

Saab
J-35 Draken
Parkjet

v1.1



Photograph of actual aircraft.



2nd Generation Jet Fighter

Construction Guide

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J-35 Draken History

The Saab 35 Draken (Dragon) is a Swedish fighter aircraft manufactured between 1955 and 1974. It was the first fully supersonic aircraft to be deployed in Western Europe and the first aircraft to do the Cobra manoeuvre. In Swedish service, it underwent several upgrades, the ultimate of these being the J 35J model. The SAF opted to retire the Draken during December 1999. The type was also exported to Austria, Denmark, Finland, and the United States.

The Saab 35 Draken is equipped with a distinctive double delta wing, what would later be known as a 'blended wing-body'. The fuselage has a circular section, and the inboard portion of the wing is a large-chord surface which extended almost to the engine intakes. It was possible to dispense with a tailplane, resulting in a clean, simple overall design. The leading edge of the inner wing was swept back 80° for high-speed performance, and the outer wing 60° for good performance at low speeds.

Up to four AIM-9 Sidewinder air-to-air missiles were carried on hard points beneath the wings and fuselage; alternative payloads include a variety of bombs and rockets, along with provisions for the installation of a pair of 30 mm cannons, located within each of the inboard wing panels. In place of the cannons, additional fuel tanks could be fitted in the same space.

The design allowed the plane to enter what the Swedish called "super stalls", which simplified can be described as an uncontrollable stall which appears on planes with specific wing configurations when pulling high alpha numbers. Due to this pilots on the J 35 were trained to prevent super stalls from happening. But out of this training came what is today known as the Cobra manoeuvre, which starts with an entry into a controlled super stall by pulling high alpha and then quickly pulling negative alpha. This basically makes the plane a full body air brake for a few seconds, which heavily drops the speed. The manoeuvre, which the Swedish named "kort parad", was used by the J 35 pilots as a combat maneuver to make a pursuing enemy fighter overshoot.



Designers Notes

I love Swedish fighters. I really like the unorthodox approach they take, unafraid to experiment with next generation technology.

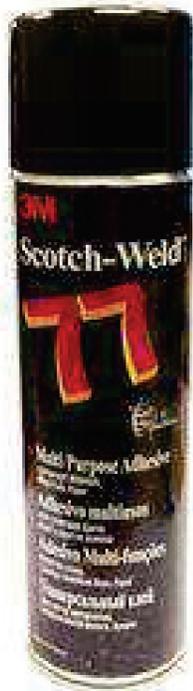
The Draken's double delta has a striking silhouette unique and very recognisable in the sky.

With two servos this is a simple and lightweight construction which should deliver a good turn of speed with its low profile section. Unfortunately the scale intakes are quite restrictive for EDF's so this design has introduced cheater vents to help airflow.

It can be built with or without 3D parts, including a complete tailcone with built in thrust tube.



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.

Cutting parts

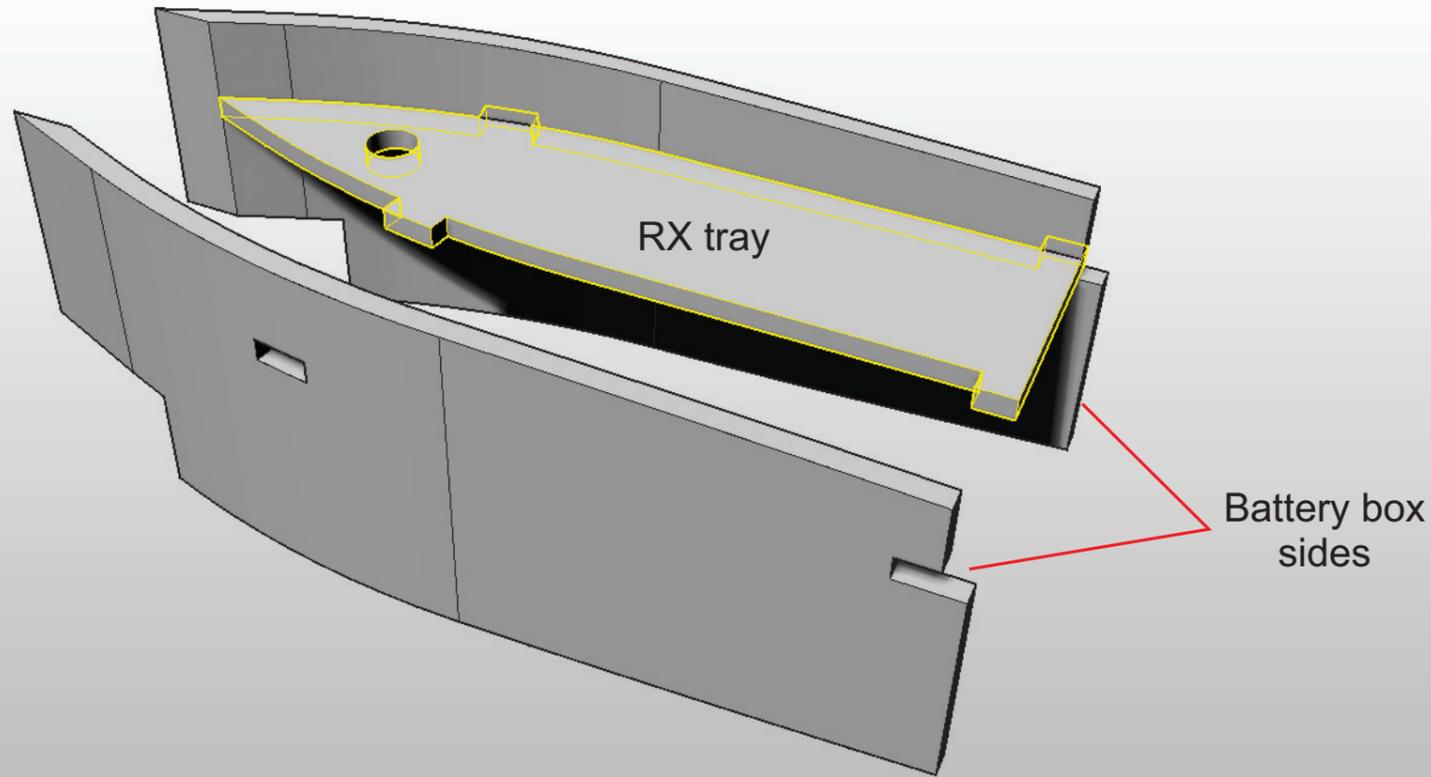
1. Print the plans,
 2. Cut around each part using scissors - allow a border of approx (1/4") 6mm
 3. Use either 3M spray mount or a very light coat of 3M 77 to the back of the parts and stick in an economical layout on the Depron foam.
 4. Using a safety rule and craft knife over a cutting mat - important!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



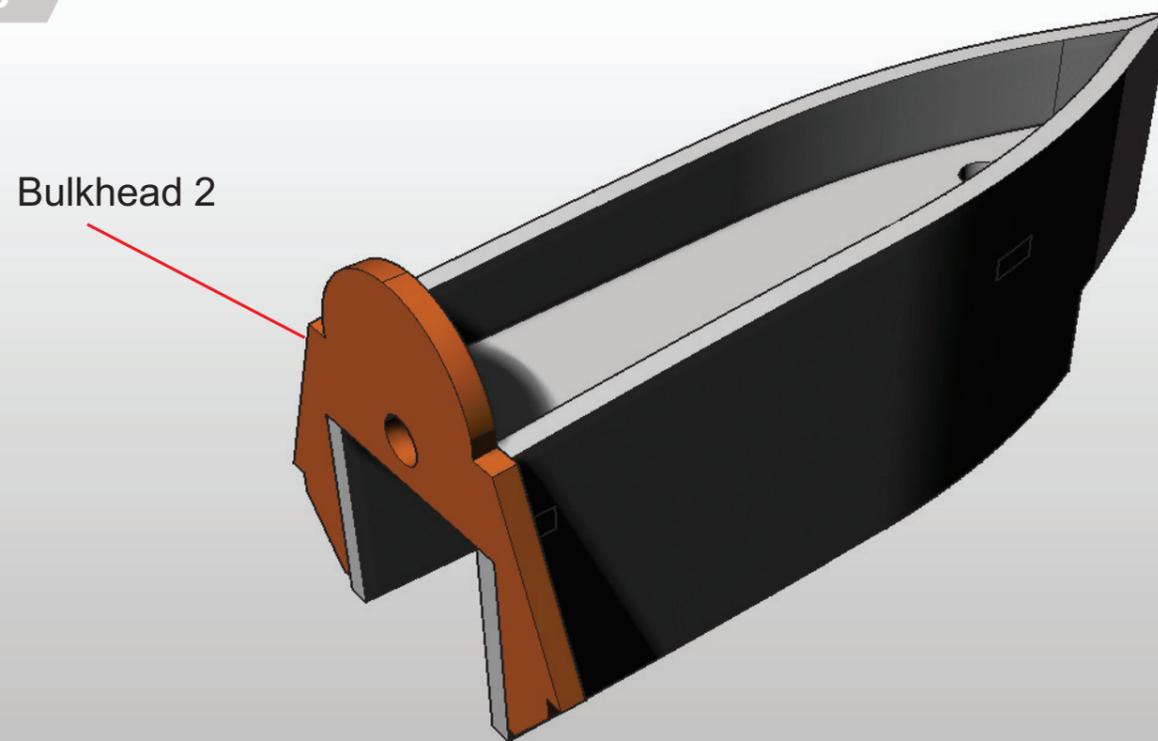
All versions



Shape the **Battery Box sides**, and glue together with the **RX tray**.



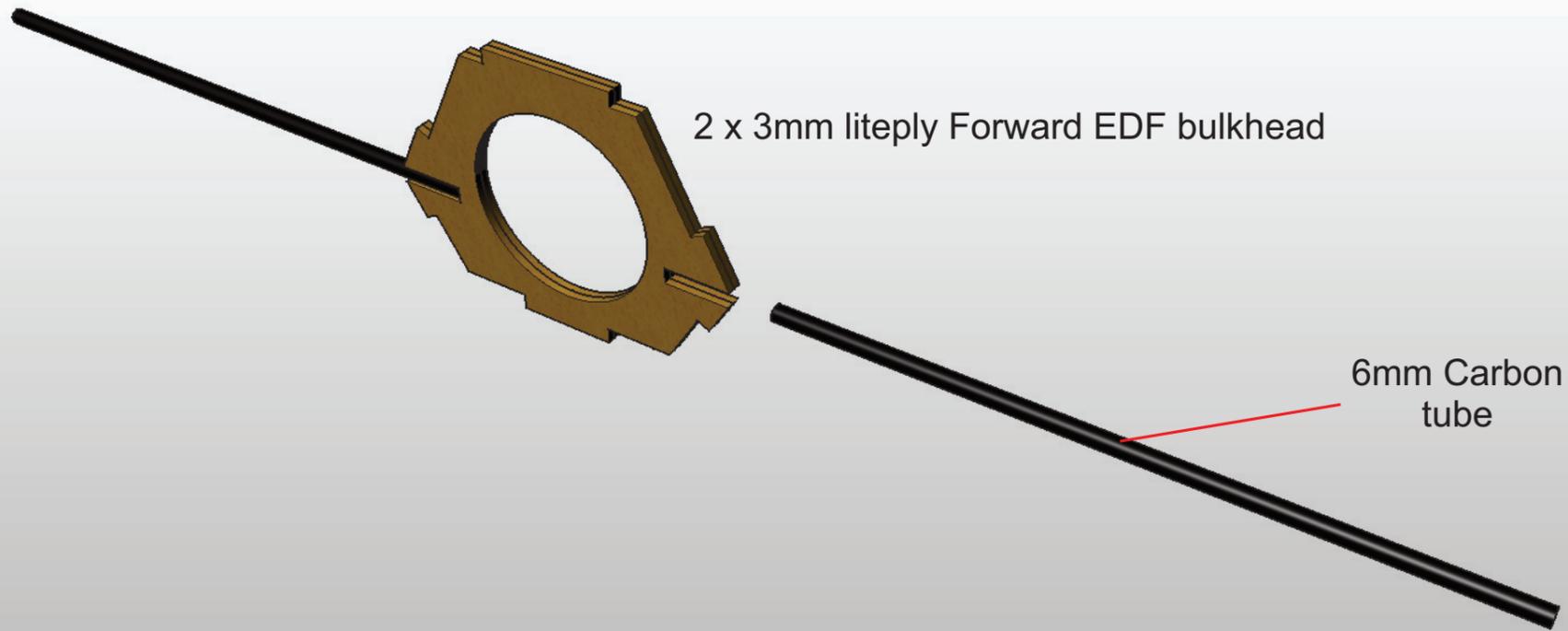
All versions



Glue **Bulkhead 2** to the Battery box.



EDF only

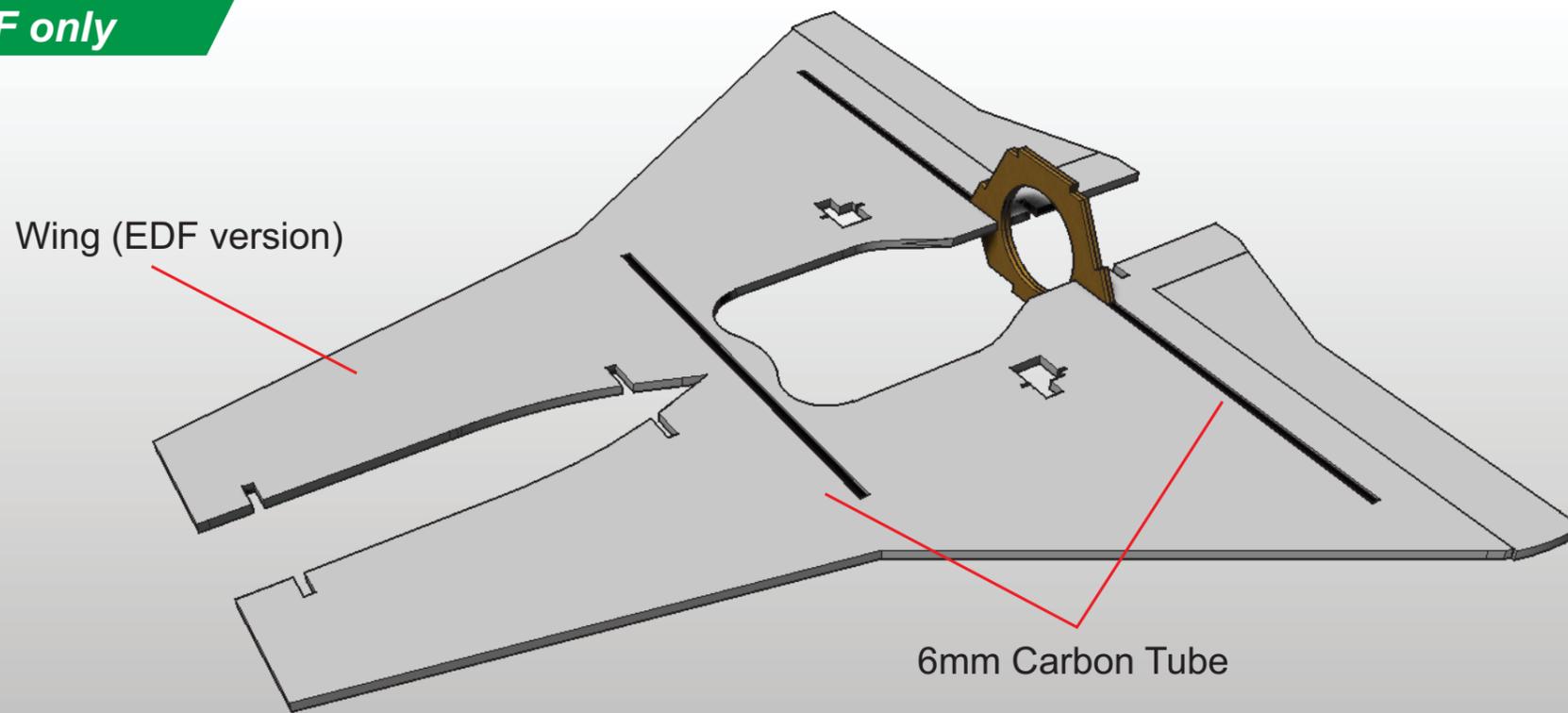


Glue the two **3mm liteply Forward EDF bulkhead** pieces together, and then the **2x6mm Carbon wing spar tubes**.

Ensure they are straight in plan and end elevation.



EDF only

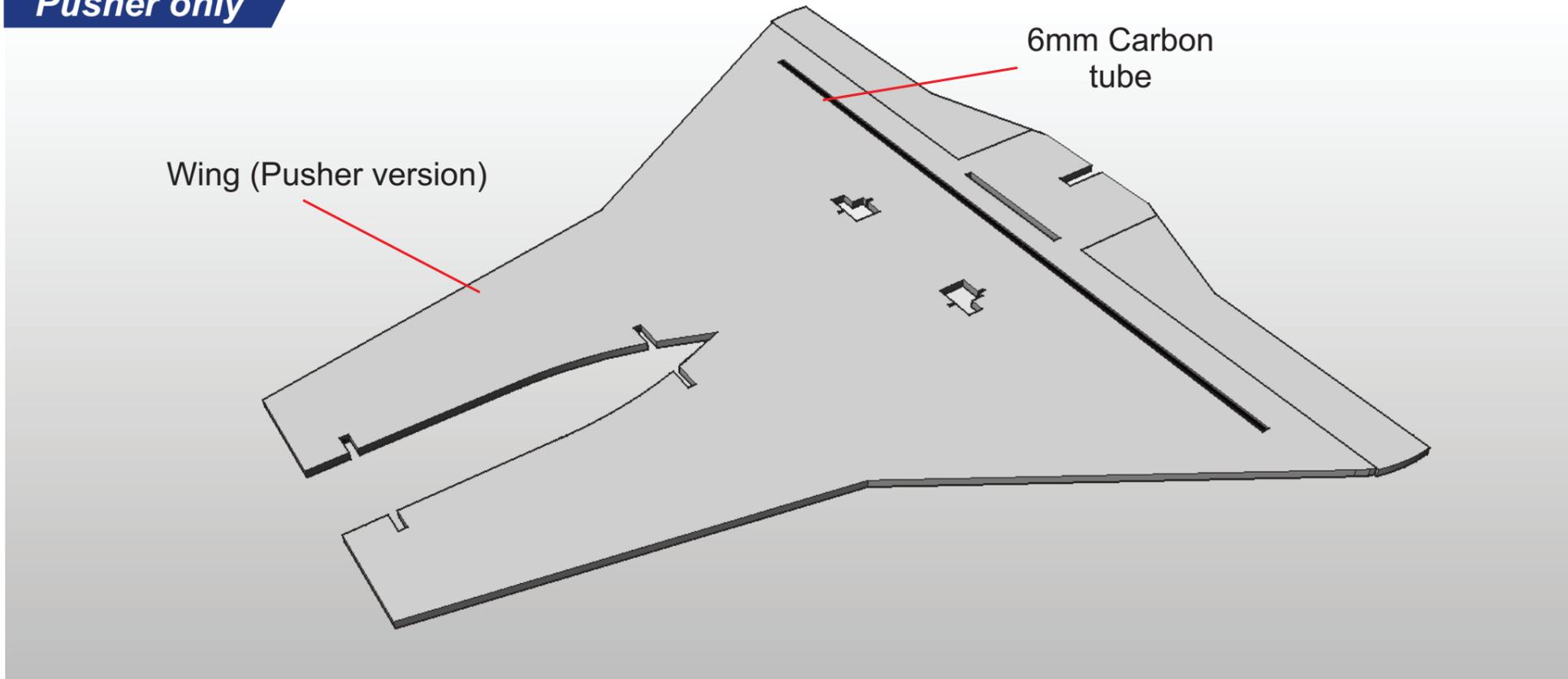


Glue both spars into the wing.

Use masking tape to 'hold' the spars in place while the glue sets.



Pusher only



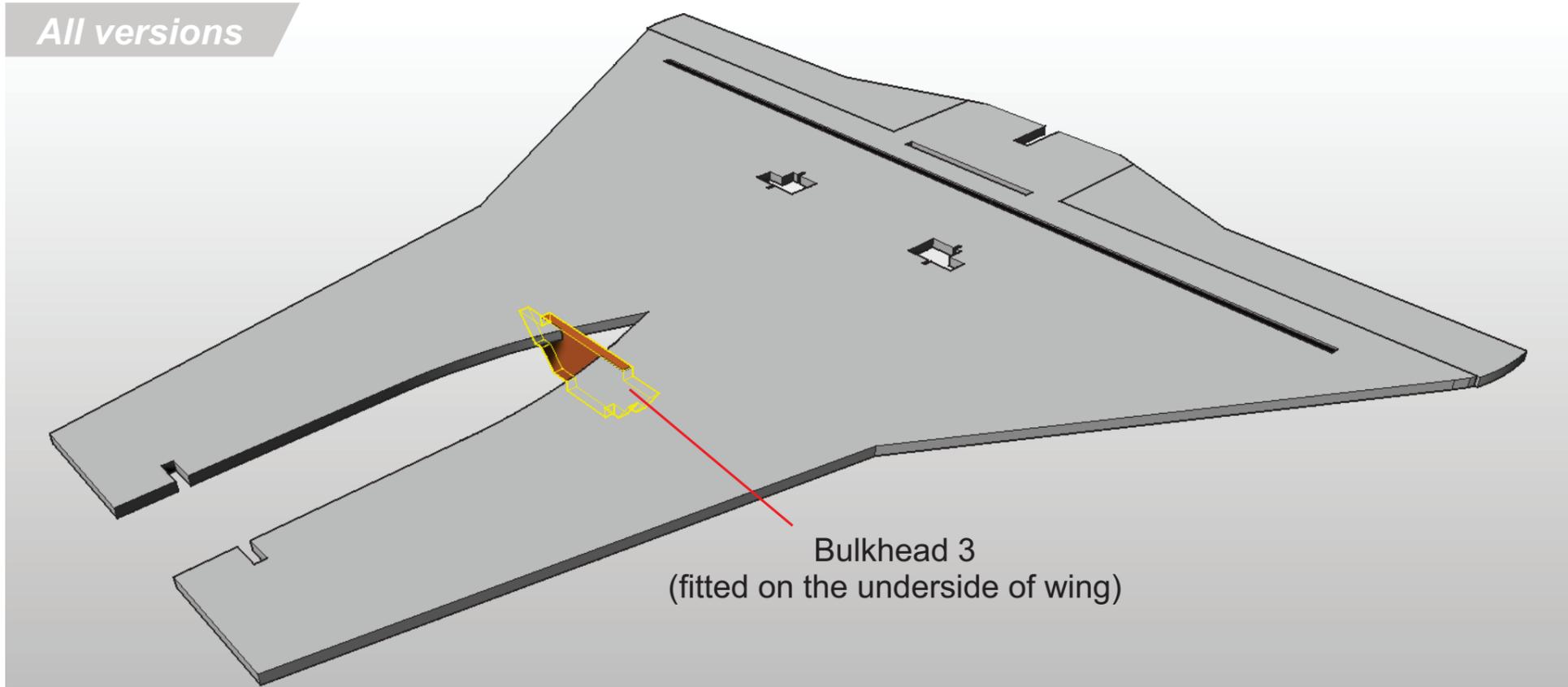
Pusher version only

Glue the carbon spar into the wing panel.

Use masking tape to hold the spar in place.



