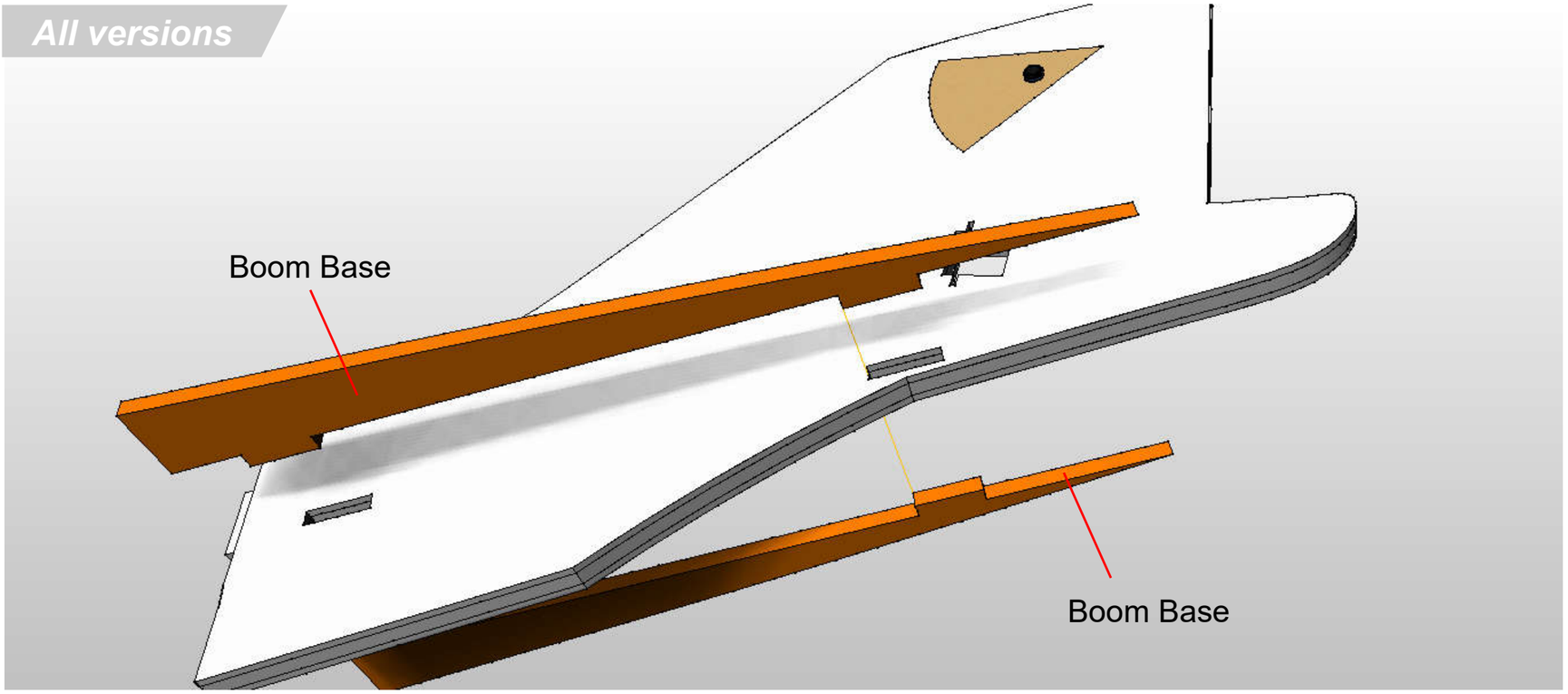
Pusher only



Pusher prop version only.

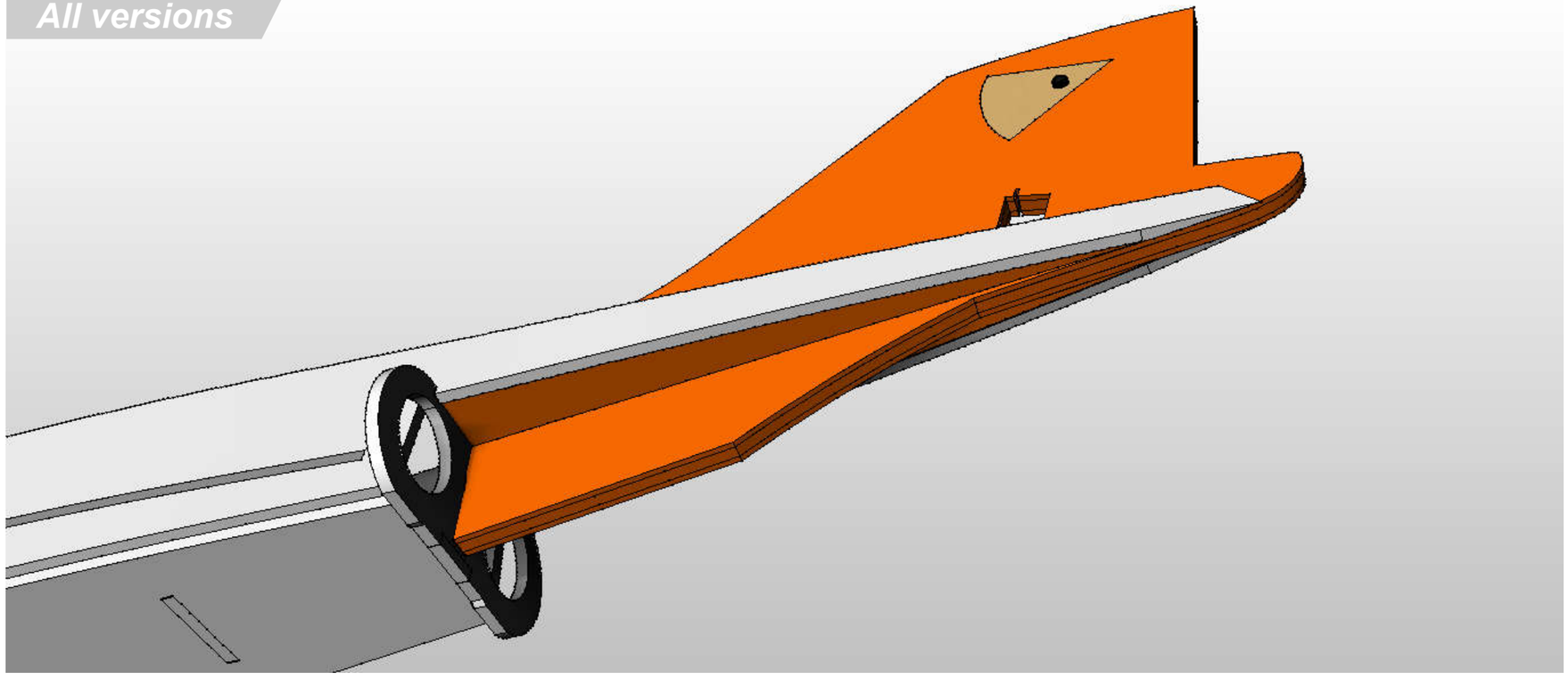
Glue the Motor stick mount into the vertical stabiliser assembly using hot melt glue.

All versions



Glue the two **Boom bases** to the Vertical stabiliser assembly.

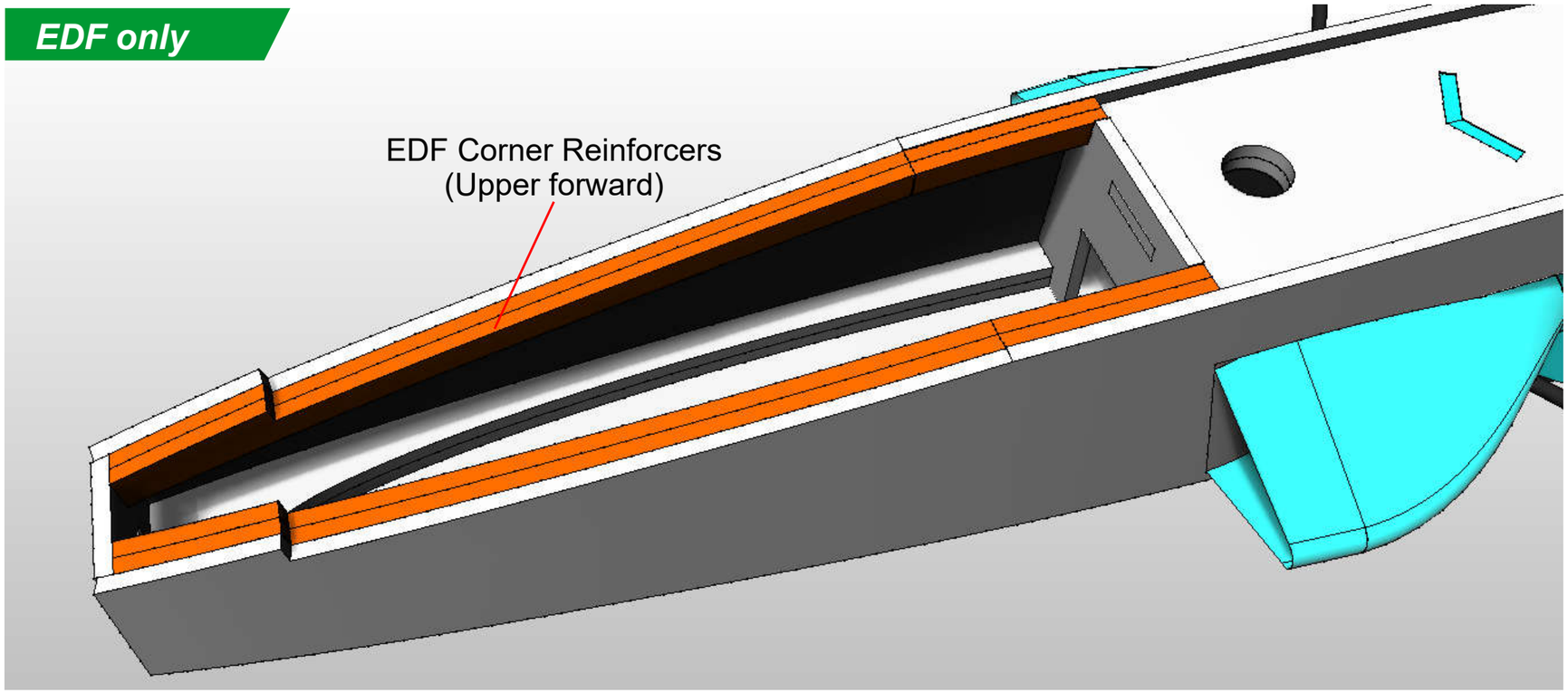
All versions



Gently part the fuselage sides and glue the vertical stabiliser assembly to the main assembly.

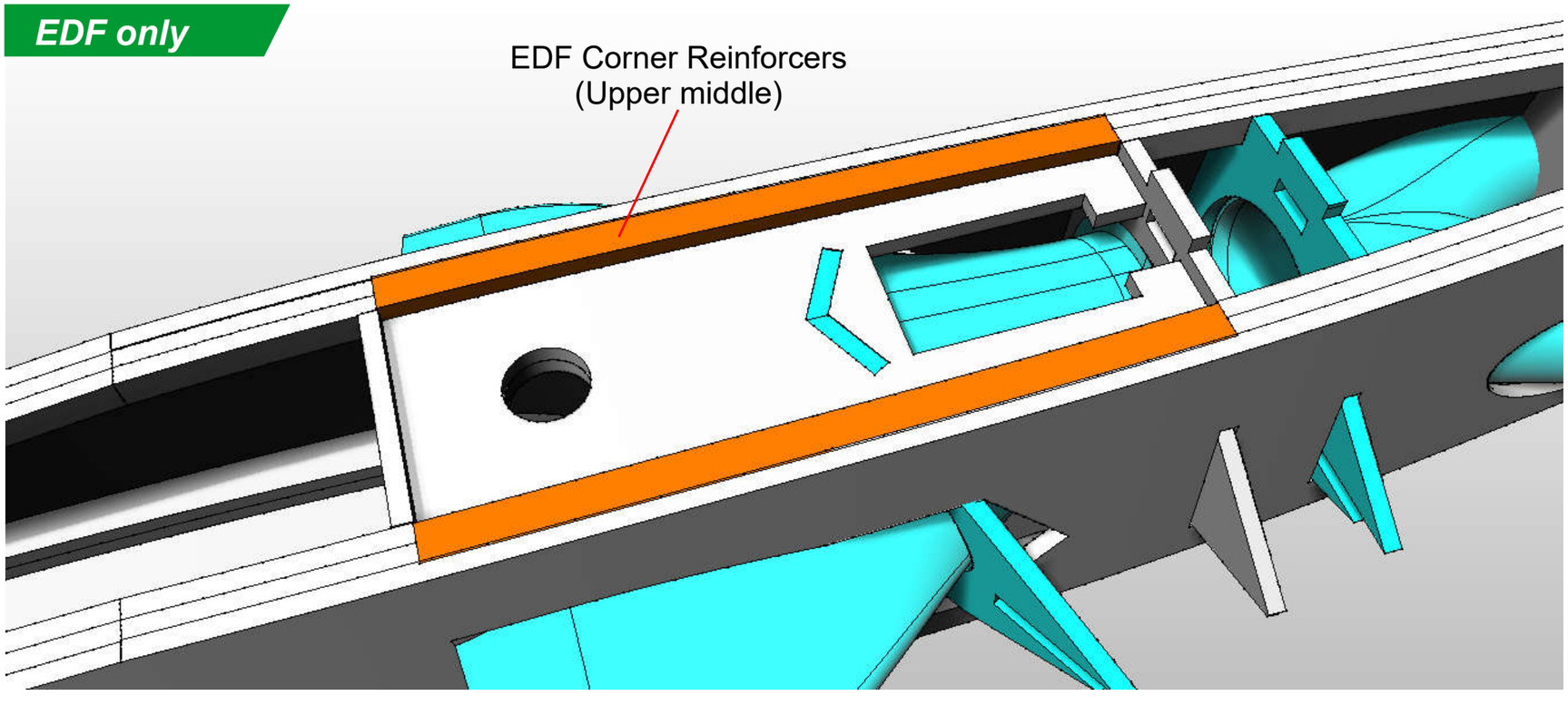
Align the boom bases to the bottom of edge, and also slotting the tab into the exhaust bulkhead.

EDF only



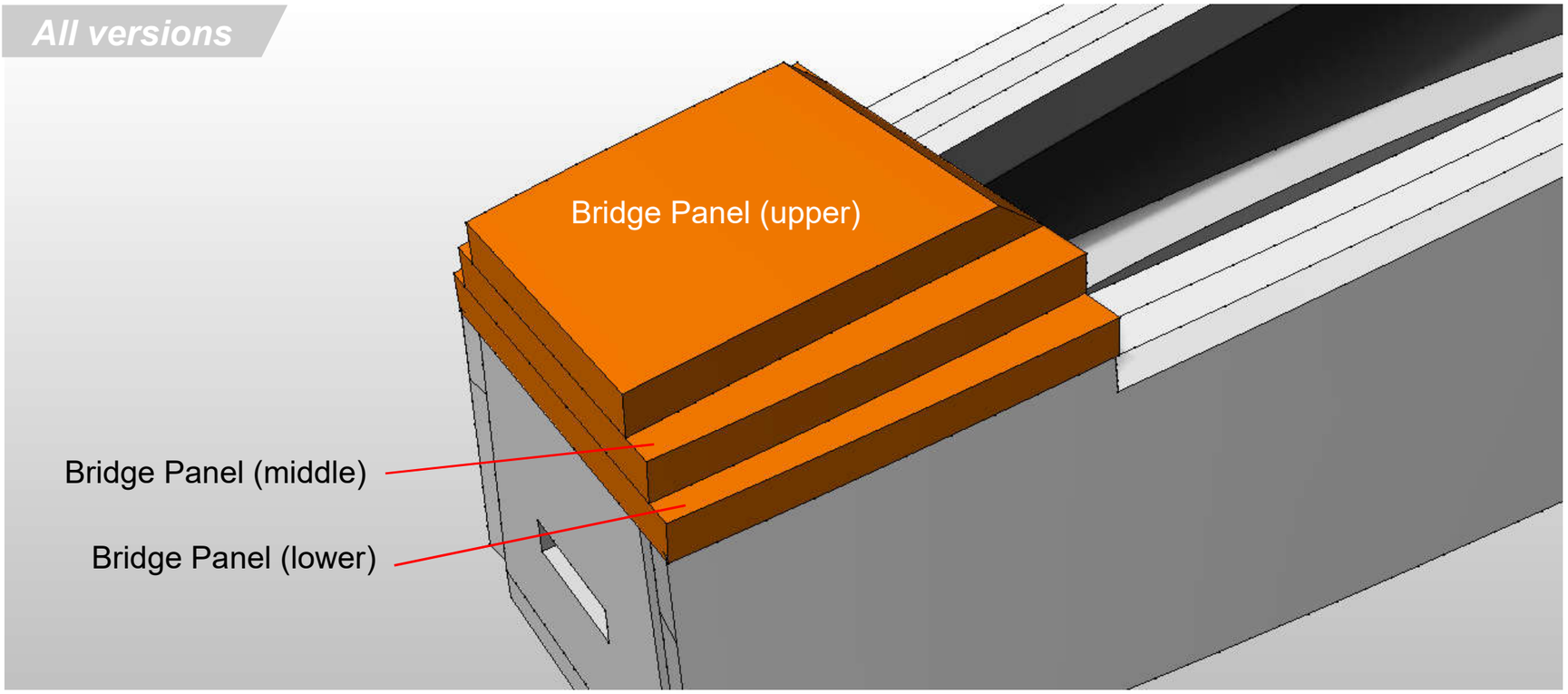
Glue the four **EDF Corner Reinforcer (Upper Forward)** pieces in place

