



Sepecat
Jaguar
Parkjet



BETA Construction Guide

By Craig Clarkstone

Jaguar History

The SEPECAT Jaguar is an Anglo-French jet attack aircraft, originally used by the British Royal Air Force and the French Air Force in the close air support and nuclear strike role, and still in service with the Indian Air Force.

Originally conceived in the 1960s as a jet trainer with a light ground attack capability, the requirement for the aircraft soon changed to include supersonic performance, reconnaissance and tactical nuclear strike roles. A carrier-based variant was also planned for French service, but this was cancelled in favour of the cheaper Dassault Super Étendard. The airframes were manufactured by SEPECAT (Société Européenne de Production de l'avion Ecole de Combat et d'Appui Tactique), a joint venture between Breguet and the British Aircraft Corporation, one of the first major joint-Anglo-French military aircraft programs.

The Jaguar was exported to India, Oman, Ecuador and Nigeria. With various air forces, the Jaguar was used in numerous conflicts and military operations in Mauritania, Chad, Iraq, Bosnia, and Pakistan, as well as providing a ready nuclear delivery platform for Britain, France, and India throughout the latter half of the Cold War and beyond. In the Gulf War, the Jaguar was praised for its reliability and was a valuable coalition resource. The aircraft served with the French Air Force as the main strike/attack aircraft until 1 July 2005, and with the Royal Air Force until the end of April 2007. It was replaced by the Panavia Tornado and the Eurofighter Typhoon in the RAF and the Dassault Rafale in the French Air Force.

A single Jaguar was converted into the Jaguar Active Control Technology (ACT) with fly-by-wire controls and aerodynamic alterations to the airframe; the aerodynamic instability improved manoeuvrability and the test data was used in the development of the Eurofighter.

The Jaguar had the unusual optional provision for overwing pylons, used for short-range air-to-air missiles, such as the Matra R550 Magic or the AIM-9 Sidewinder. This option frees up the under-wing pylons for other weapons and stores.

Designers Notes

The Jaguar - affectionately called the 'Mule', was commonplace at airshows in the 80's and I occasionally saw it flying overhead as a teenager also. I wanted to make this model as there are hardly any Jaguar designs around and I thought that it would be fun to make some plans to honour this warbird.

The EDF unit is positioned on an angle to ensure the jet thrust angle matches the original plane as close as possible. This is due to the high wing position in relation to the exhaust outlets.

The Pusher variant motor is positioned on the wing-line, so doesn't require any angle, but the model has a slightly fatter fuselage at the rear to accommodate it. It also makes it easier to control the elevator.

If you enjoy this design please help me to fund my next project and send a donation for \$10 to Paypal address :-

clicketyclarkstone@gmail.com

Thank you! and happy flying. Craig :)



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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)

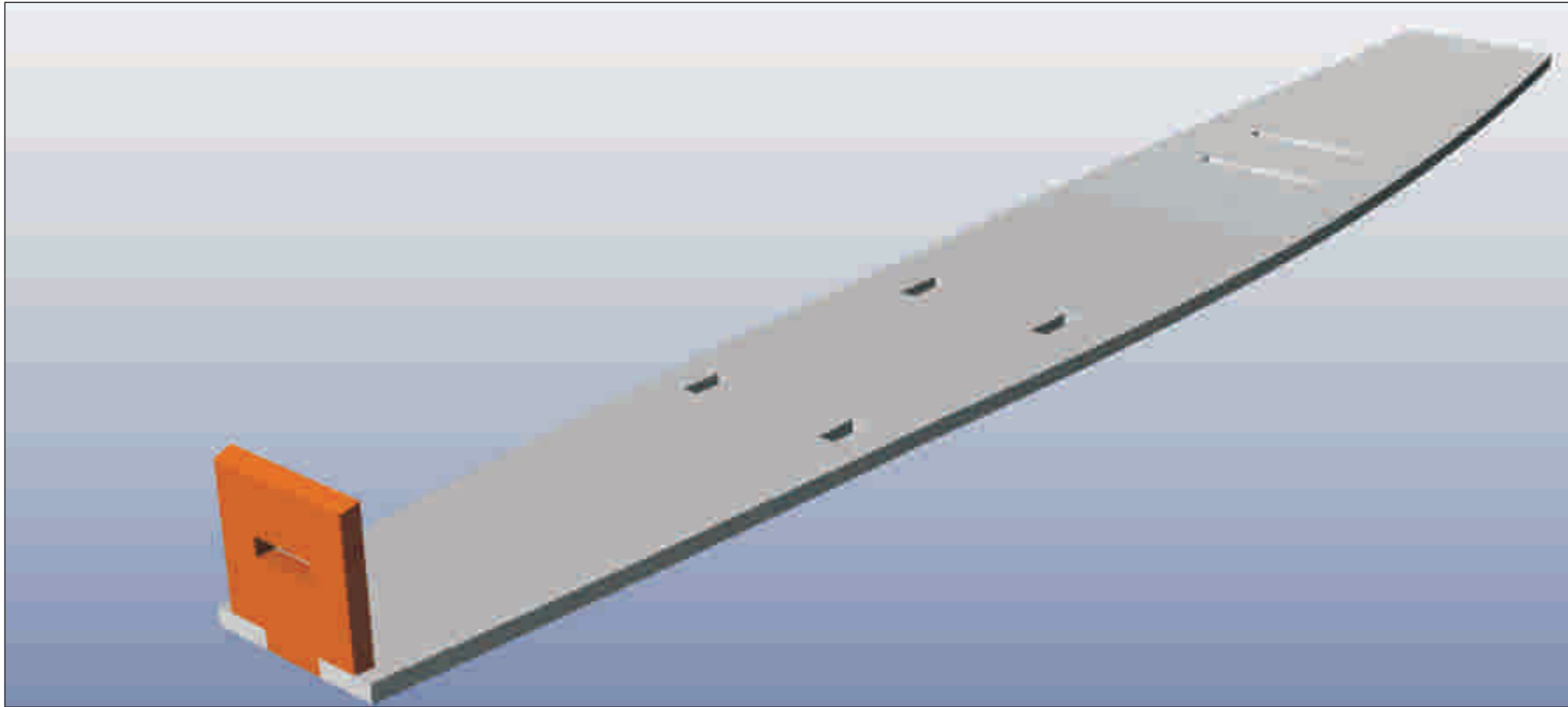
Cutting parts

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!)

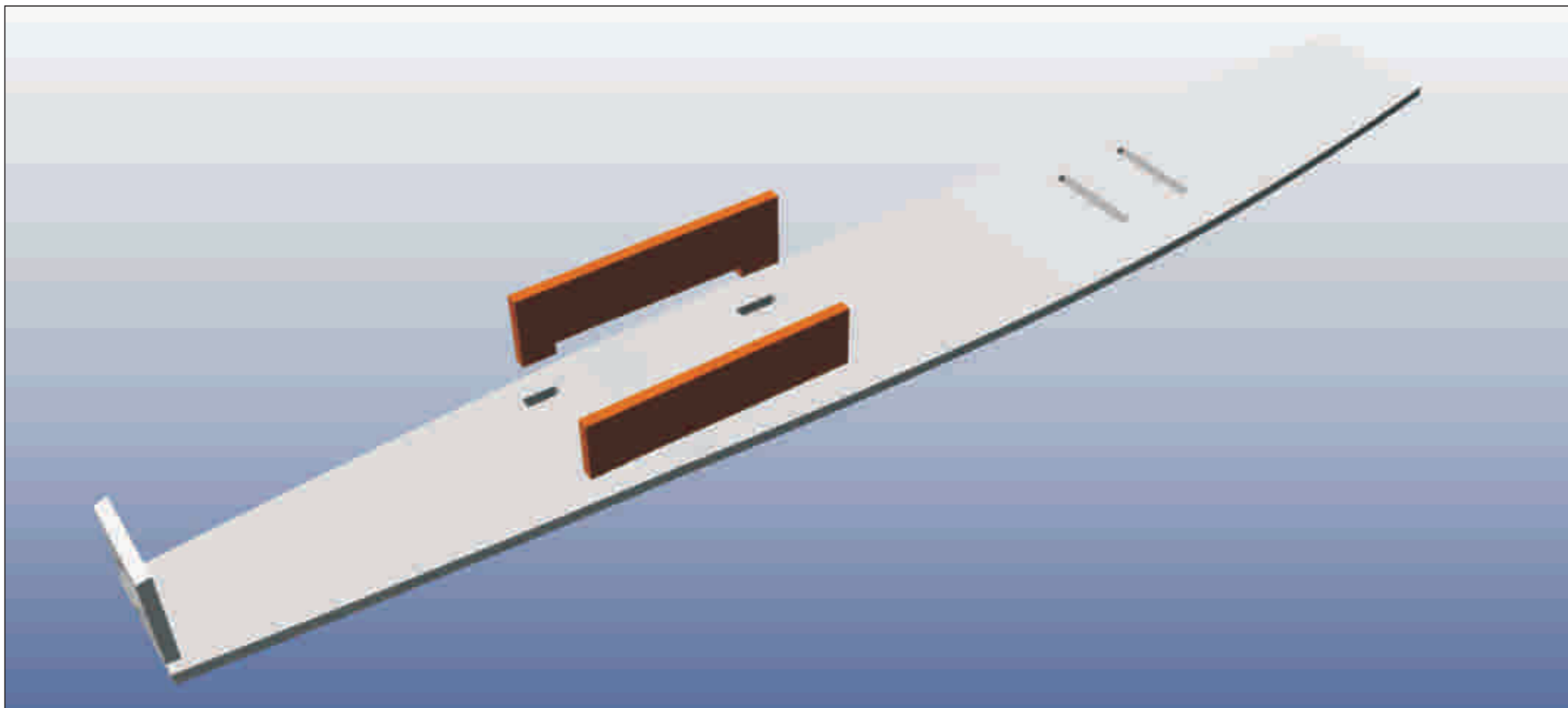
IMPORTANT Wherever the plans call for marking guidelines onto the depron, please ensure that you do otherwise it can cause problems later on. I suggest you use a Sharpie Fineliner to transfer the lines.

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.

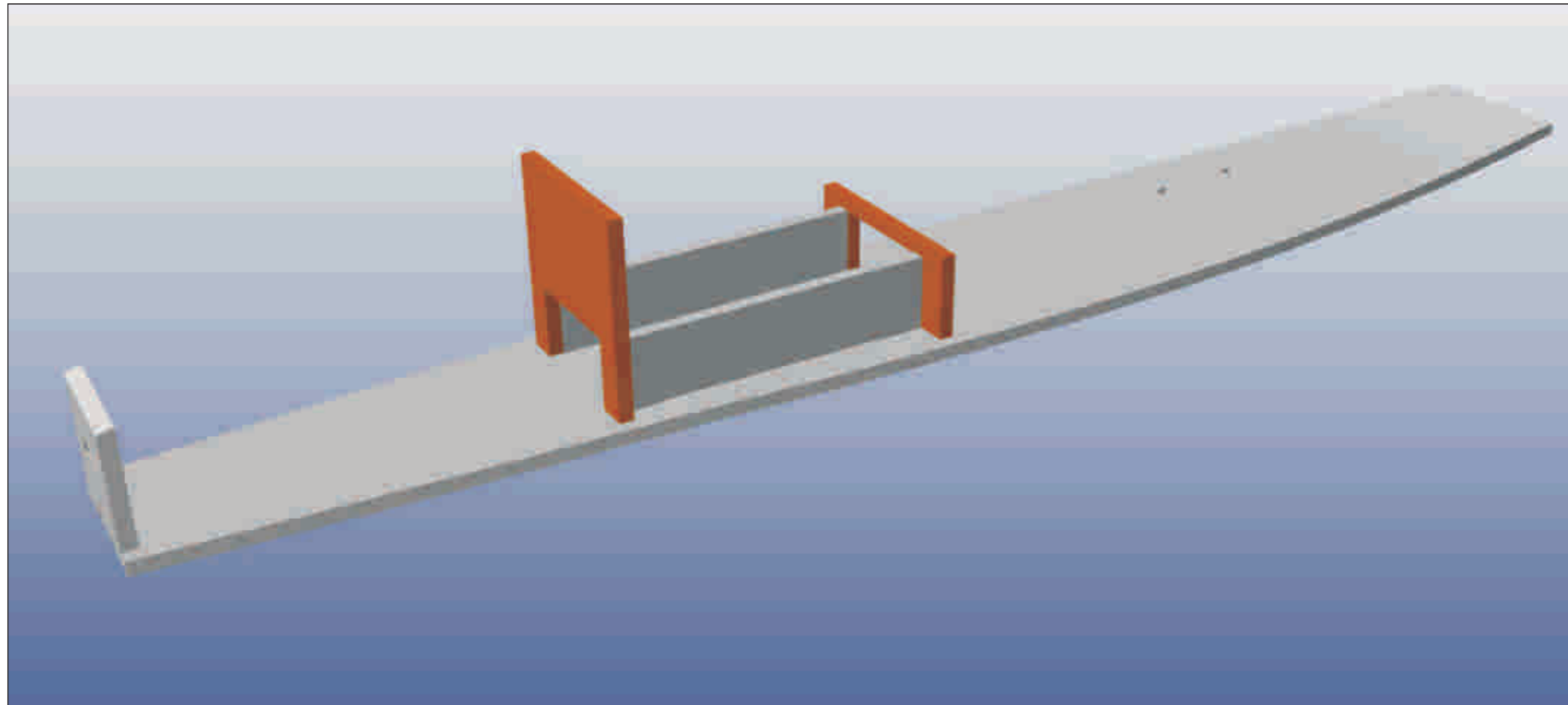


Glue bulkhead 1 to the belly panel

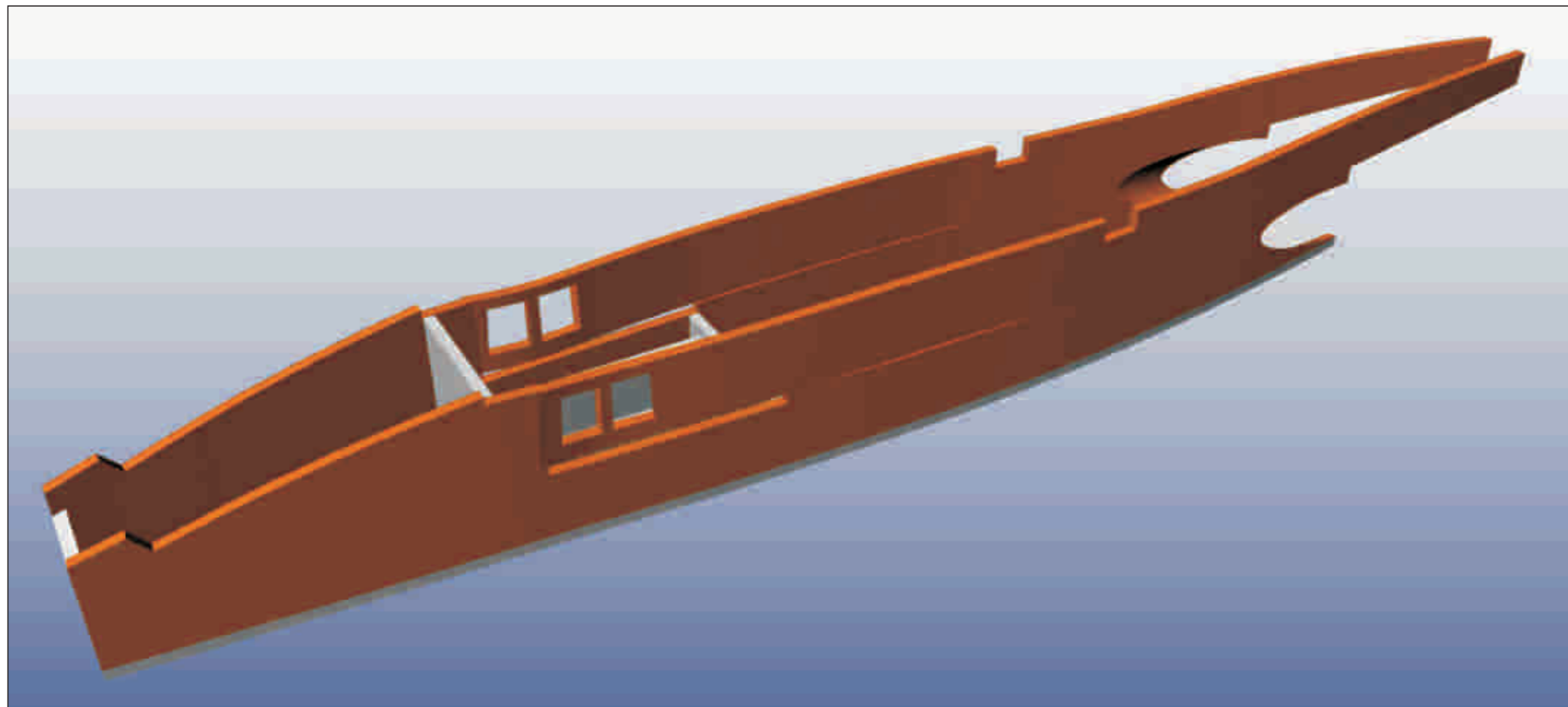


Glue the battery tray sides into the belly panel - note the holes & slots are designed to only fit one way around