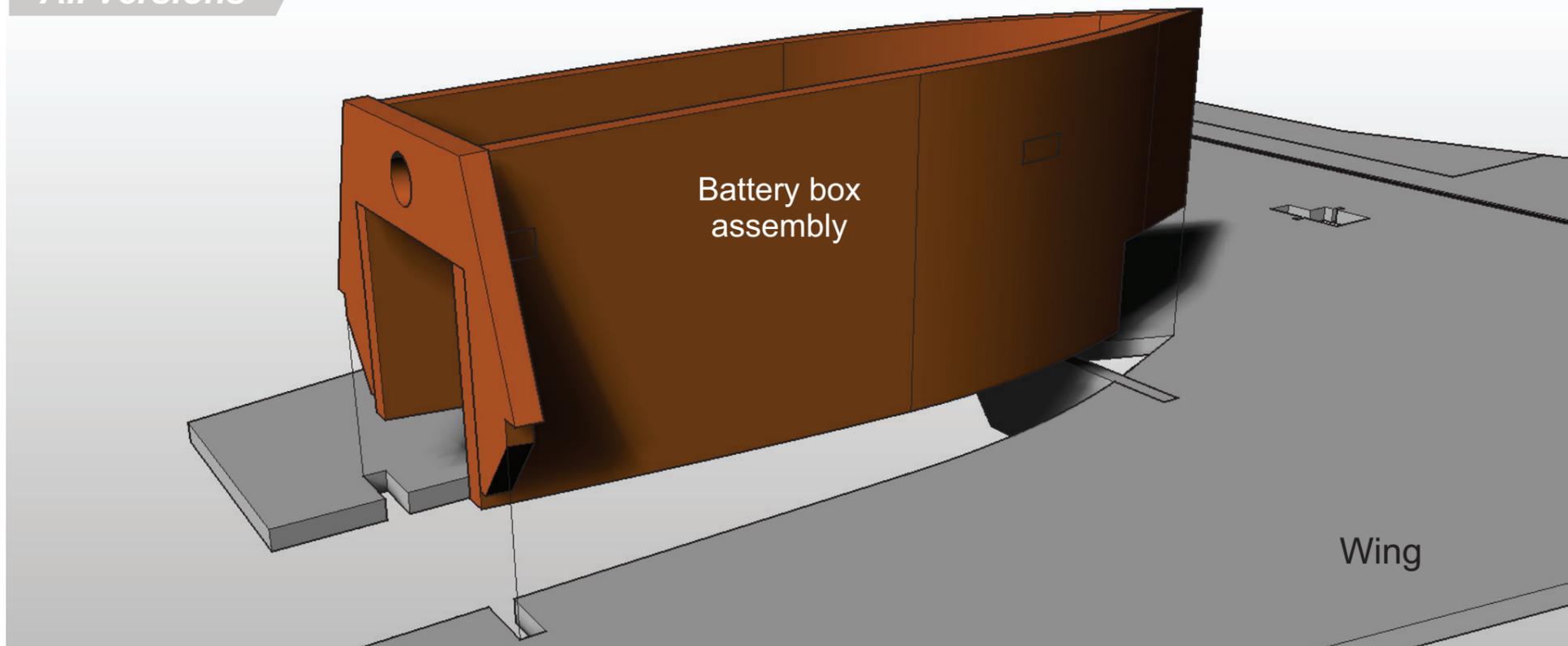
All versions



Glue bulkhead 3 onto the underside of the wing panel



All versions

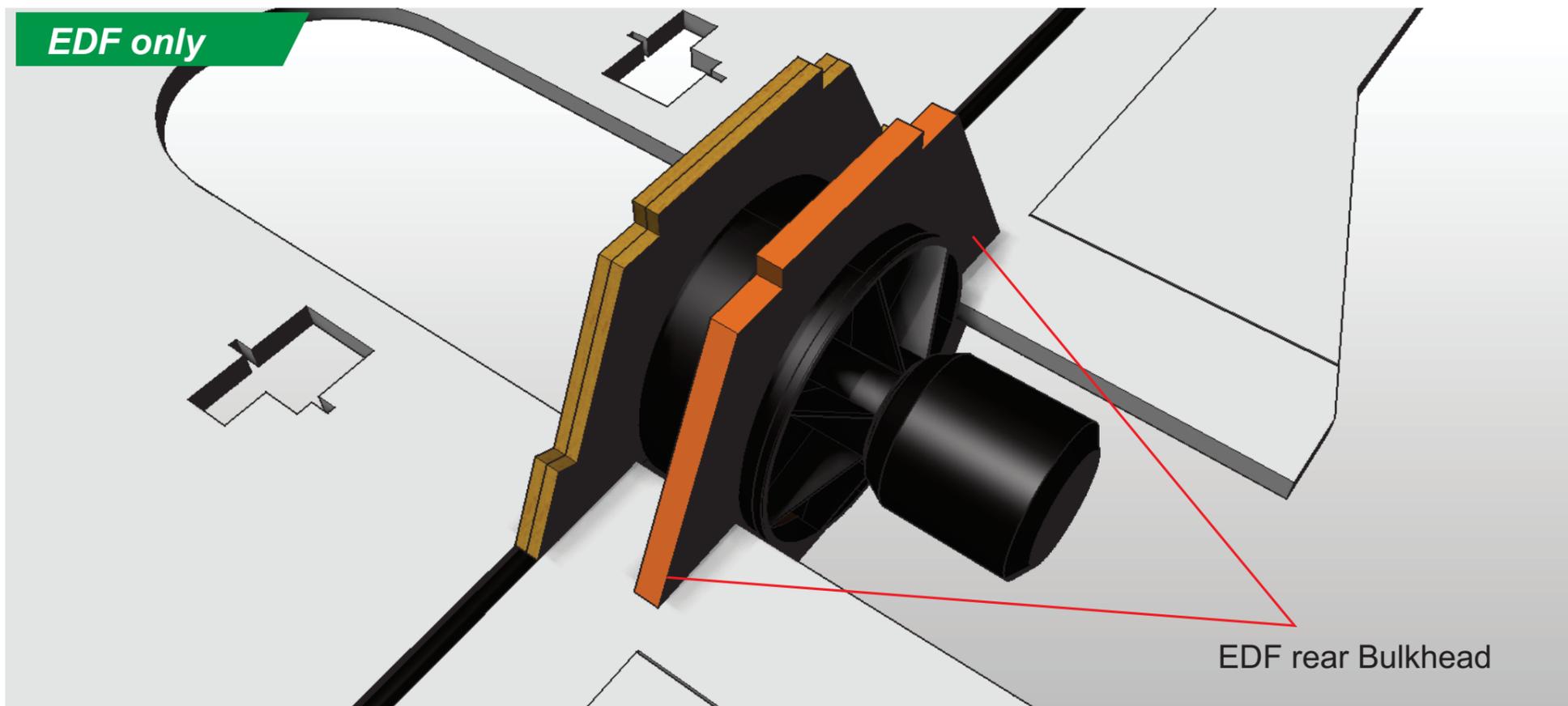


Glue the battery box assembly into the wing.

Use Epoxy (sparingly) as it needs to 'slide' in place.



EDF only

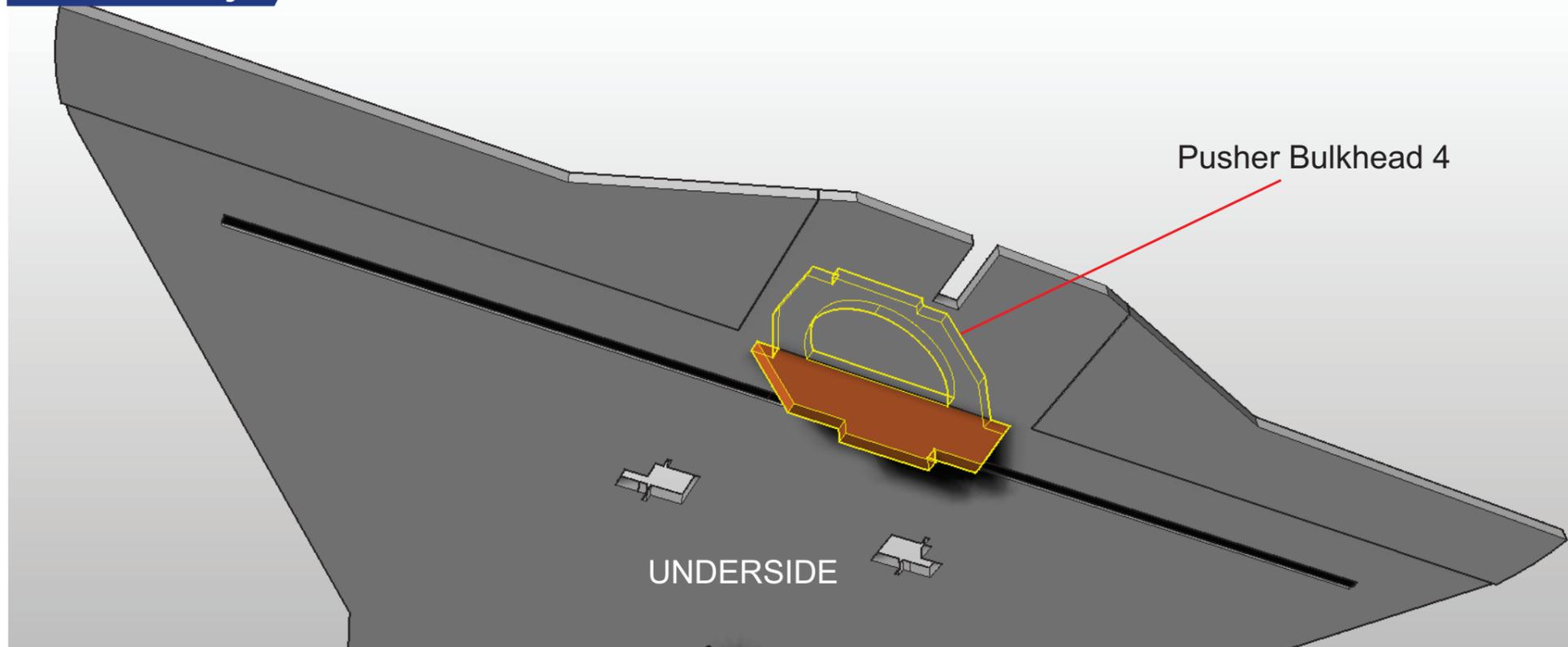


Glue the **EDF Rear Bulkhead** into the wing using UHU por.

DRY FIT the EDF unit in place - do not glue.



Pusher only

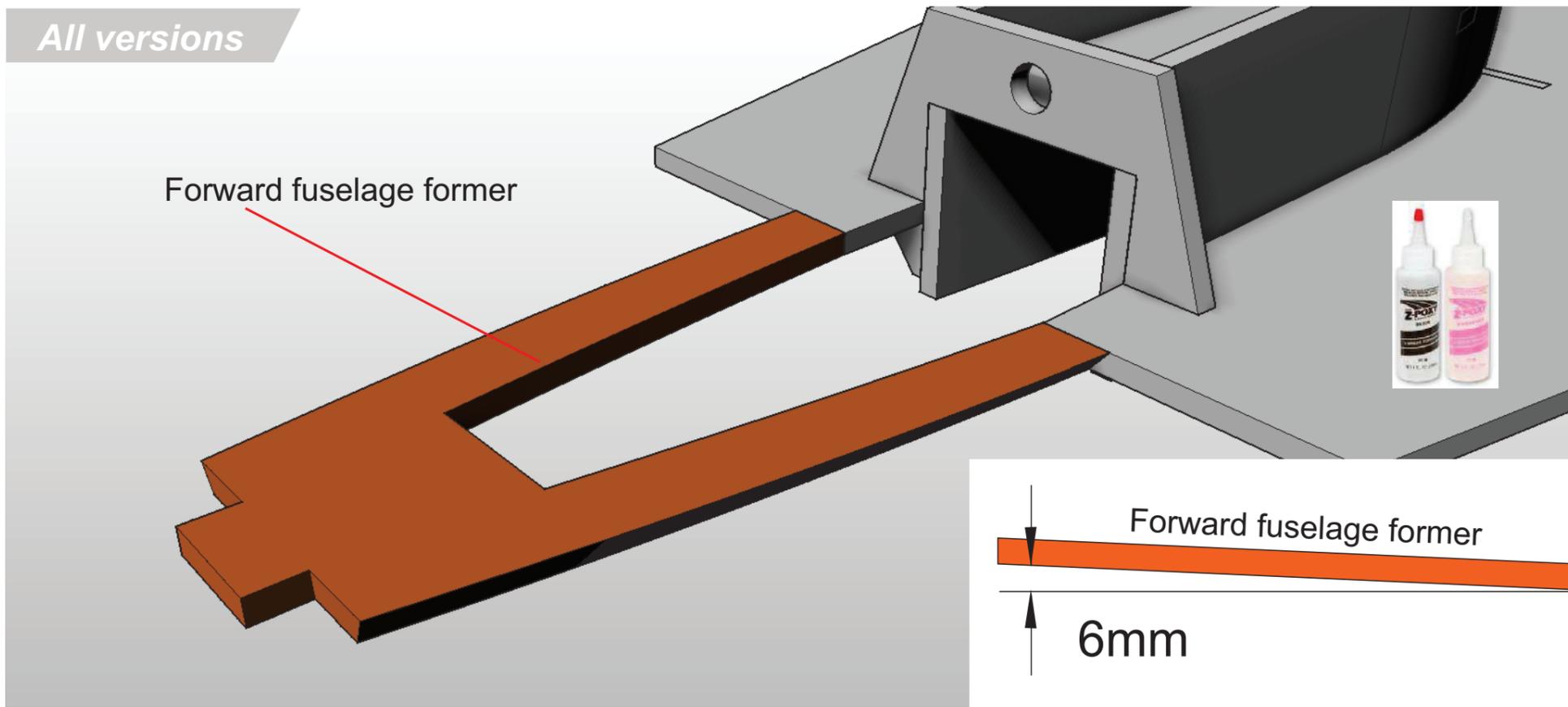


PUSHER ONLY

Glue the **Pusher Bulkhead 4** to the underside of the wing.



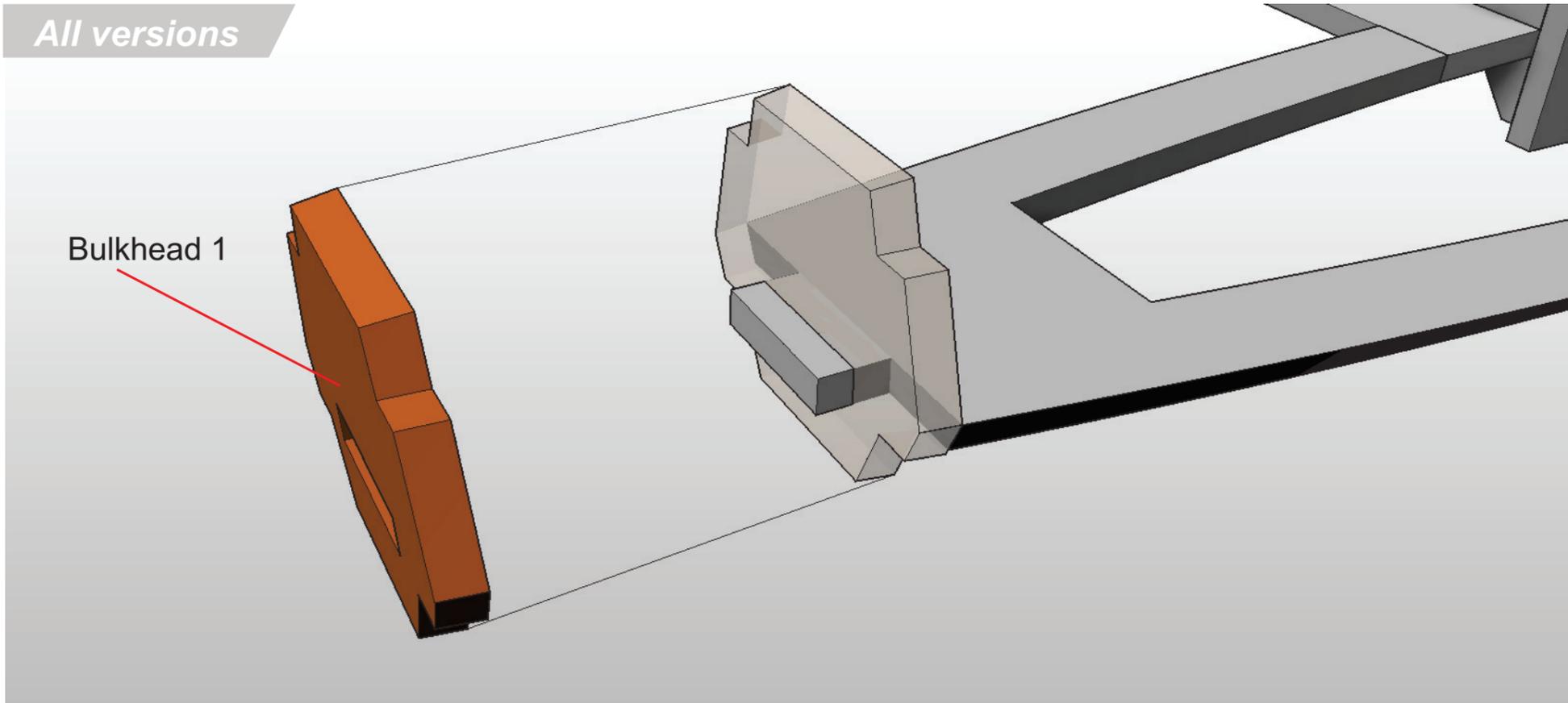
All versions



Raise the forward edge of the **Forward Fuselage Former** 6mm higher than the rear. Glue in place using Epoxy.



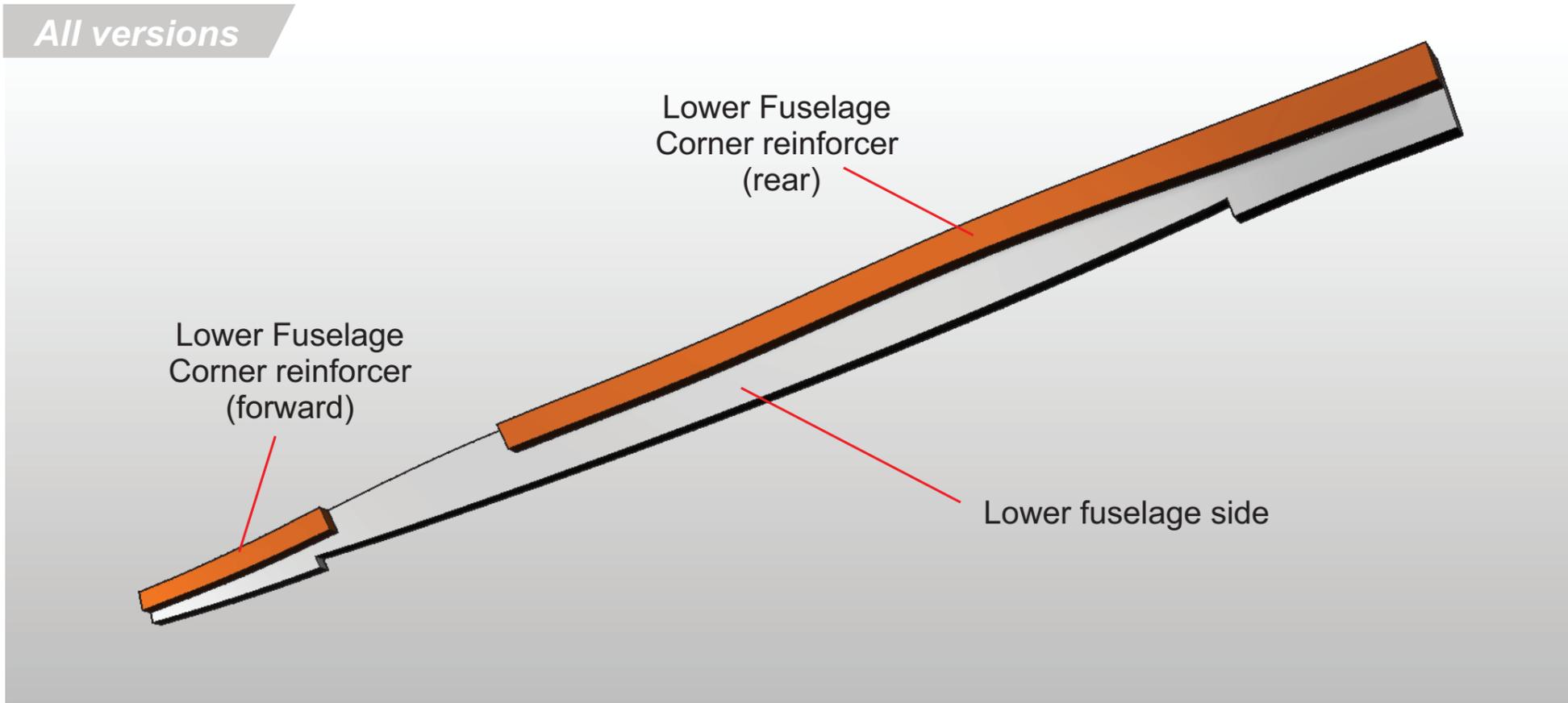
All versions



Glue **Bulkhead 1** onto the assembly, revealing the nosecone alignment tab sticking out.



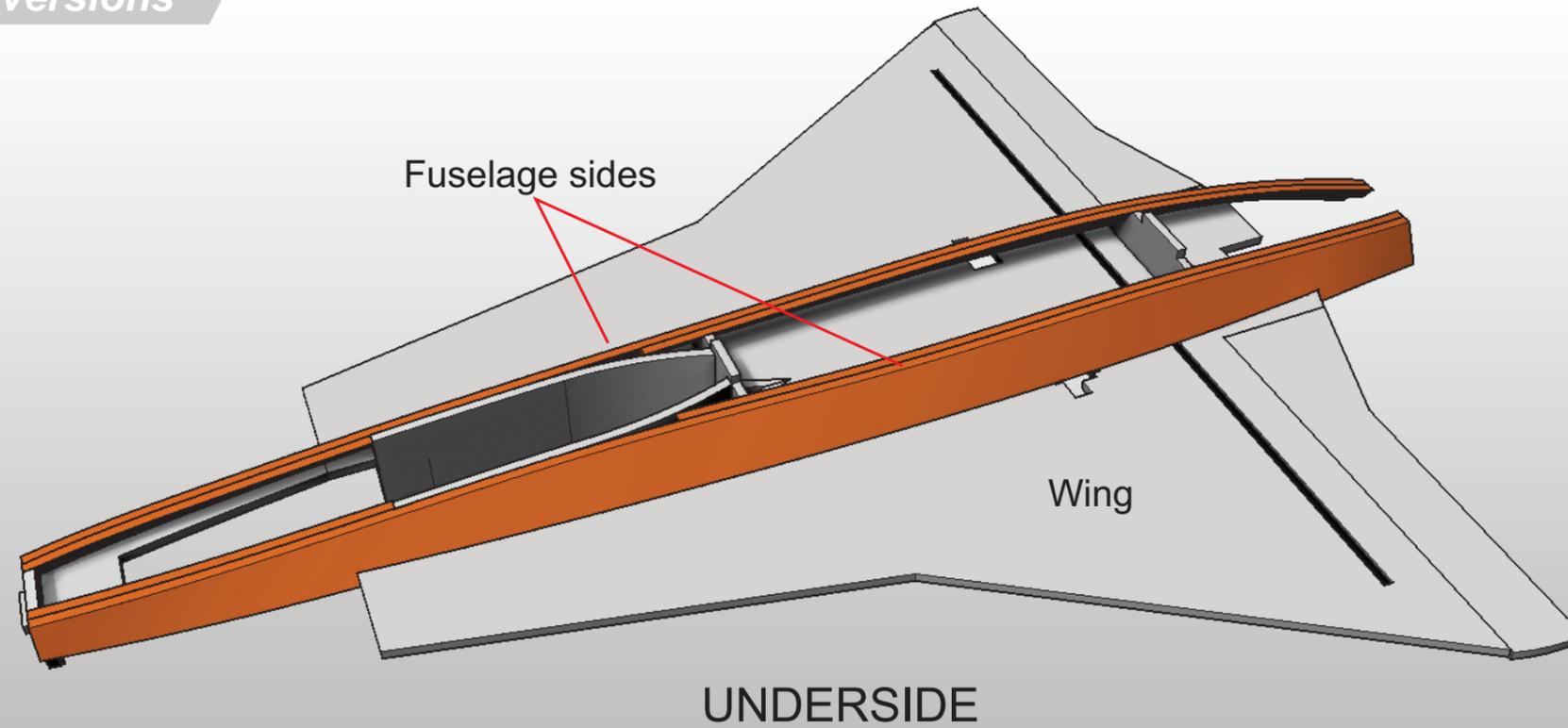
All versions



On both **Lower Fuselage Sides**, glue the **Corner Reinforcers** on as indicated.