EDF only



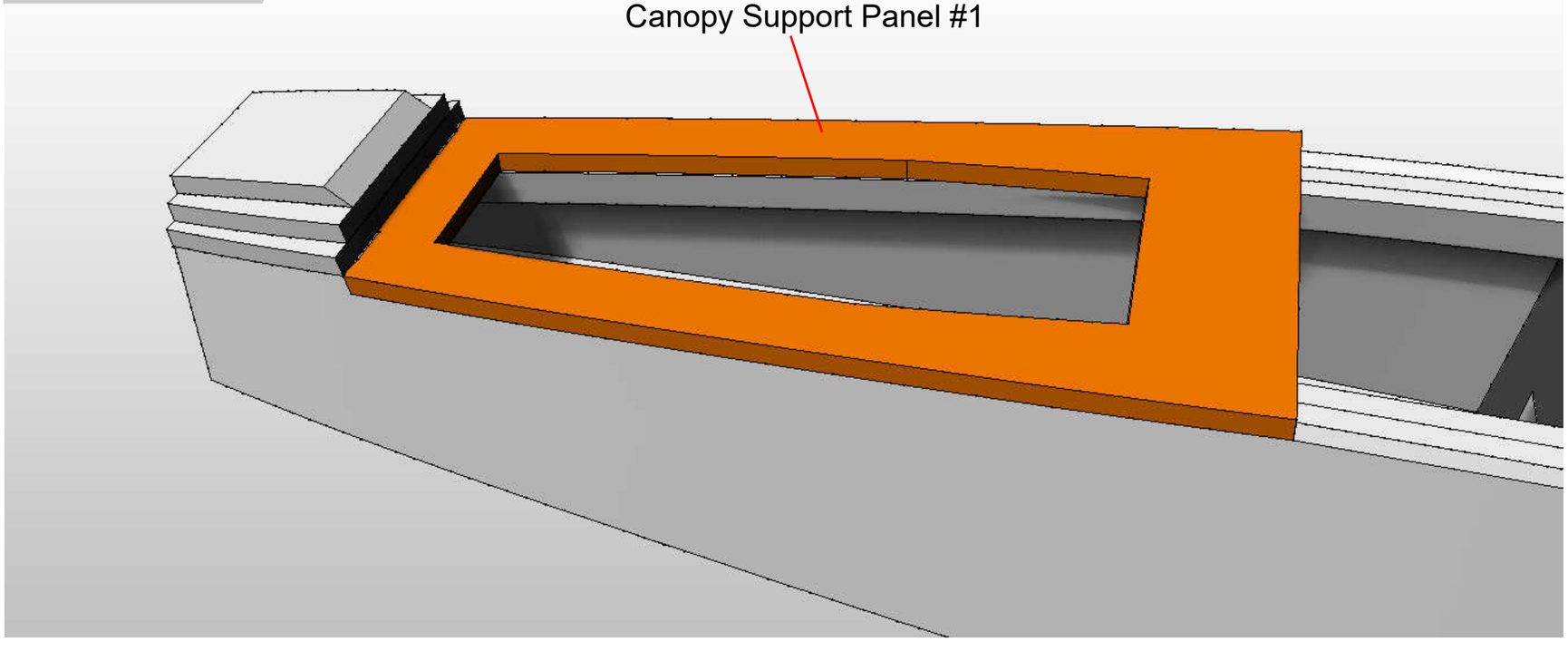
Glue the two **EDF Corner Reinforcer (Upper Middle)** pieces in place

All versions



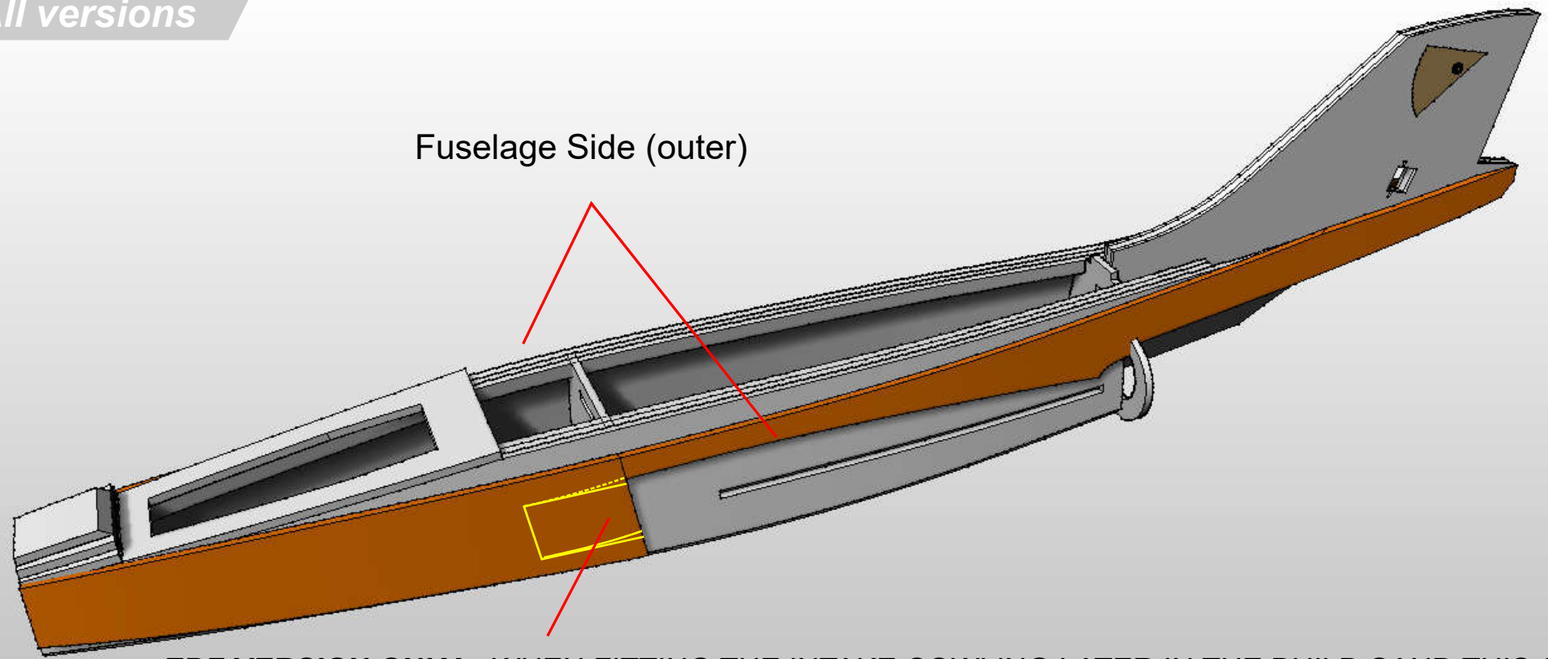
Glue the three **Bridge Panels** together to form the forward fuselage.

All versions



Glue the **Canopy Support Panel #1** in place.

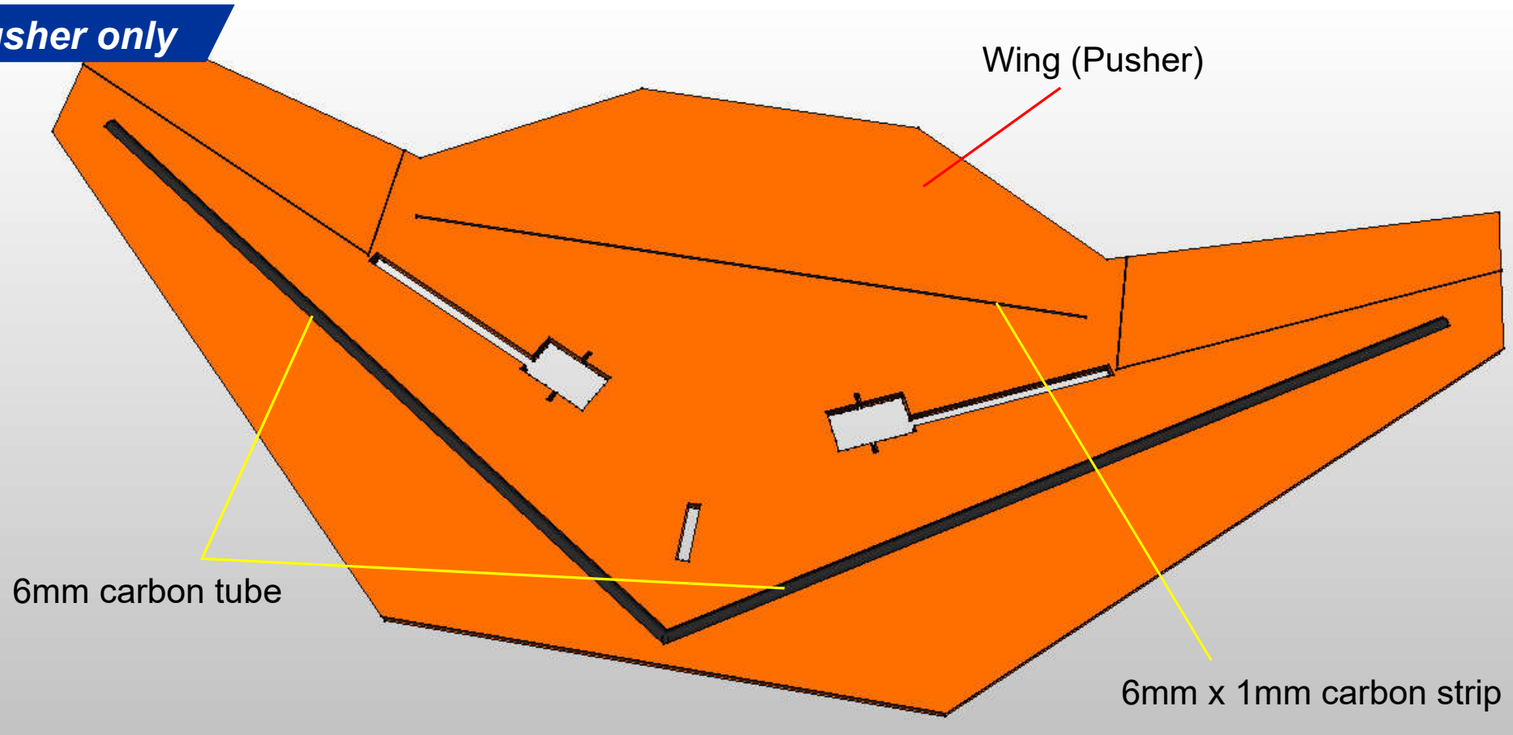
All versions



EDF VERSION ONLY. WHEN FITTING THE INTAKE COWLING LATER IN THE BUILD SAND THIS AREA (BOTH SIDES) HERE TO FORM A SMOOTH TRANSITION AND TO ENLARGE THE INTAKE AREA.

Glue the **Fuselage Side (Outer)** to the assembly aligning to the marks from the plans.

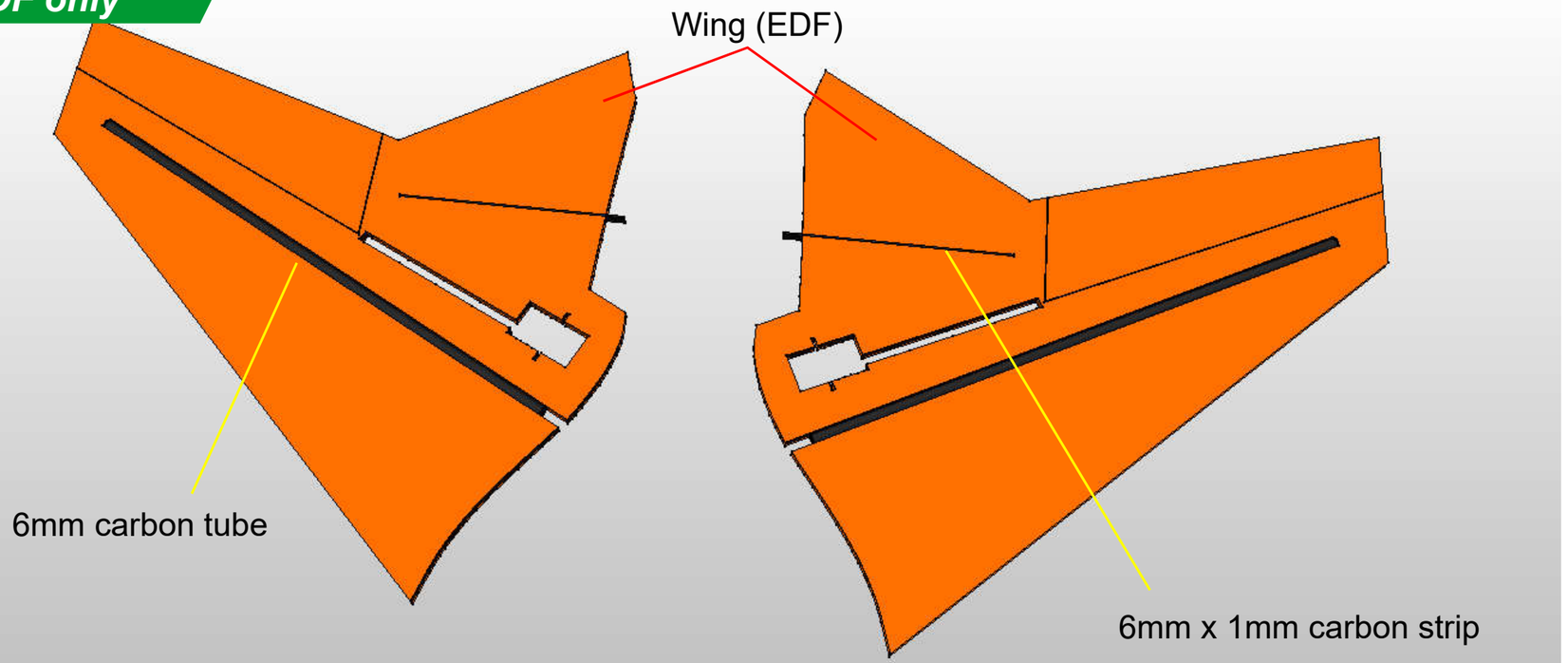
Pusher only



Glue the Carbon reinforcers into the slots in the **Wing**. Use Masking tape top and bottom to retain the epoxy until it is set.

tip: Try Washi Tape, it makes a better job than ordinary masking tape.

EDF only



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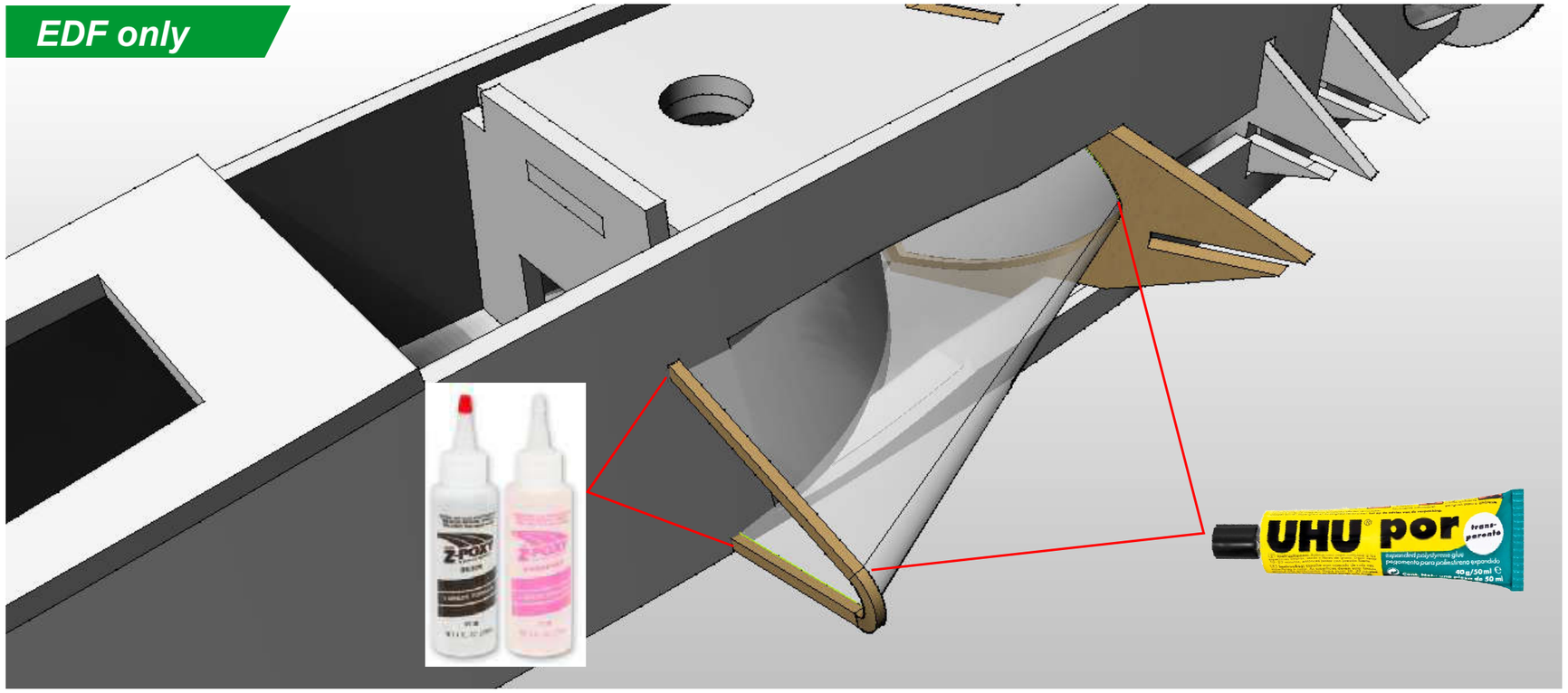
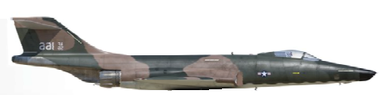
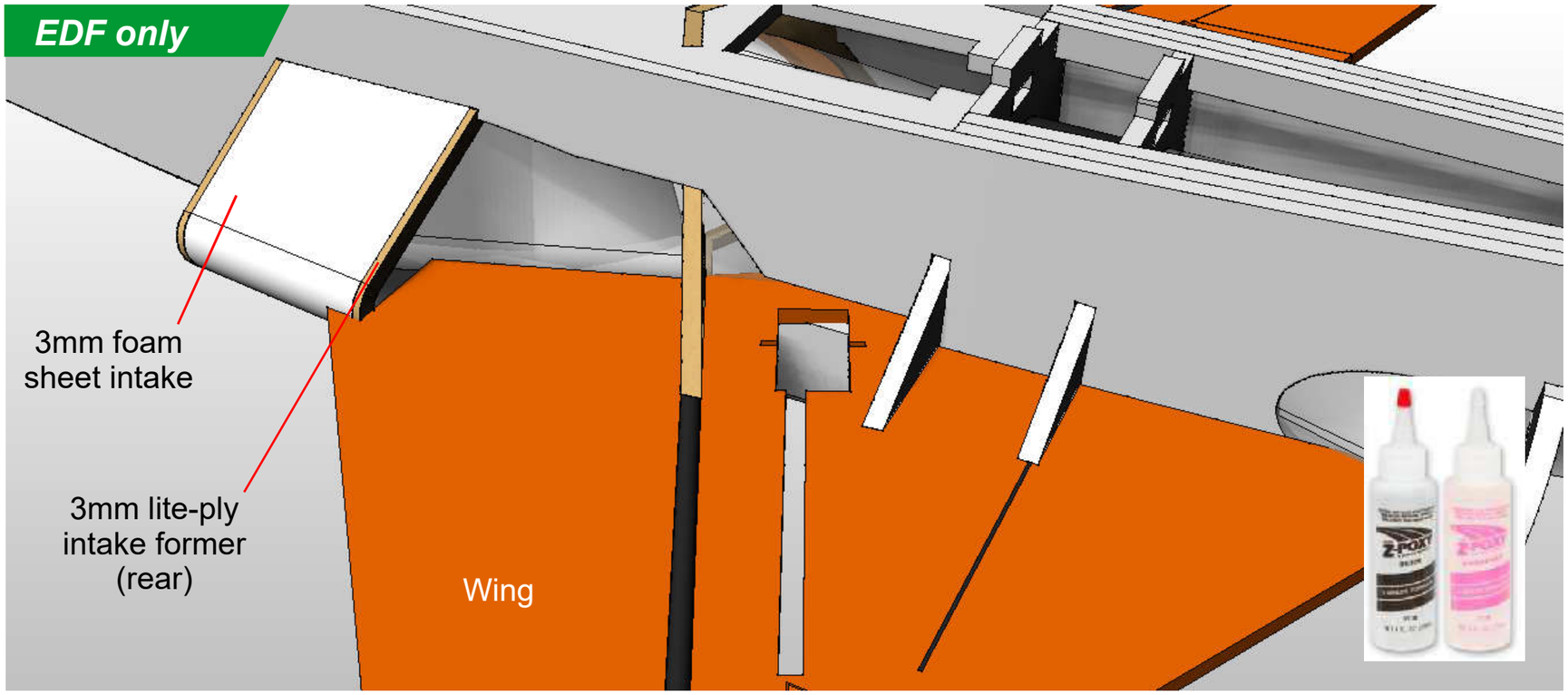