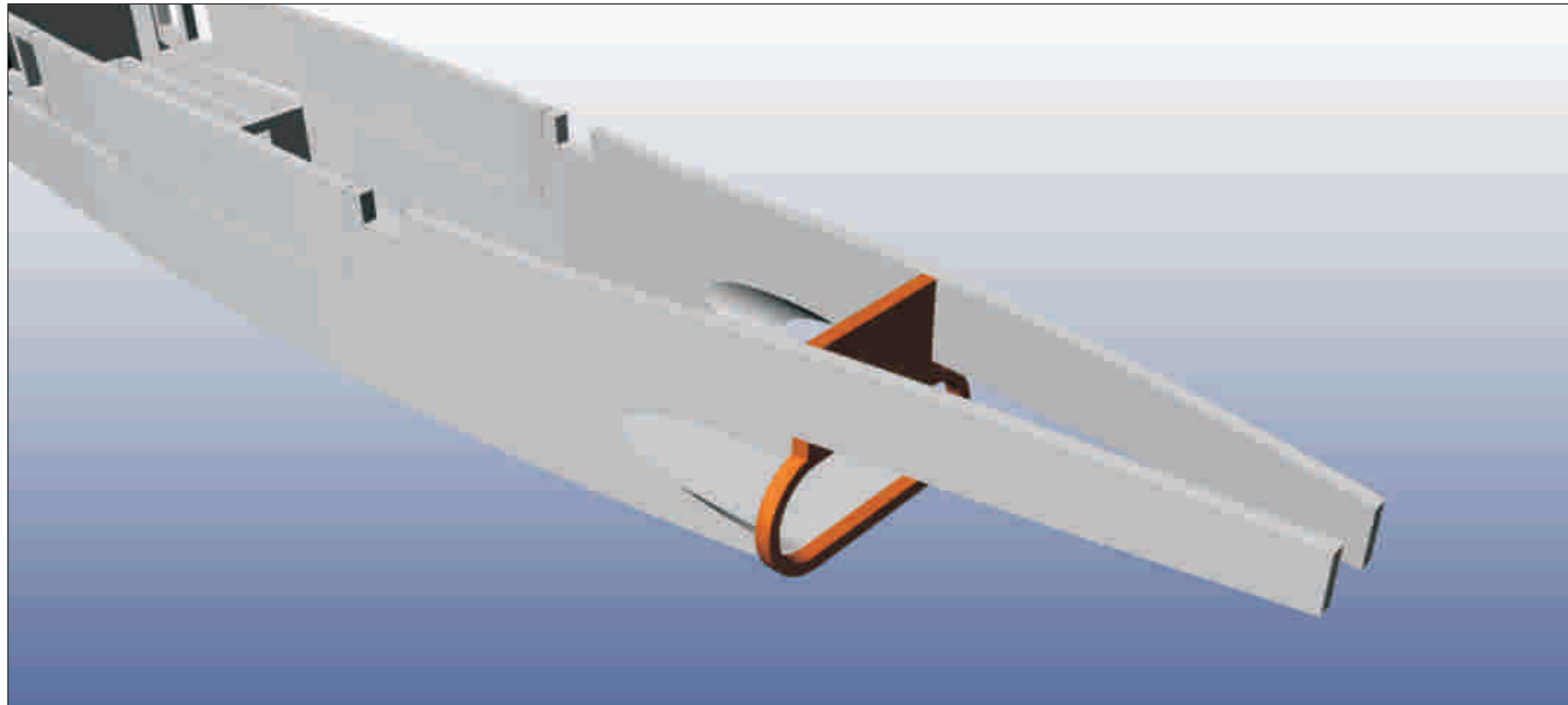
Align bulkheads 2 and 3 into position and glue into place



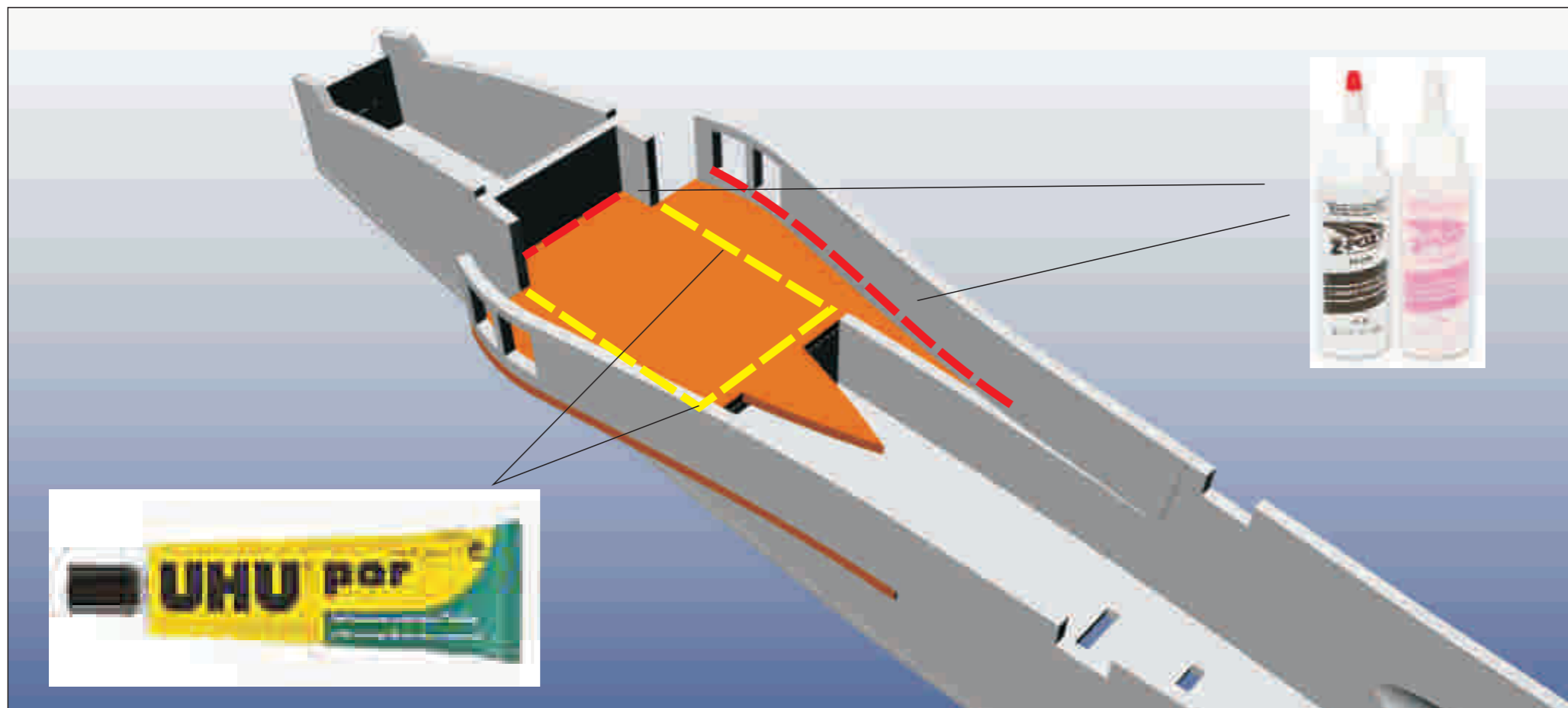
Glue the fuselage sides onto the belly as shown

(EDF ONLY - ensure that the EDF bulkhead angles are drawn on the inside faces of the fuselage sides before glueing to the belly)





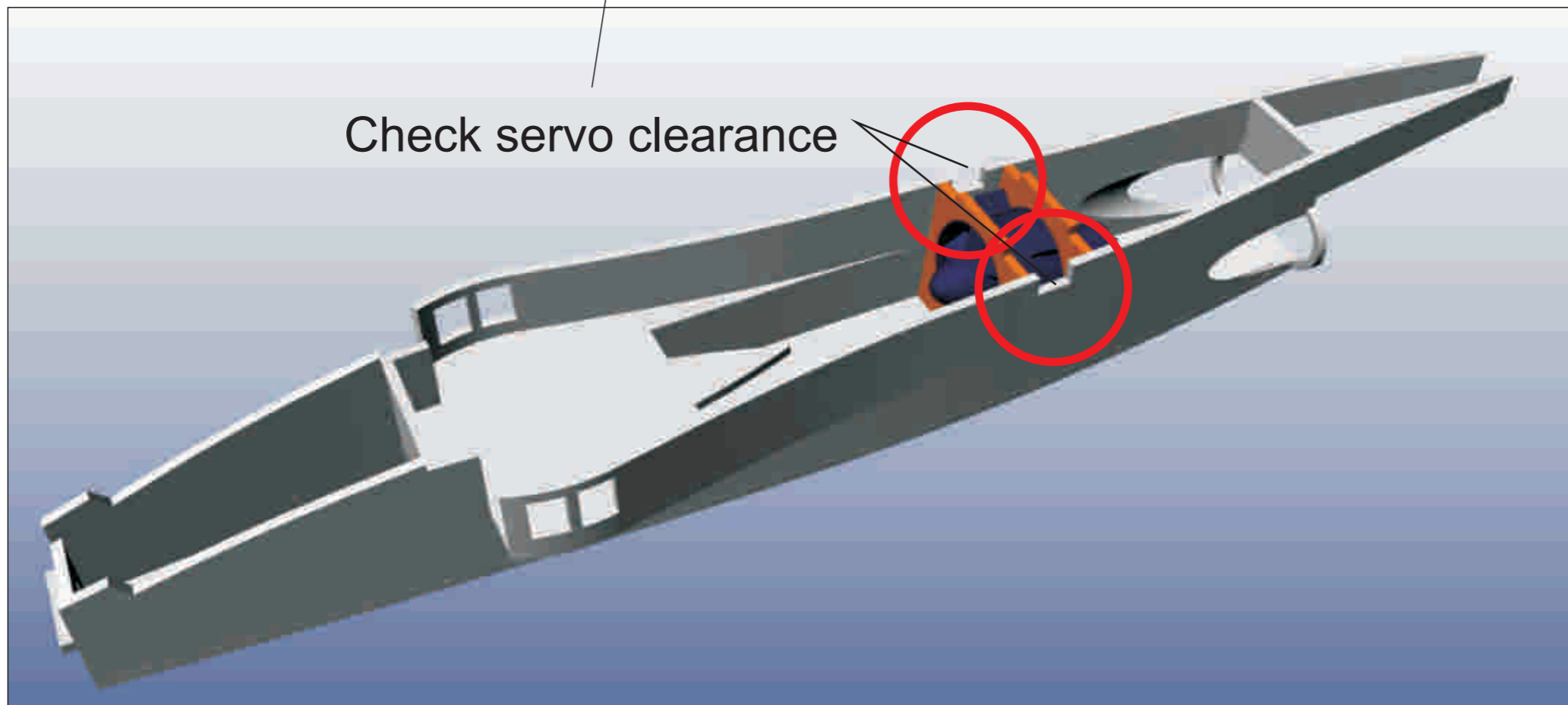
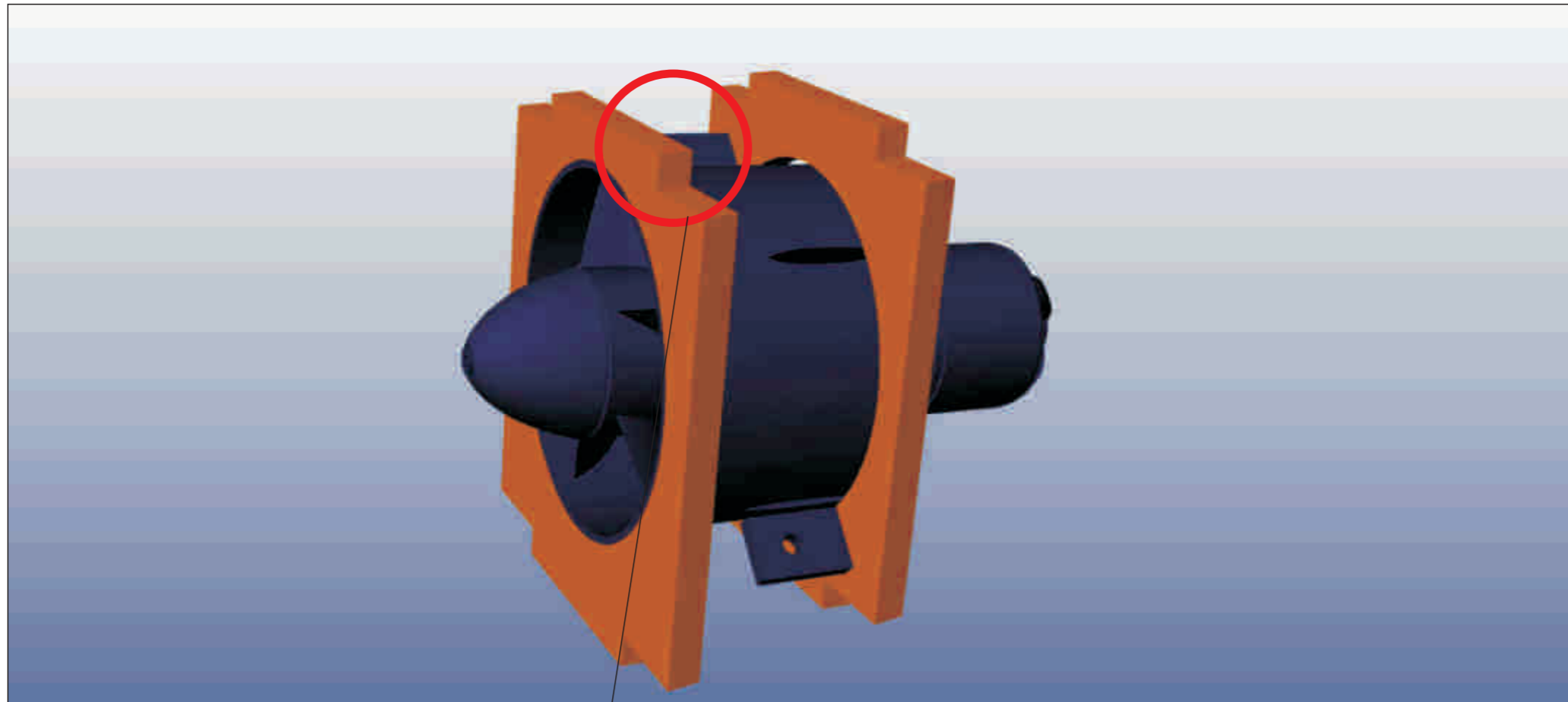
Glue the exhaust bulkhead in place



Shape the air intake sides then glue the horizontal bulkhead in place using uhu por on the base, and epoxy on the air intake sides.