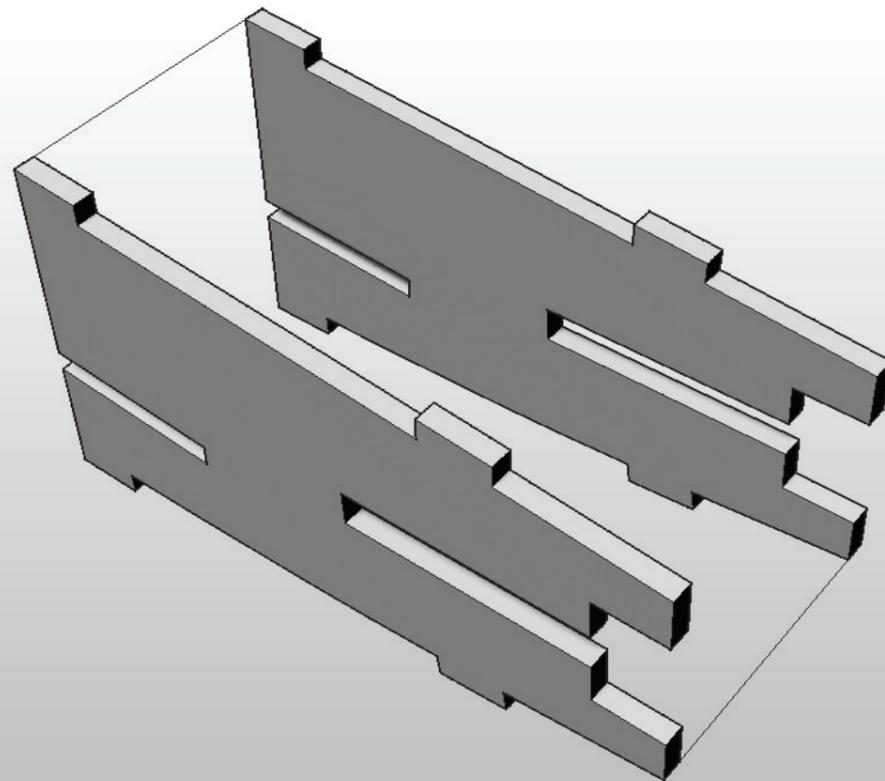
All versions



Glue the **Fuselage Sides** using the pre-marked lines on the wing and the bulkheads.



Pusher only

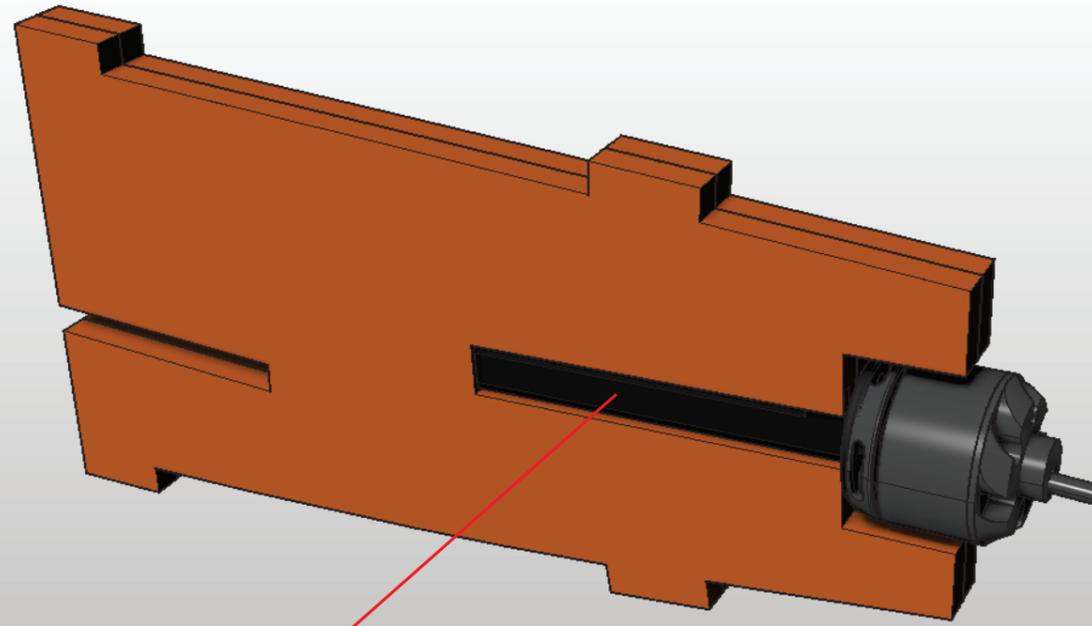


PUSHER ONLY

Glue the two **Motor Mount** pieces together.



Pusher only



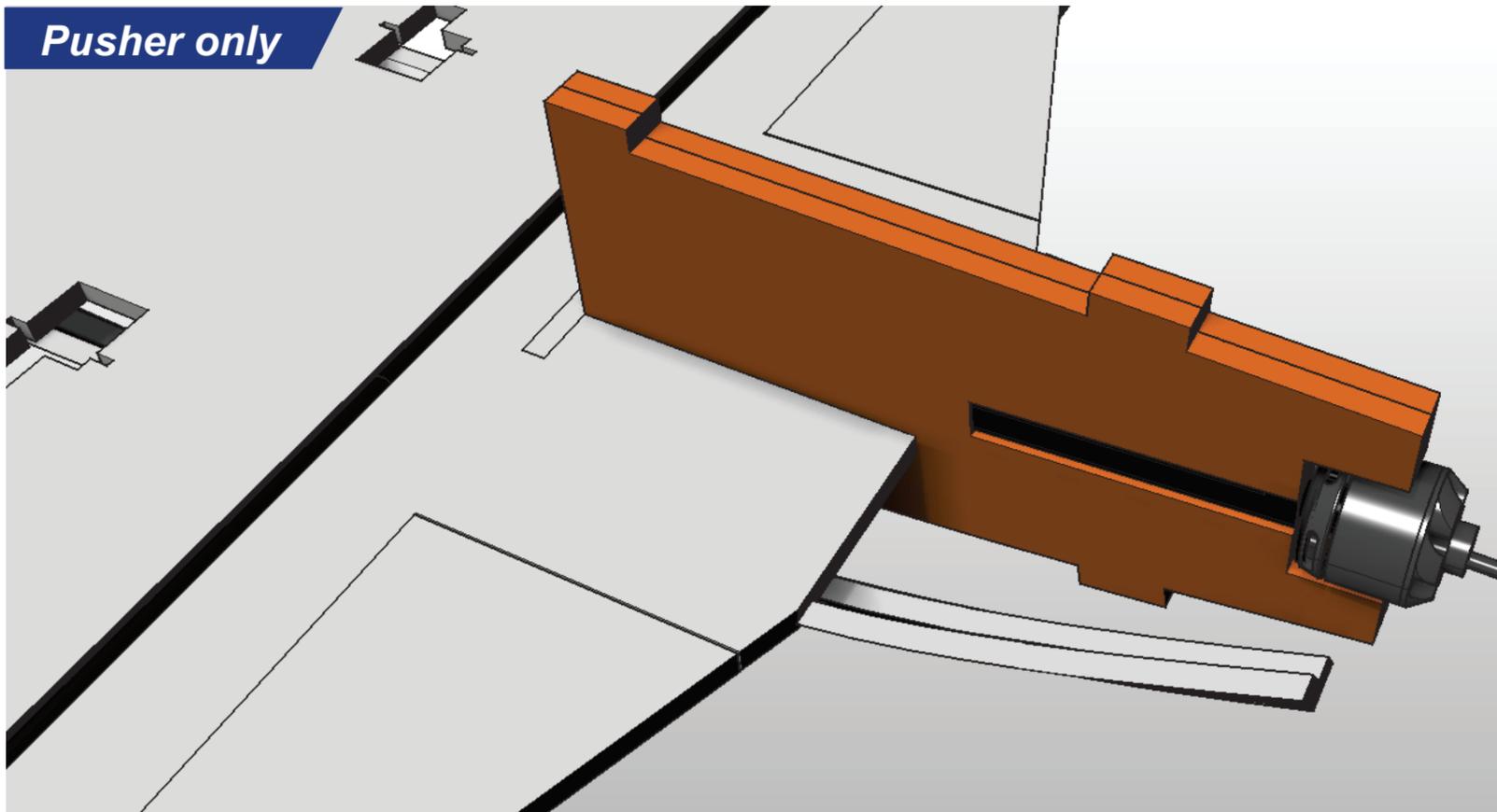
Hobbyking - SKU: OR004-00602

Using hot melt glue, mount the Stick mount into the motor mount assembly.

The stick mount can be purchased from Hobbyking / Ebay or you can download the 3d printing files for free on website.



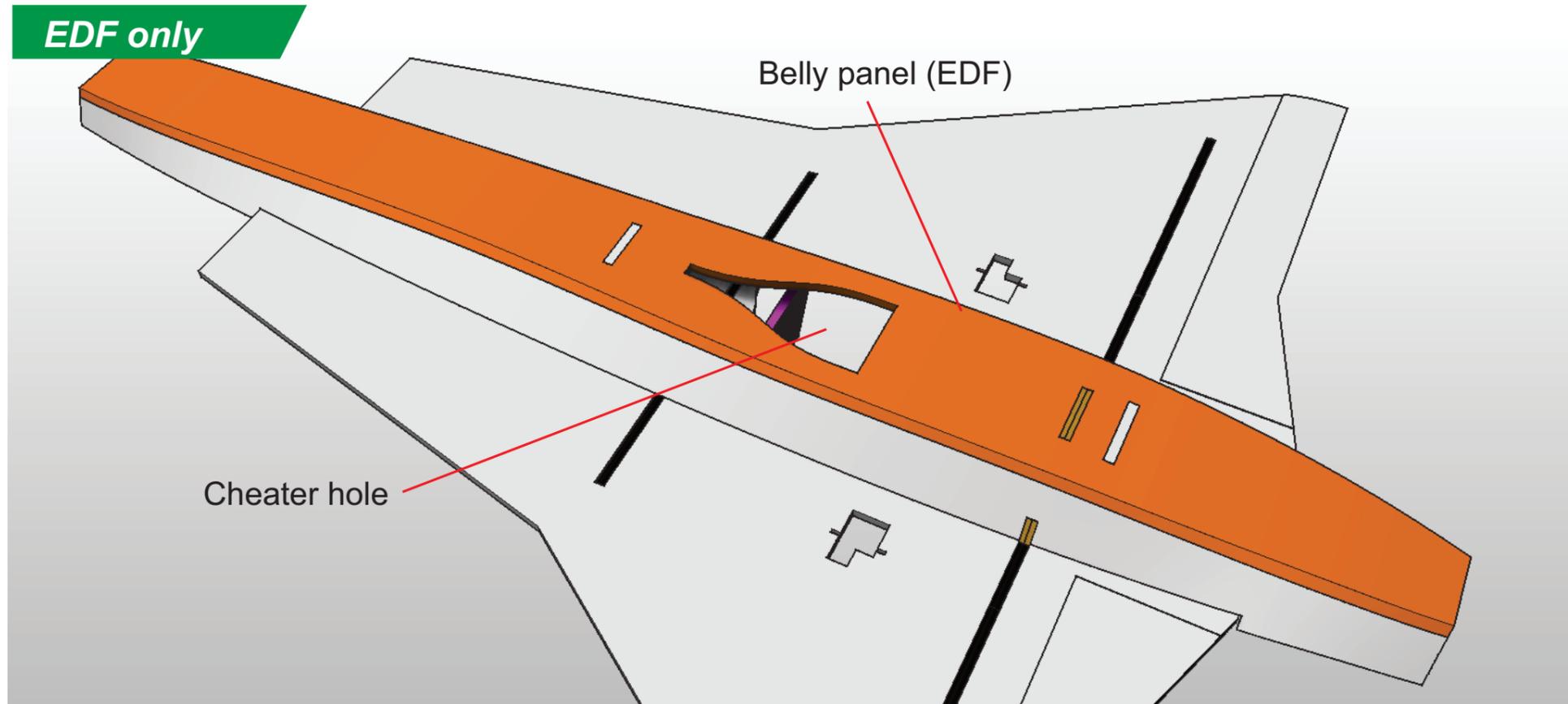
Pusher only



Glue the motor mount into the wing panel using epoxy (sparingly)



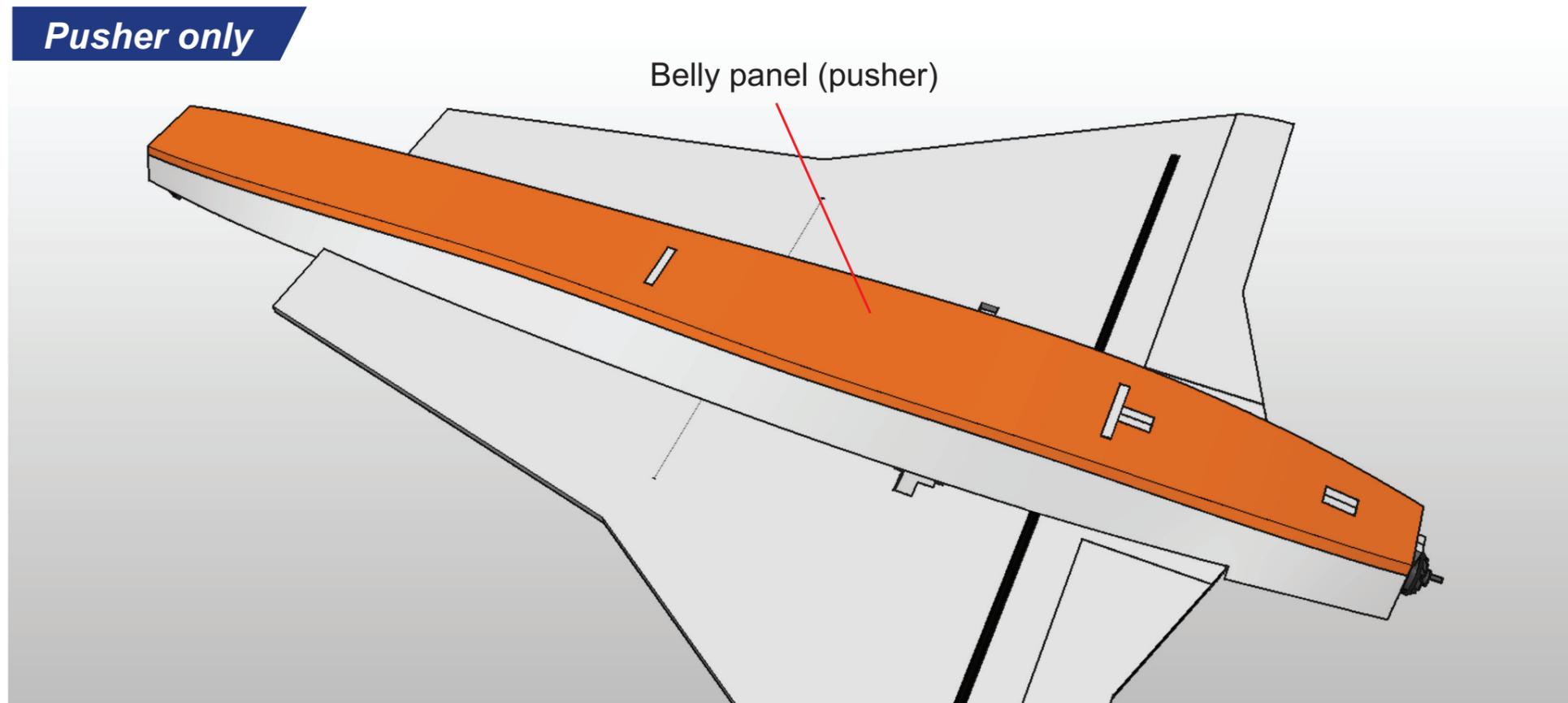
EDF only



Cut out the cheater hole AFTER gluing the **Belly panel (EDF)** to the assembly.

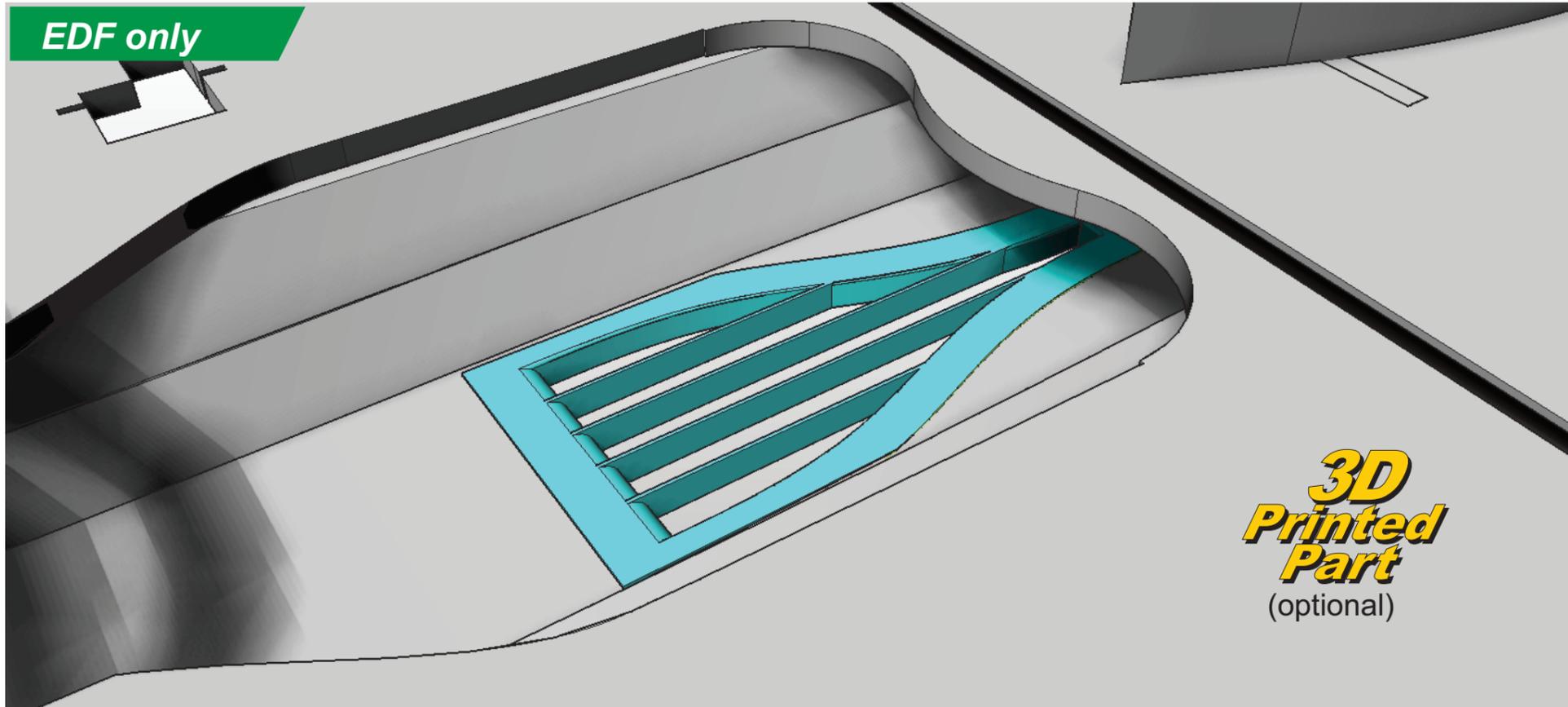


Pusher only

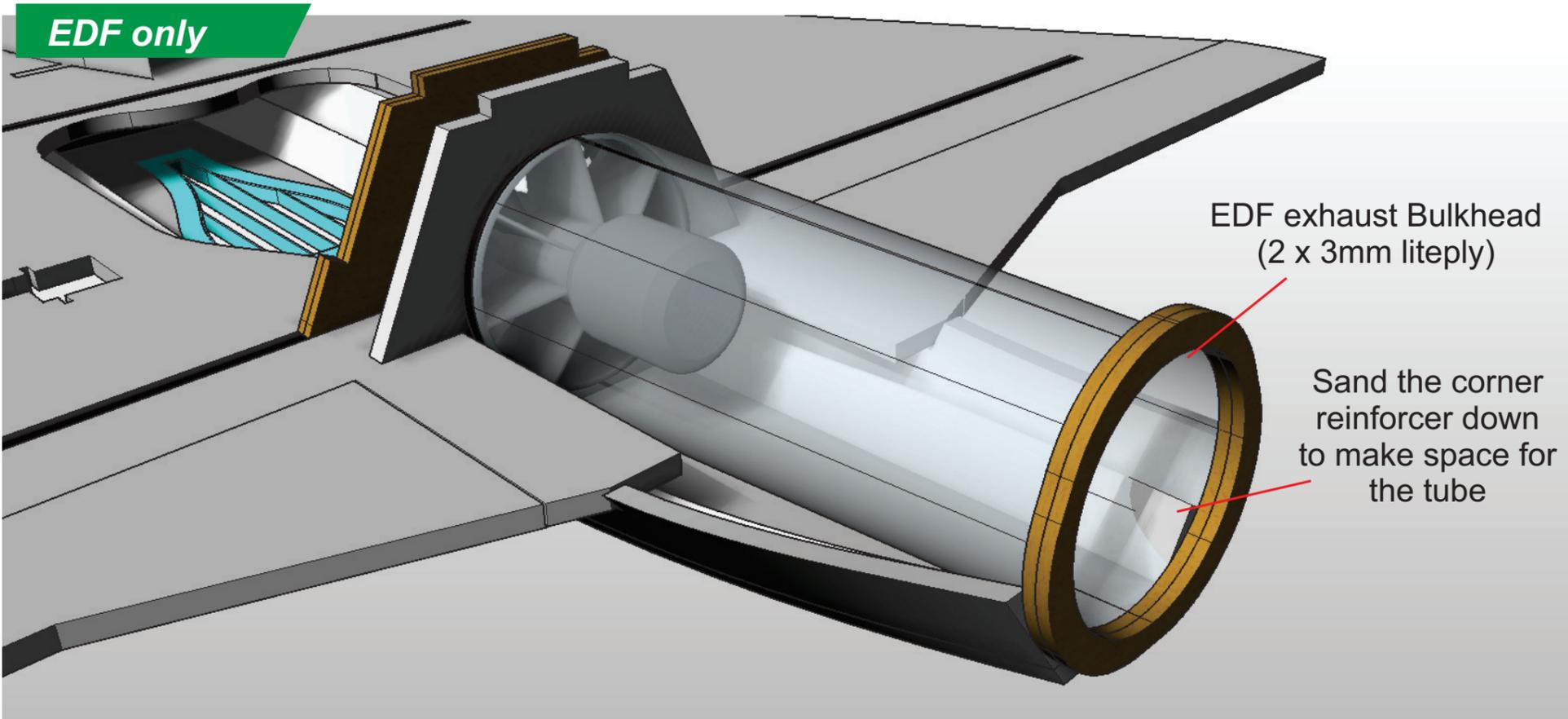


Glue the **Belly panel (Pusher)** to the assembly.





Insert the 3D printed grille into the cheater hole, from the inside of the fuselage.