Non - 3D printed Air intakes.

Glue the intake former (3mm lite-ply) to the marked place on the Fuselage sides (inner) using epoxy.

Using 0.4mm plastic sheet, create the forward intake ducting. Carefully glue in place using UHU Por.



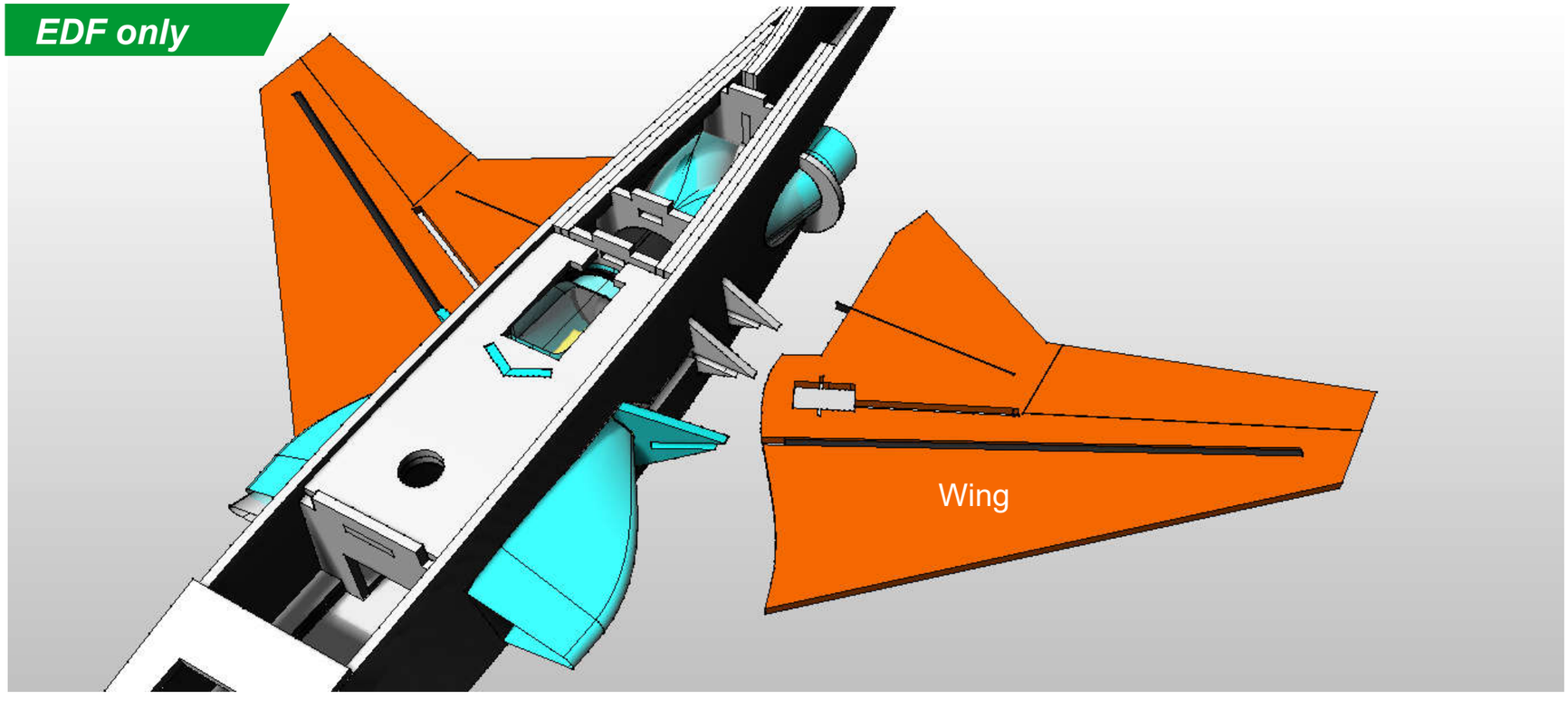


Non 3d Printed version

Cut the rear intake bulkhead former (3mm liteply) and glue the 3mm foam sheet intake between the parts to create the intake.

Slide the two wings onto the assembly using epoxy.

Ensure that both wings set perfectly mirrored and horizontal

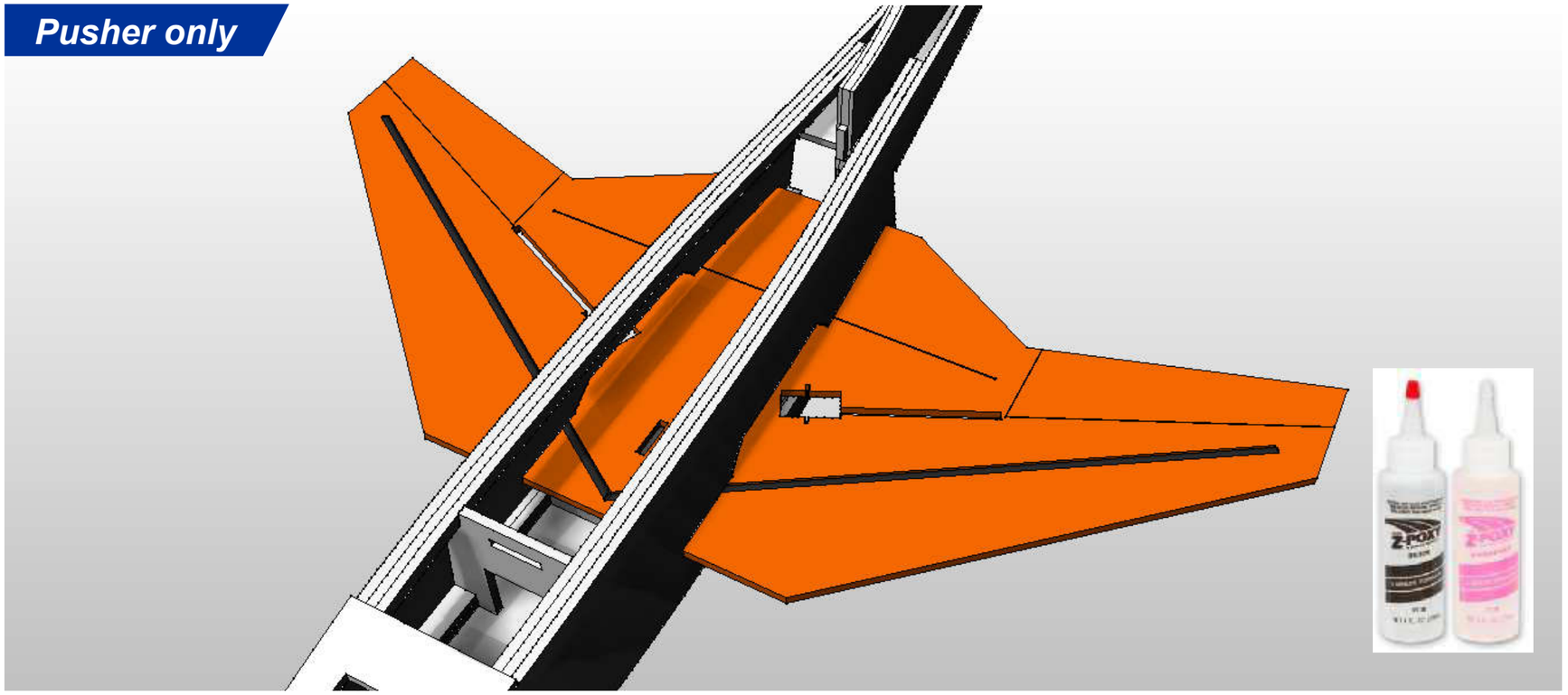


3D printed version

Slide the two wings onto the assembly using epoxy.

Ensure that both wings set perfectly mirrored and horizontal

Pusher only



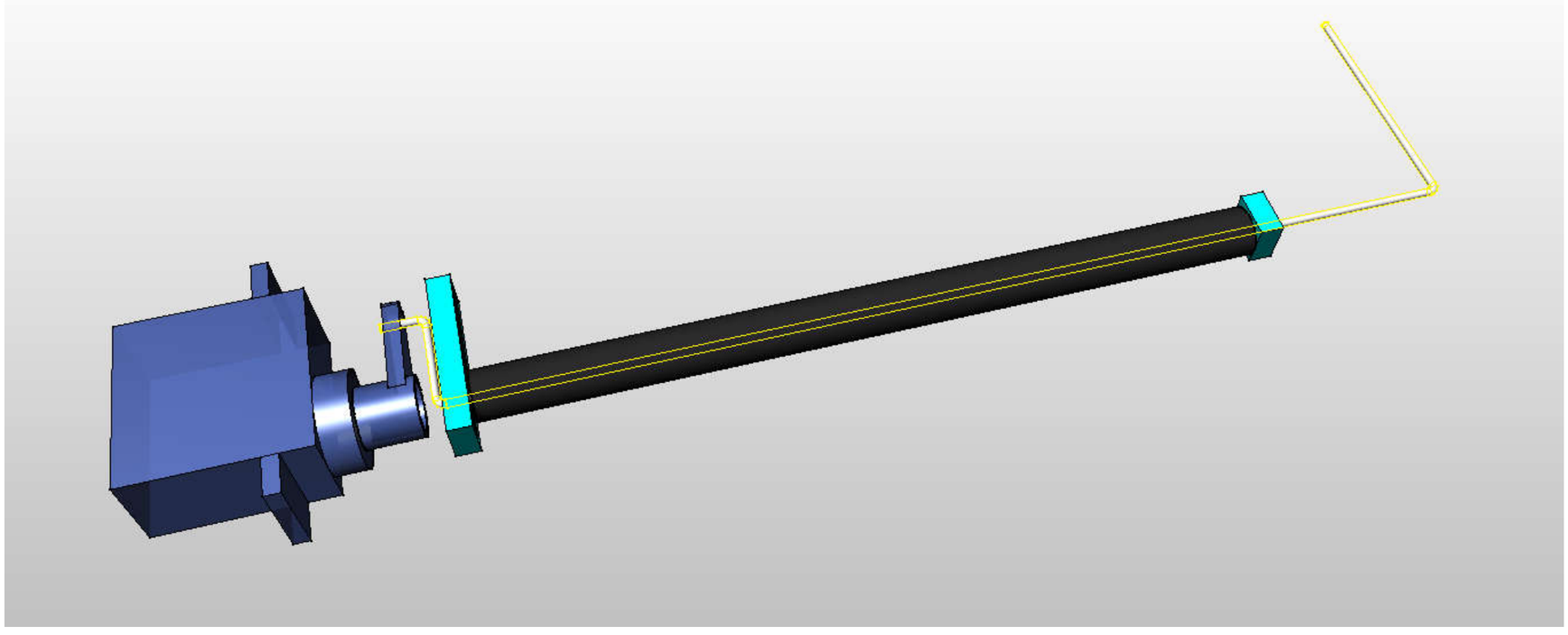
Pusher version.

Slide the wings into the slot.

Apply epoxy along the inside of the fuselage where the wing intersects the fuselage sides.

Slide the wing back and forwad in the slot a few times until the epoxy is drawn into the slot.

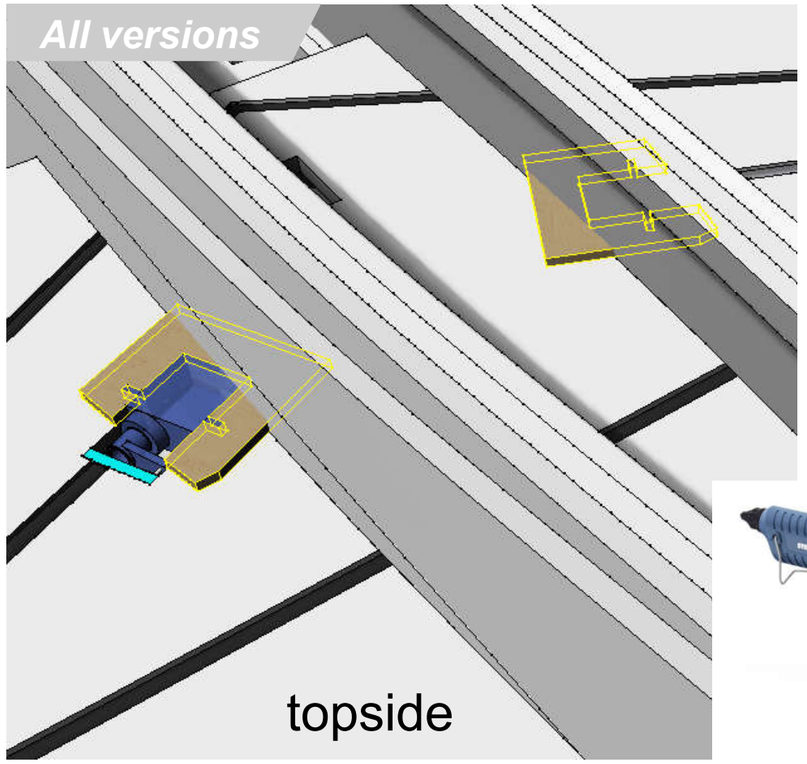
Align perfectly, then leave to set.

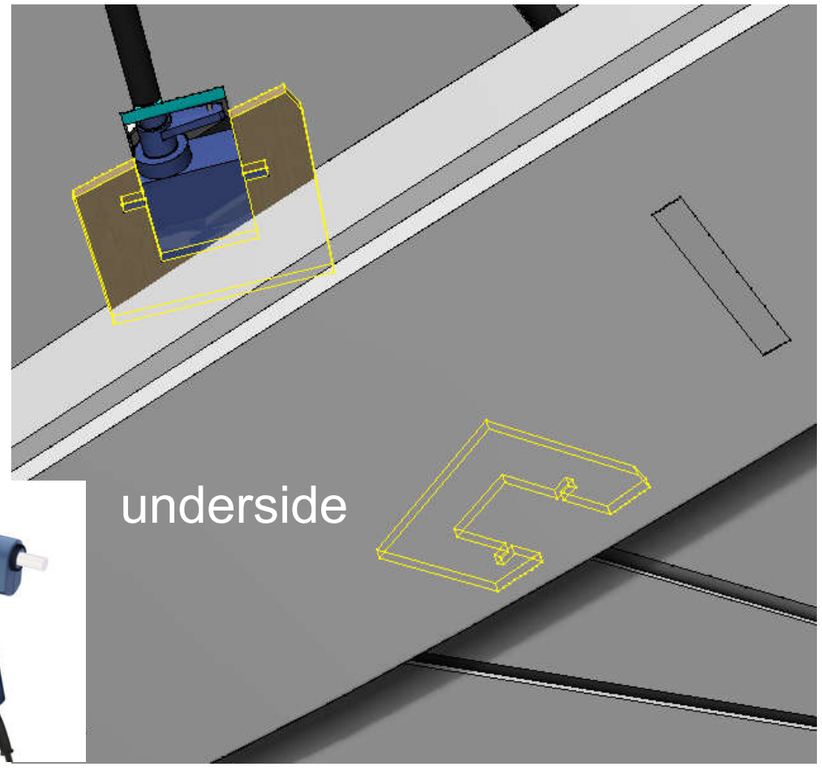


Assemble the aileron linkage.