It can be located by parting the air intake sides with one hand, while lowering the rear part into the cut-away area, then lowering the front edge down.

Use epoxy (sparingly) on the air intake sides, pinning into position until set.



Check servo clearance

EDF Variant only

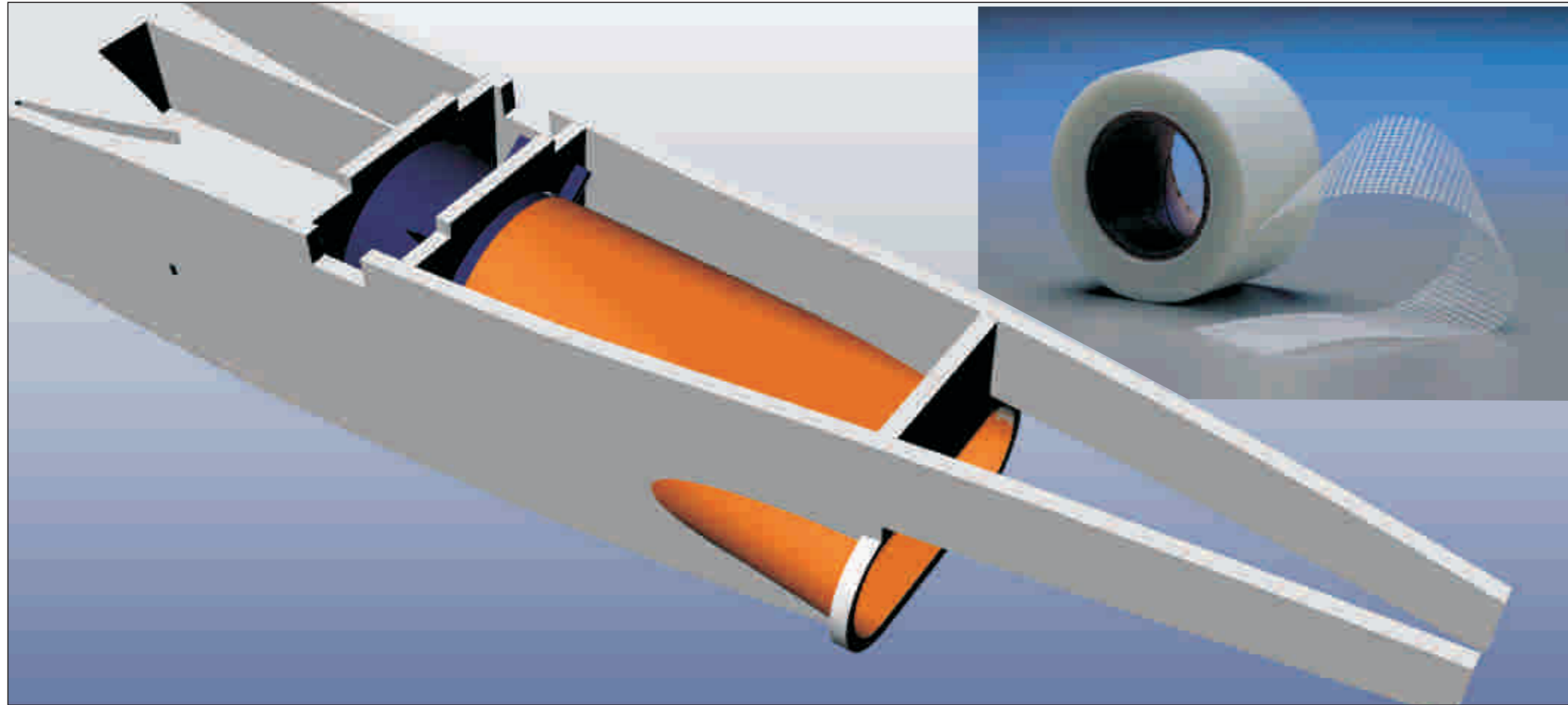
Trim away the depron circular cut to ensure (if necessary) to fit your EDF unit into the EDF front and rear bulkheads.

Depending on the mounting tabs that come on your specific EDF unit, rotate the EDF until the plastic tabs find space that won't interfere with either the fuselage sides, nor the aileron servos. Dry fit to check.

Once you have checked, glue the two bulkheads into the airframe with the EDF dry fitted. Use the pre-drawn lines as your angle locator.

Sit the EDF in place (ensuring you can still fit the bell-mouth ring) glue the EDF to the bulkheads, using beads of hot melt glue.

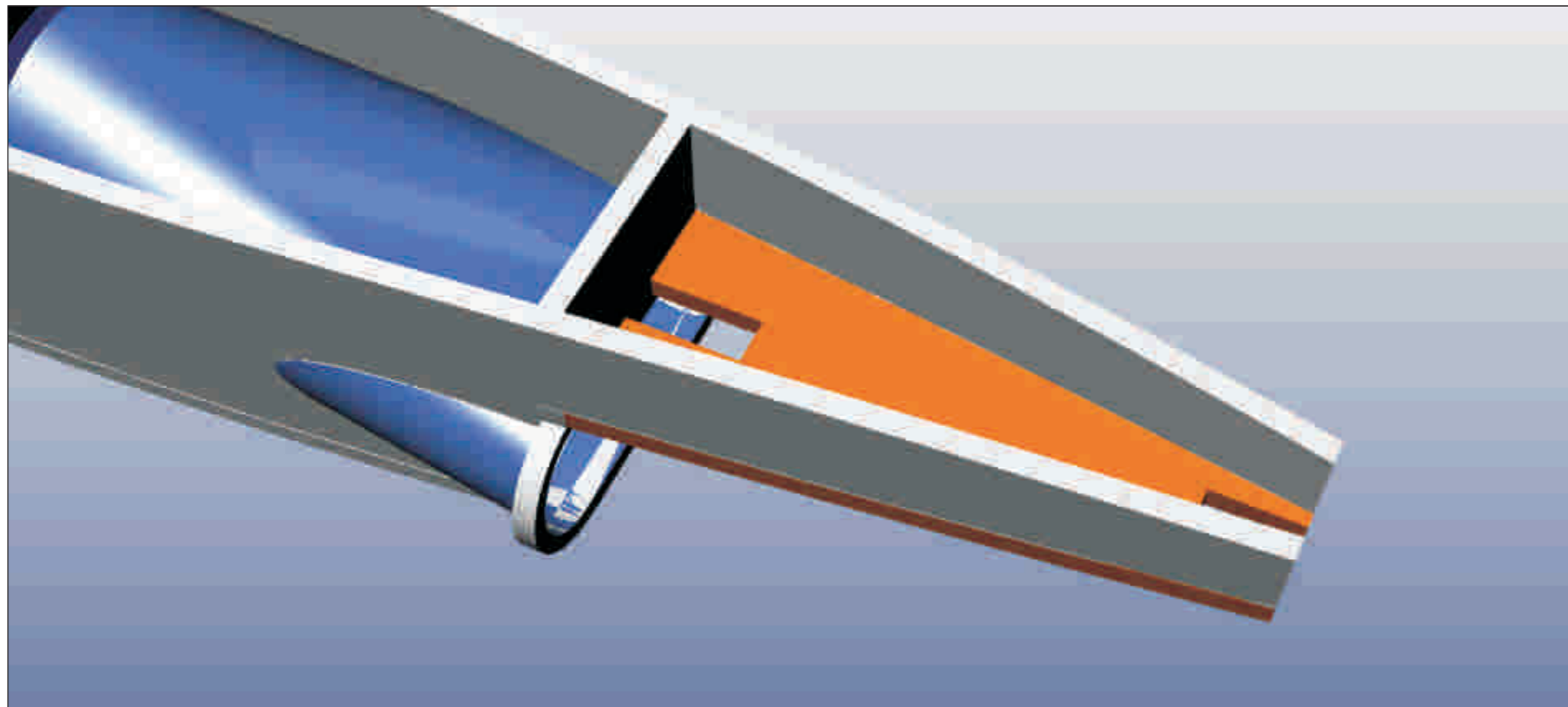




EDF variant ONLY!

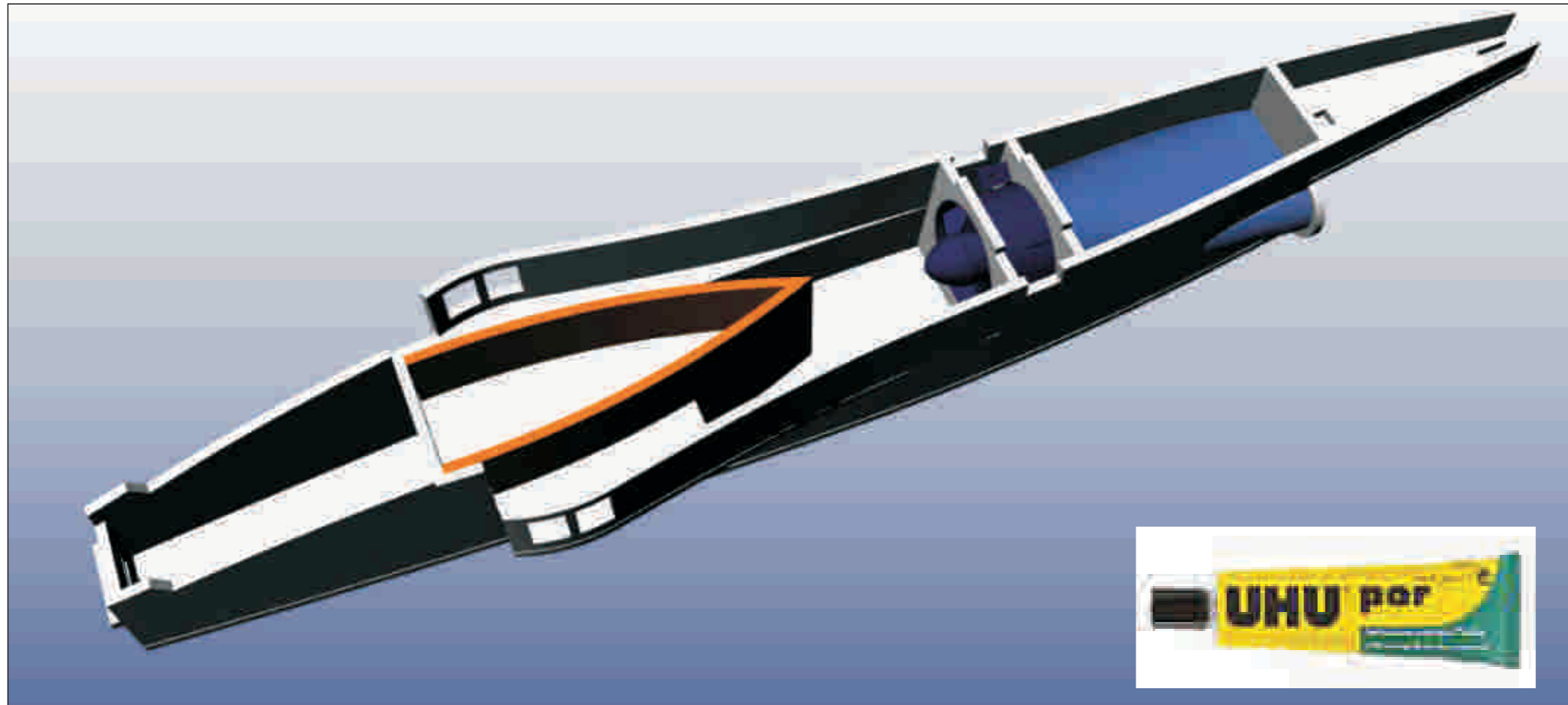
While it is easy to access, make the ducting from 0.5 mm plastic sheet, using nylon reinforced tape to join together.

Use a few beads of hot melt glue to secure around the tail of the EDF unit. Not too much or you will heat-distort the ducting.



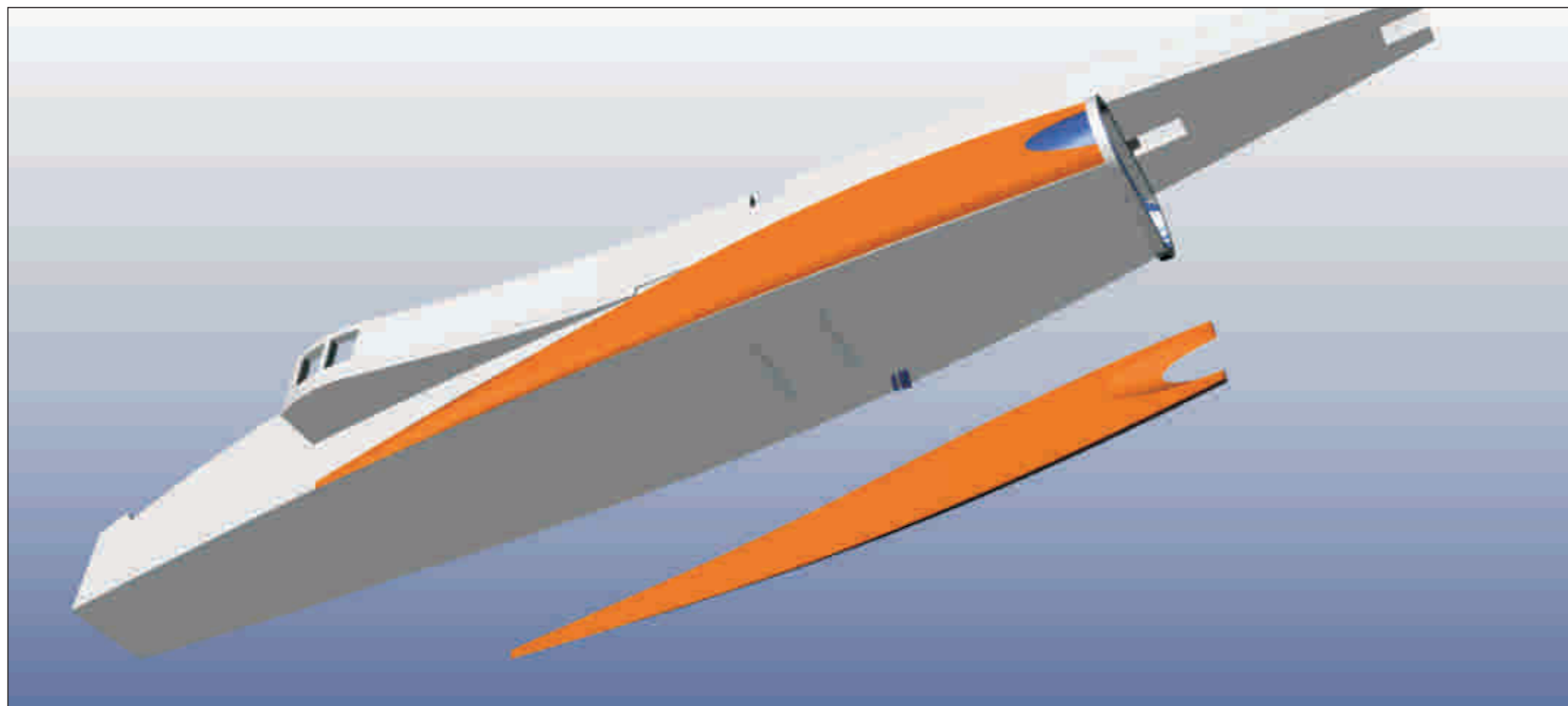
Glue the rear fuselage belly piece to the underside of the airframe as shown