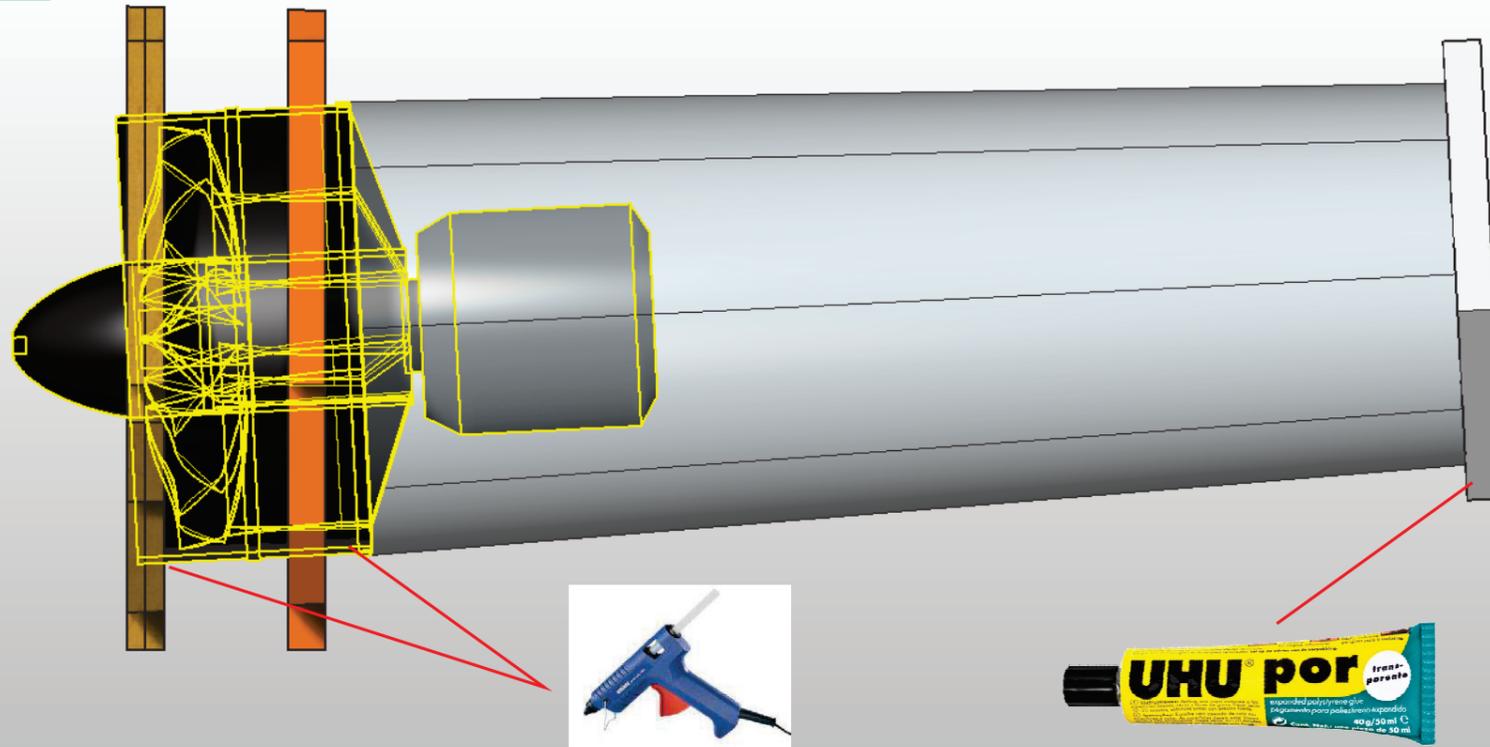
Construct 2 x 3mm liteply Exhaust Bulkhead glued together, and attach to the fuselage.

Make a thrust tube from 350micron sheet plastic taped together using nylon reinforced tape.

DRY FIT ONLY.



EDF only

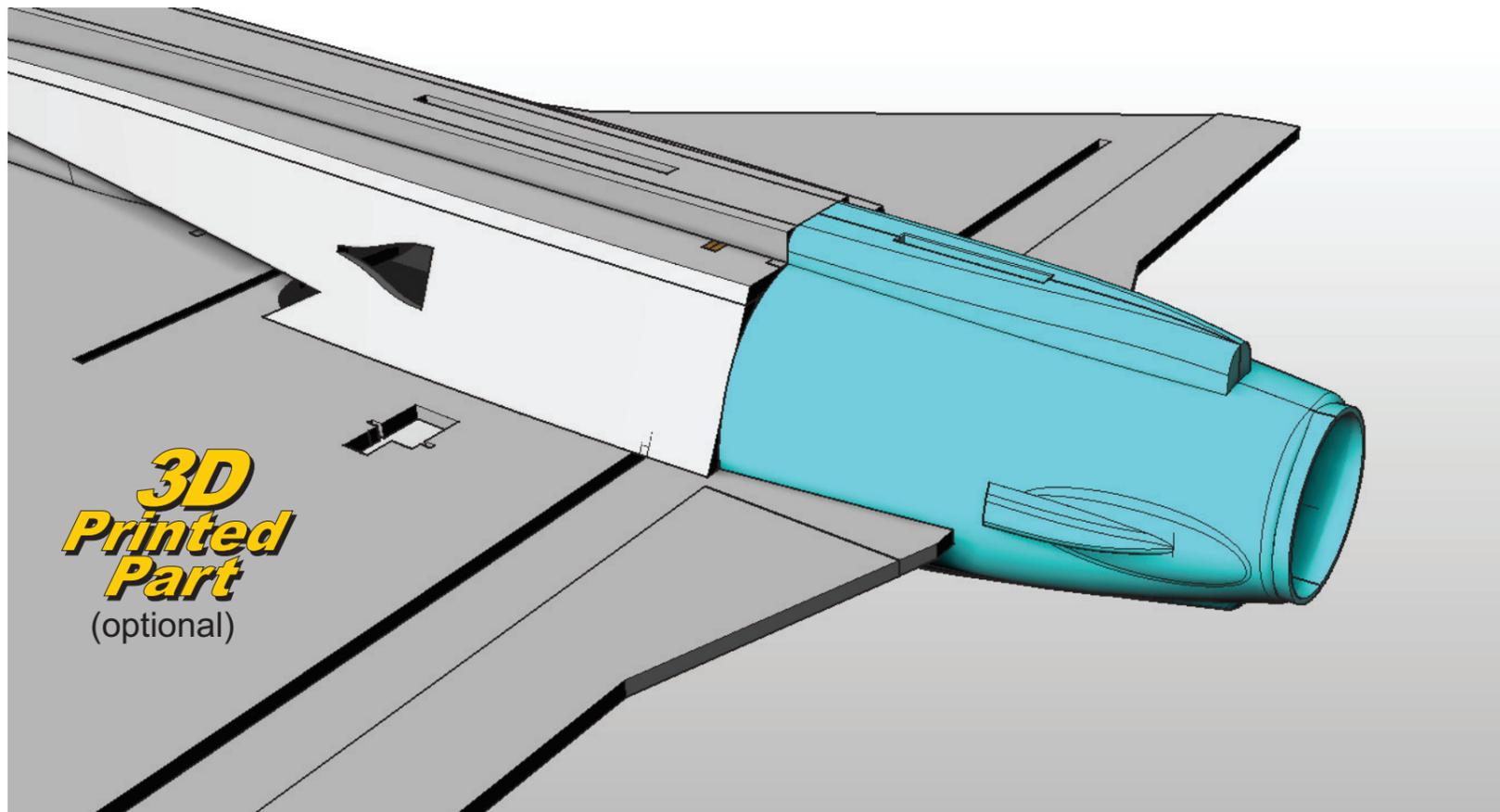


NOT USING 3D PRINTED TAIL

Twist the EDF within the bulkheads to make a smooth alignment into the thrust tube.

Glue the thrust tube into place using UHU por at the tail, Hot melt at the front.

Glue the EDF unit in place using hot melt.

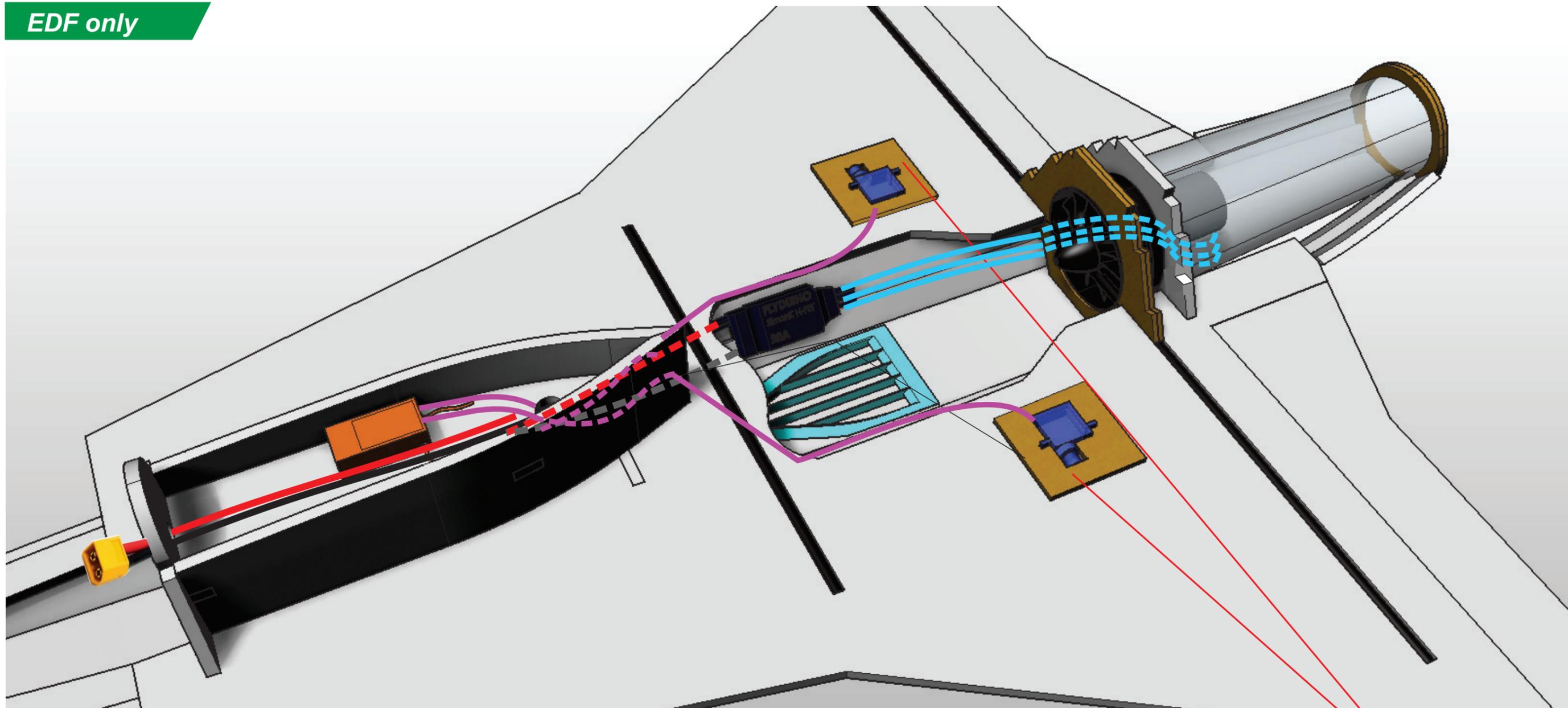


USING 3D PRINTED TAIL

Fit your EDF 'non-twisted' into the EDF Bulkheads and glue in place using hot melt - do not use a thrust tube.

In order to maintain the correct shape in the depron, carry on building the aircraft up without this part until the upper fuselage is glued, then trim the tail all the way off up the rear EDF bulkhead - leaving only the wing untrimmed, as this will slot into the 3d printed part.



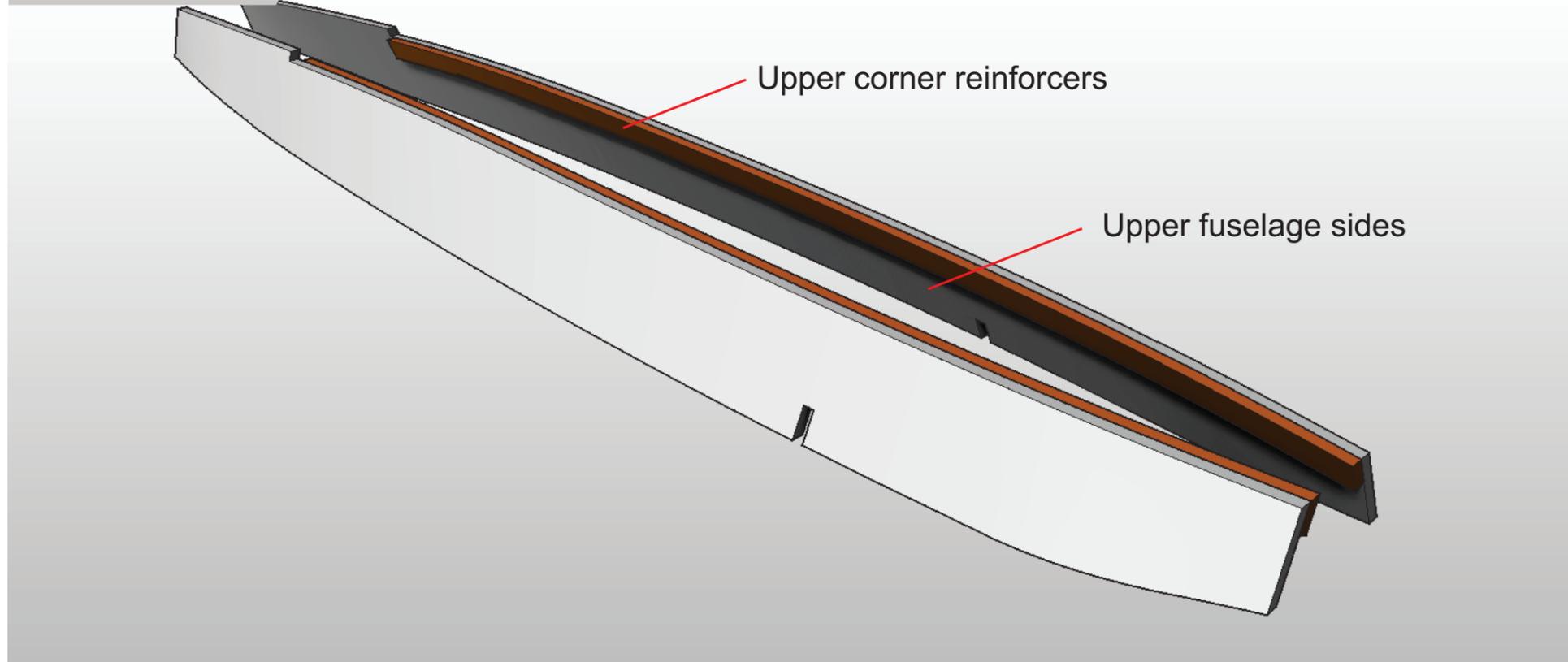


Using Hot melt glue, fix the ESC to the side of the cheater hole to give it cooling, but without impinging too much on the airflow. Run the Motor cables through the cut out area of the EDF bulkheads and then take the power cables up into the RX tray. The Battery bay is quite tight - (especially for the EDF version) so I recommend that you take the power cables over the RX tray instead of through the battery bay.

Glue the Servo reinforcement 3mm liteply pieces, then glue the Servos in using Hot-melt glue. Set up the servos on your Transmitter as Elevons with 40% Expo. Run the servo cables along the edge of the wing in the EDF chamber to avoid clashin with the upper fuselage sides - firmly stuck down.



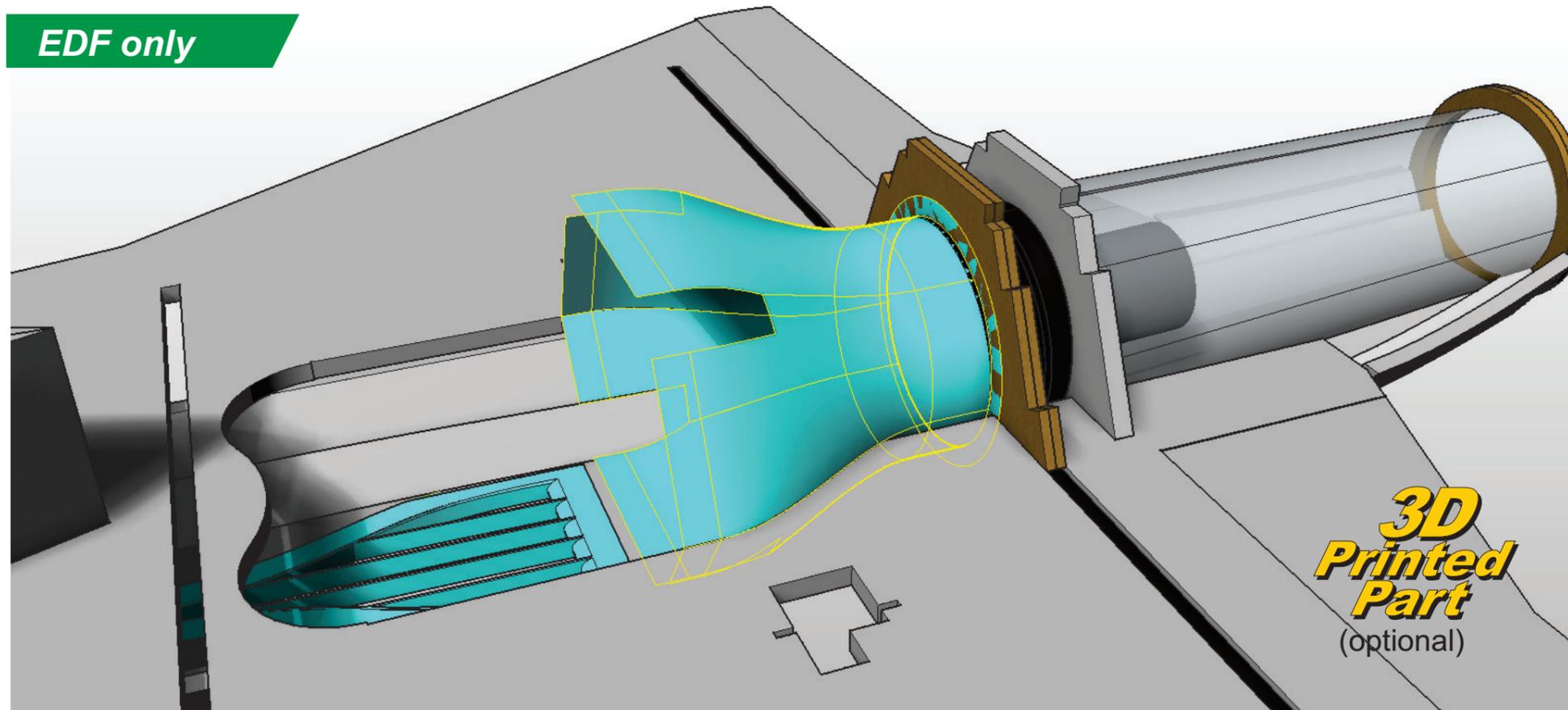
All versions



Glue the **Upper Corner Reinforcers** to the **Upper fuselage sides**.



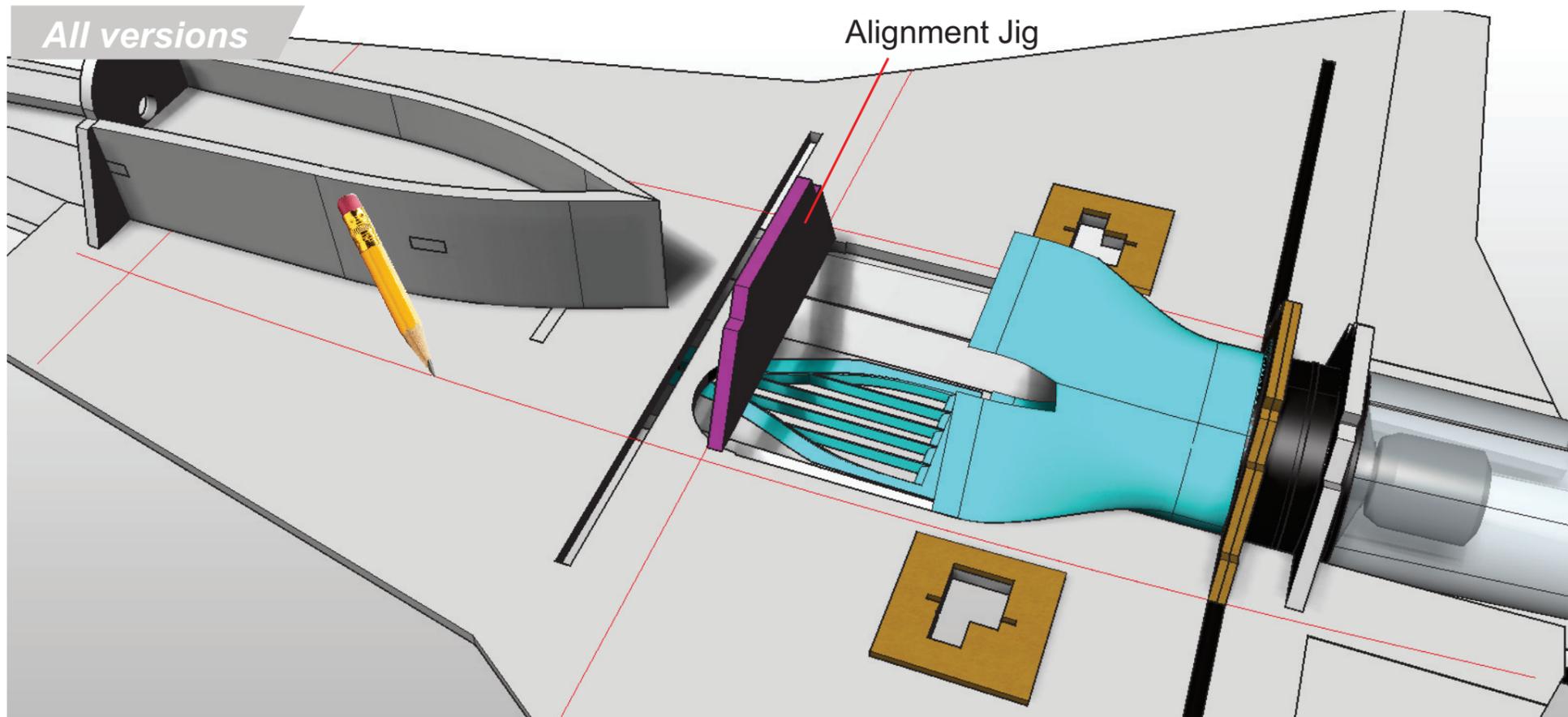
EDF only



Glue the 3d printed air intake duct in place.