Glue the 3mm lite-ply (or 3d printed pieces) and 6mm carbon tube together as shown

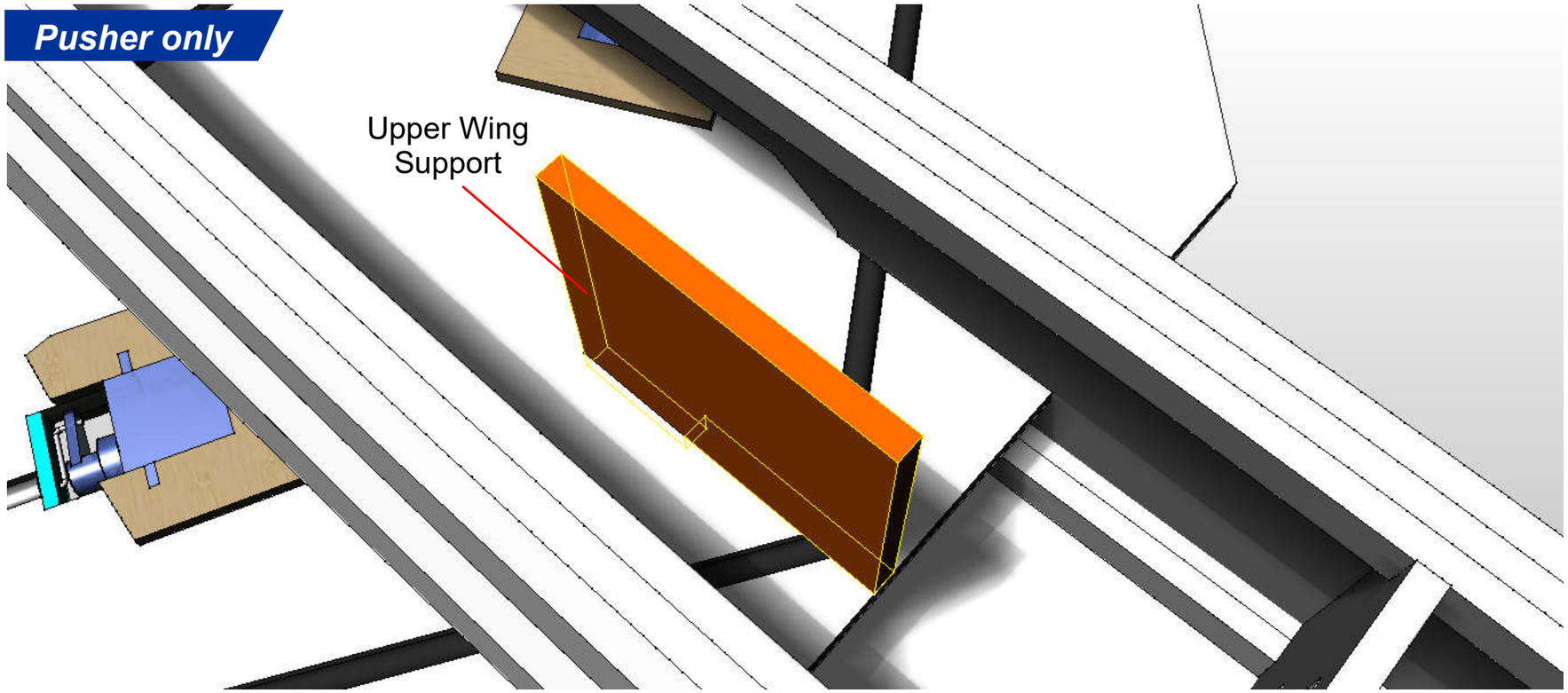
Bend and thread the piano wire through so that the centreline of the shaft is aligned with the servo centreline.





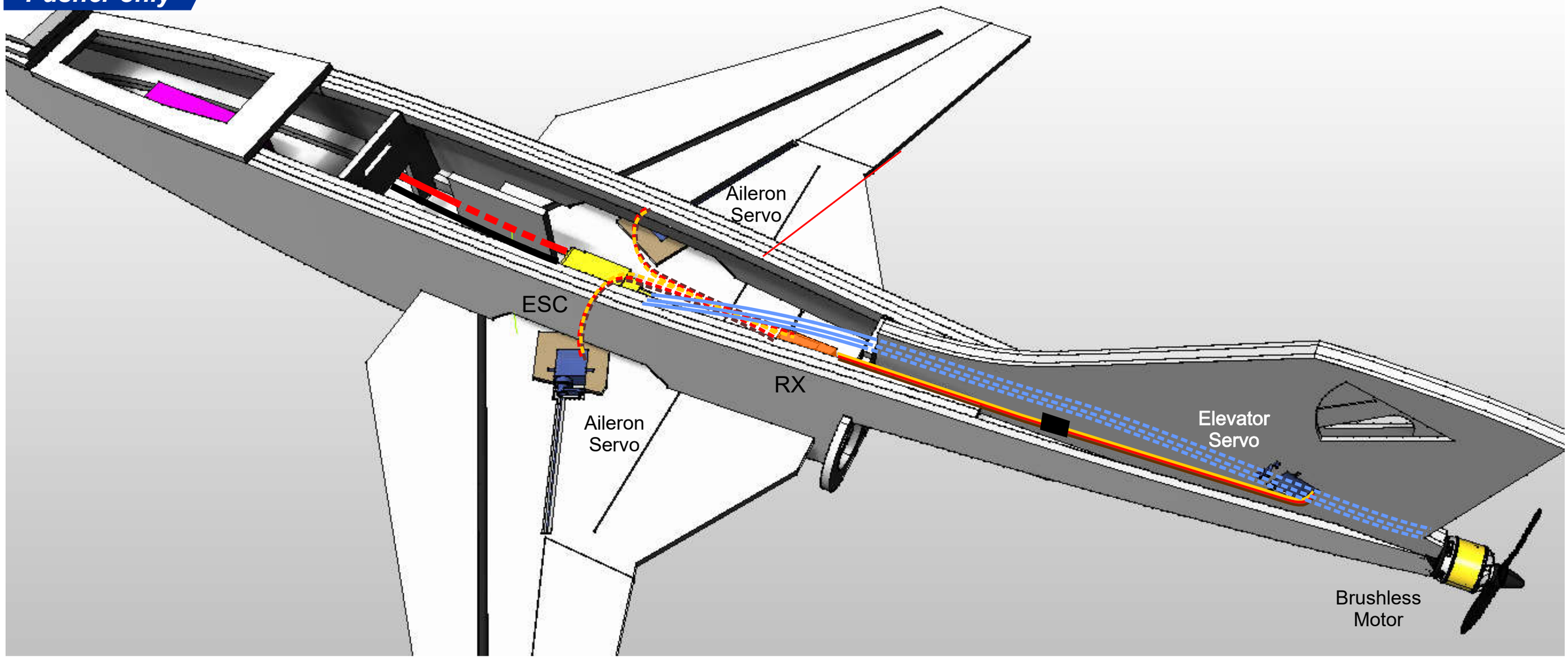
Trim out the 4 Servo reinforcers from 3mm liteply and glue either side of the aileron servo slot in the wing using UHU por.

Glue the Aileron linkages into the dedicated holes using hot melt glue.



Glue the **Upper wing support** onto the wing located in the slot.

Pusher only



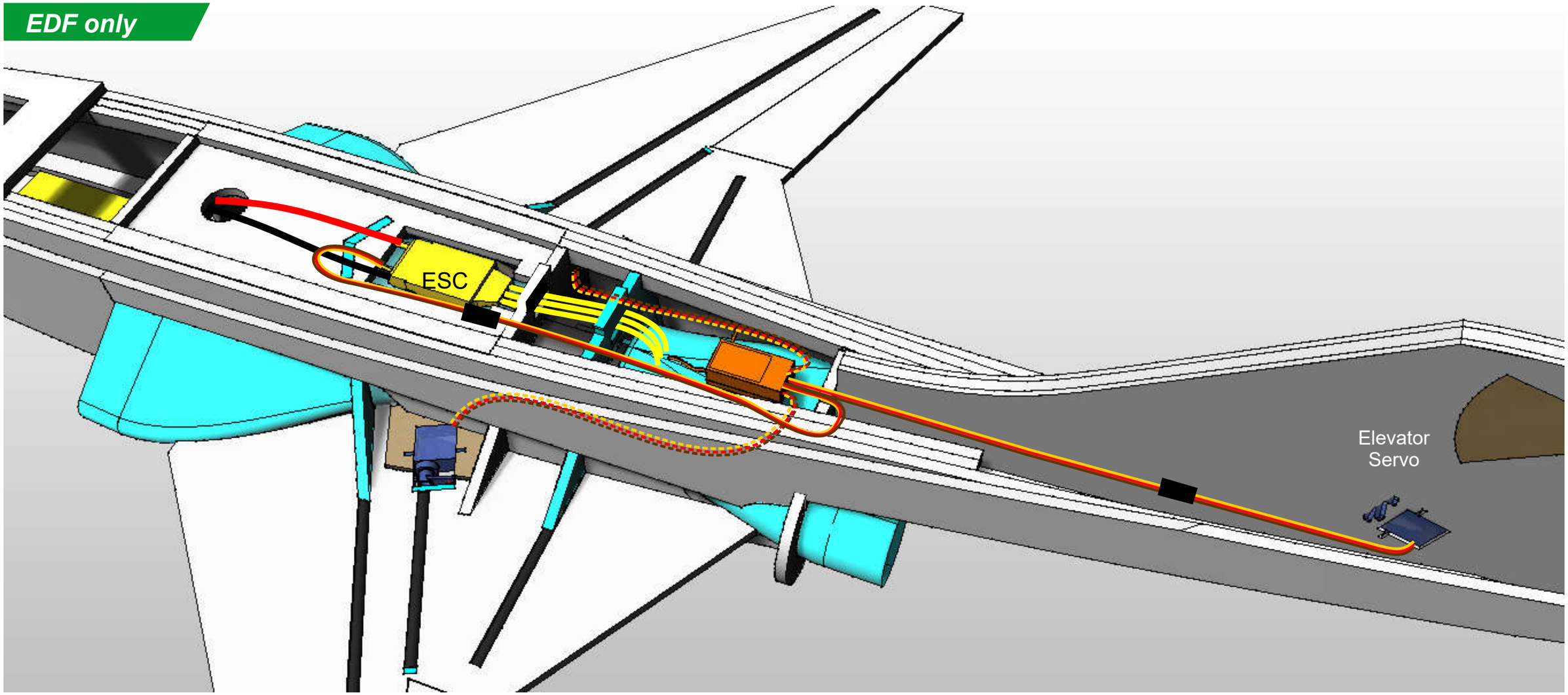
PUSHER ELECTRICAL CONNECTIONS

Connect the wires as shown. Run the Motor cables along one side of the vertical stabiliser and make a discrete exit hole to allow them to reach the motor.

Use a servo extension cable to the Elevator servo to help to reach your RX.

Connect the motor to the wiring and test / set-up the servos.

EDF only

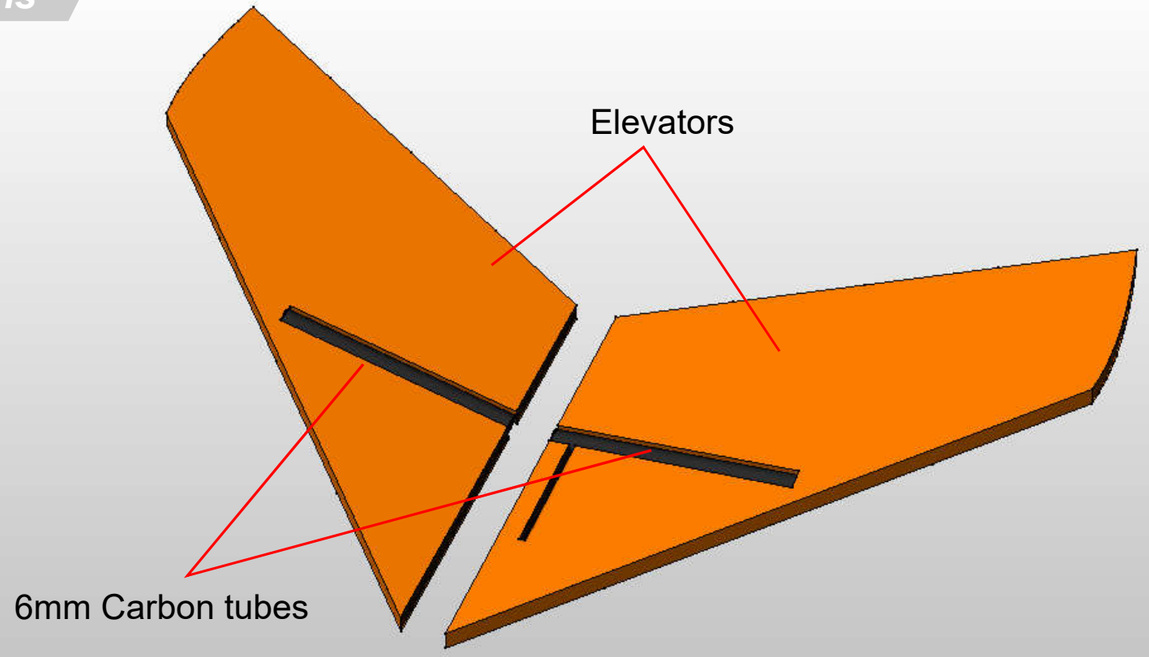


EDF ELECTRICAL CONNECTIONS

Connect the wires as shown. Use a servo extension cable to the Elevator servo to help to reach your RX.

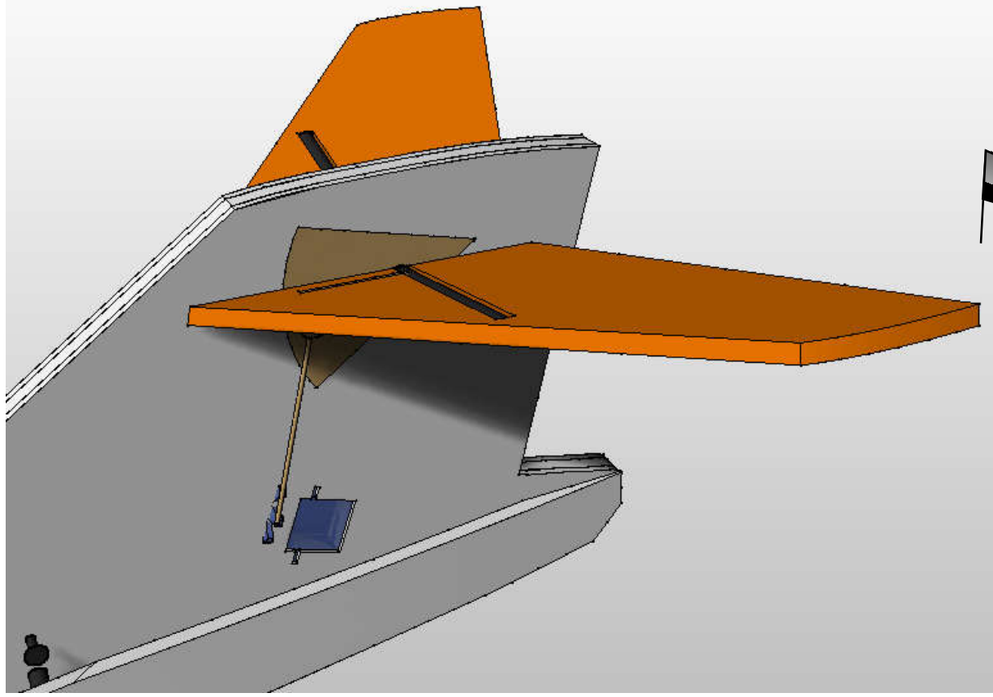
Connect the EDF motor to the ESC and test airflow direction. Set-up the servos. Position the ESC over the top of the ESC cooling hole

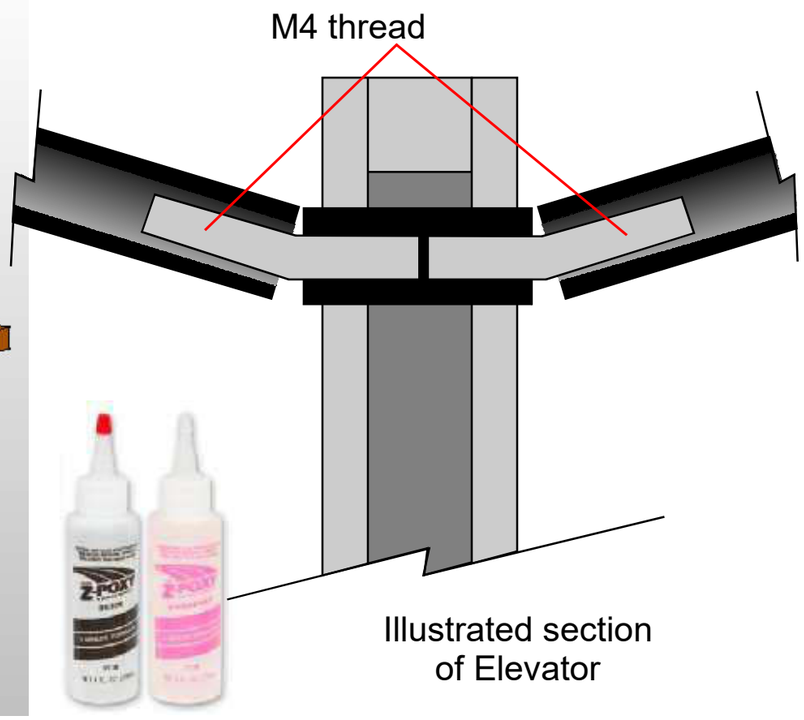
All versions



Using the same method as the main wing, glue the 6mm Carbon tubes into the **Elevator** slots so that the carbon is aligned with the inner edge of the foam