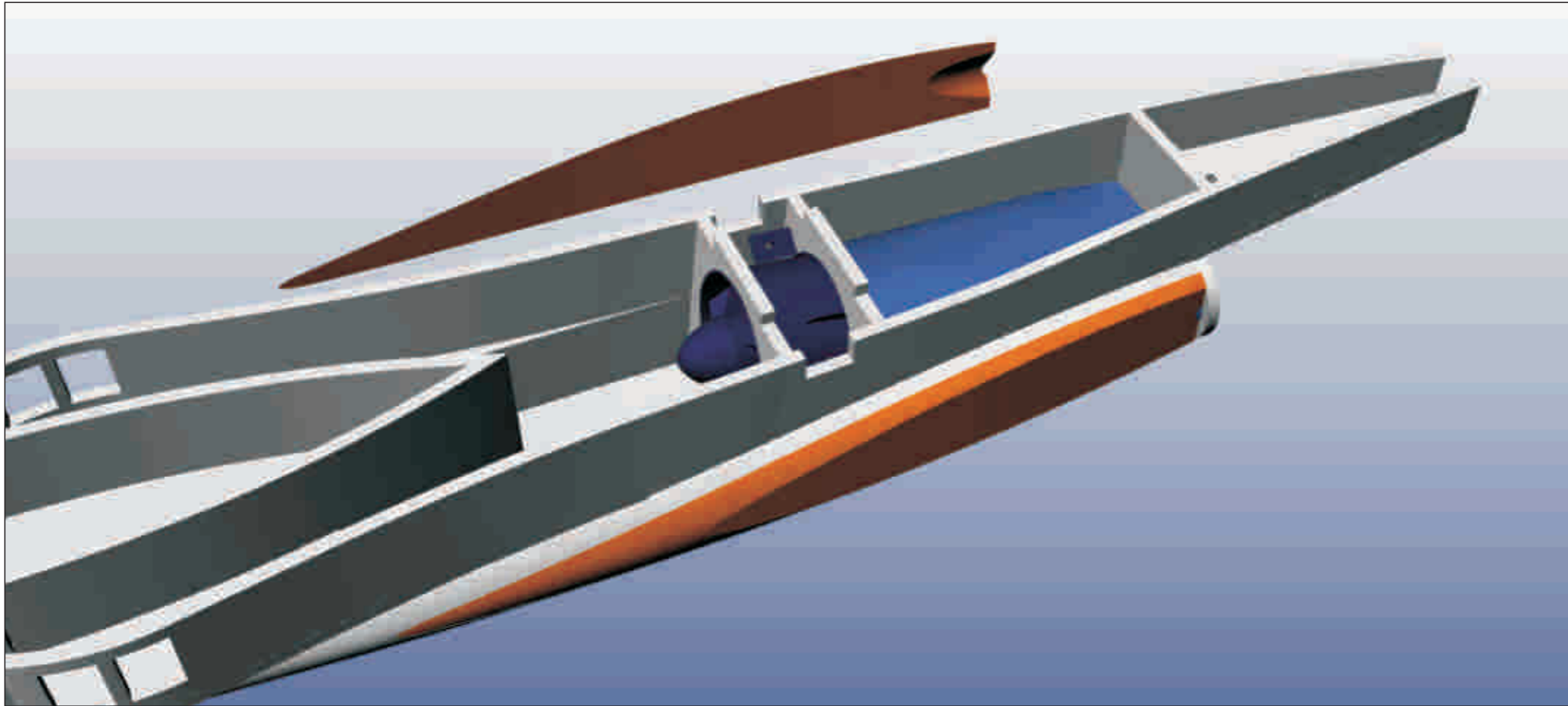


Curve the two air intake inner pieces and glue together, then into the airframe as shown.

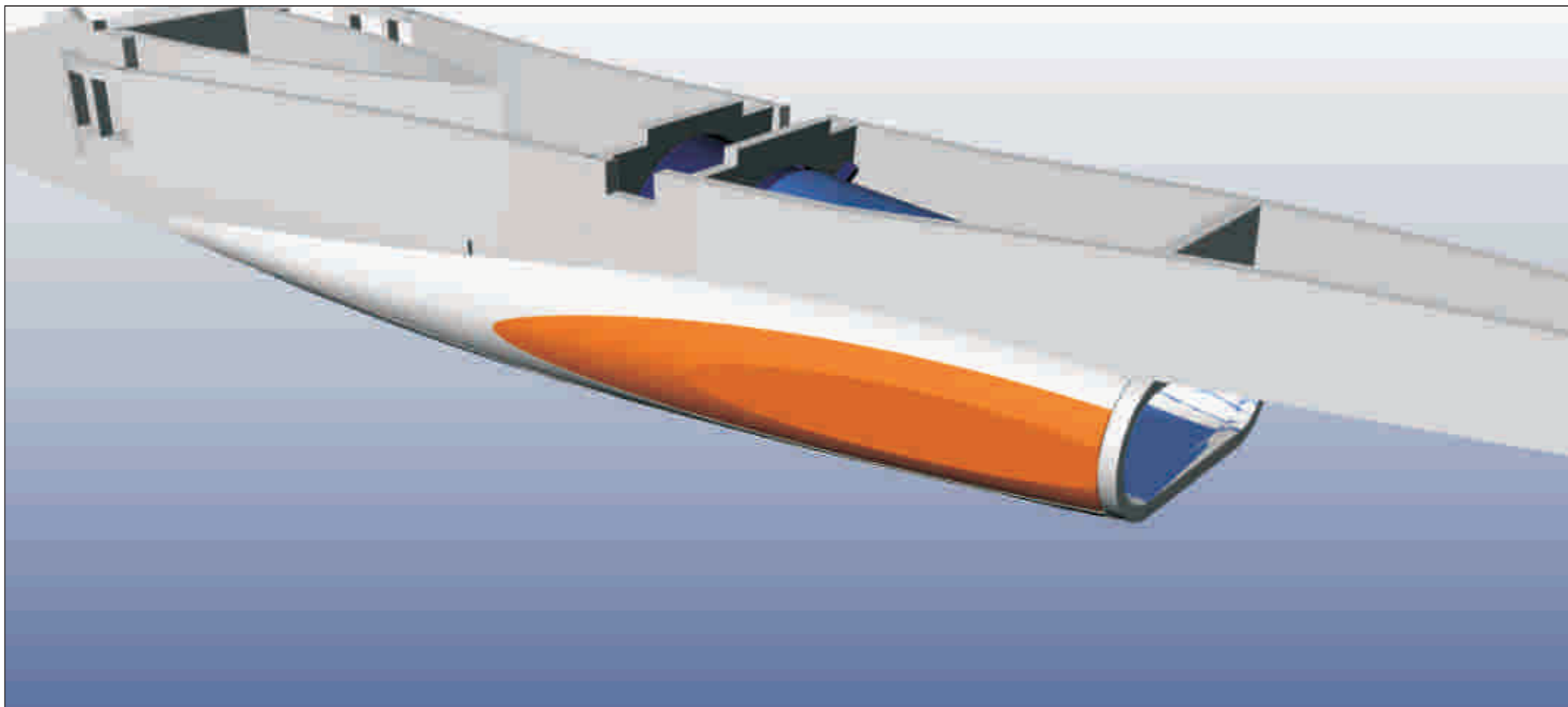
Note the lap-joint at the front of this piece is to open up to air intakes as much as possible to help the airflow (especially on the EDF variant)



Pre-shape and Glue the nacelle part 1 pieces to the fuselage, following the curve of the lower belly piece.

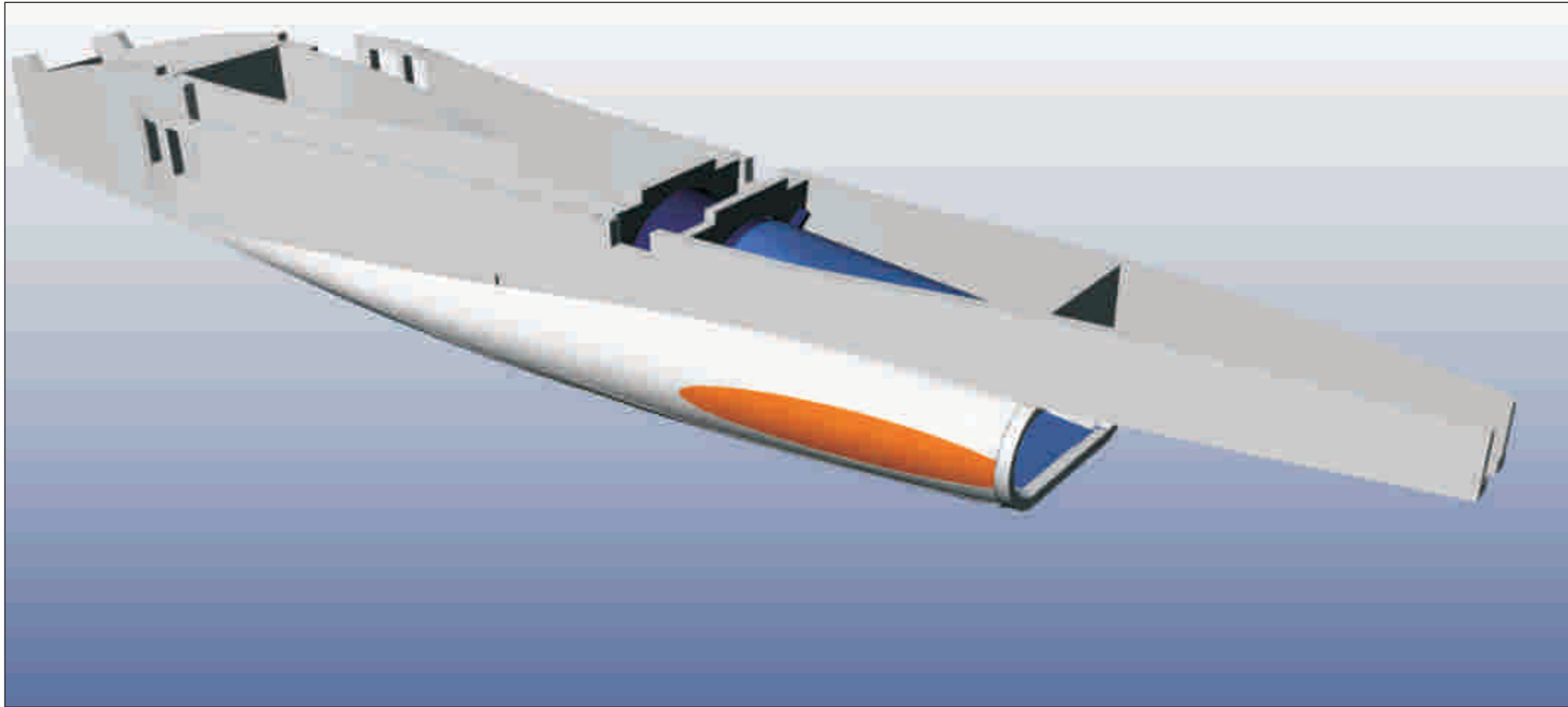


Pre-shape and Glue the nacelle part 2 pieces to the part 1 pieces already stuck onto the fuselage

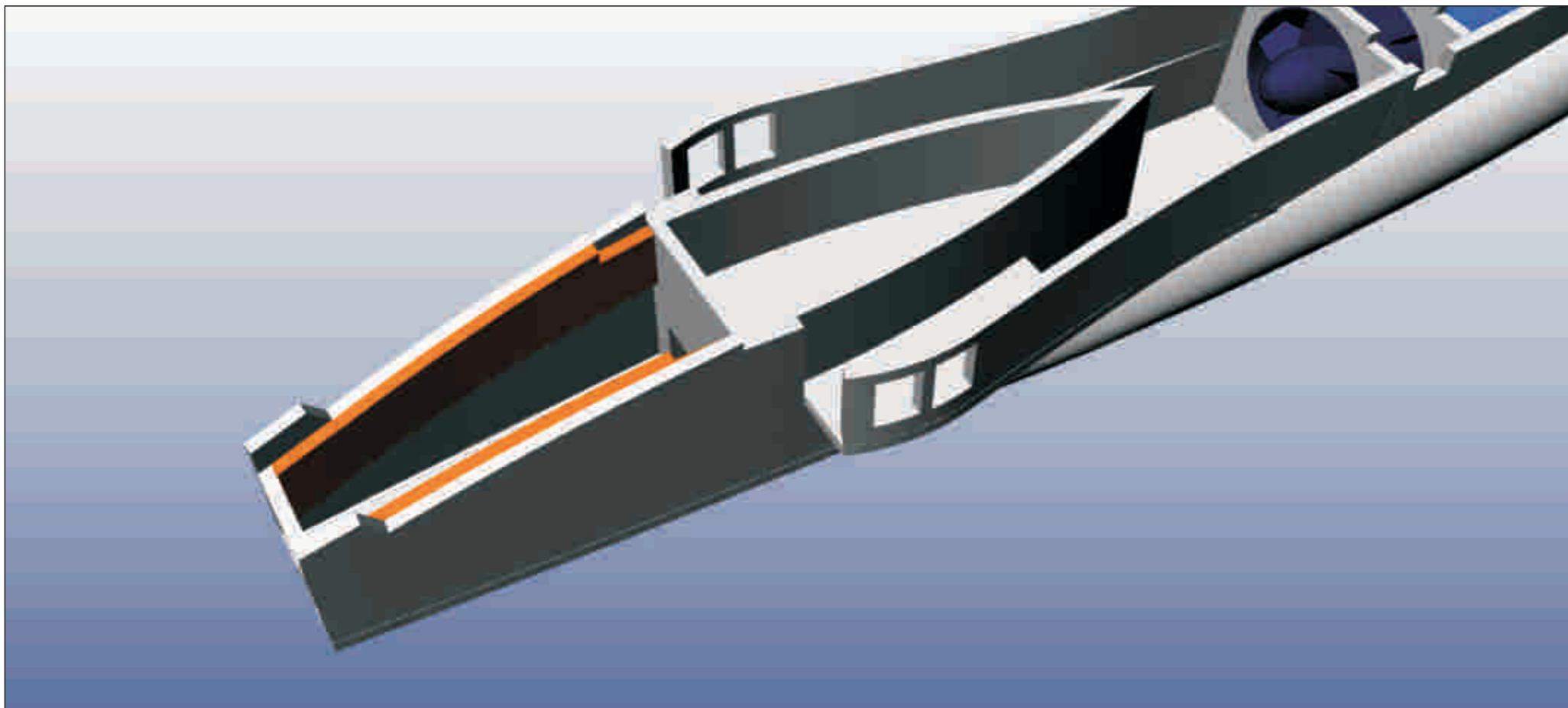


Pre-shape and Glue the nacelle part 3 pieces to the part 2 pieces already stuck onto the fuselage