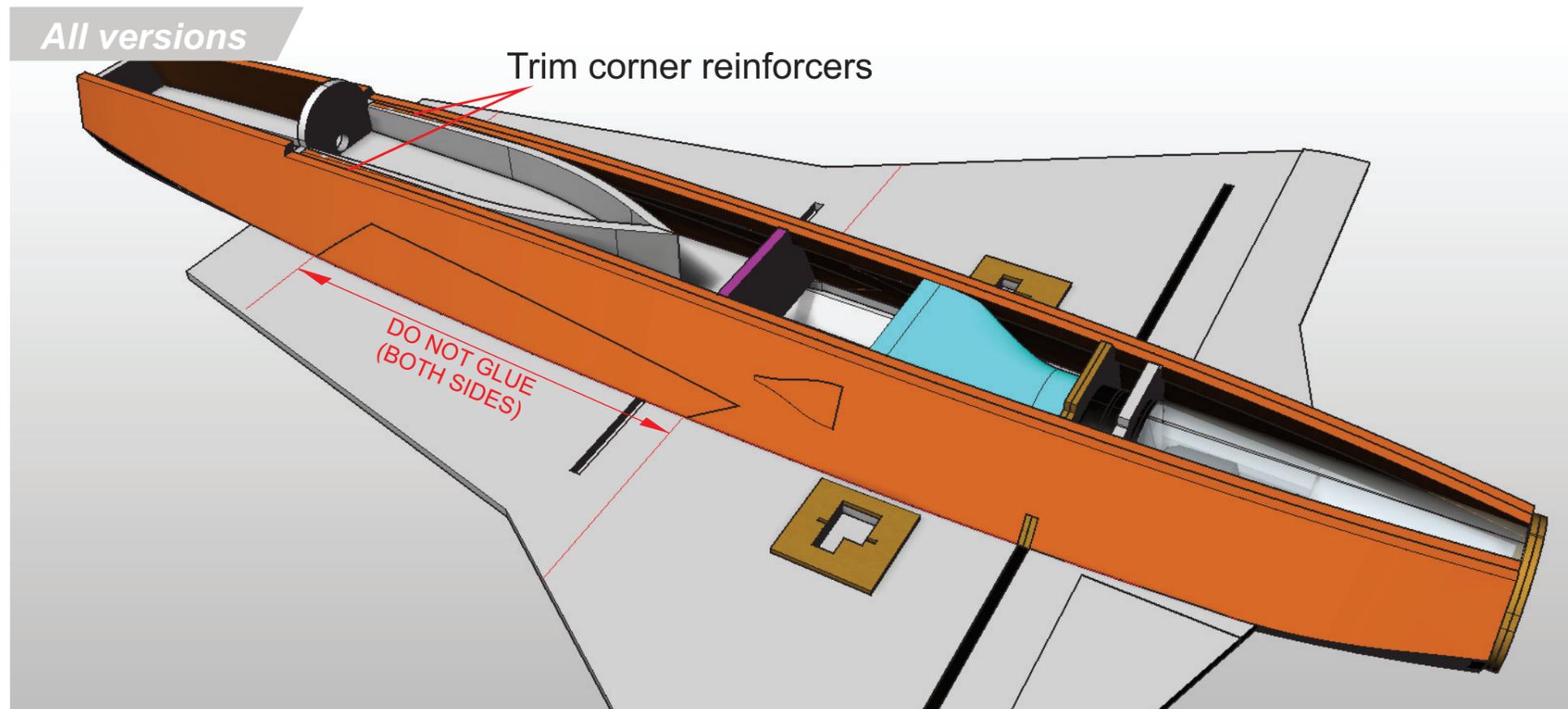
If you aren't using it, then ensure the Bellmouth that comes with your EDF is attached to the EDF unit.





Mark the upper fuselage line and the 'no-glue' line from the plans onto the wing as shown

Position the alignment jig as shown



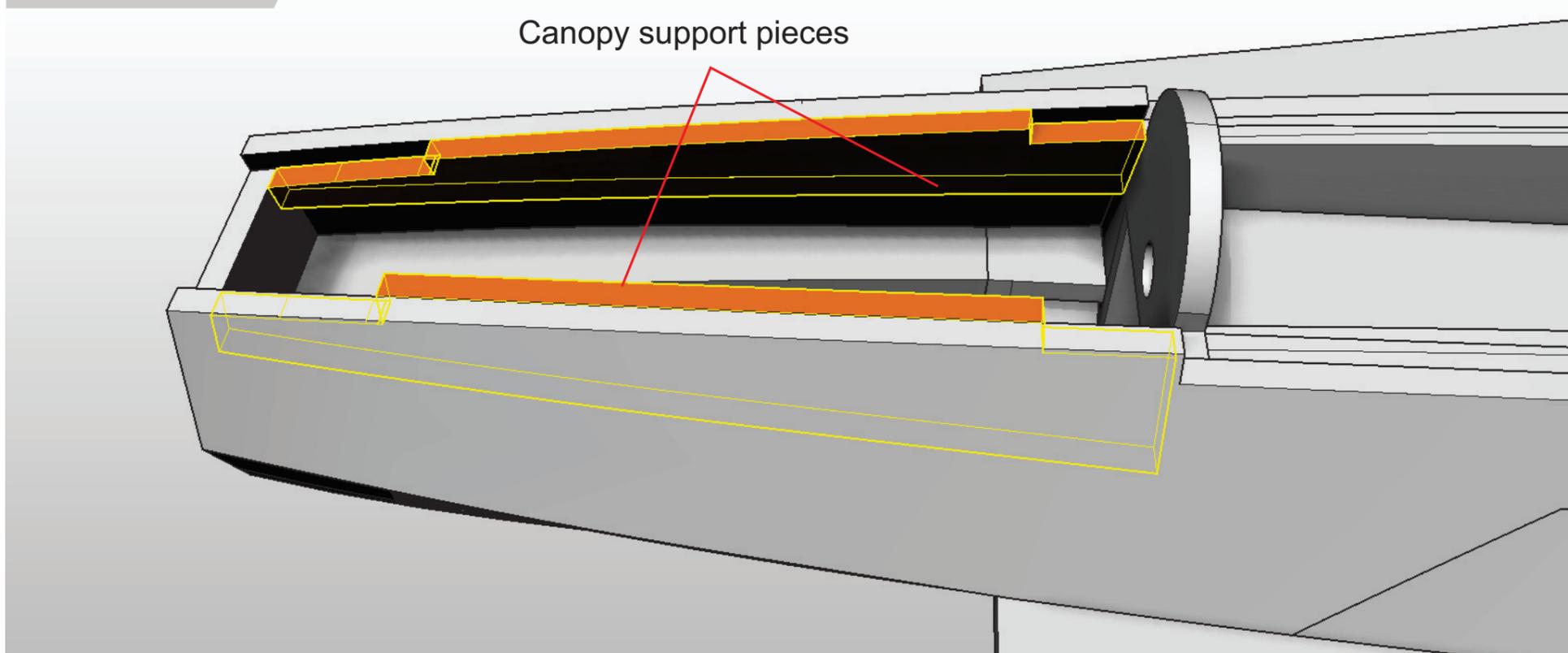
Glue the Upper fuselage parts to the assembly - ensure NO GLUE in the air intake region.

You will need to trim the corner reinforcers a little next to the battery box.

Don't glue the JIG. this is to hold the position the pieces in place until the glue holds it.



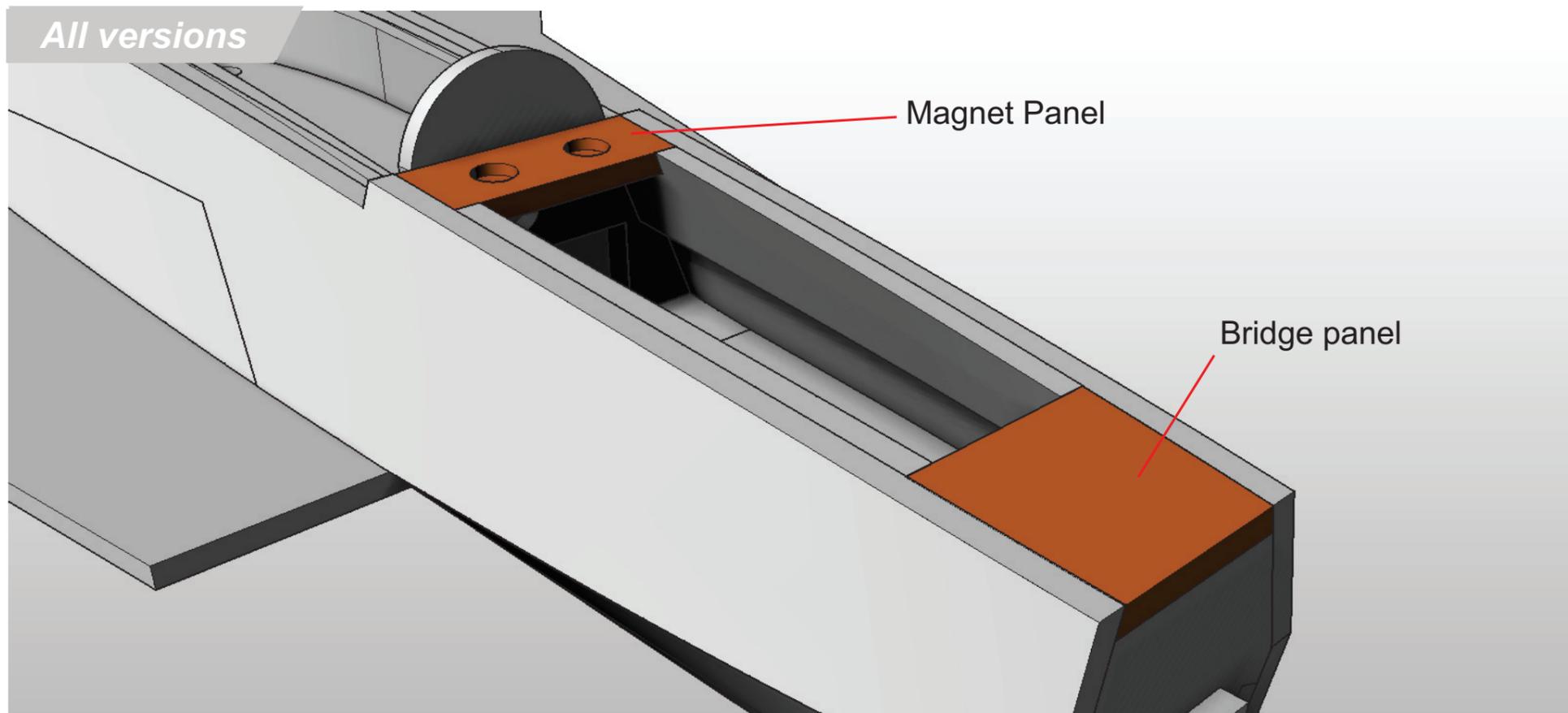
All versions



Glue the **Canopy Support Pieces** in place.



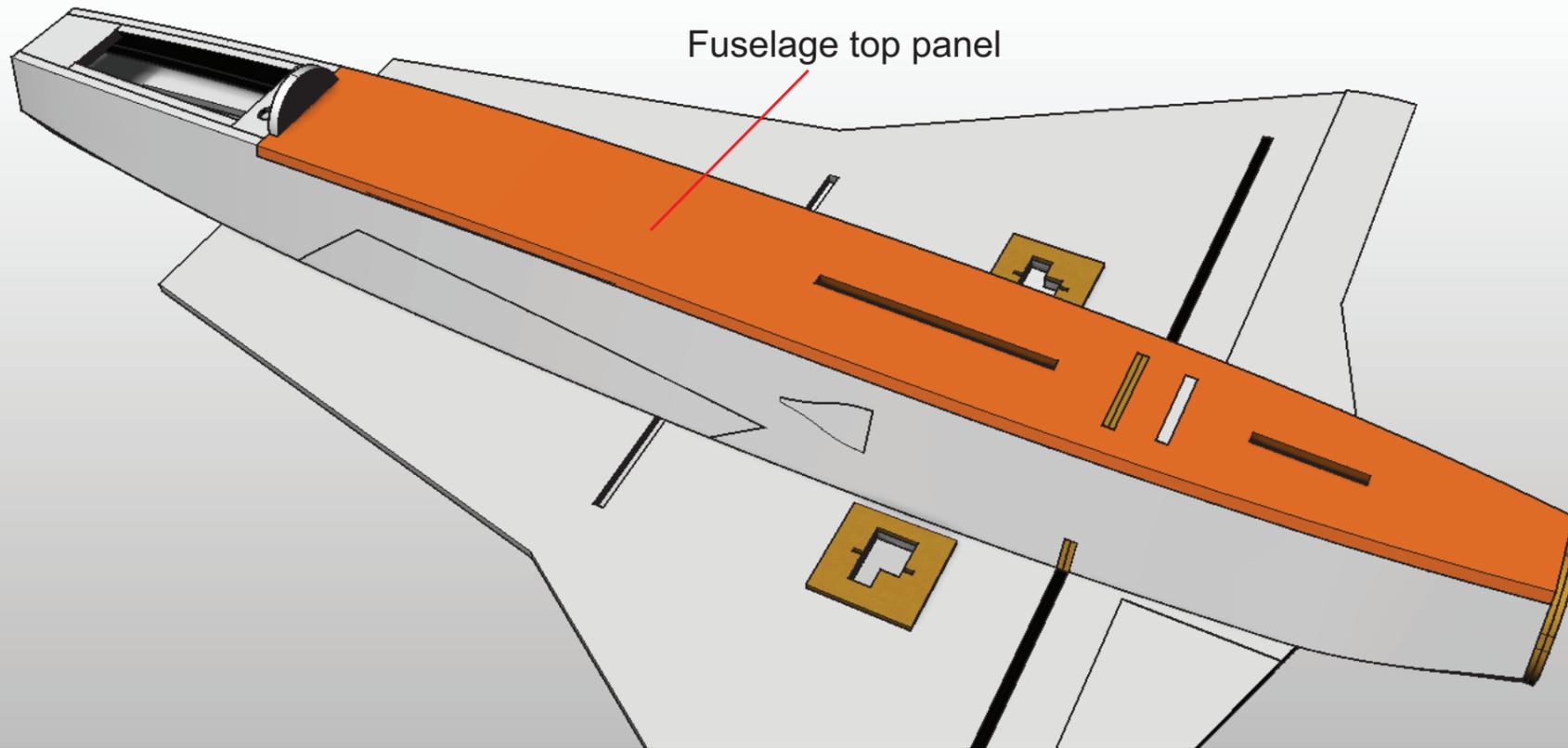
All versions



Glue the Magnet and Bridge panels in place.



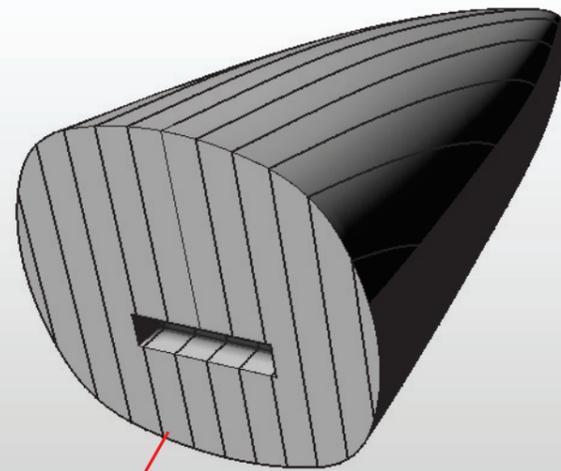
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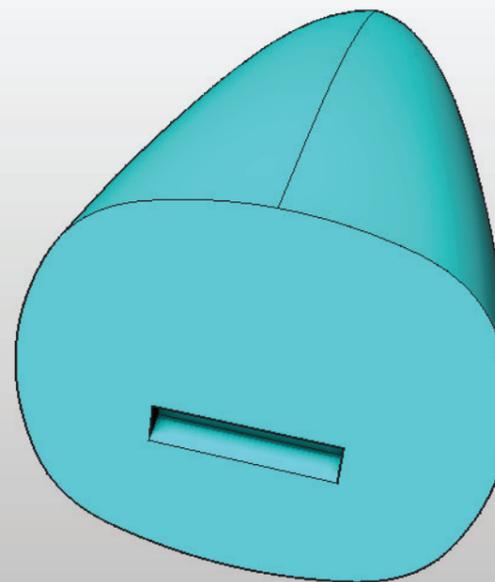
Glue the **Fuselage Top Panel** in place.



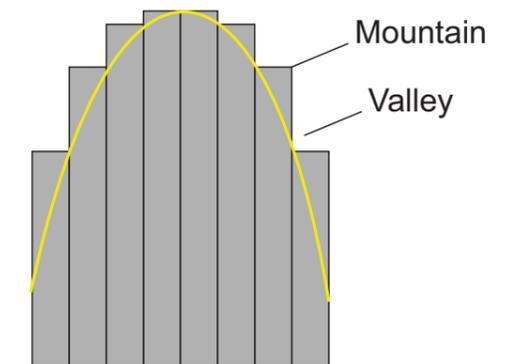
All versions



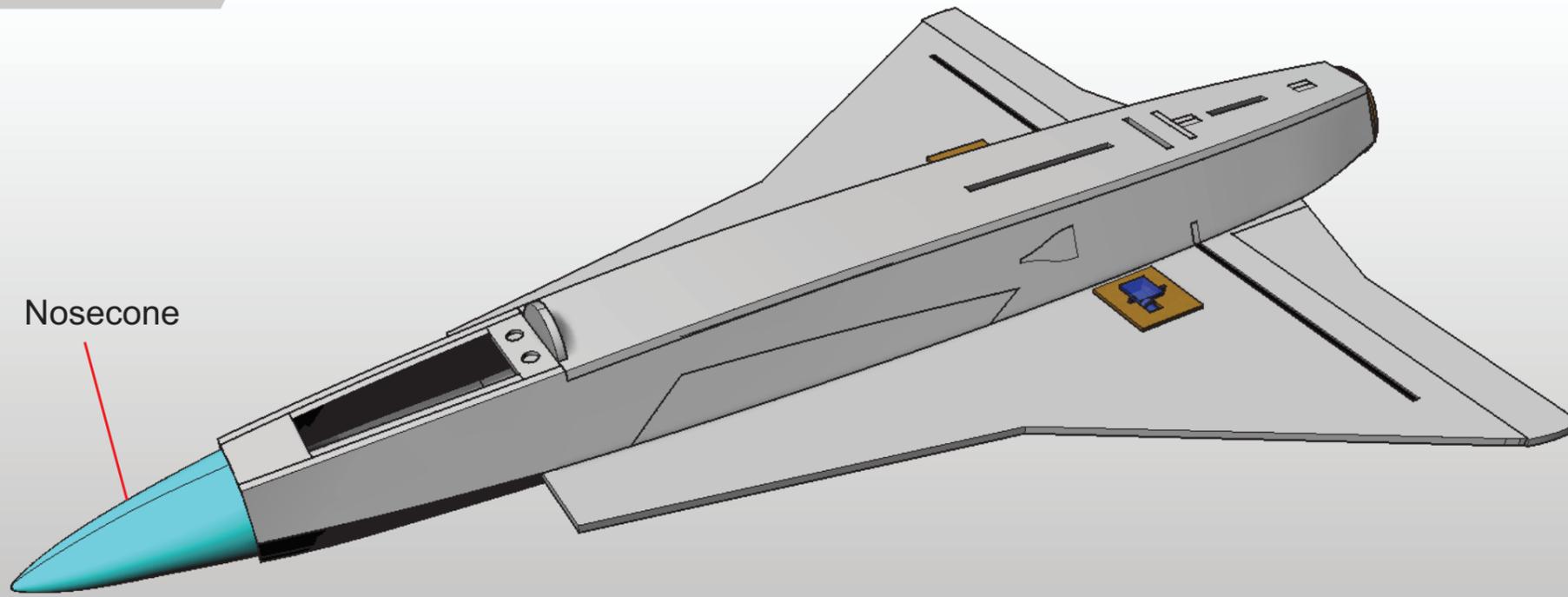
**3D
Printed
Part**
(optional)



Create either a 3d printed Nosecone or a nosecone consisting of layers of foam sanded to get the right shape, by removing the 'mountains' until the 'valleys' are no more.



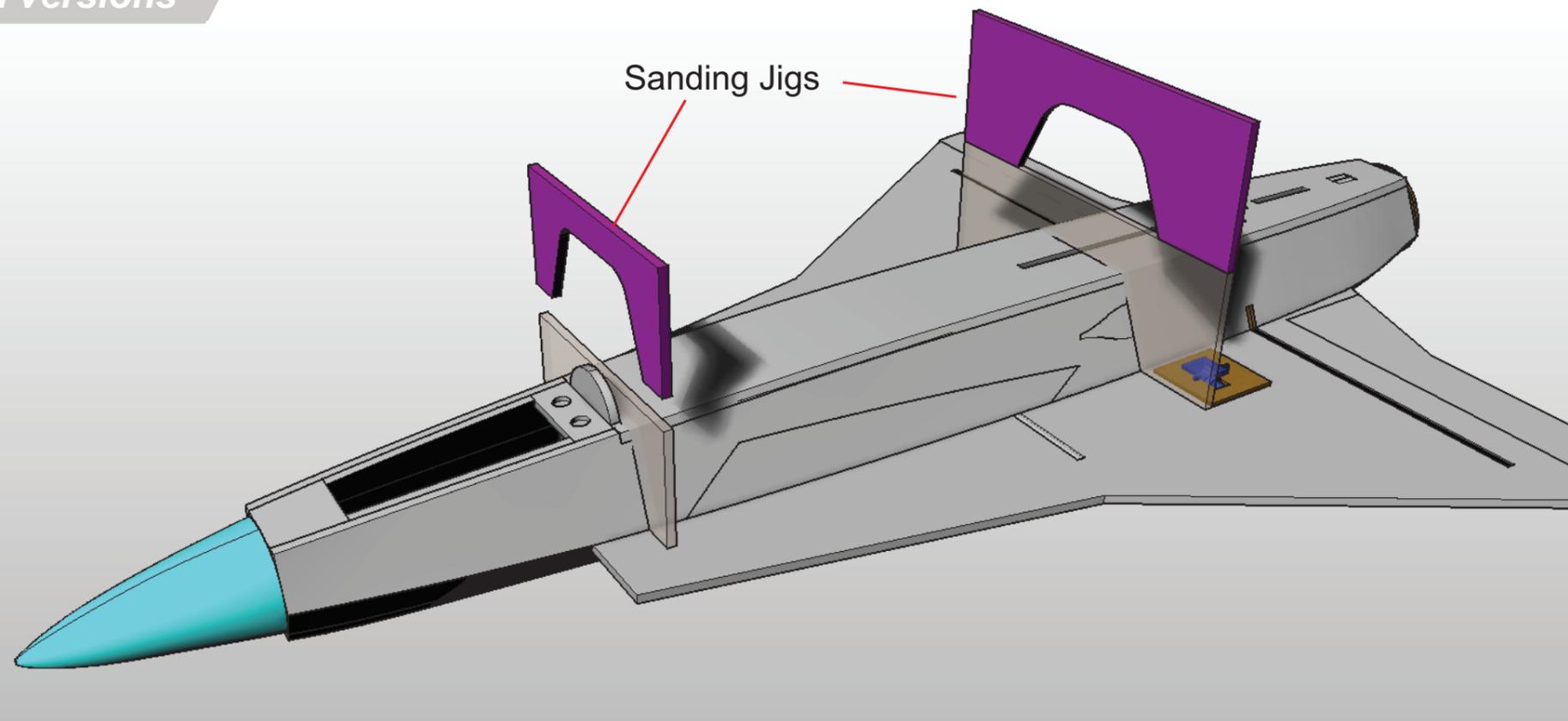
All versions



Glue the **Nosecone** to the assembly



All versions

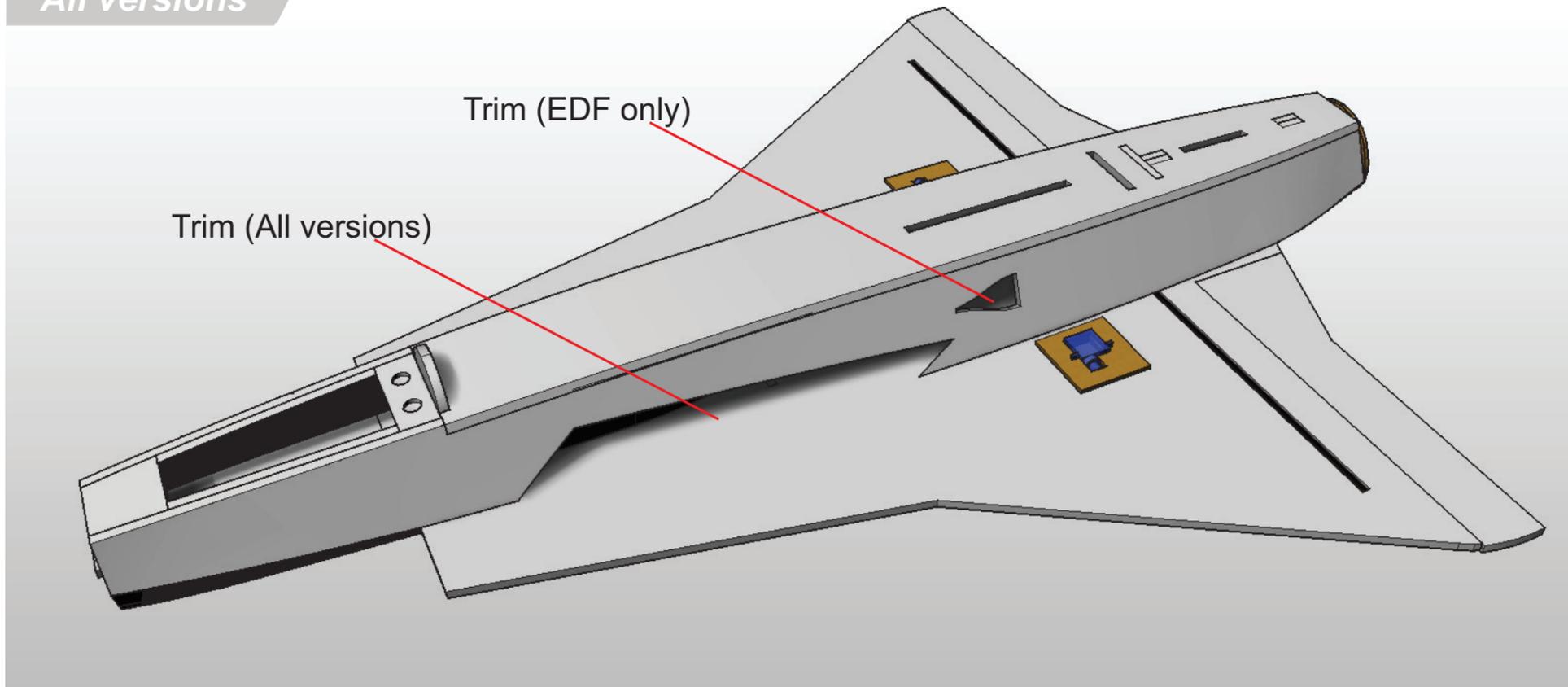


Position the sanding Jigs just behind bulkhead 2 and just in-front of the servo reinforcers.