All versions



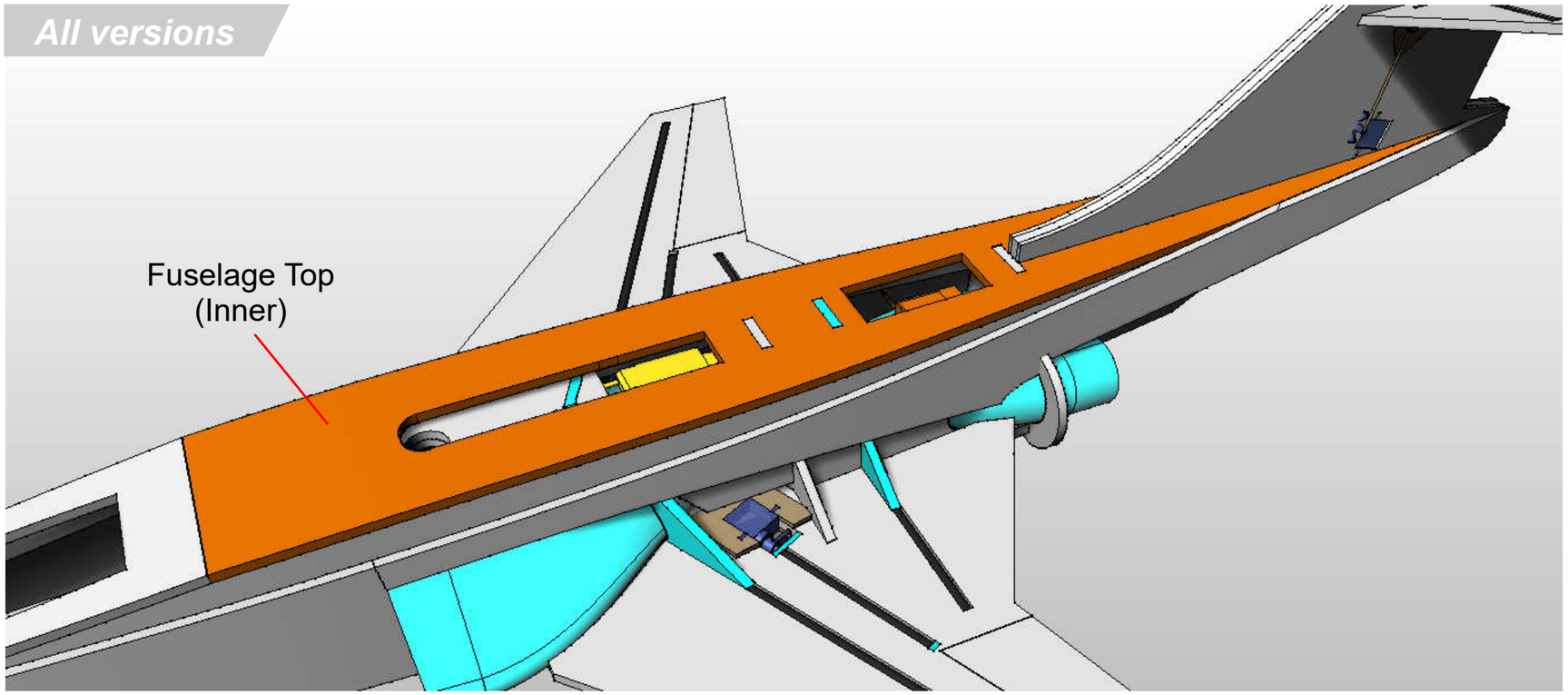


Remove the heads of two 4mm machine screws and bend the to the correct angle (Measure off GA drawing).

Slot them into the elevators and elevator mechanism, securing in place with epoxy. Be careful not to get any epoxy into the hinging faces.

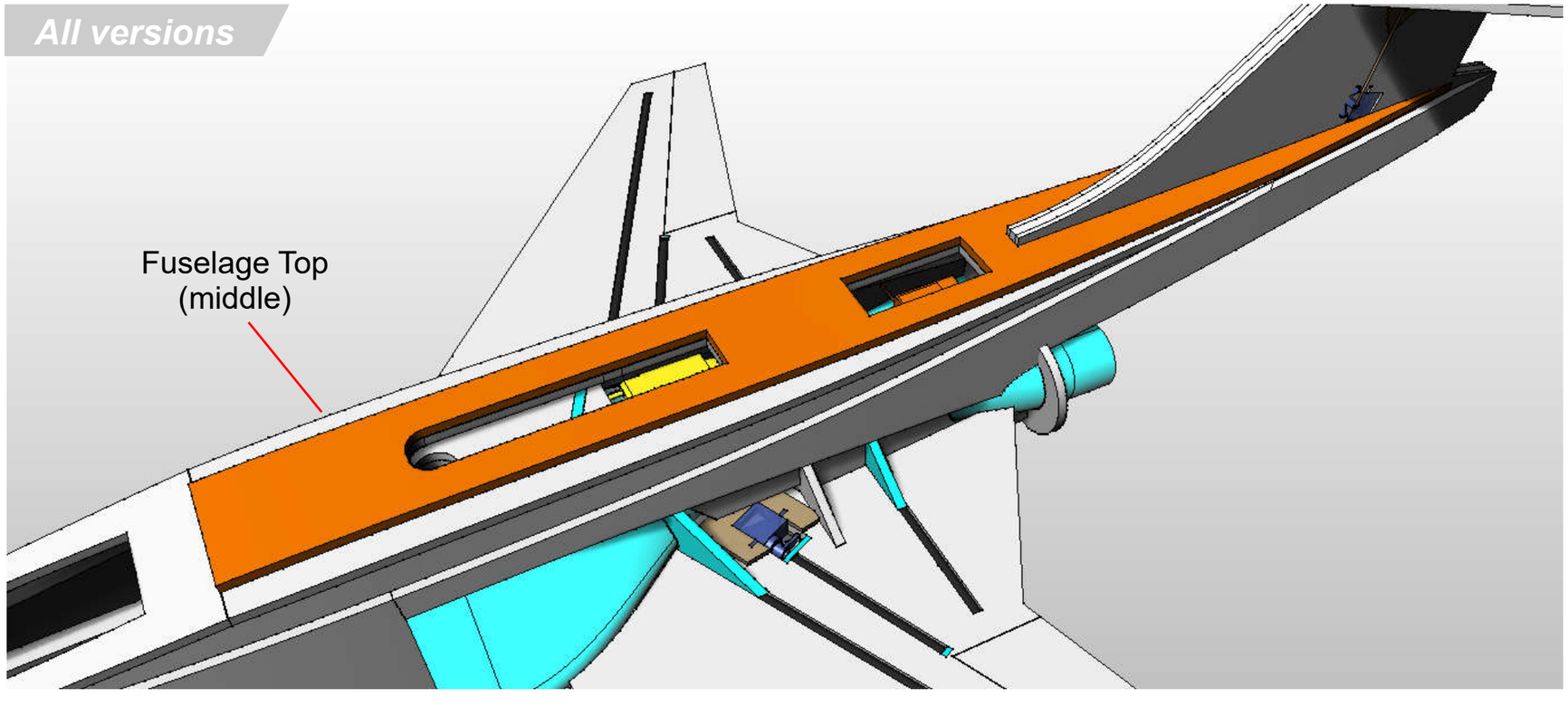
Fabricate/3D print a control horn and glue into place using epoxy - ensuring it is angled vertically and not perpendicular to the elevators.

All versions



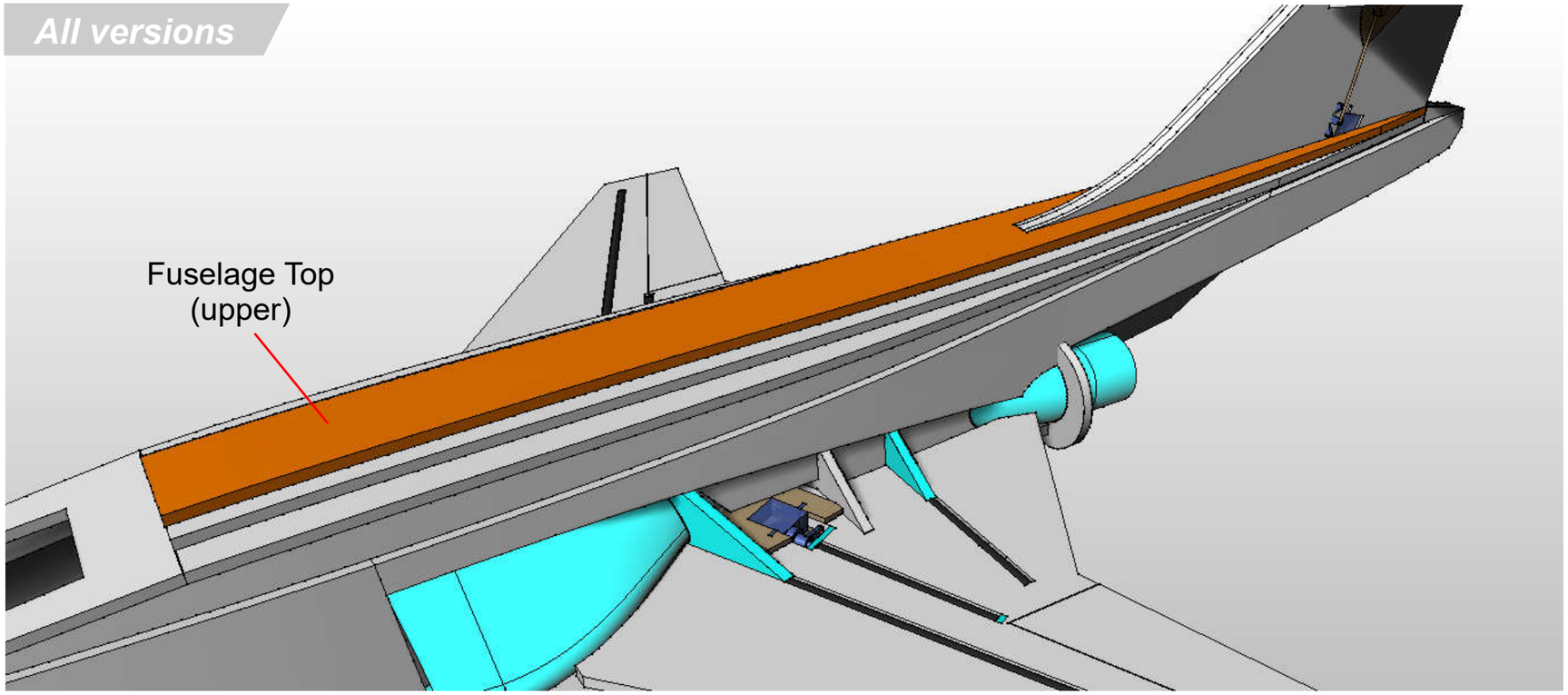
Glue the **Fuselage Top (Inner)** in place.

All versions



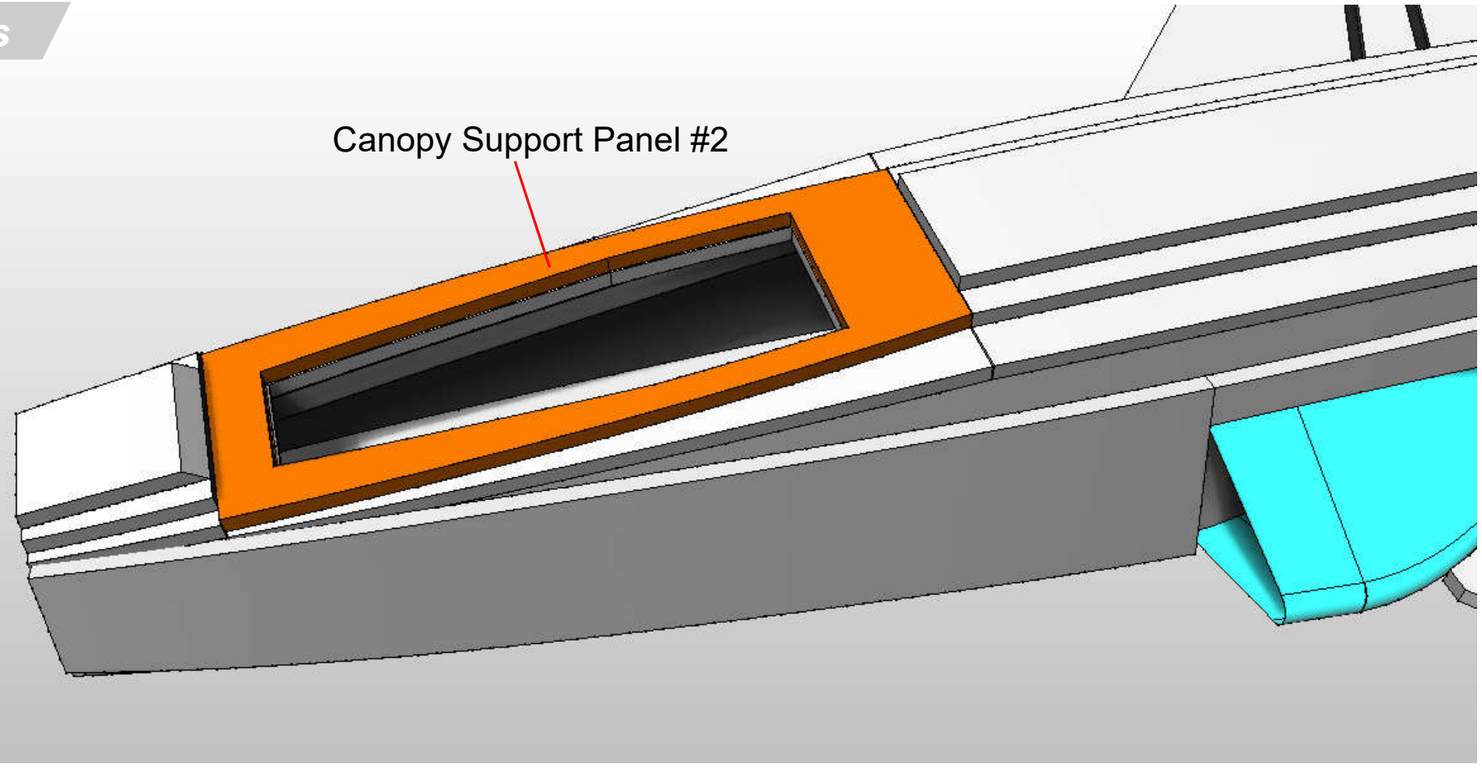
Glue the **Fuselage Top (middle)** in place.

All versions



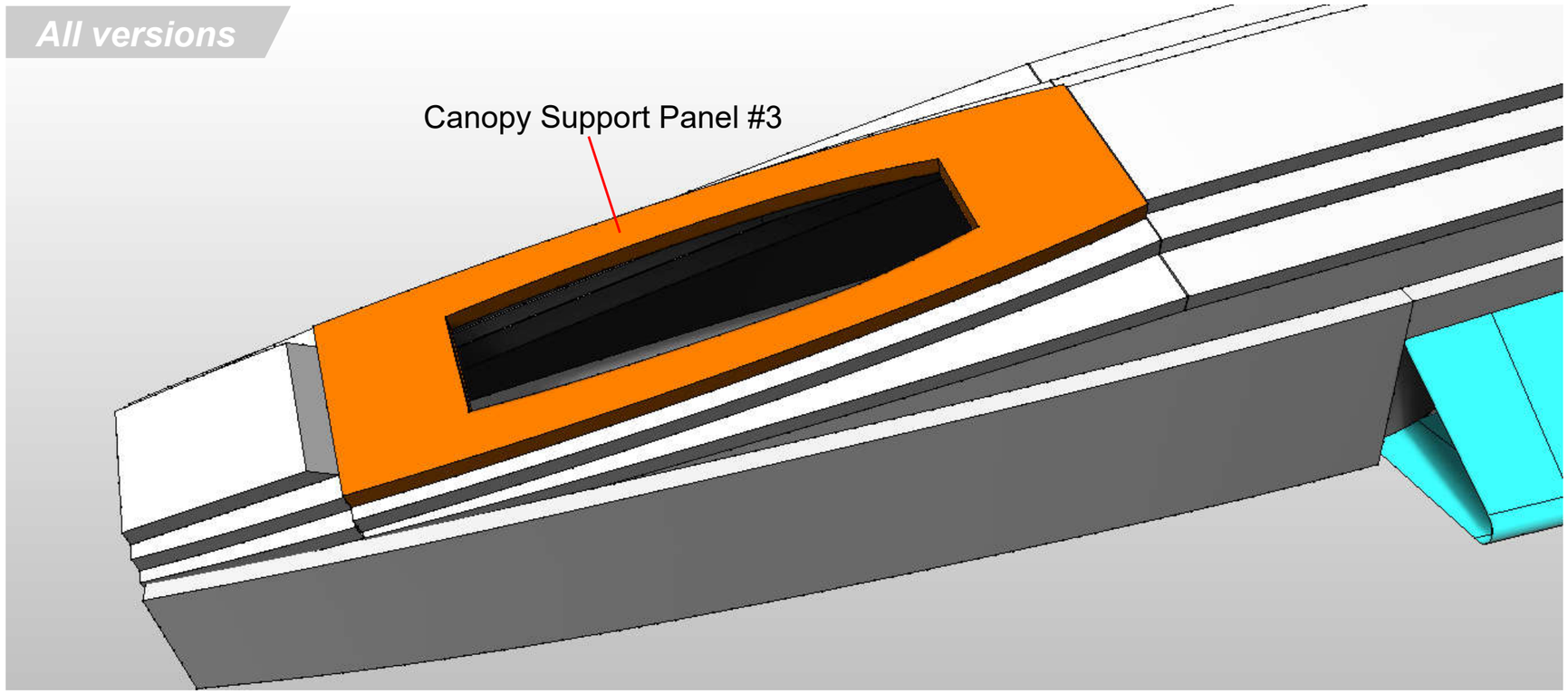
Glue the **Fuselage Top (upper)** in place.