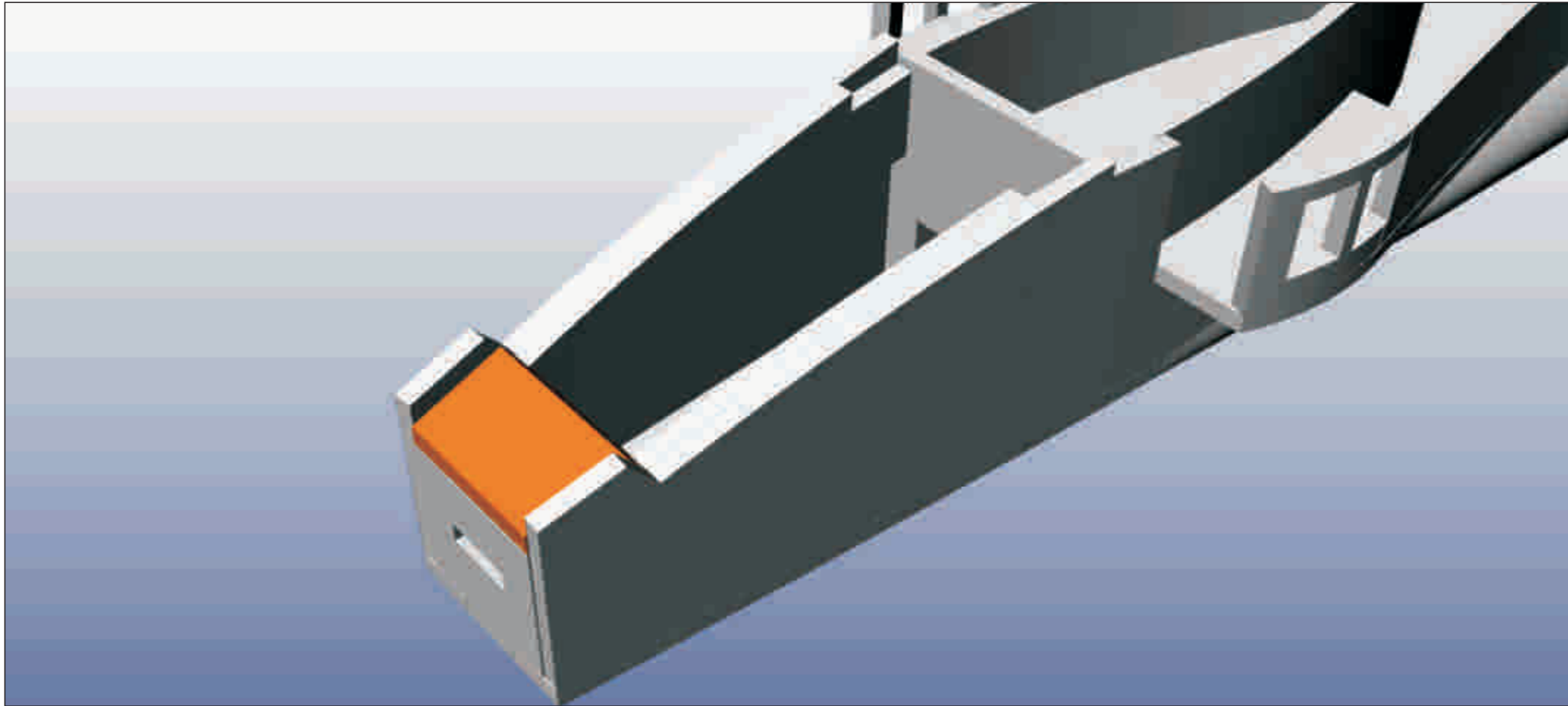


Glue the nacelle part 4 pieces to the part 3 pieces already stuck onto the fuselage and sand to shape - following the shape of the exhaust bulkhead.

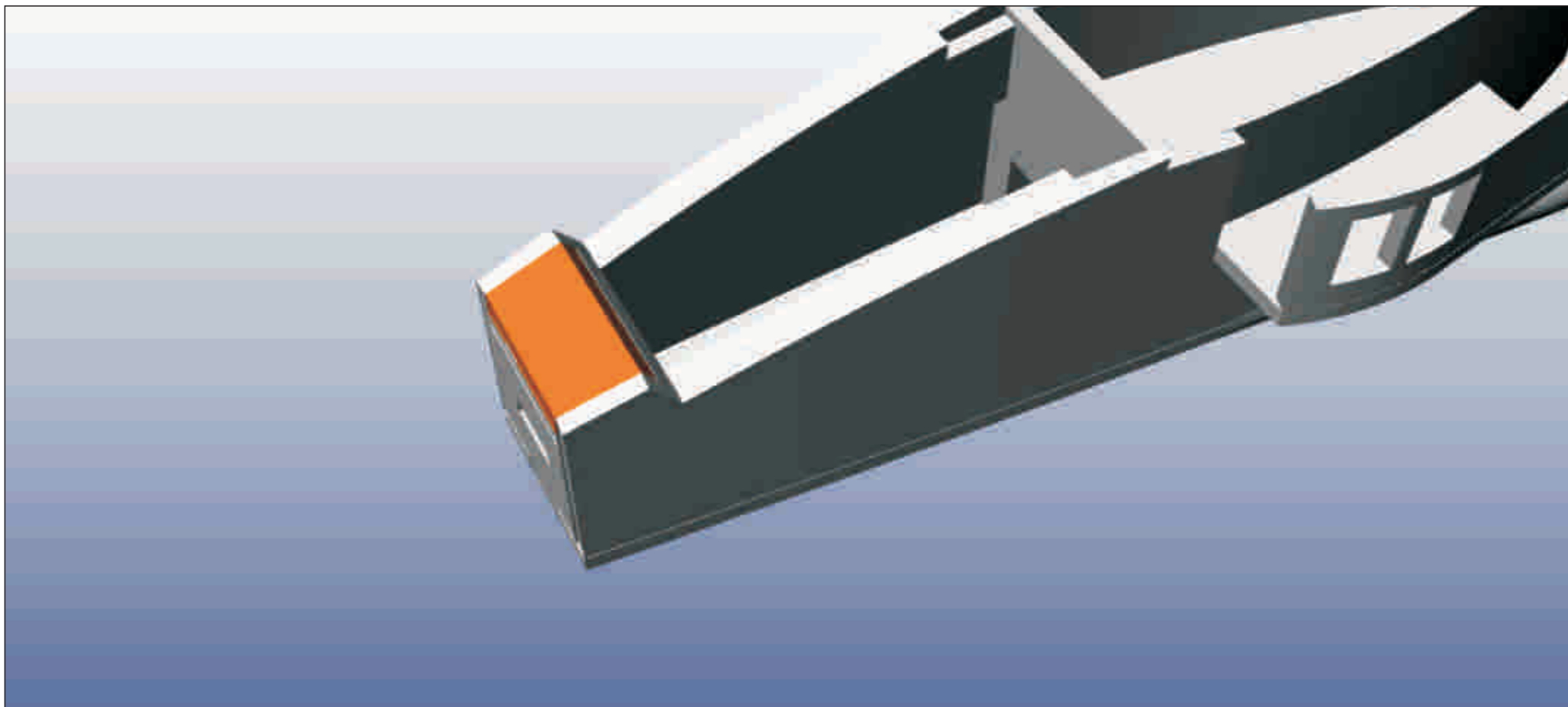


Glue the canopy support sides to the airframe as shown



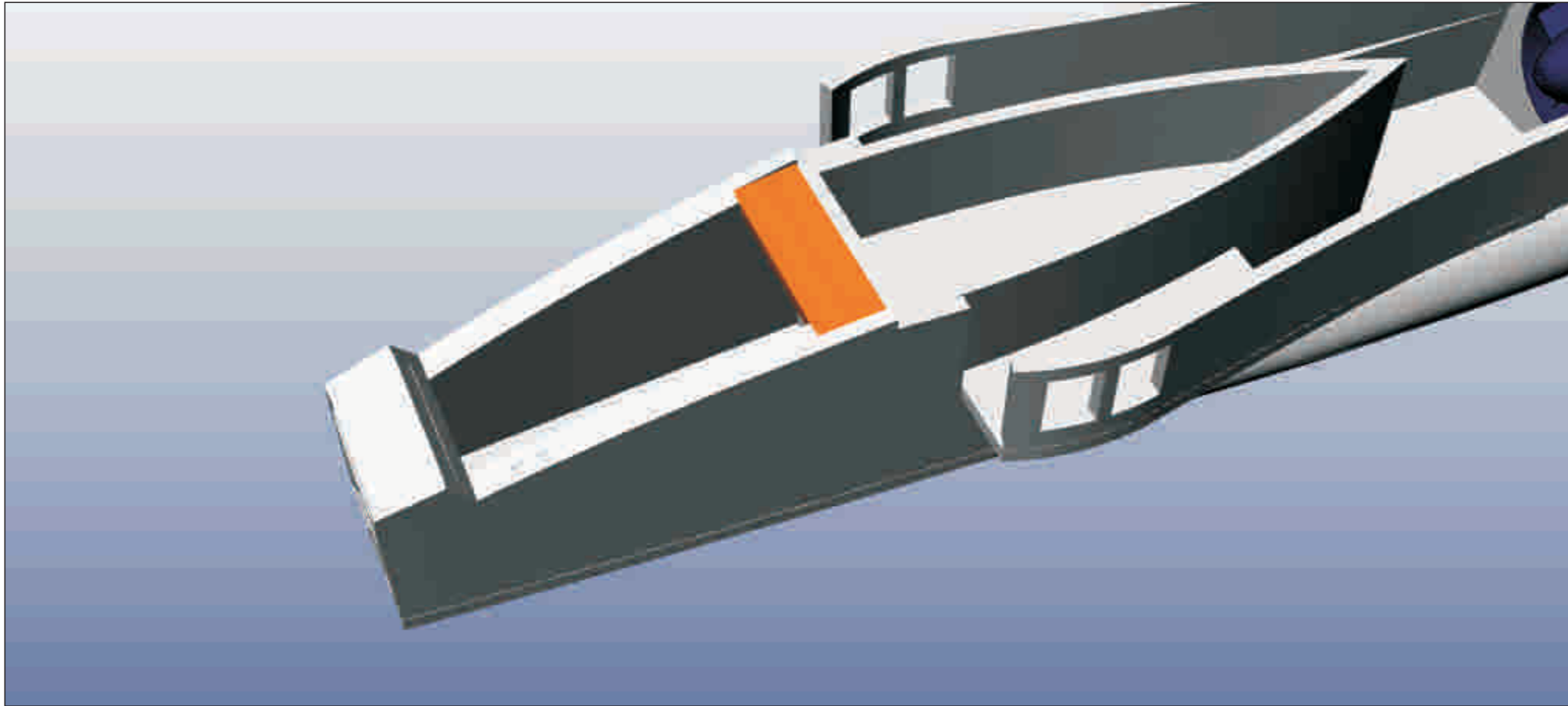


Glue the canopy bridge 1 in place.

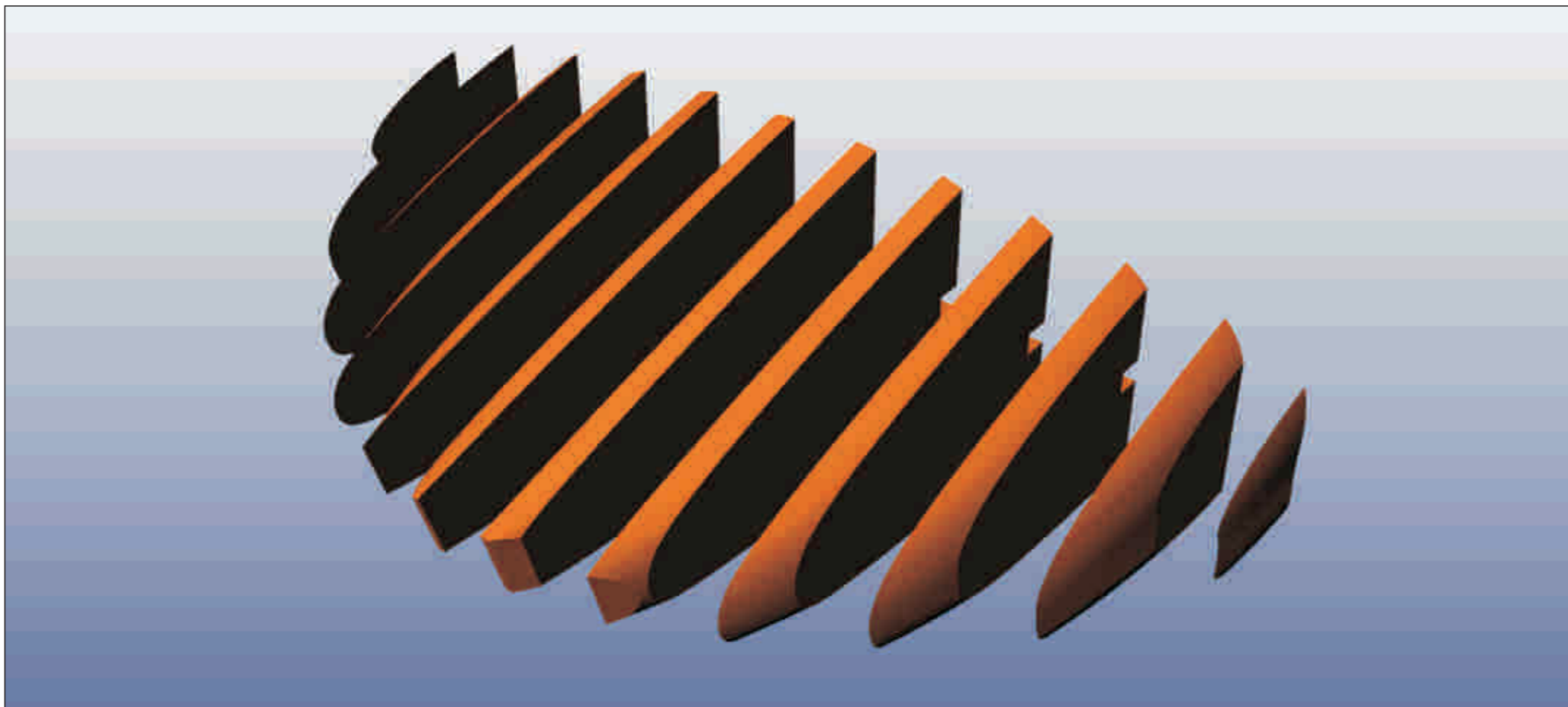


Glue the canopy bridge 2 in place.