Using a block and sandpaper sand the shape all the way from the nosecone to the exhaust.



All versions

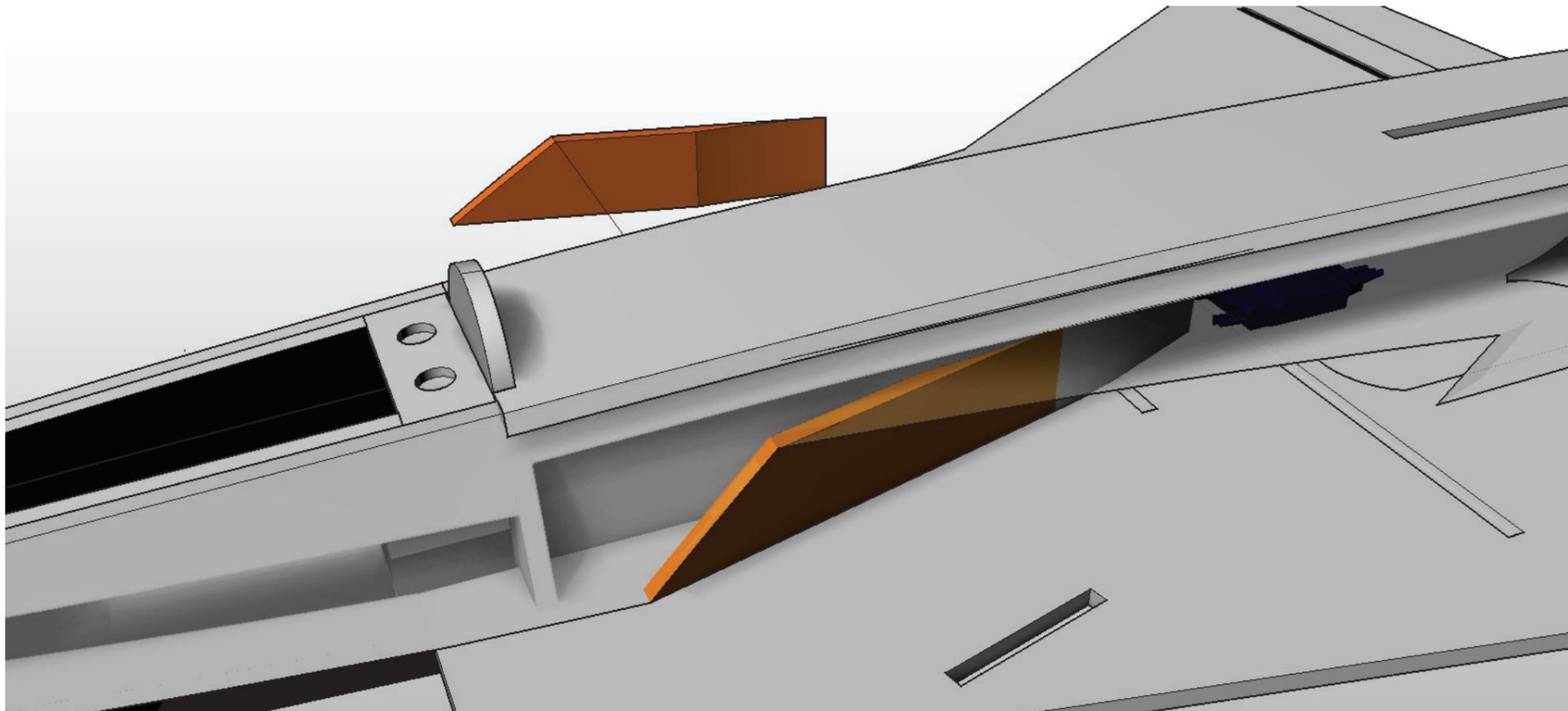


With a fine scalpel, trim away the areas shown.

Be mindful of the need to chamfer the rear of the air intake to match the air intake bulkheads.

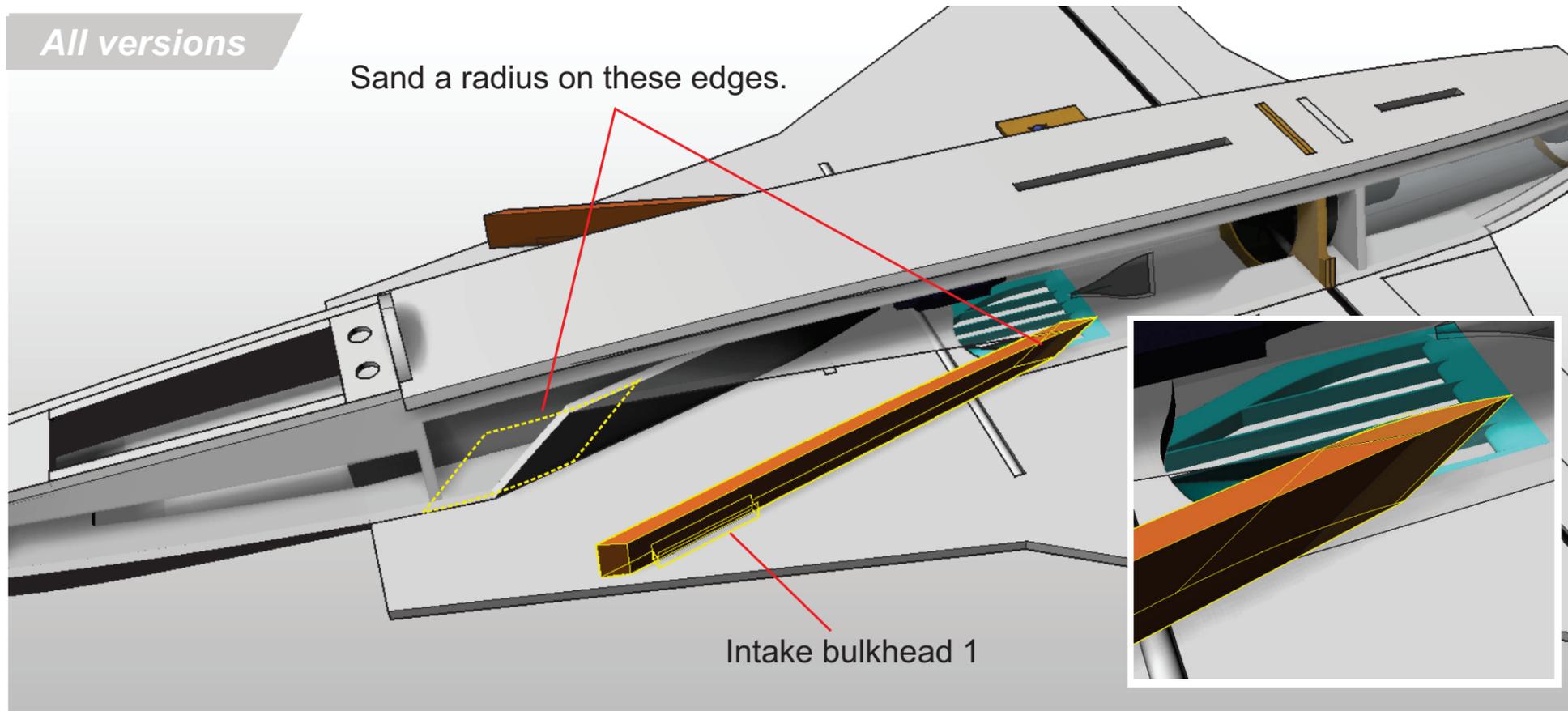


Glue the Intake inner fairings in place as shown



All versions

Sand a radius on these edges.



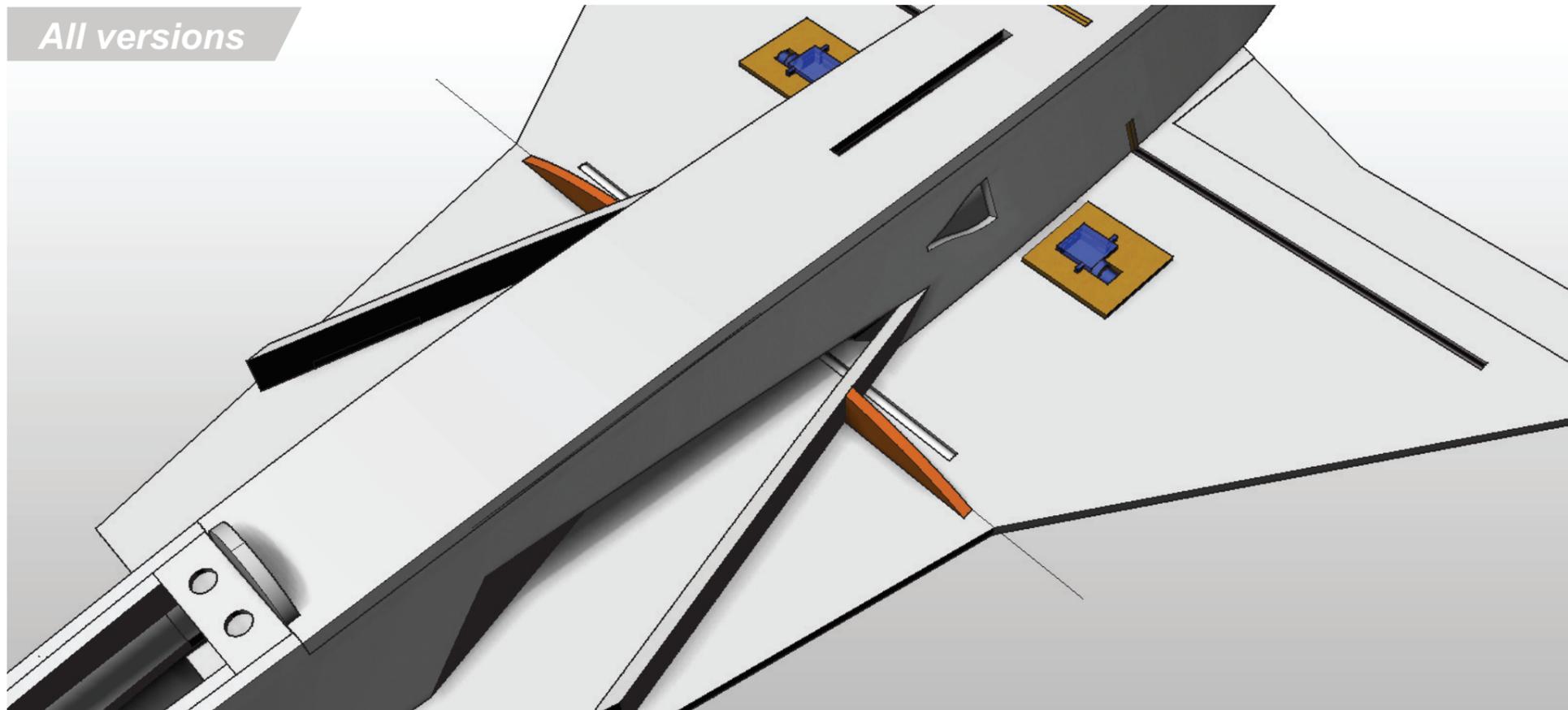
Intake bulkhead 1

Sand the edge of the **Intake Bulkhead 1** as shown. Glue into place into the wing slot.

Sand the inner intake edge into a soft radius to help the airflow.



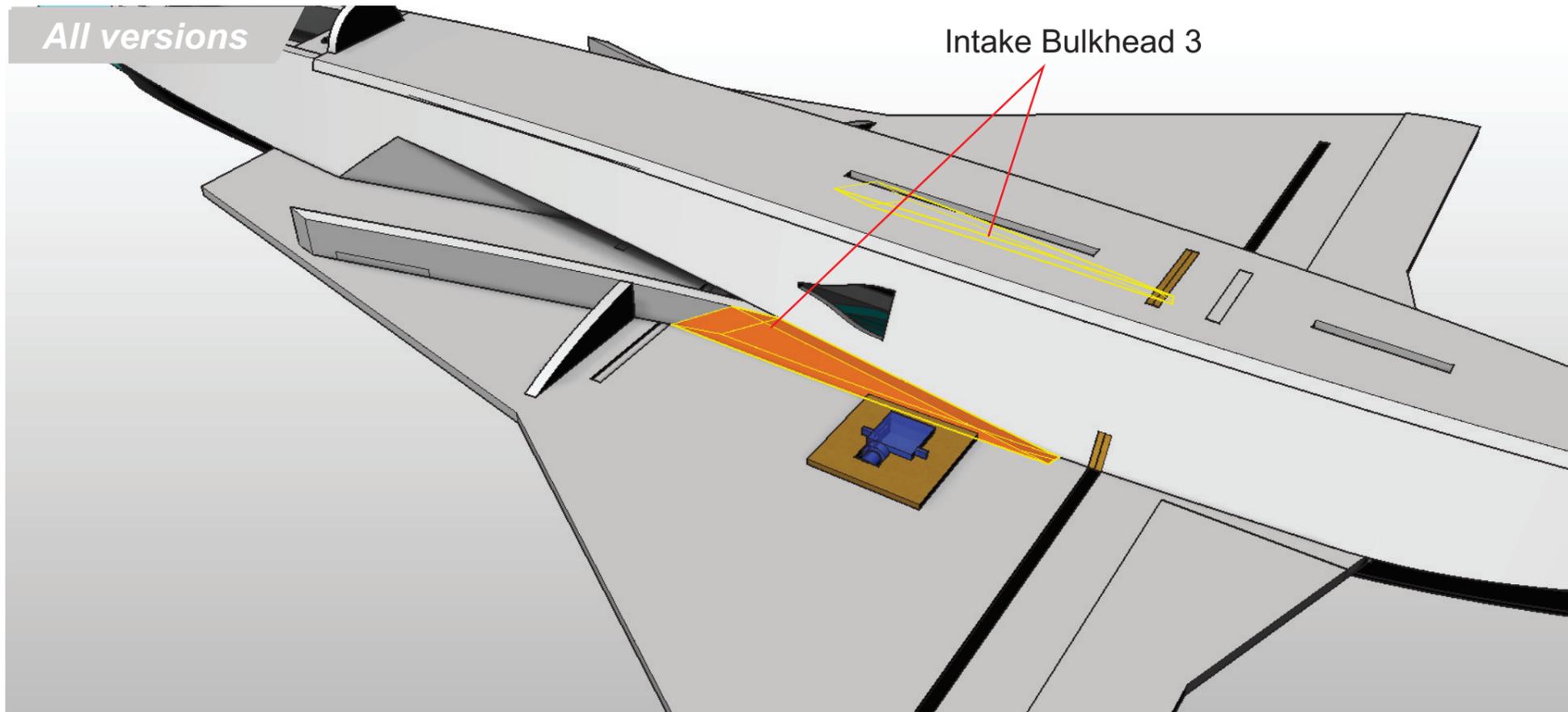
All versions



Glue **Intake Bulkheads 2** to the wing - with the rear face aligned to the crank in the wing as shown.



All versions

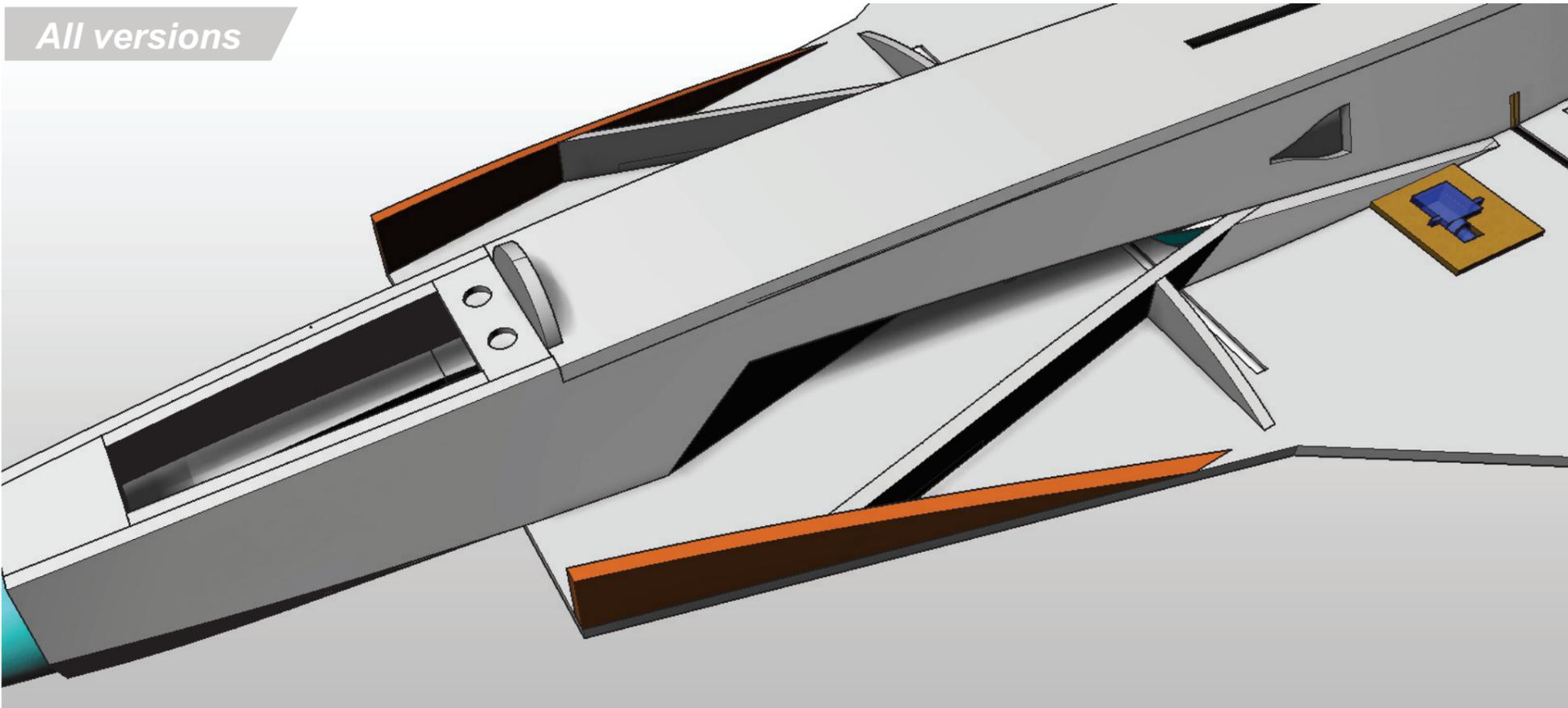


Intake Bulkhead 3

Glue Intake **Bulkhead 3** in place



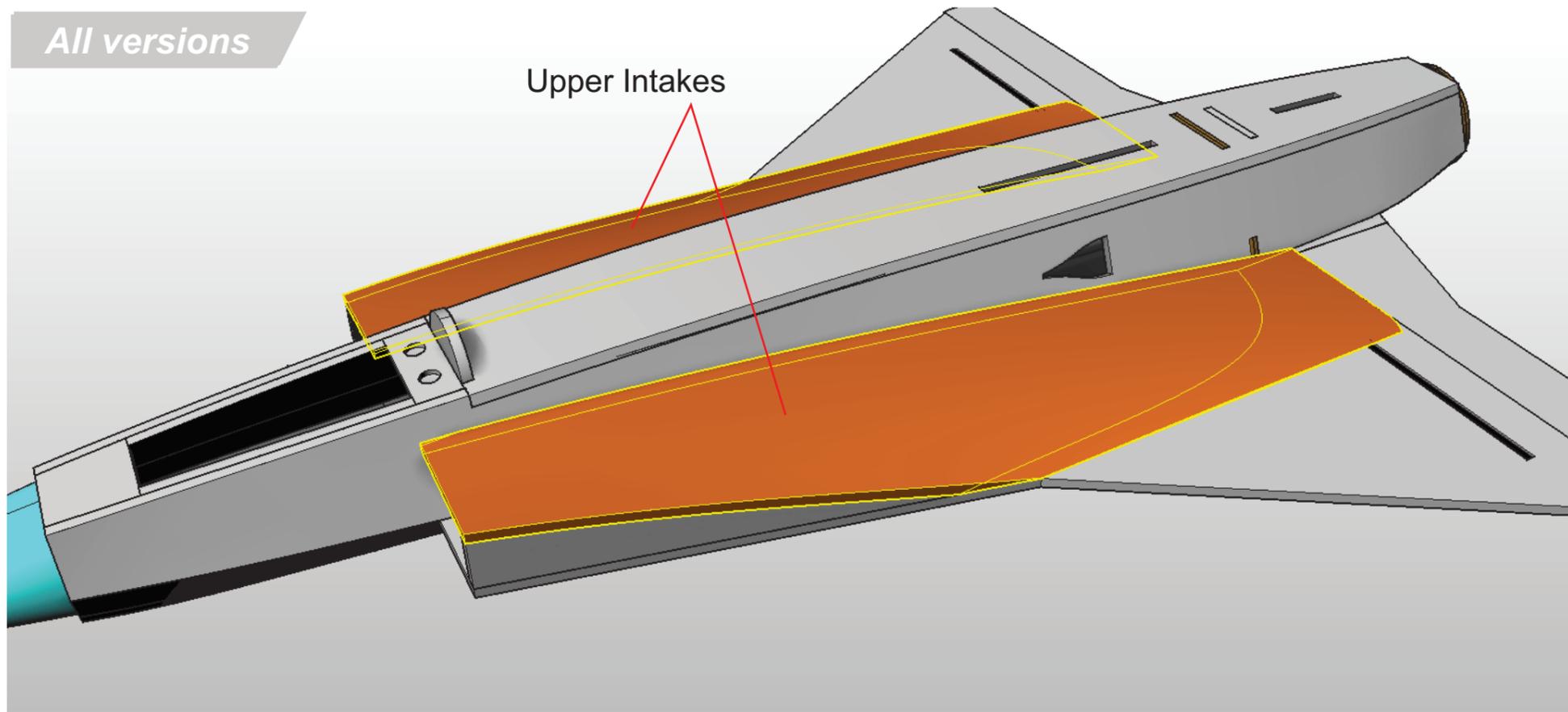
All versions



Glue Intake **sides** to the wing.