All versions



Glue the **Canopy Support Panel #2** in place.

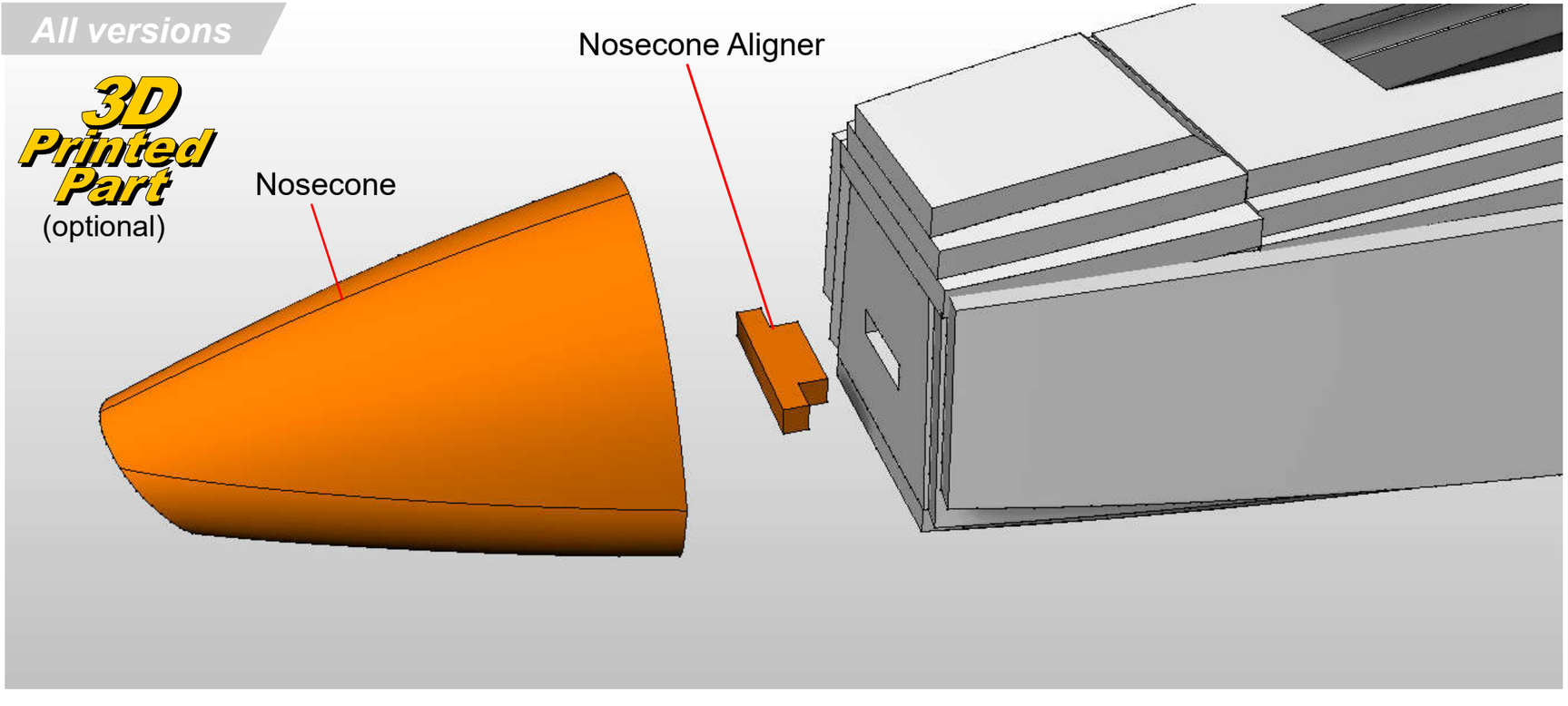
All versions



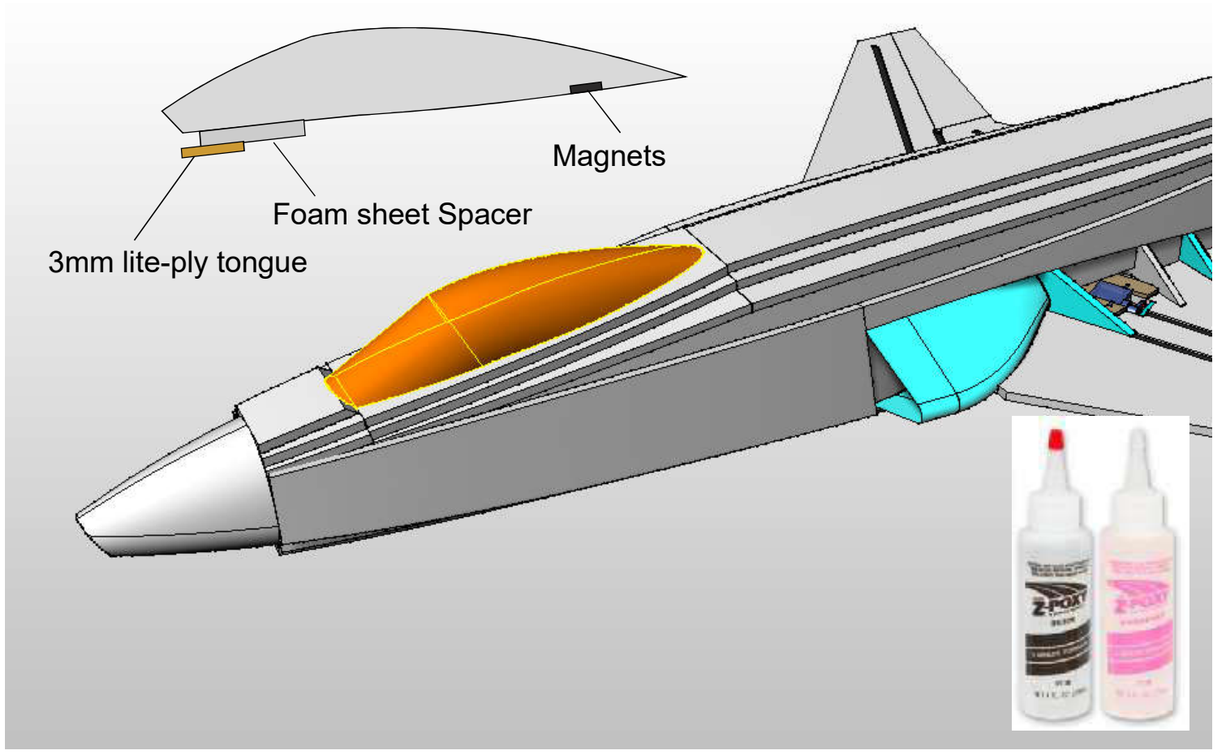
Glue the **Canopy Support Panel #3** in place.

All versions

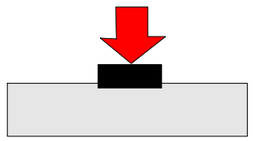
3D Printed Part (optional)



Fabricate your **Nosecone** using laminated sheet foam or 3D print one. Using the **Nosecone Aligner**, glue to the assembly.



Create the canopy in the same way as the nosecone, or 3d Print one and add magnets as shown.

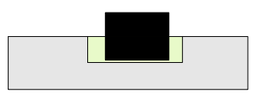


1. press magnet into depron to impress shape.

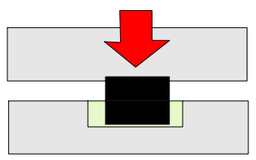
2. Dig out a recess for the magnet using a sharp knife.

3. Apply glue into recess and push magnet into it.

4. Whilst still wet, lay masking tape over the area.



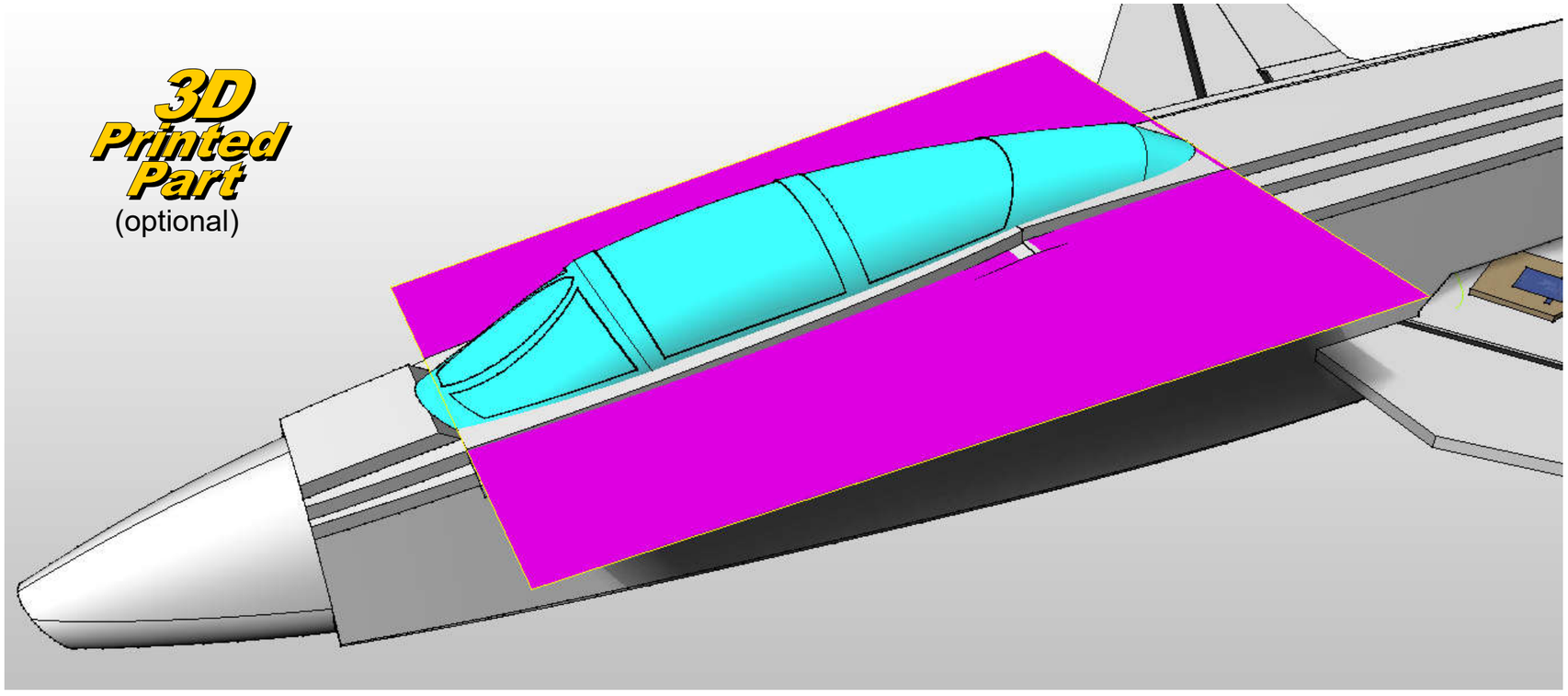
5. When fully cured, remove tape and put adjoining magnet on top



6. When correctly aligned, press adjoining depron onto the sticking up magnet to impress shape.

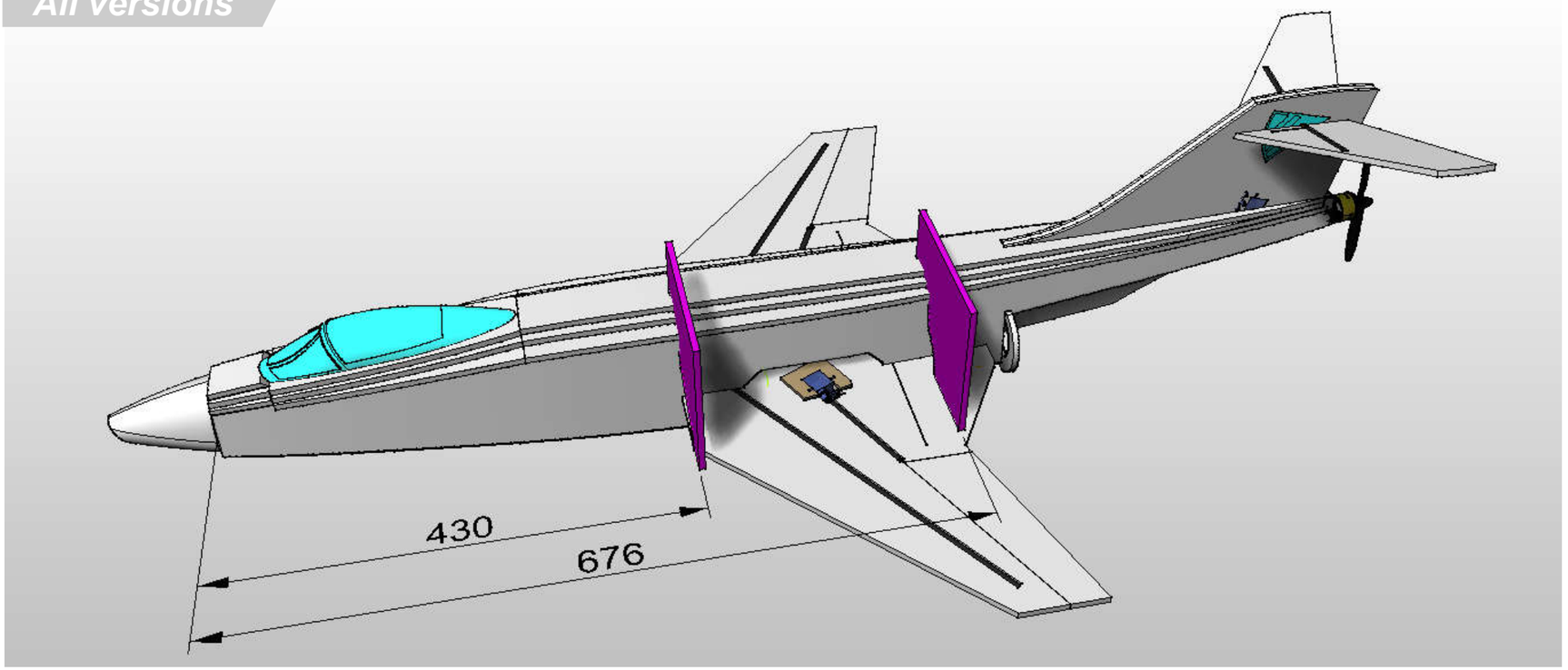
7. Repeat steps 2-4 for the upper part.

IMPORTANT.
Before glueing the upper magnet in, check that the magnet is the right way around!



For the double canopy you will need to sand down the fuselage flat across the length of the canopy - identified by the purple surface.

All versions

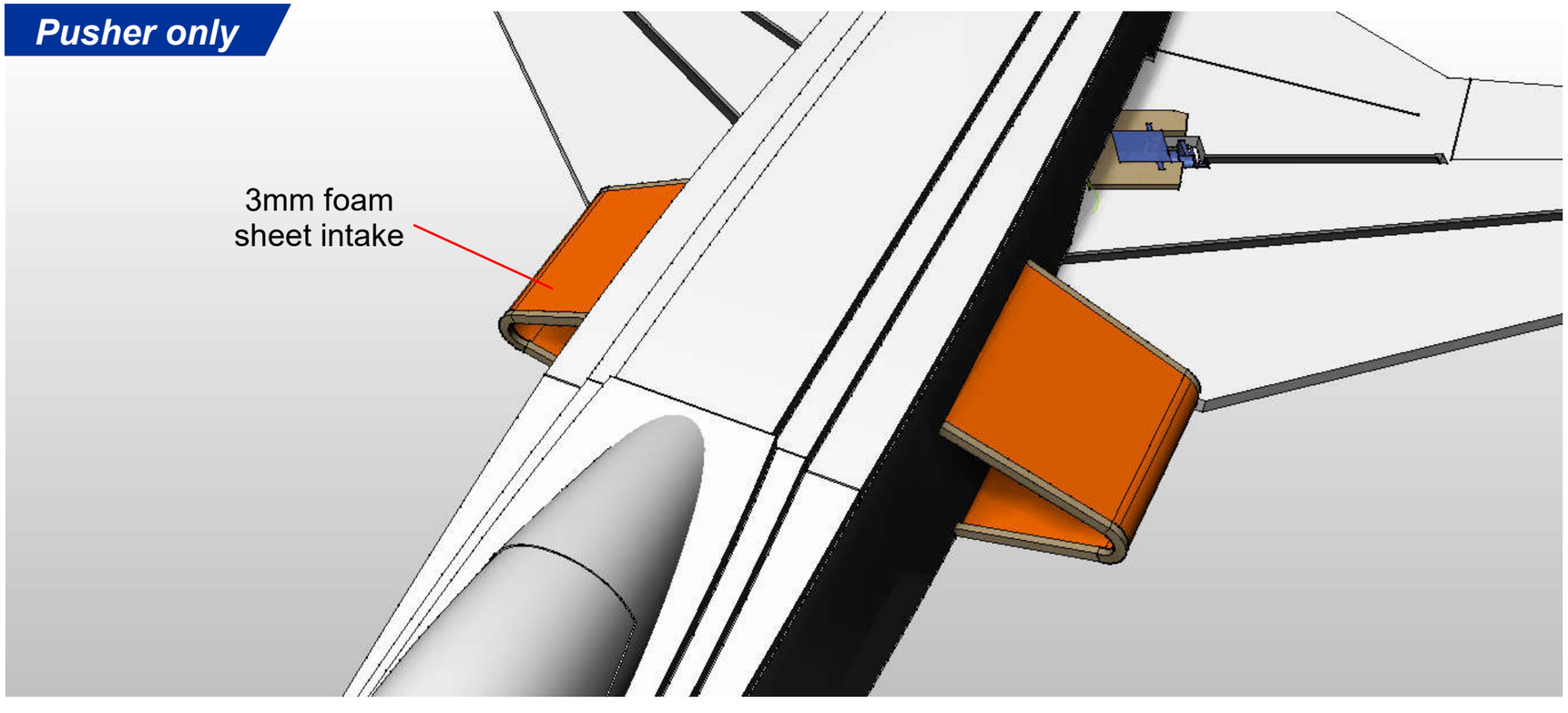


Sand the fuselage smooth using the Jigs to get the correct shape.