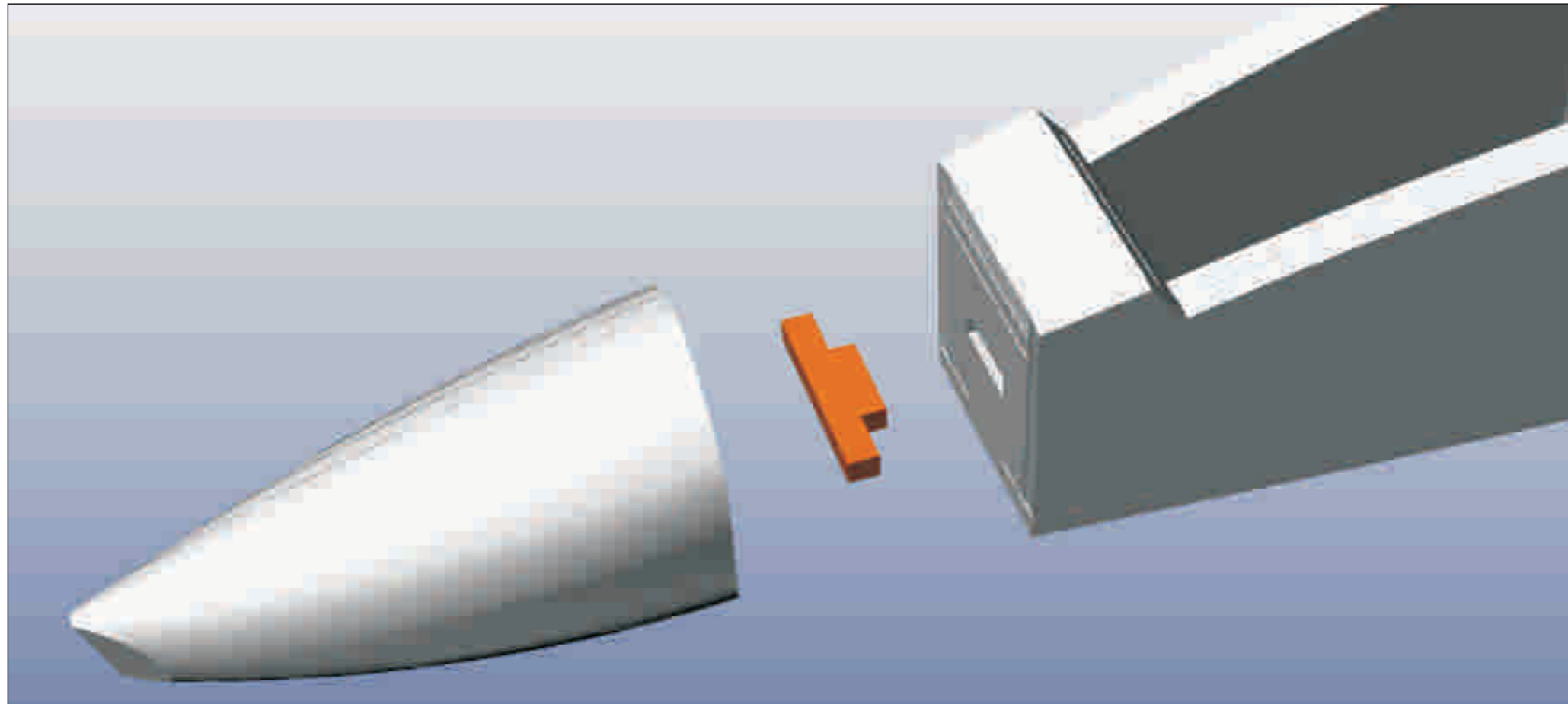


Glue the magnet bridge in place.

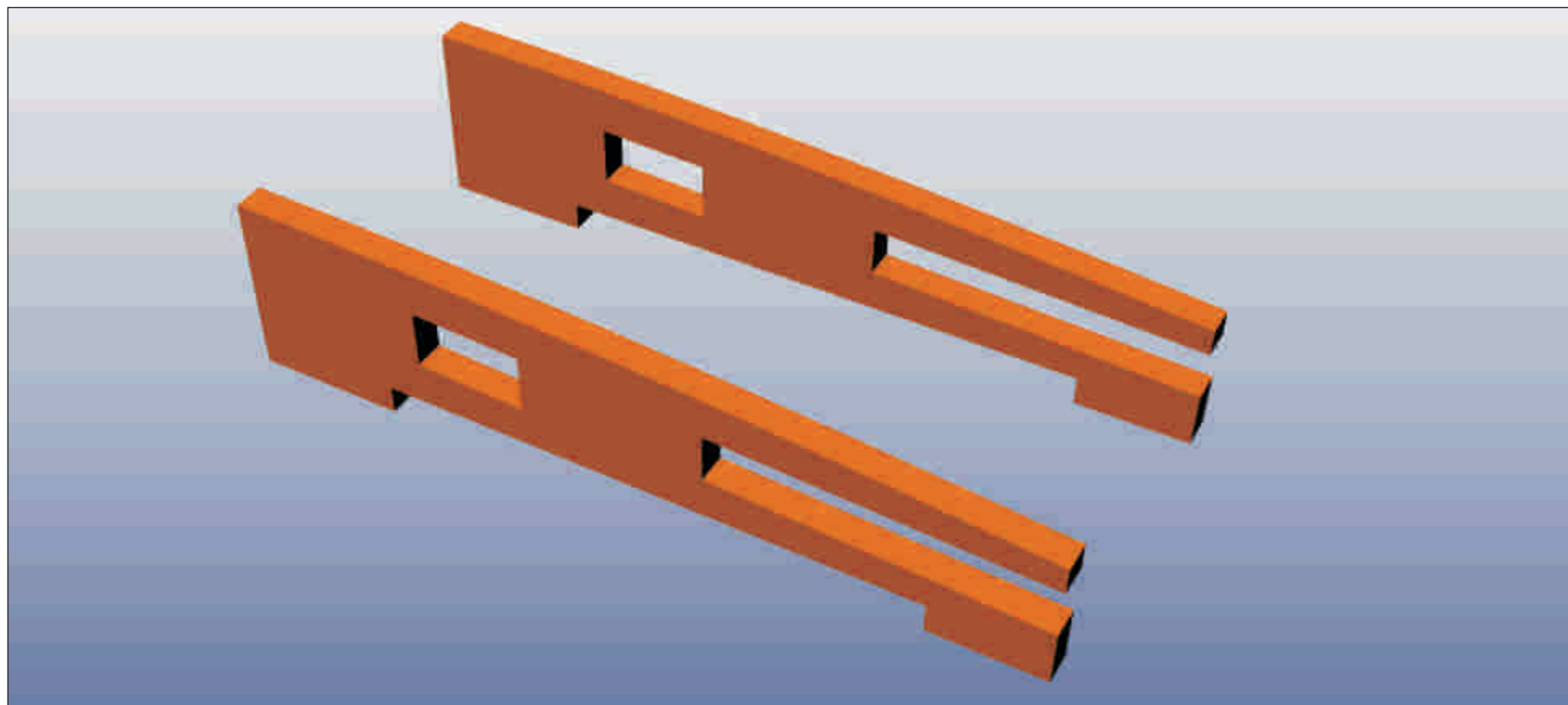


laminare the nose pieces together



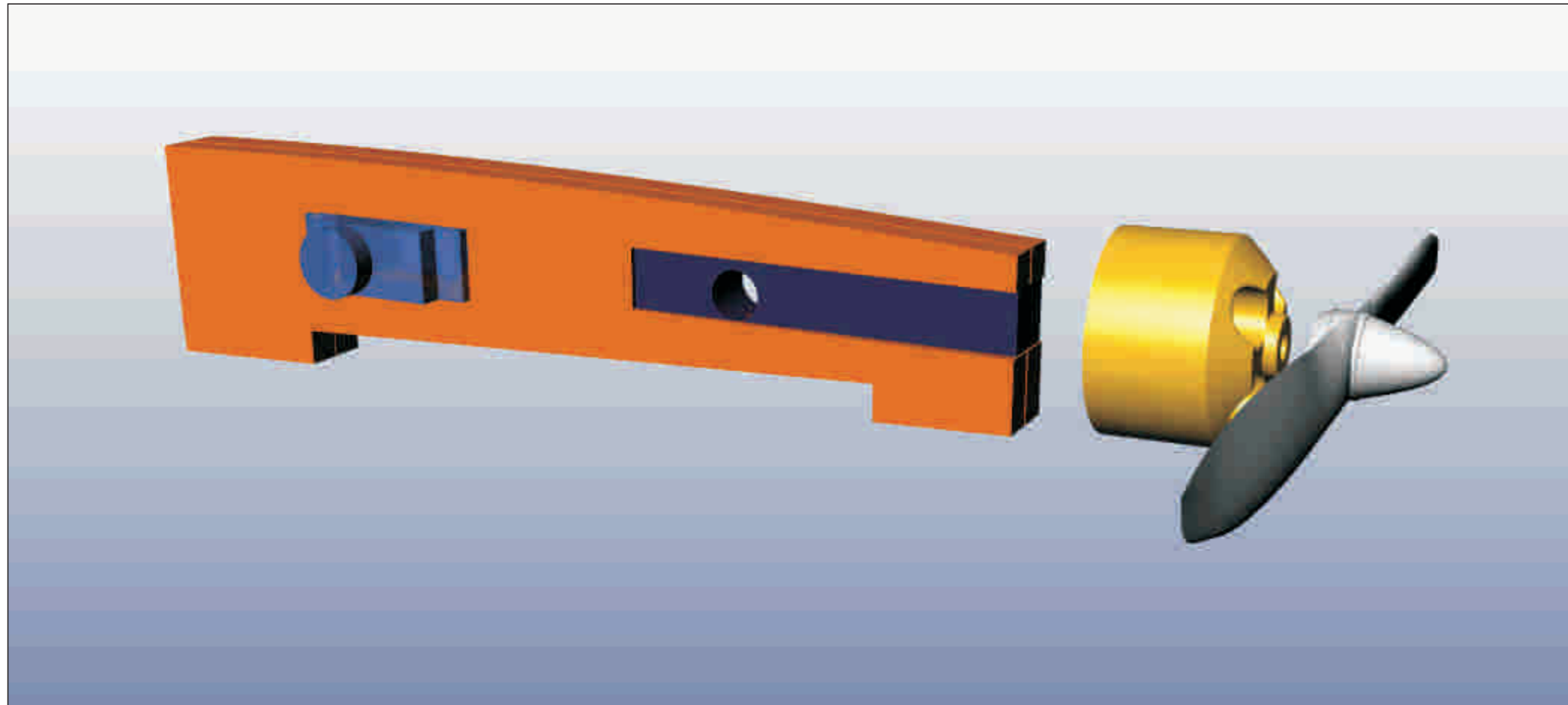


Use the nosecone aligner to glue the nose to the fuselage correctly



Glue together the tail 'spine' pieces note the slot in the rear parts is for the pusher motor mount - which is not needed if you are making and EDF version



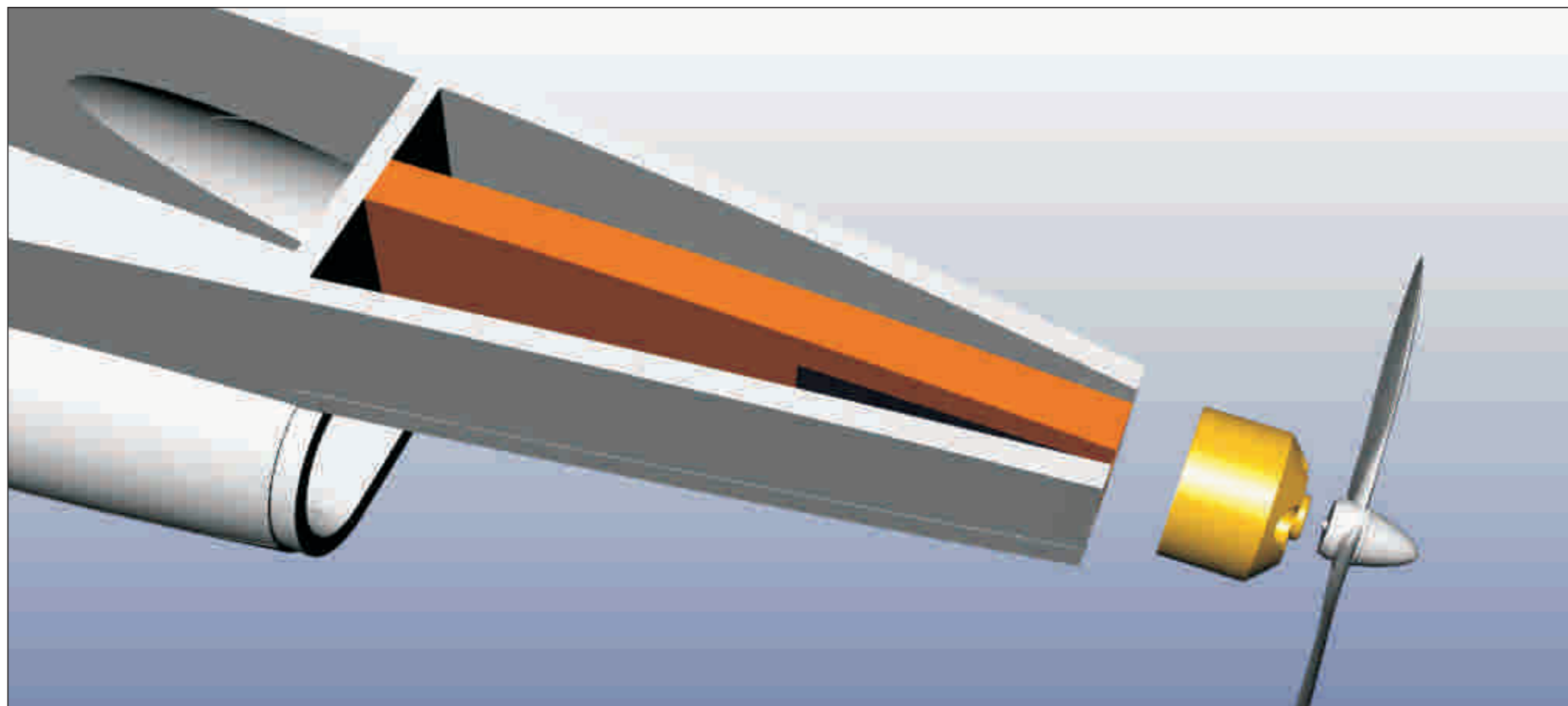


PUSHER ONLT

pre-drill the plastic motor mount as per the drawing and bond to the spine using hot melt glue.