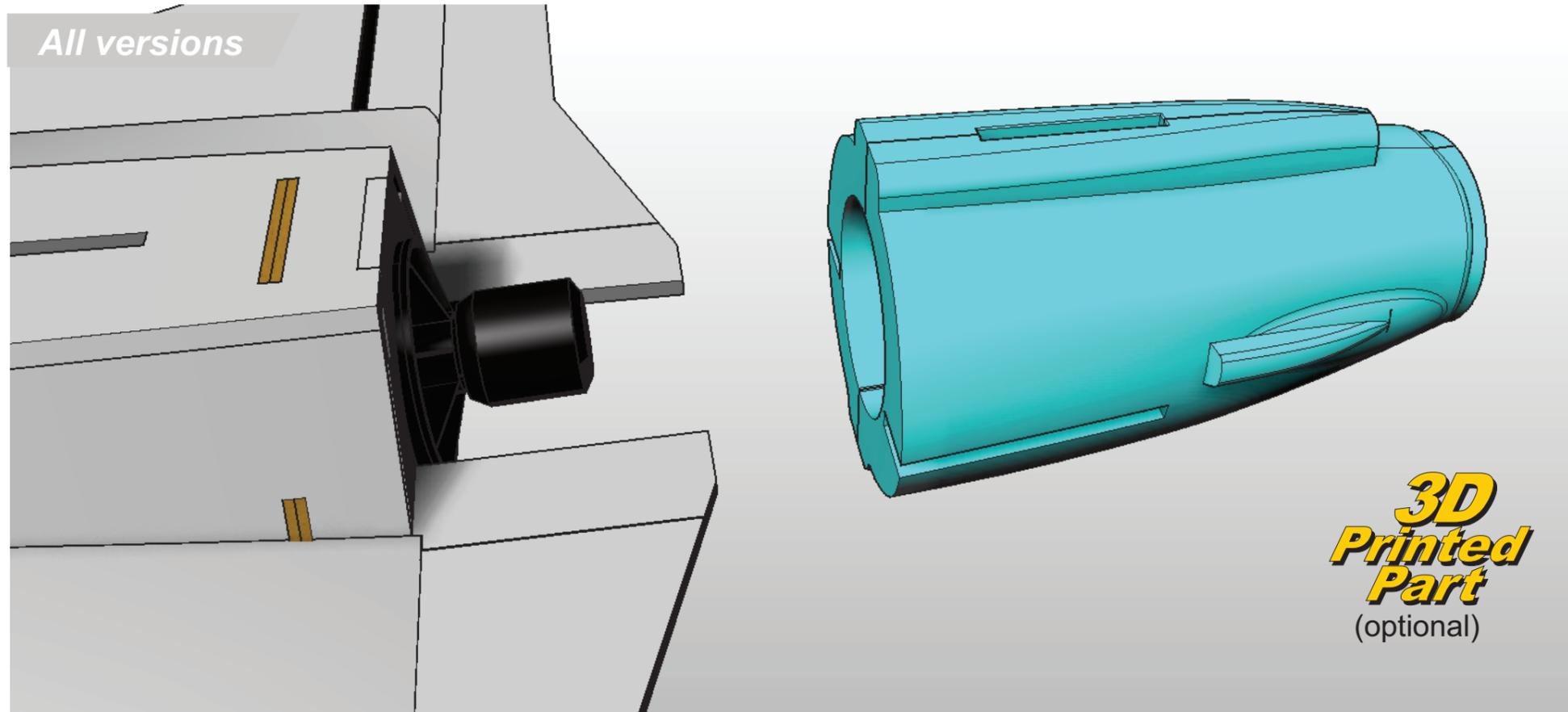
All versions



Glue the **Upper Intakes** in place



All versions



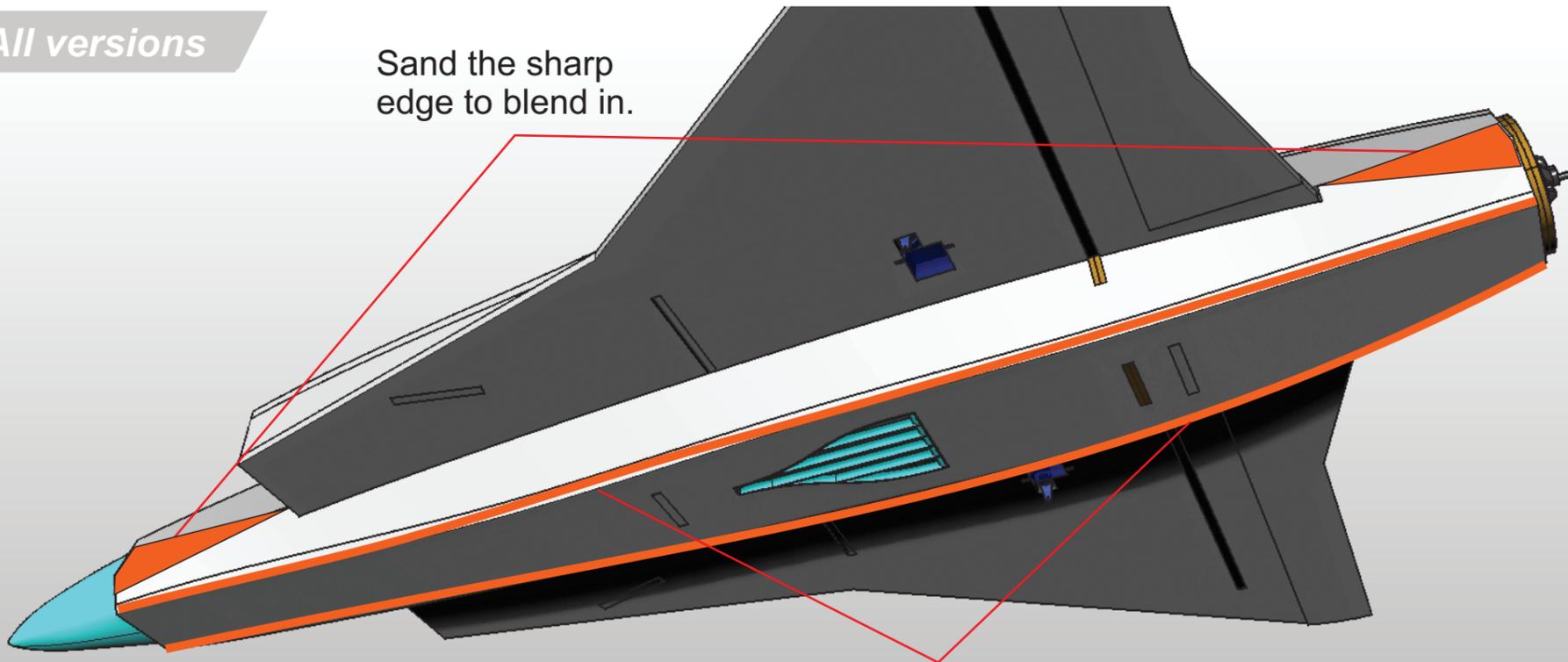
If you want to use the 3d printed tailcone (optional) then carefully trim away the depron pieces up to the bulkhead, then glue the tailcone in place.

There are both Pusher and EDF tailcone options available.



All versions

Sand the sharp edge to blend in.

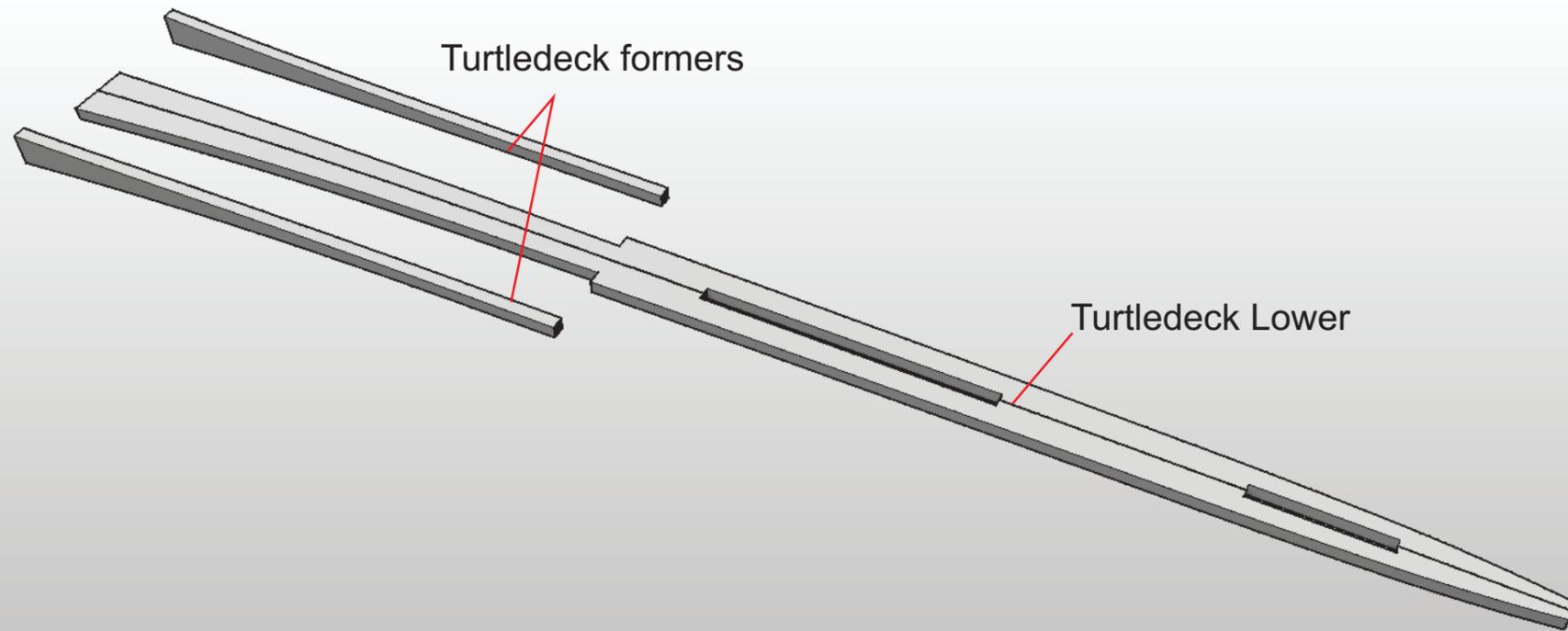


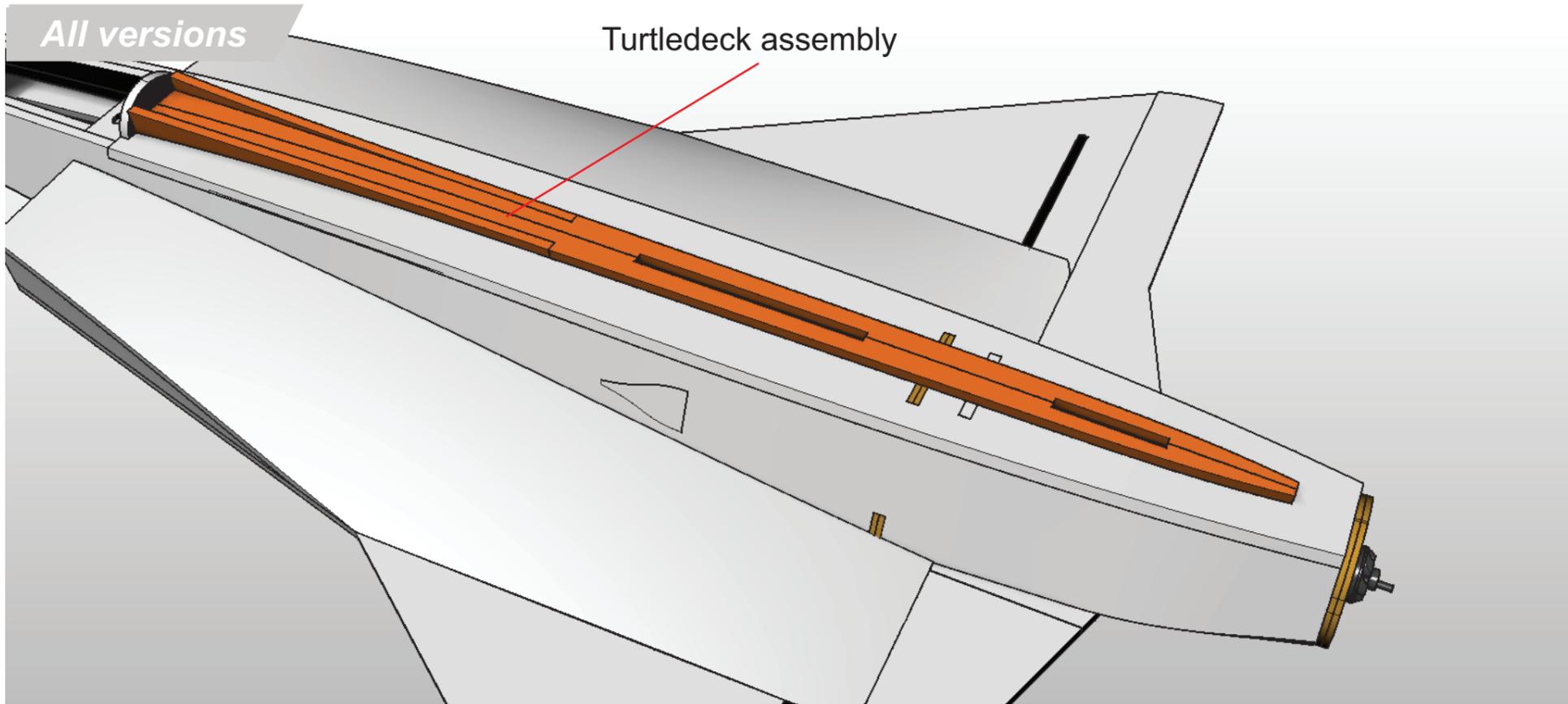
Sand the corners to match the radii of the nosecone and exhaust

Glue the **Upper Intakes** in place

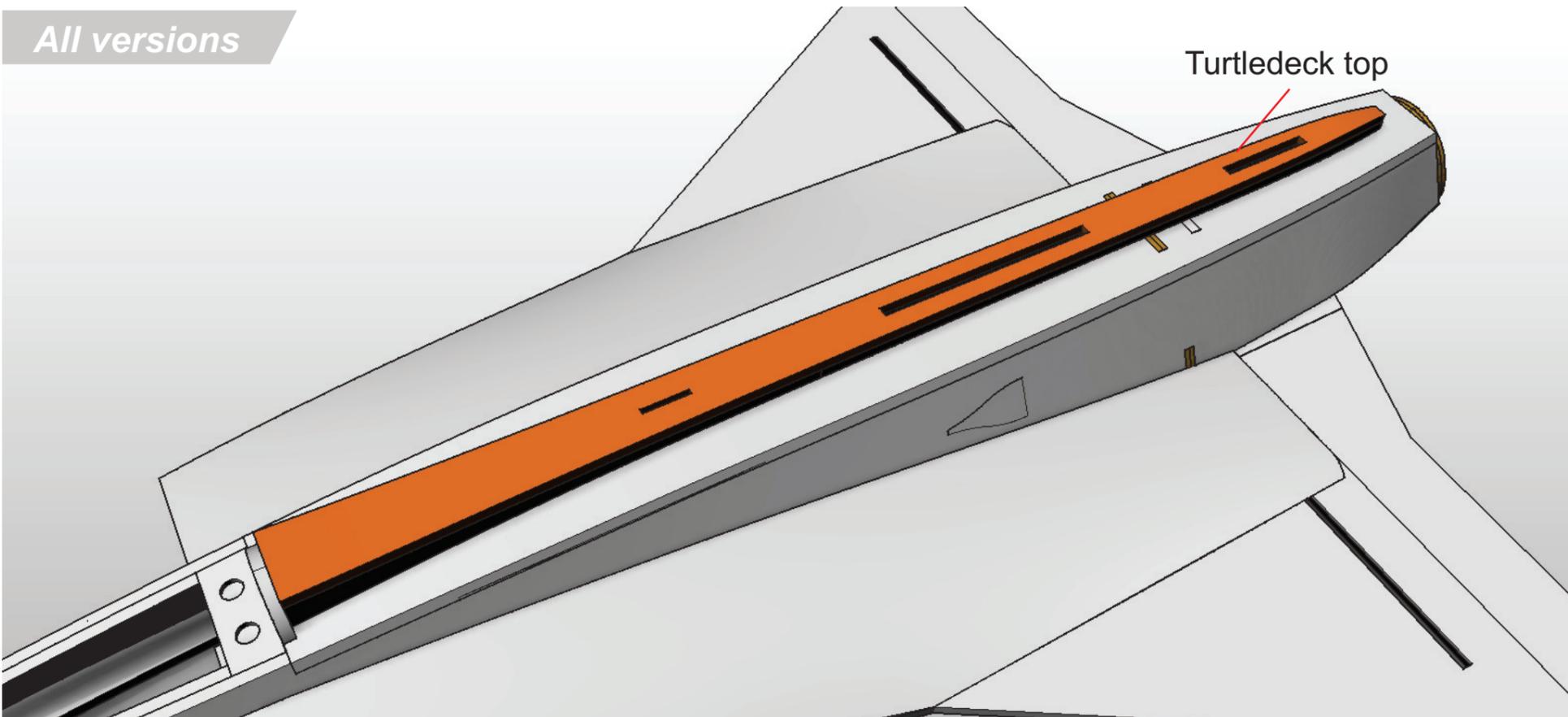


Glue **Turtledeck formers** to the **Turtledeck lower** .





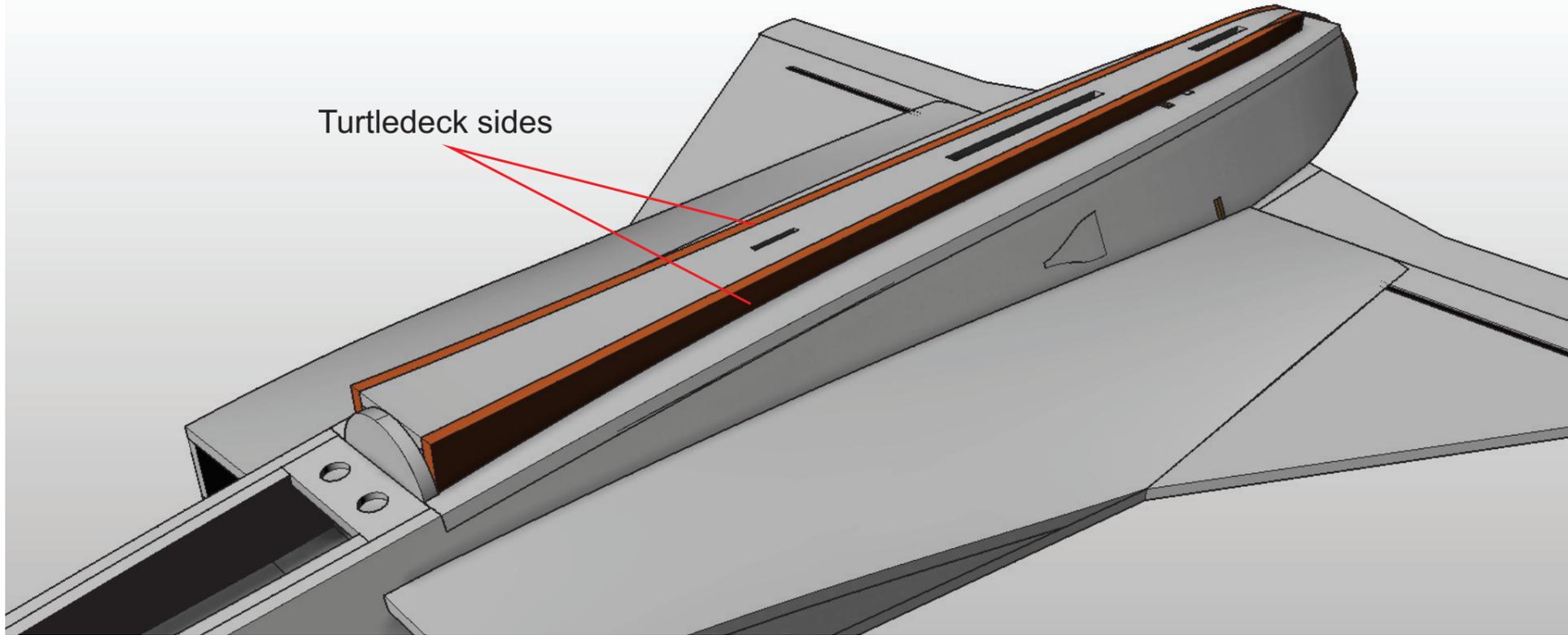
Glue the **Turtledeck assembly** to the aircraft.



Glue **Turtledeck top** to the assembly.



All versions

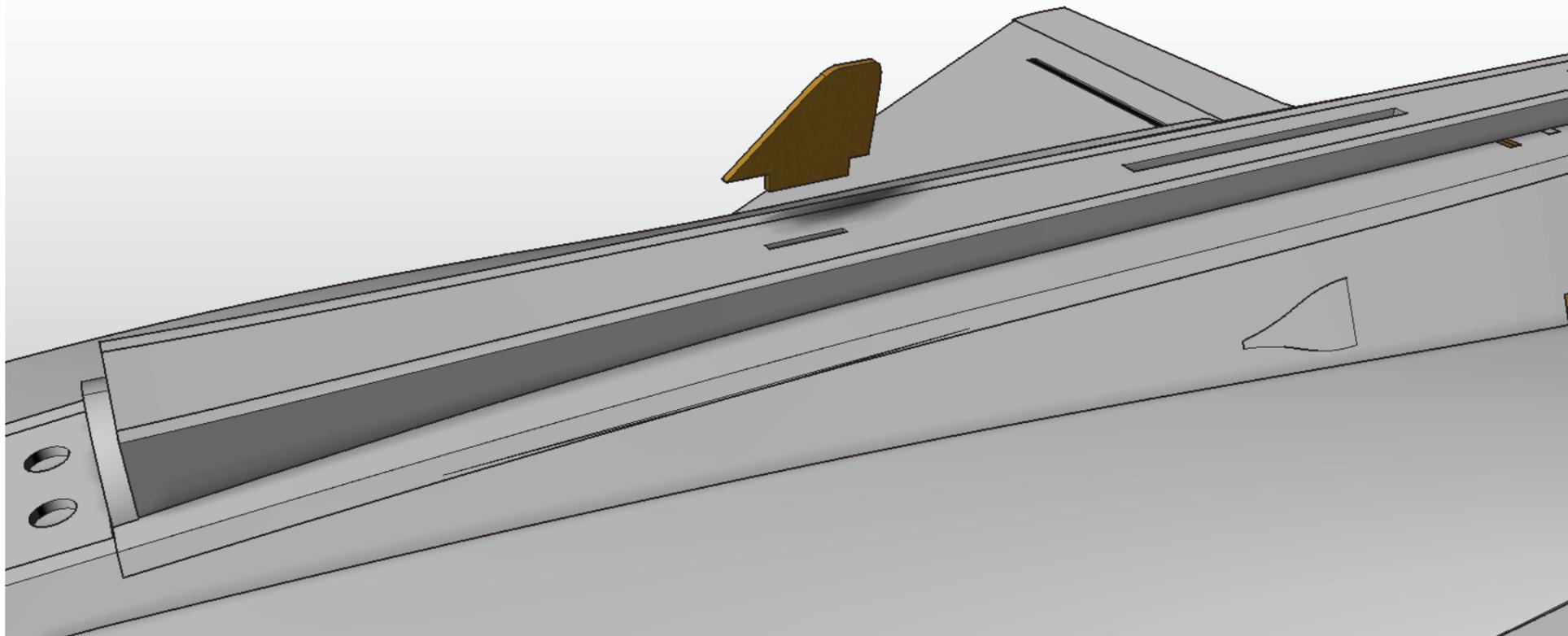


Glue the **Turtledeck sides** to the aircraft.

Sand down the top edges to match the shape of bulkhead 2 - reducing in radius as you go rearwards.