Start with a retractable craft knife to slice away the bulk then work your way through various grit sand papers to get smooth.

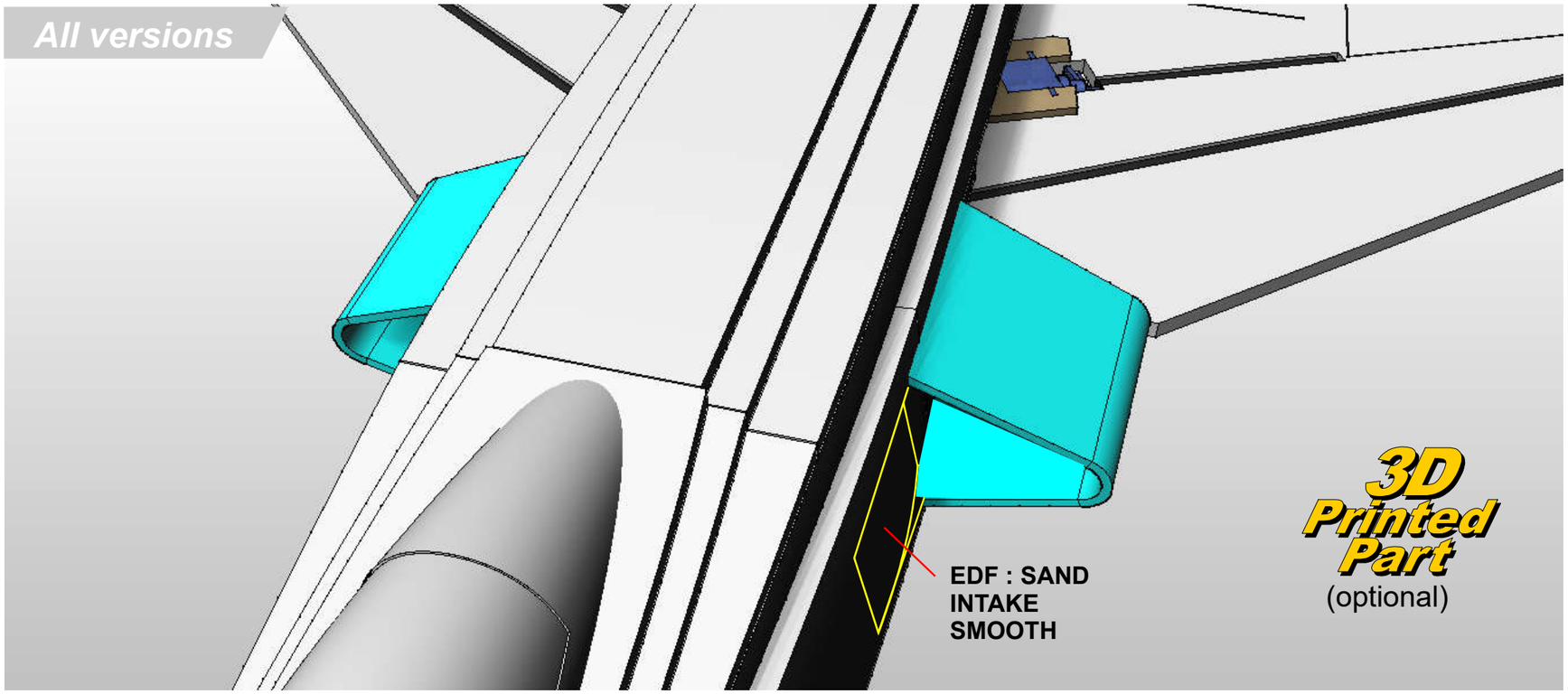
For the initial shaping you could try a palm sander to speed you up.

Pusher only



Non-3d Printed version.

Fabricate the intakes using 3mm liteply formers and 3mm foam sheet as shown.

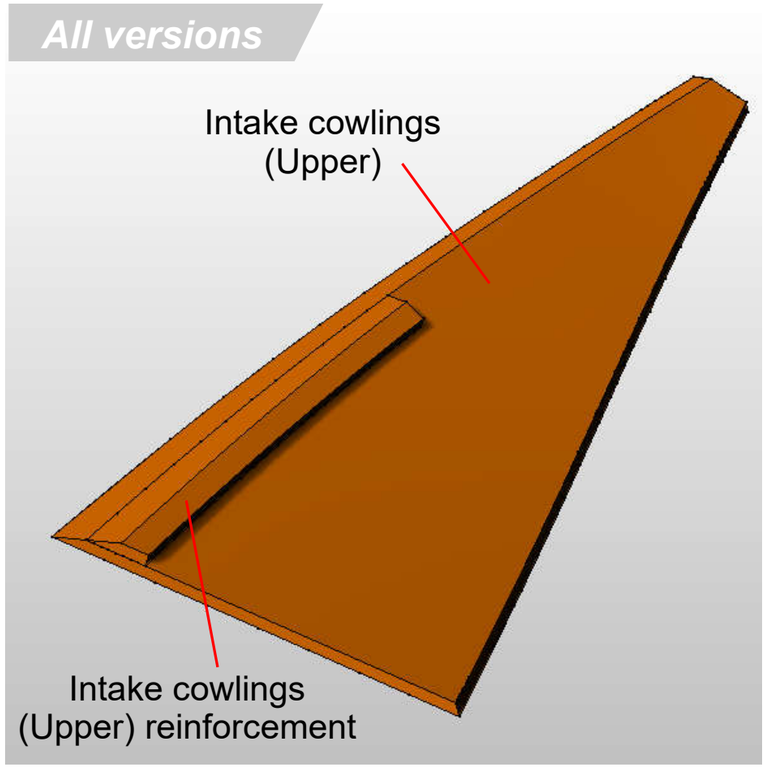


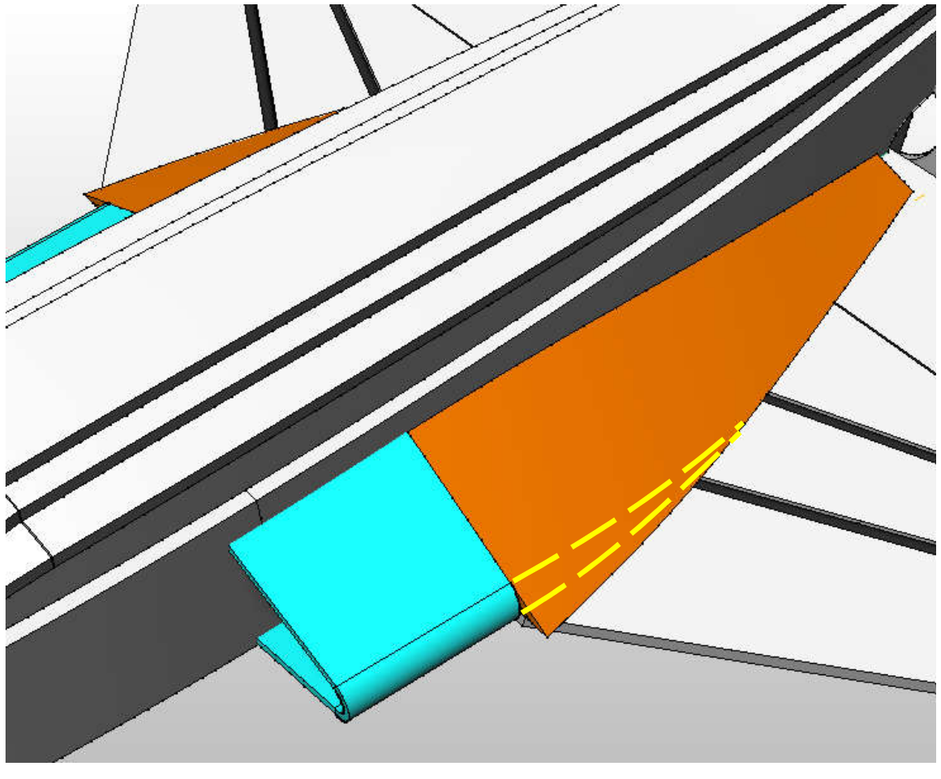
3D Printed Intakes.

Glue these in place.

Note - these parts sit over the intake ducts on the EDF version.

EDF VERSION : Sand the fuselage sides to form a smooth intake into the air intake.

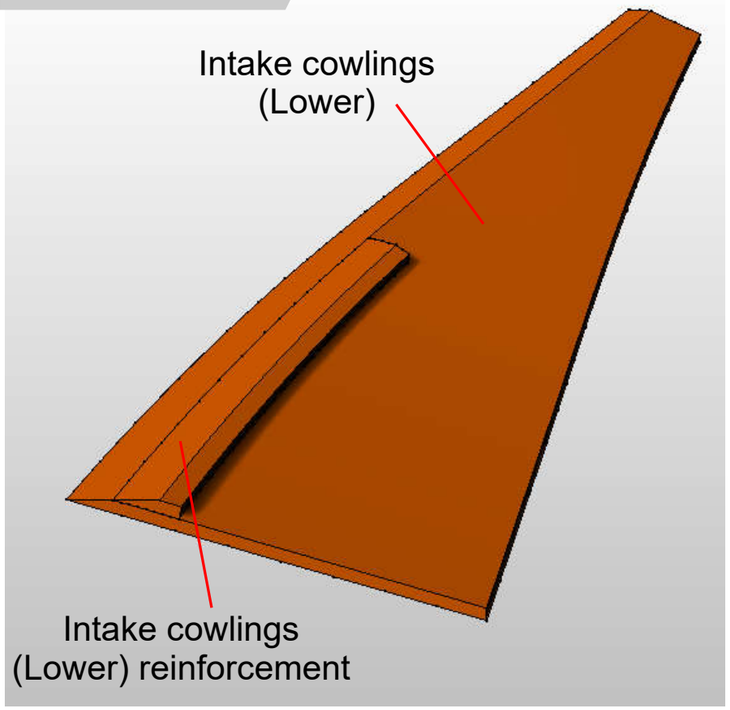


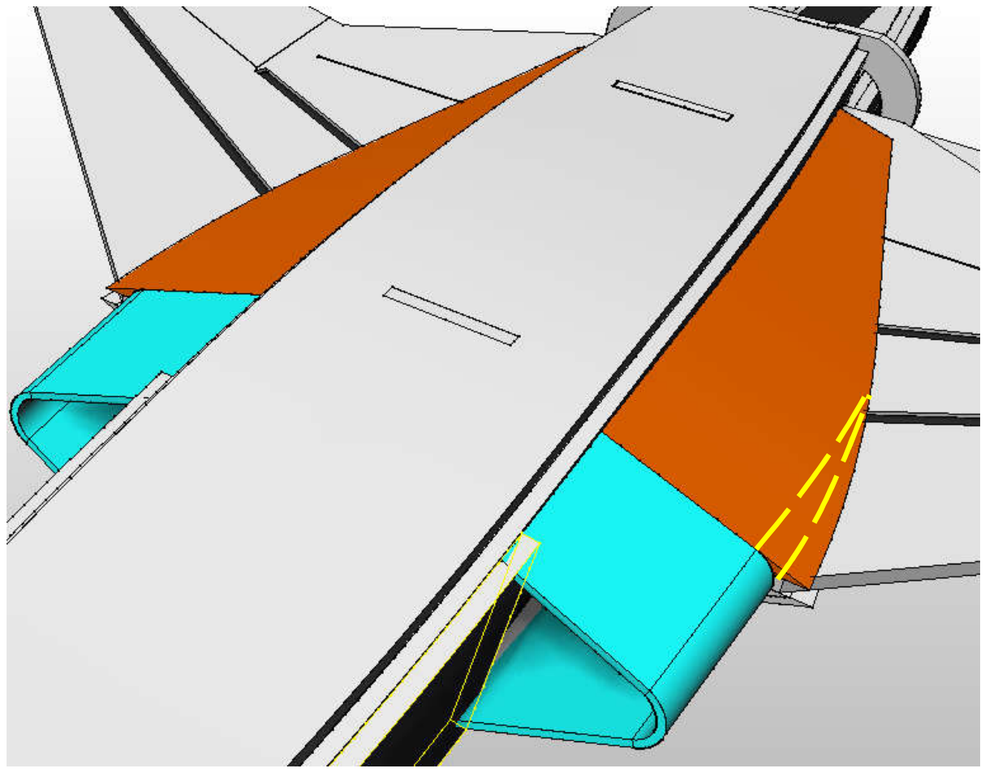


Glue two pieces of the **Upper Intake Cowling** together and dry fit to the fuselage.

Sand the lower corner to blend to the shape of the intakes as illustrated.

All versions

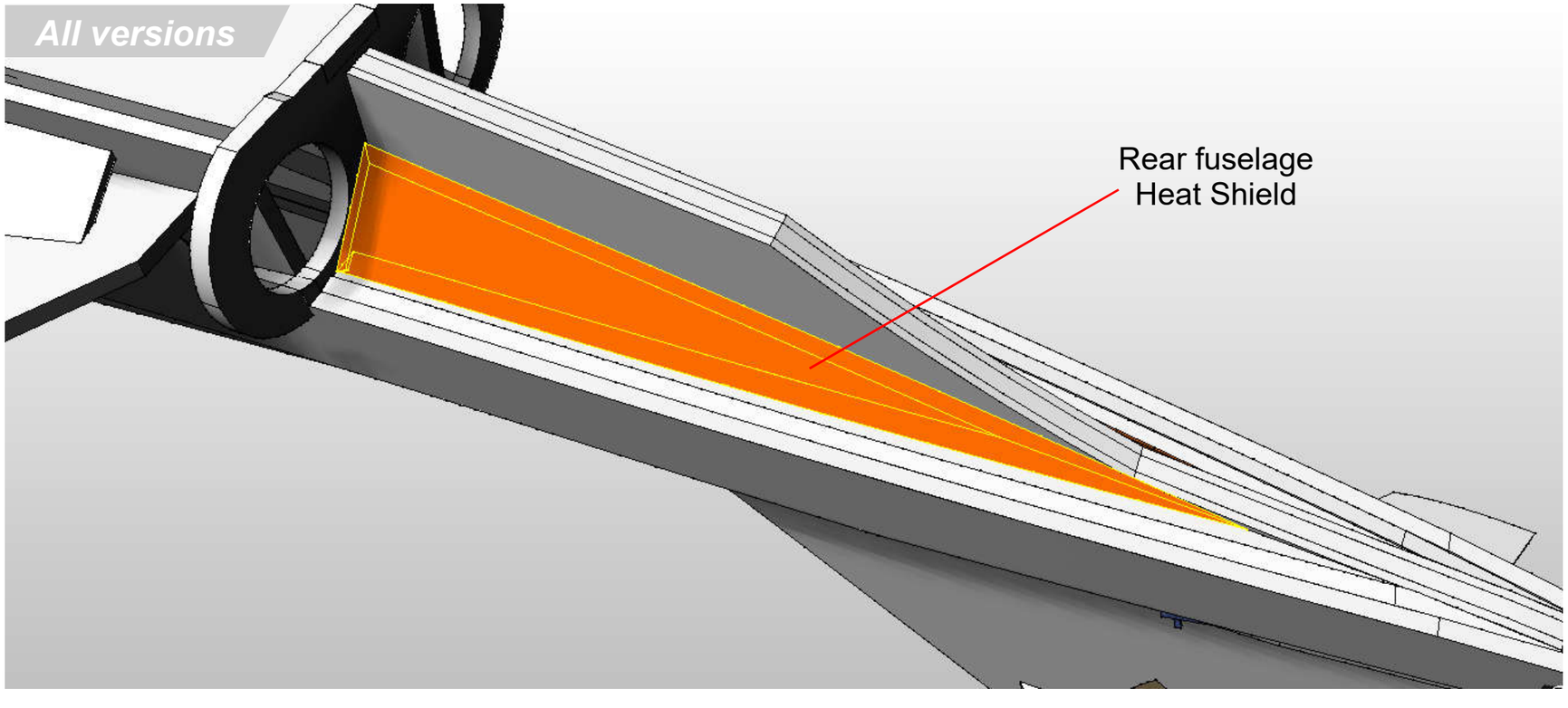




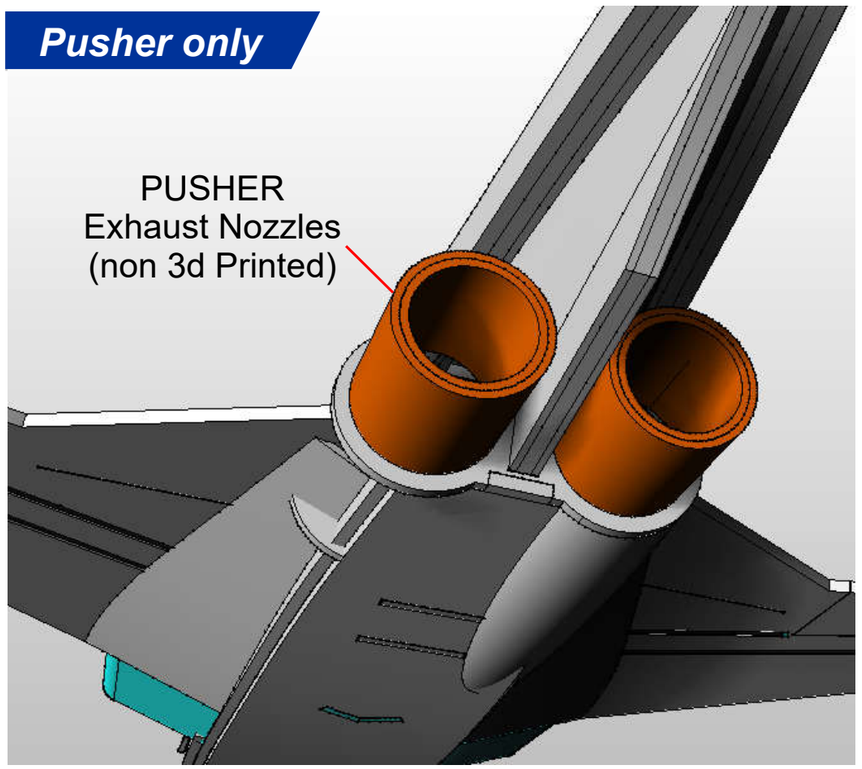
Glue two pieces of the **Lower Intake Cowling** together and dry fit to the fuselage.