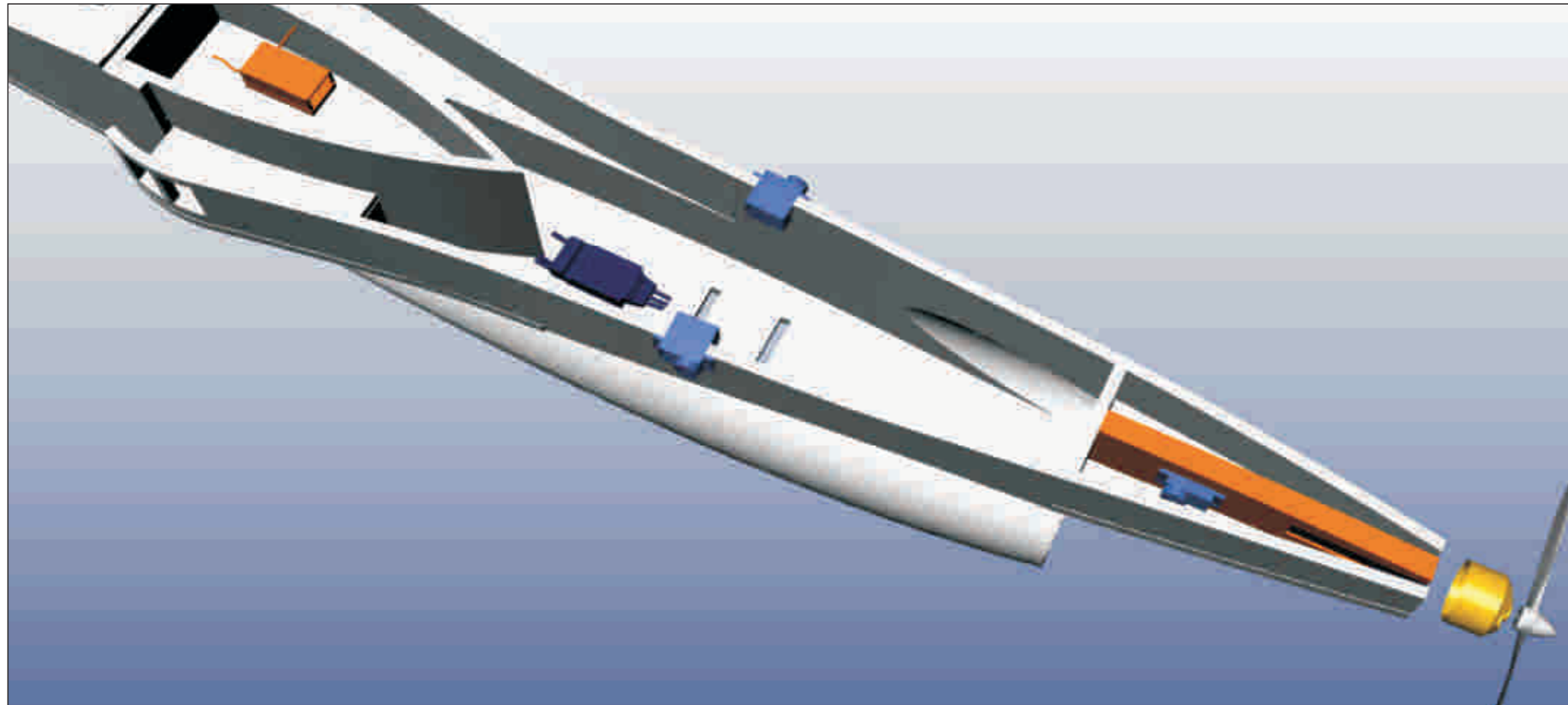
BOTH VERSIONS

Mount the 9gram servo in the hole

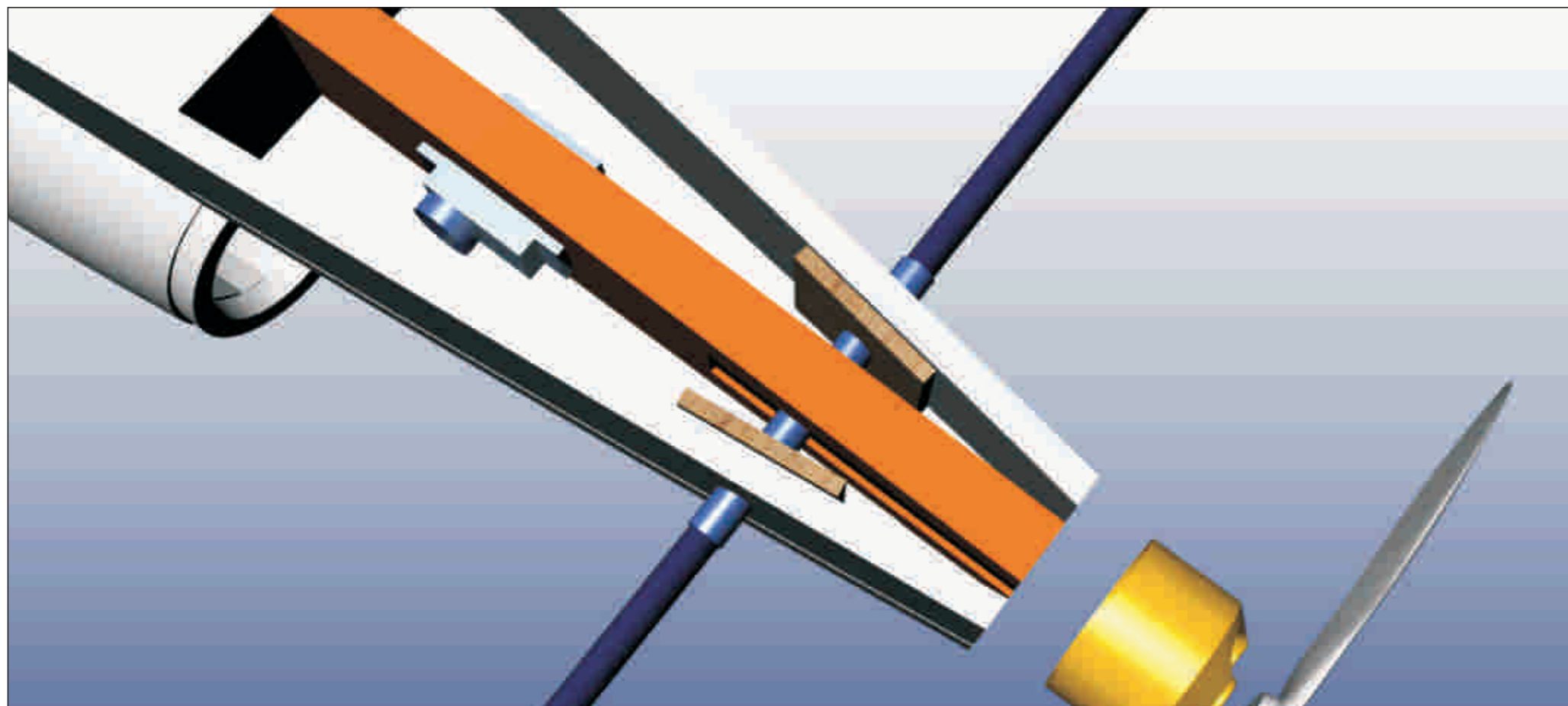


Glue the spine assembly into the airframe using UHU Por.



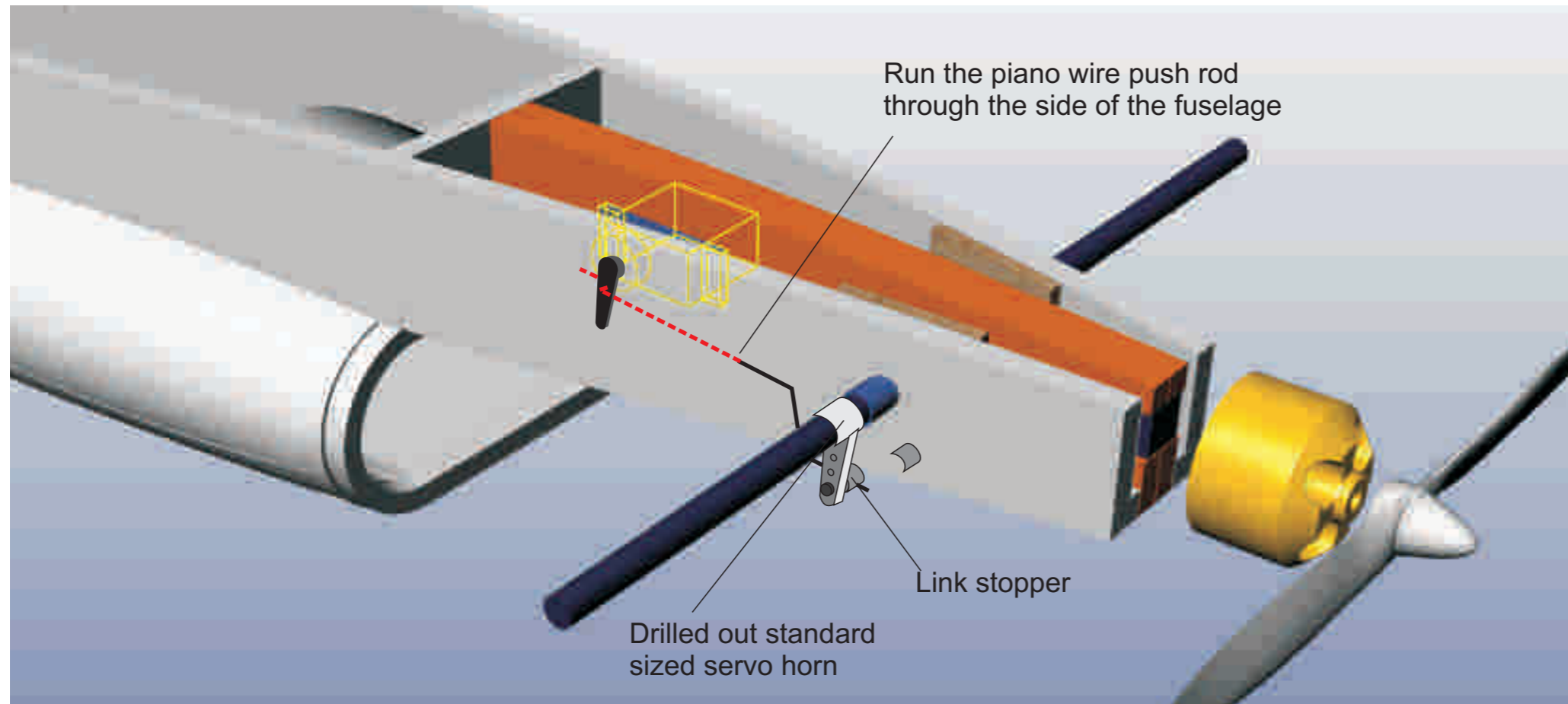


Fit all the electronics in and test everything



Glue the 3mm lite ply elevator supports in place, then locate the aluminium tube through the airframe as shown, use epoxy to secure all in place.

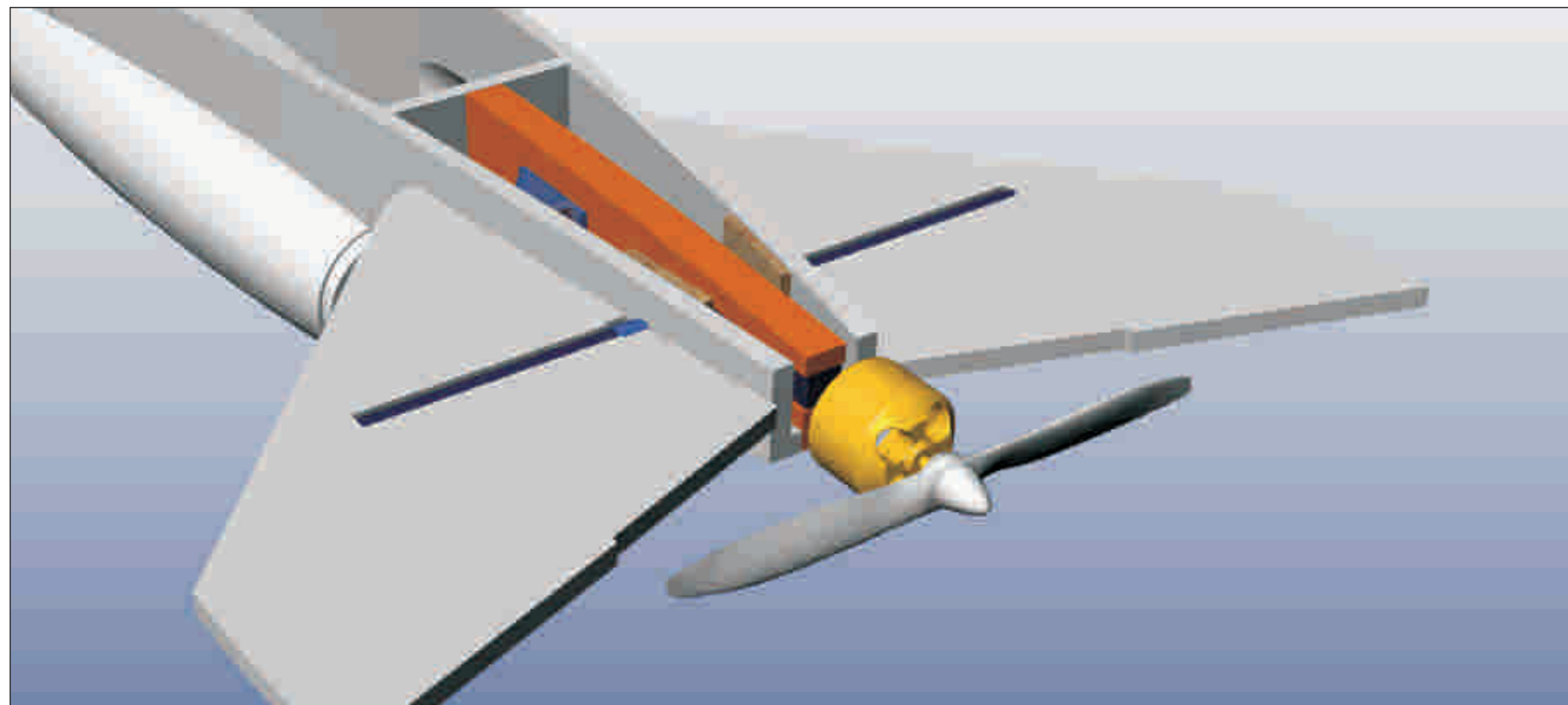




Create the elevator linkage as shown. Take care to ensure that the piano wire is strong enough not to bend under load.

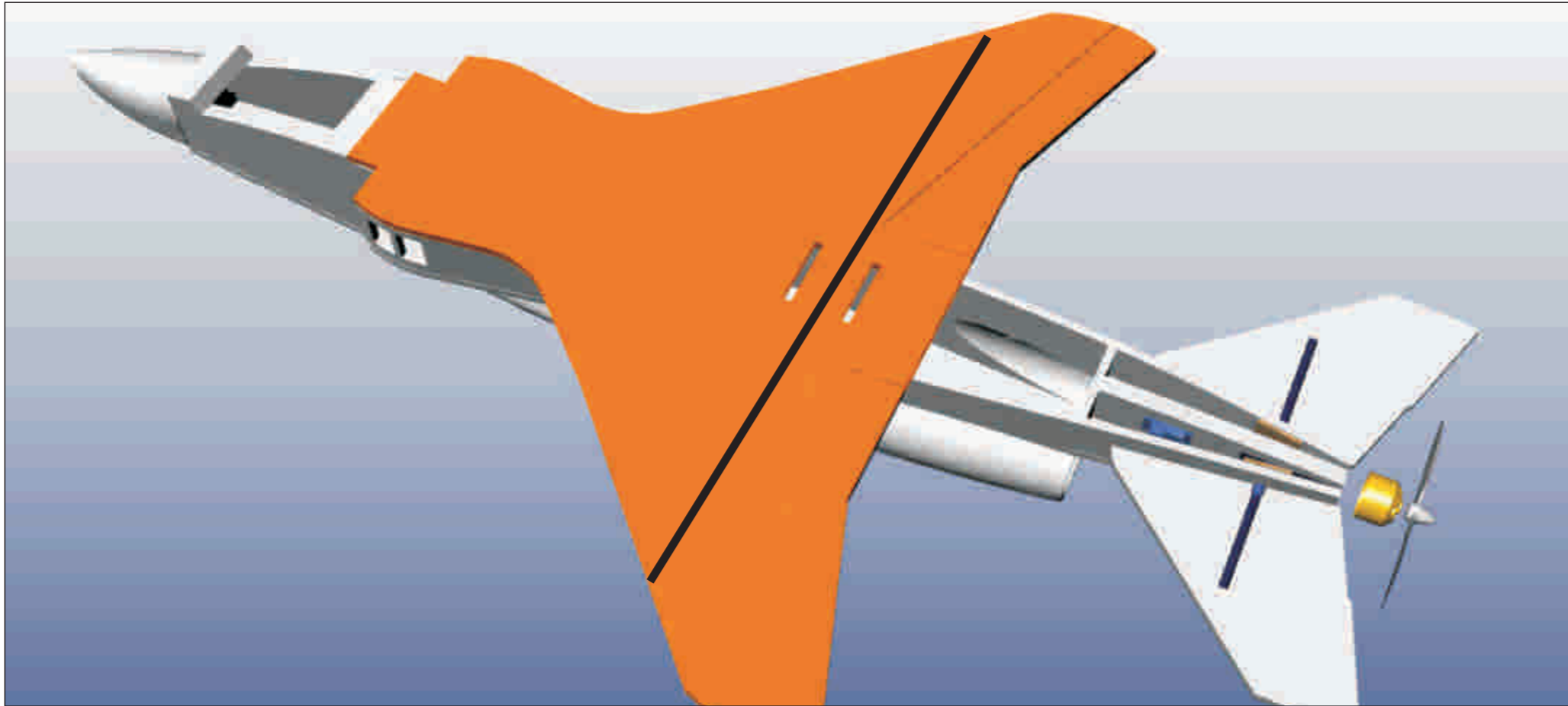
Also, dry fit the elevators to ensure that there is no collision with the pushrod and the elevators.