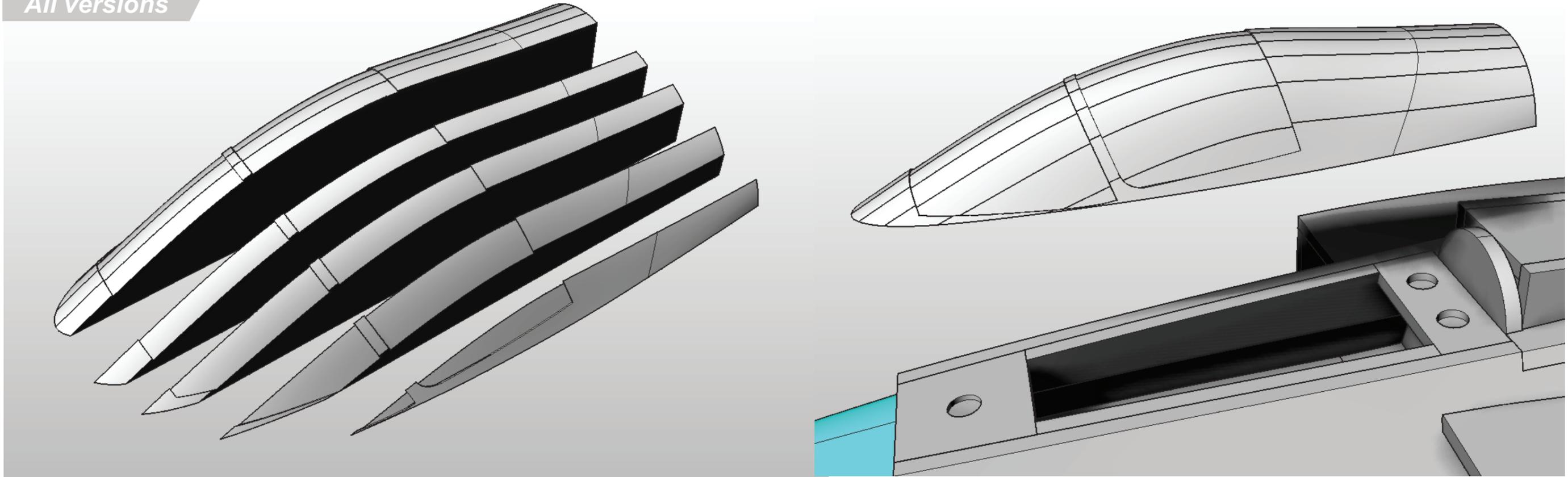


All versions



Glue the **3mm Liteply Dorsal Antenna** to the assembly.

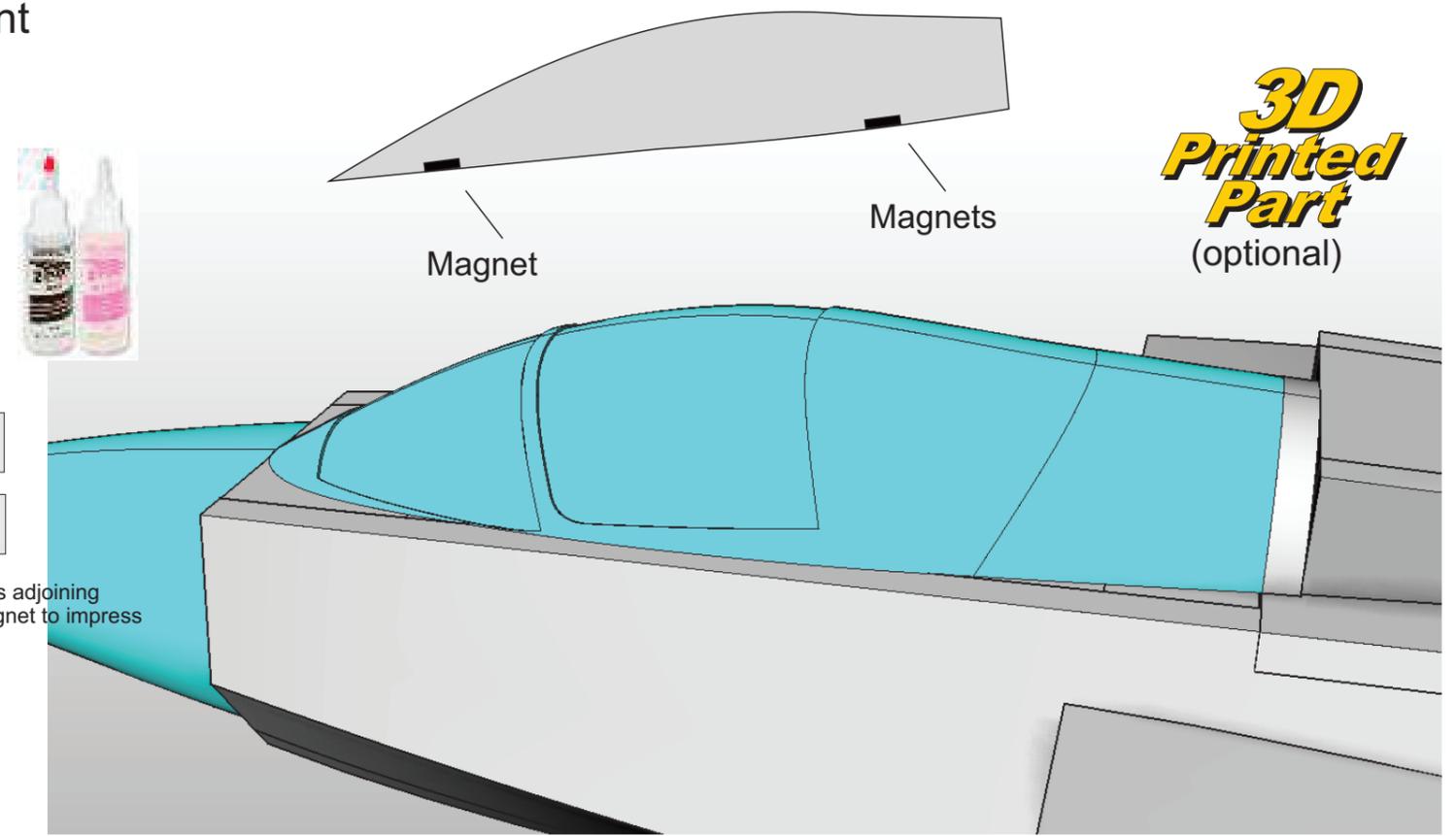




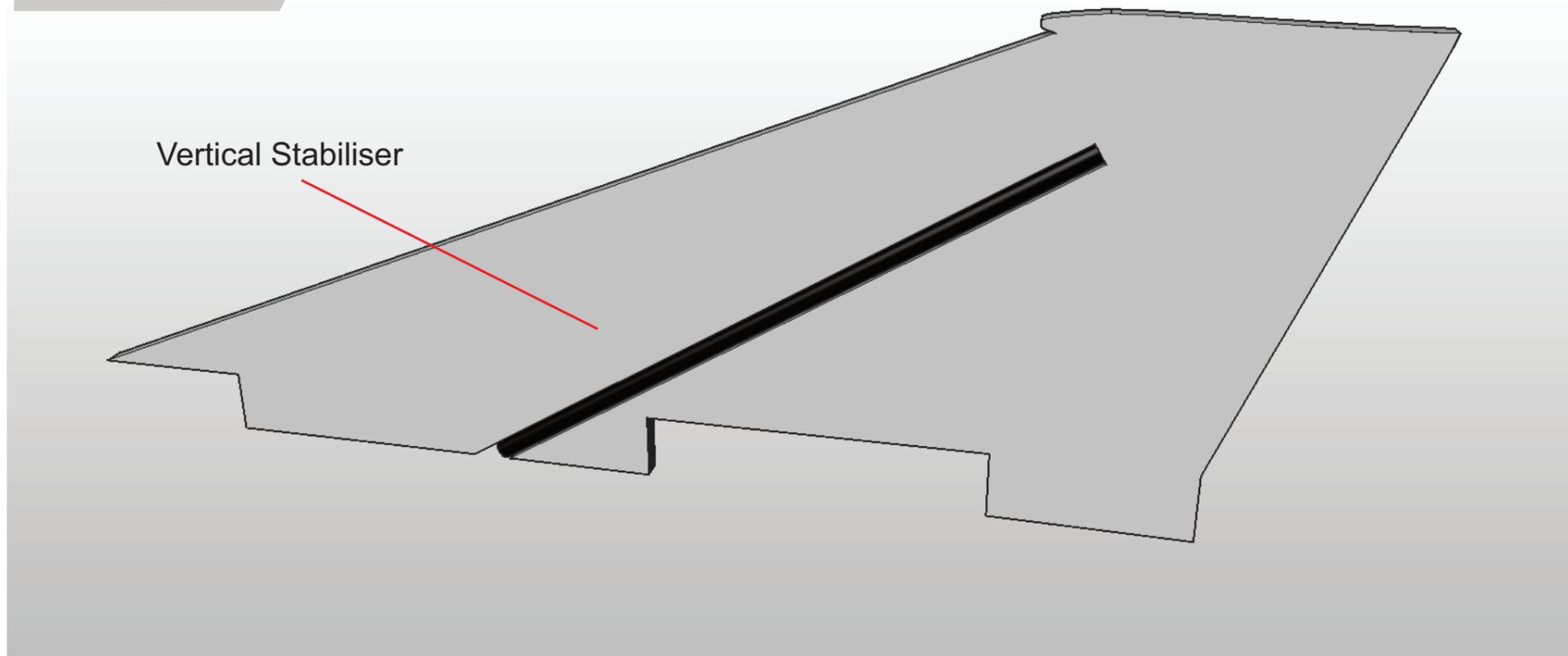
Create the canopy in the same way as the nosecone, or 3d Print one and add magnets as shown.

-
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!



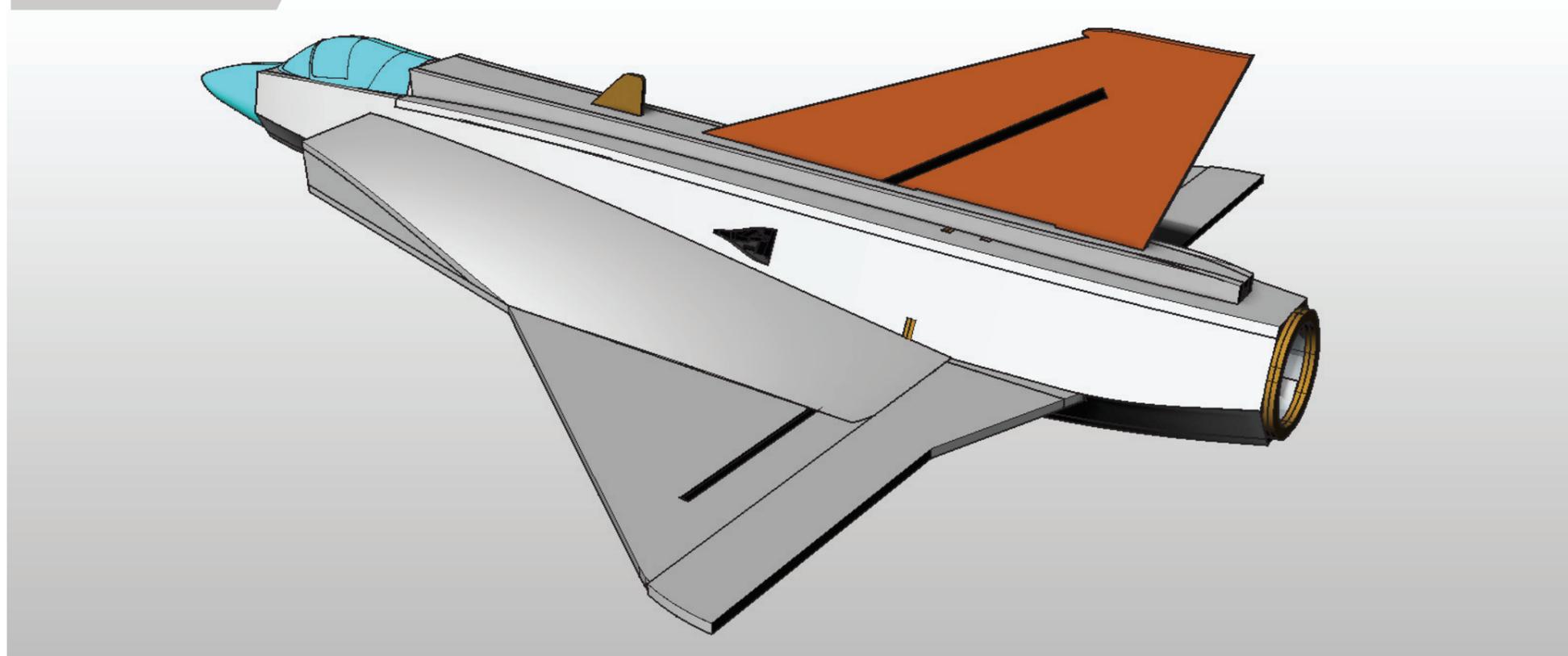
All versions



Use epoxy and masking tape to glue the **Vertical Stabiliser** spar in place.



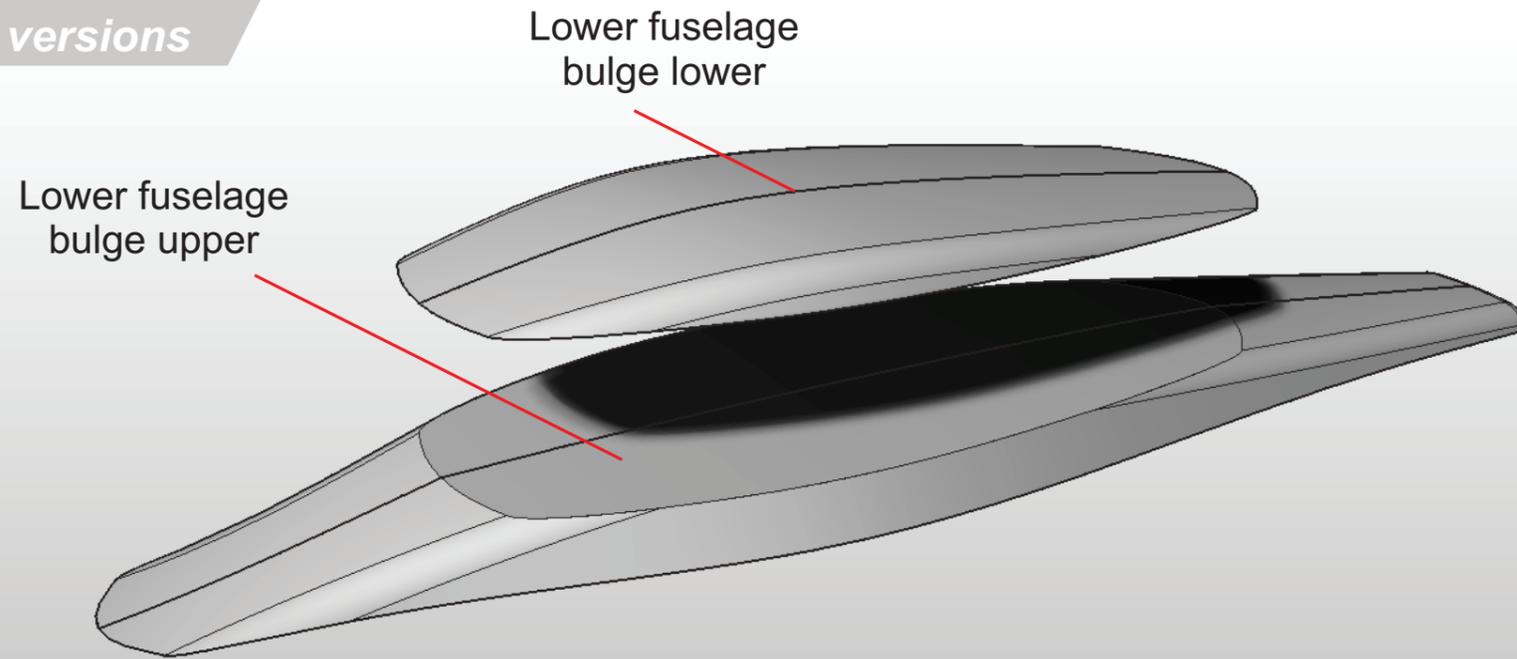
All versions



Glue the **Vertical Stabiliser** to the assembly.



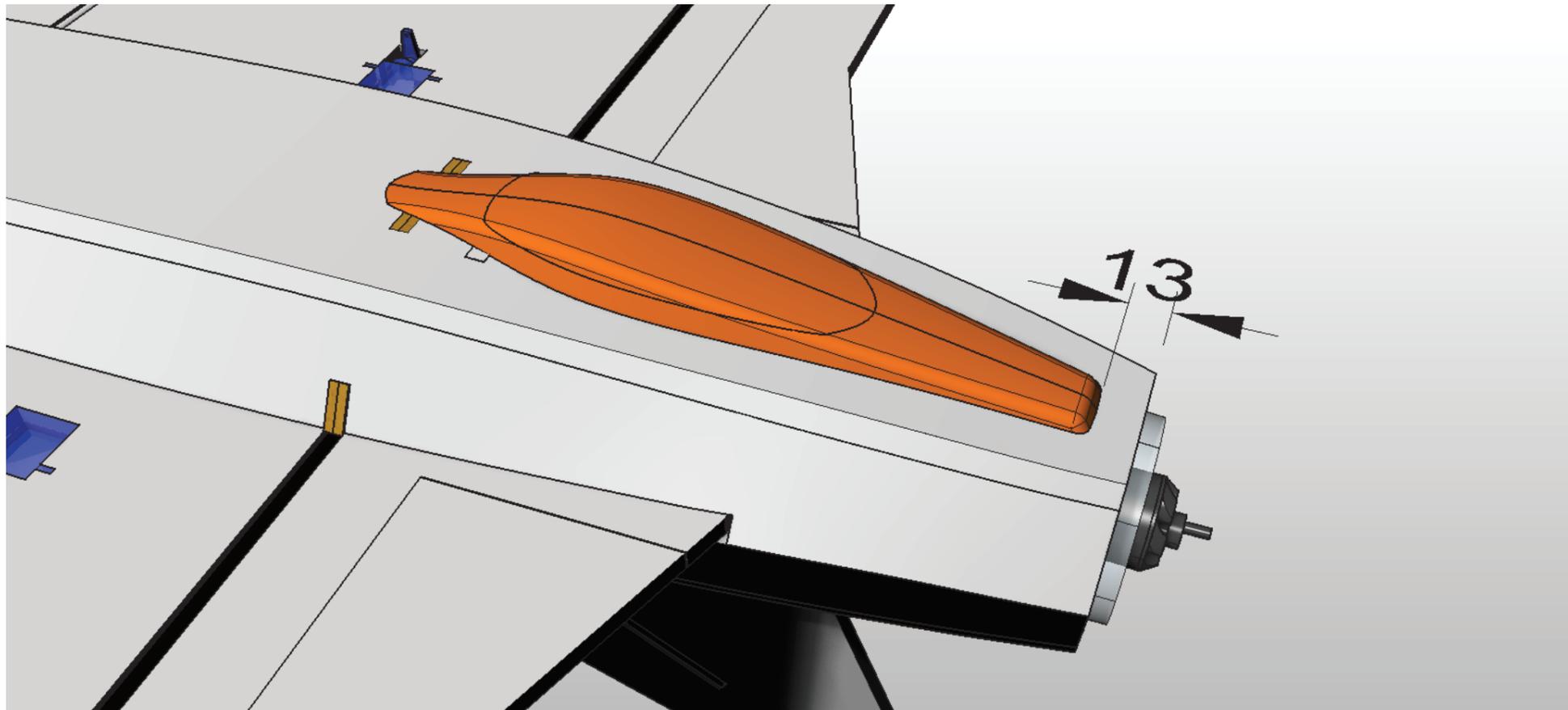
All versions

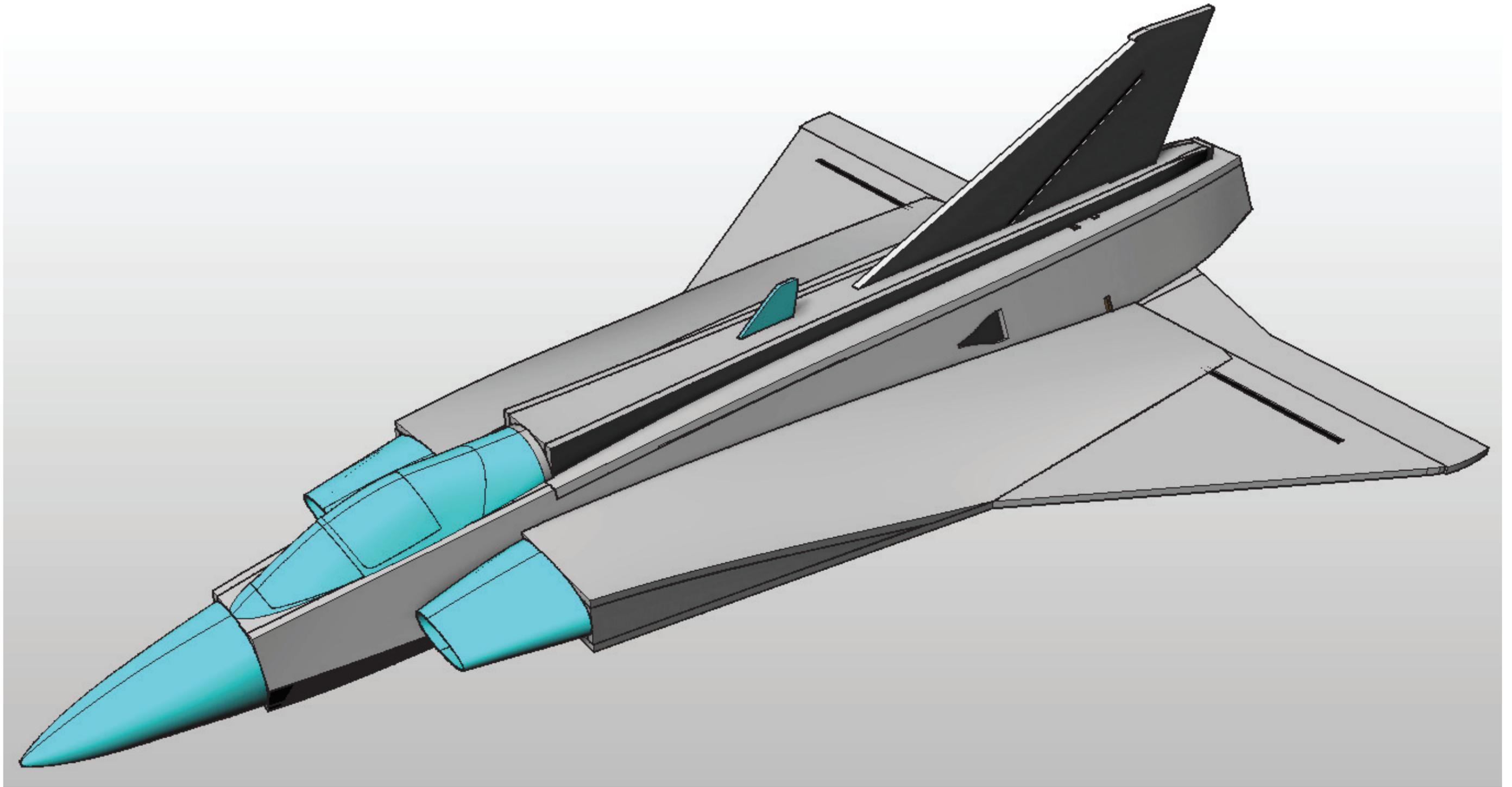


Glue the **Lower Fuselage Bulge** pieces together and sand to represent the shape shown here.



Glue the **Lower Fuselage Bulge** to the belly panel as shown.





Congratulations! Your Draken is Complete. You can fly it as it is, or you can paint it!





There are several amazing paint schemes for the Draken, browse on Google images to find your favourite!