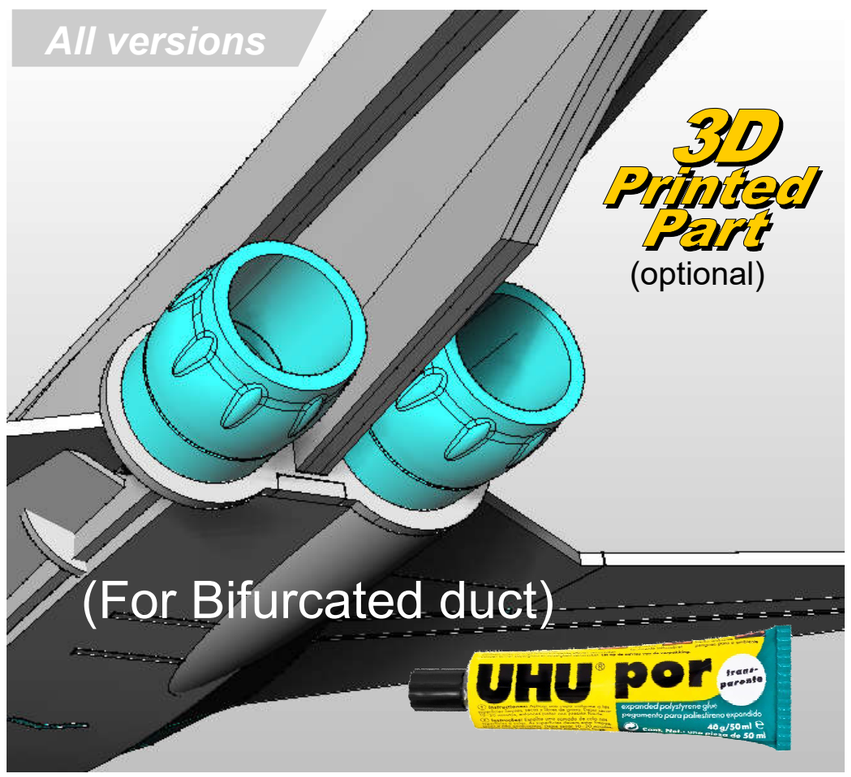
Sand the lower corner to blend to the shape of the intakes as illustrated.

All versions

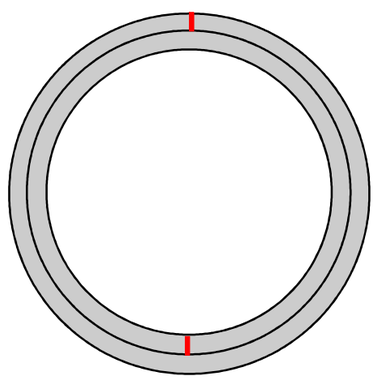


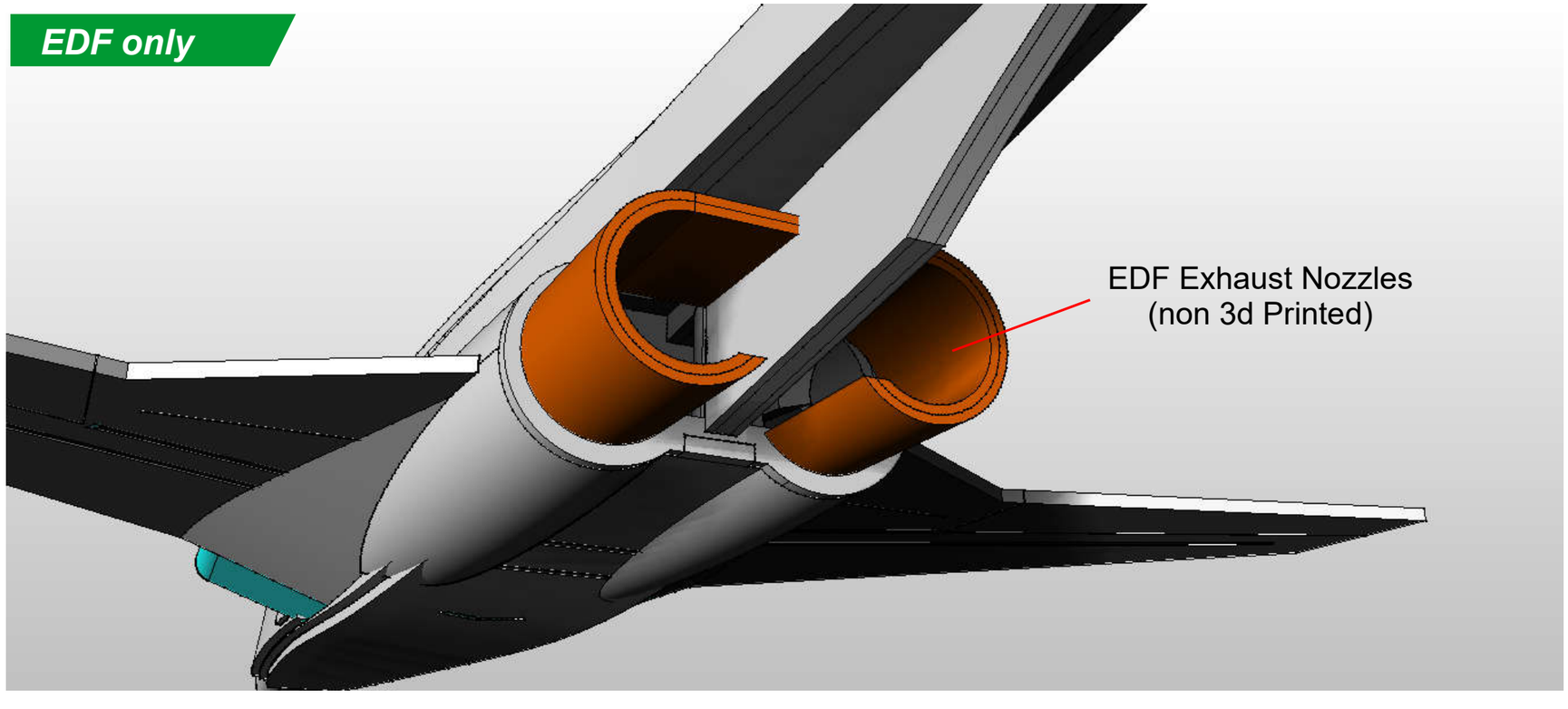
Excluding the non-3d printed EDF version, Glue the two **Rear Fuselage Heat Shield** pieces in place.





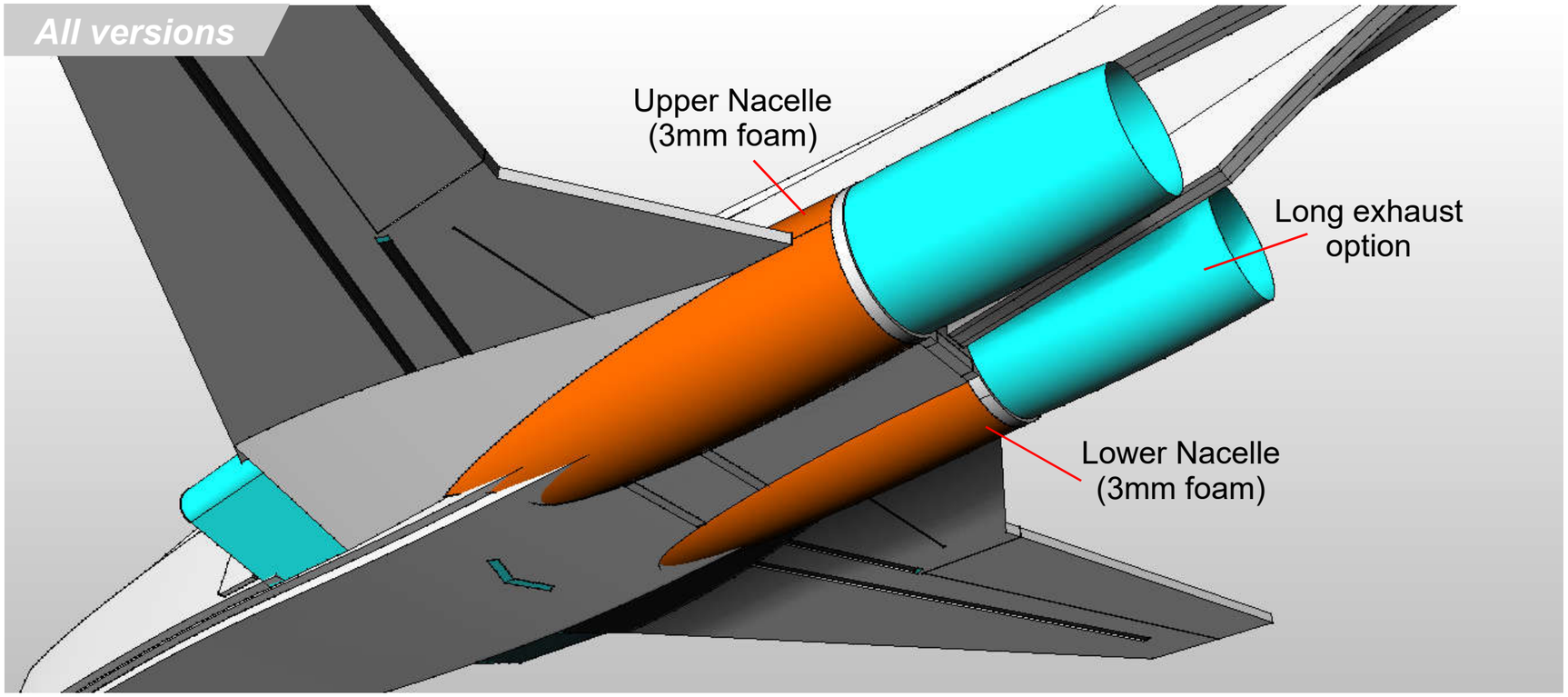
Either 3D print or fabricate your **Exhaust Nozzles** using 3mm foam sheet, rolled, putting the 'joint' on opposing sides.





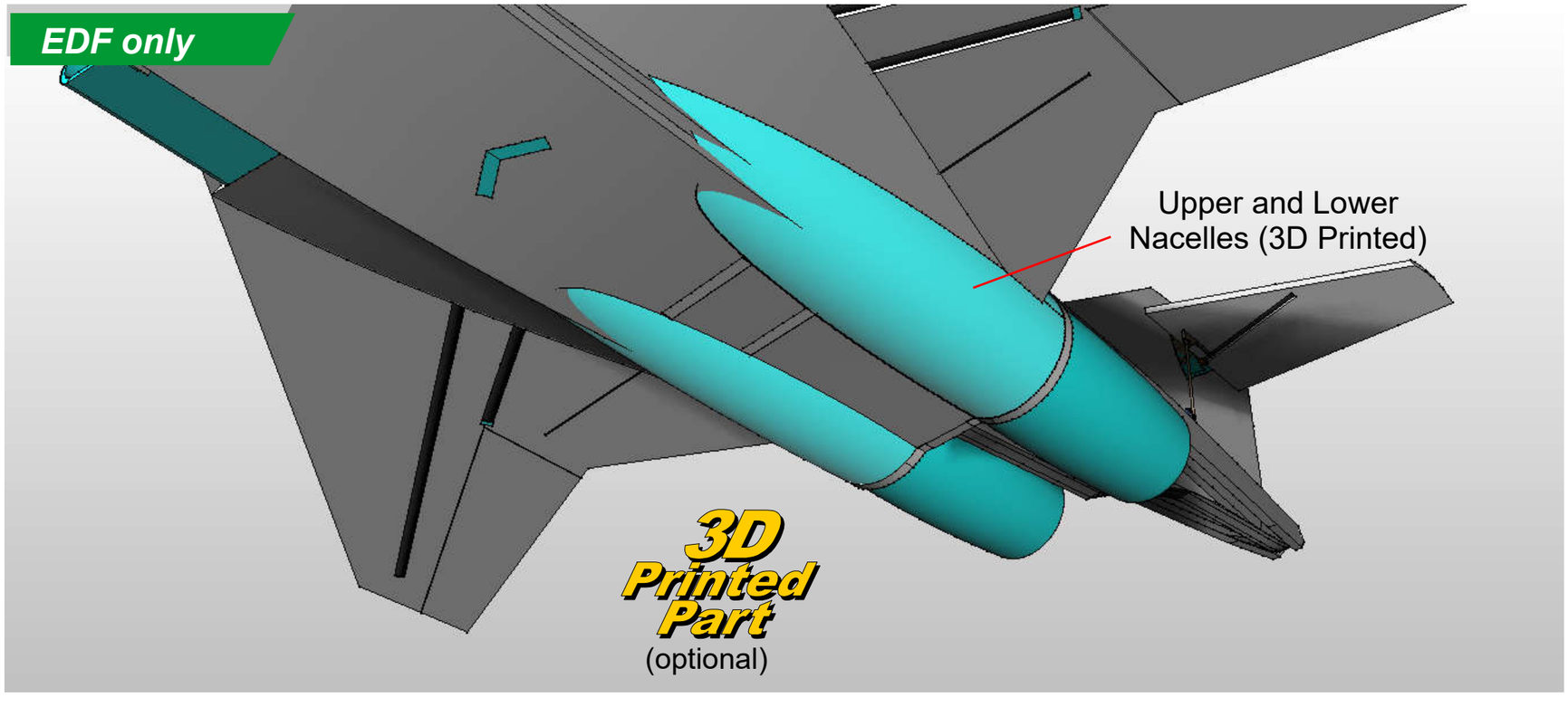
Use the Jigs to make the Non-3D printed EDF version.
Trimming to shape as shown.

Glue in place.

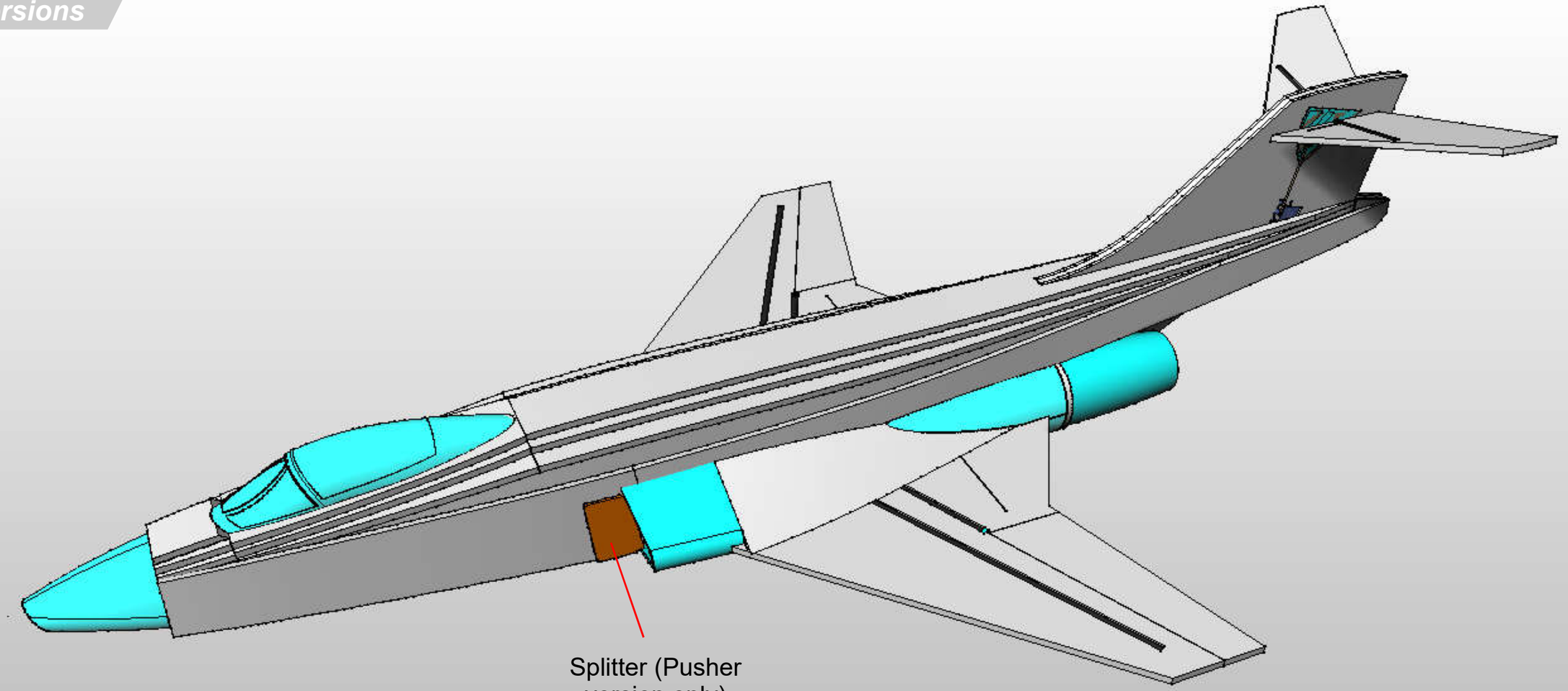


Using 3mm foam sheet, Construct the **Upper and Lower Nacelles** by rolling and bending over a table edge to get the correct shape.

Sand the edges to get a good mating fit then glue in place.



Alternatively use the **3d printed Upper and Lower Nacelles.**



For the Pusher version remember to add the 3mm foam Splitter as shown.

Congratulations! Your model is now complete. Either fly it as it is, or paint it in your favourite colour scheme - remember to use non-solvent paints!