With the servo horns, select the nearest hole to axis on the servo end, and the furthest hole to axis at the elevator end. Try and achieve max 30 degrees deflection.

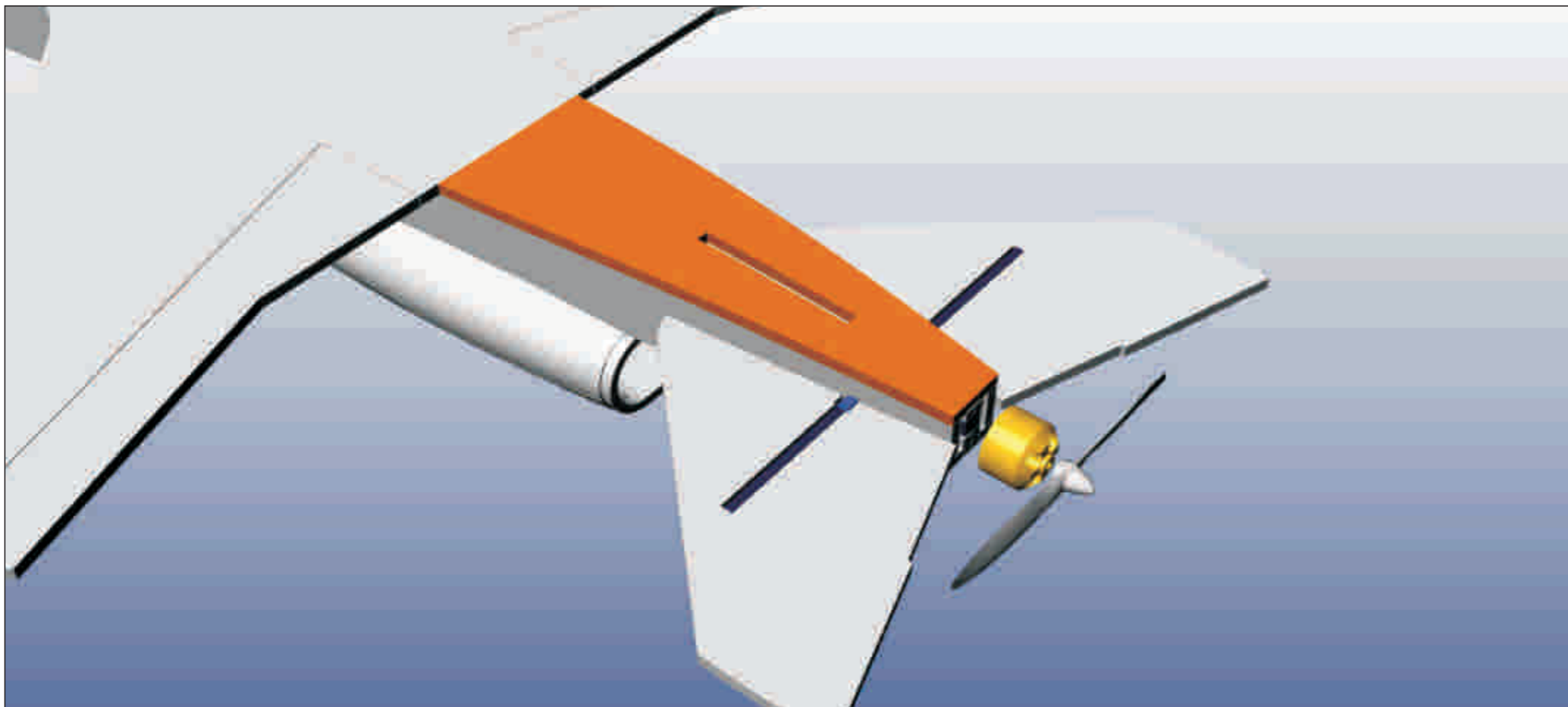


Glue the elevator pieces in place as shown. masking top and bottom to ensure no epoxy dribbles out, to leave a flat surface.



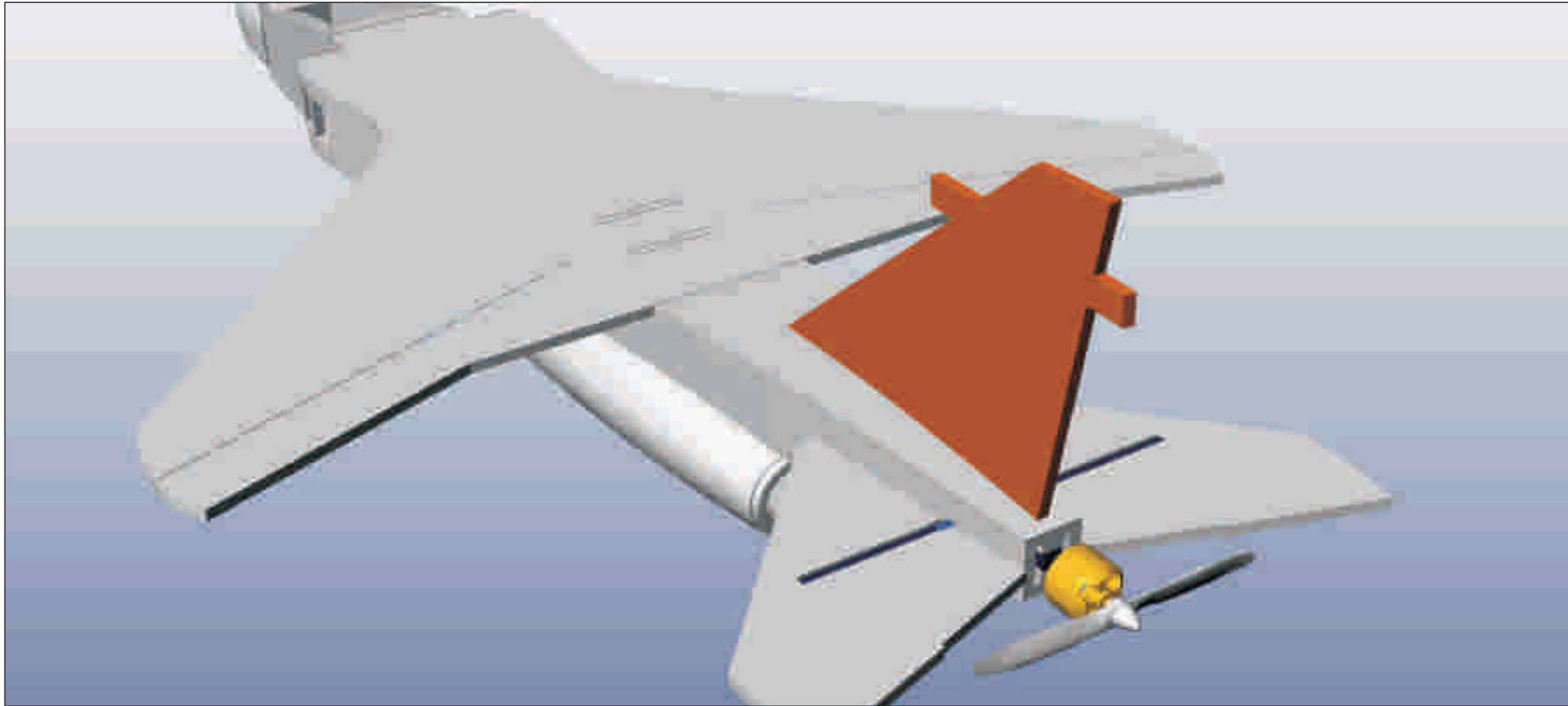


Glue the spar into the wings using epoxy and masking tape, then attach the wing onto the airframe using UHU por.

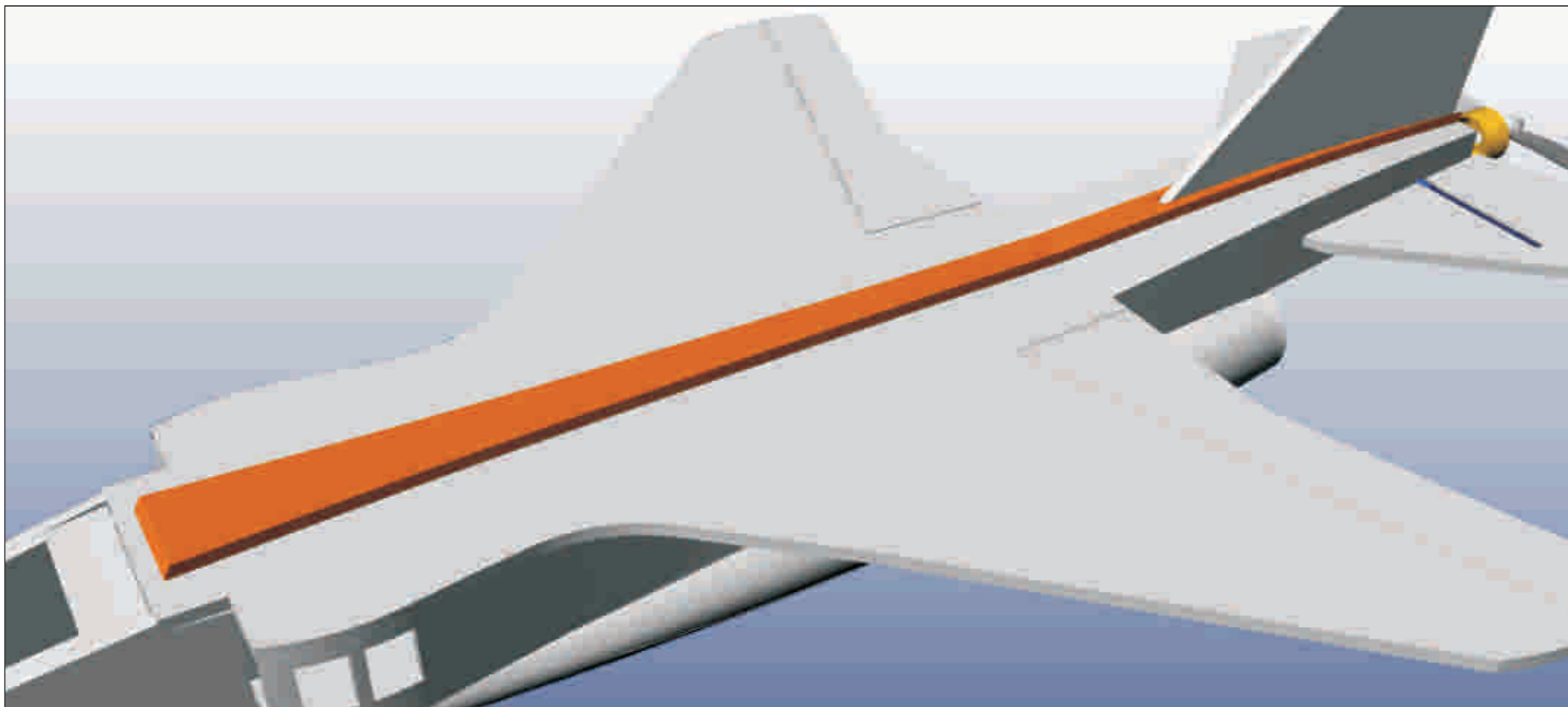


Glue the Fuselage rear top in place



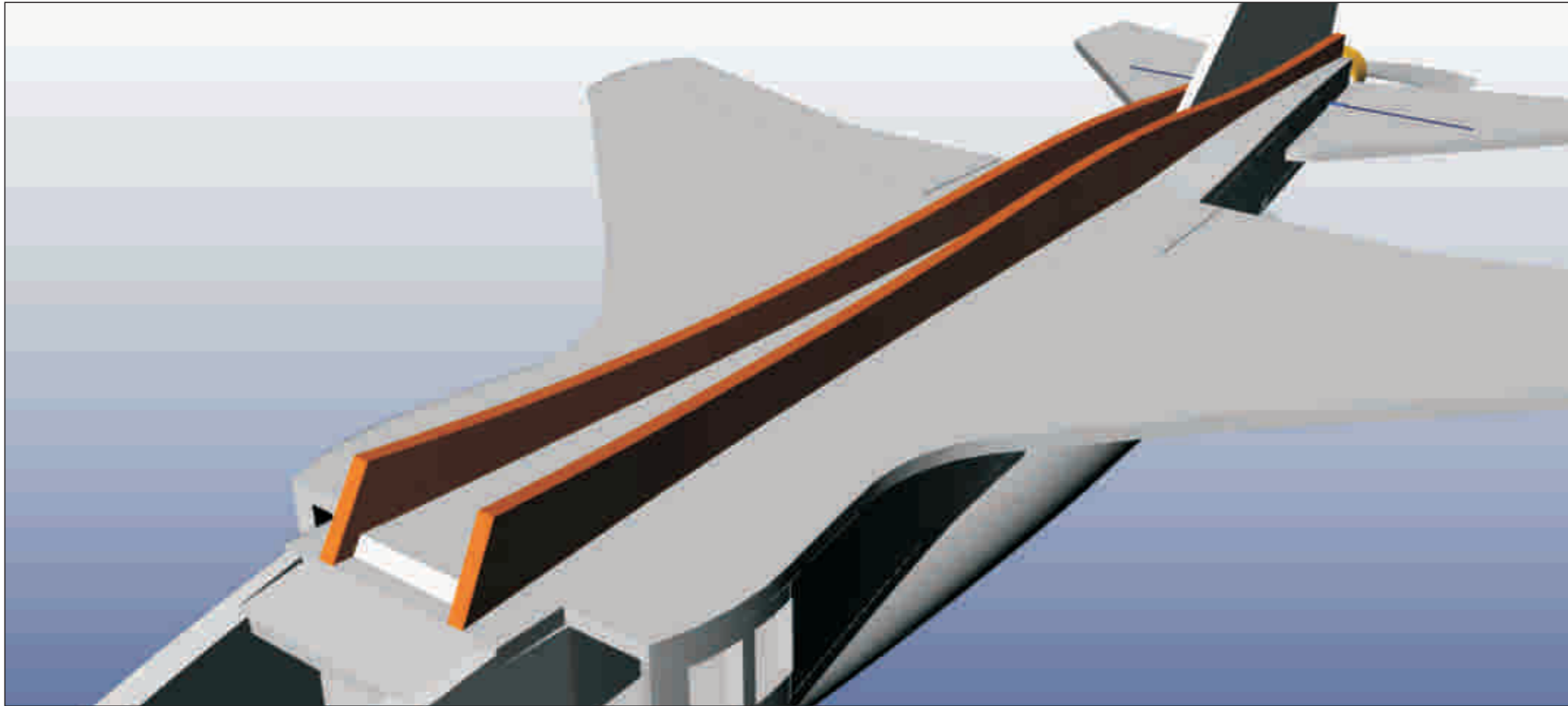


Glue the vertical stabiliser in place as shown.

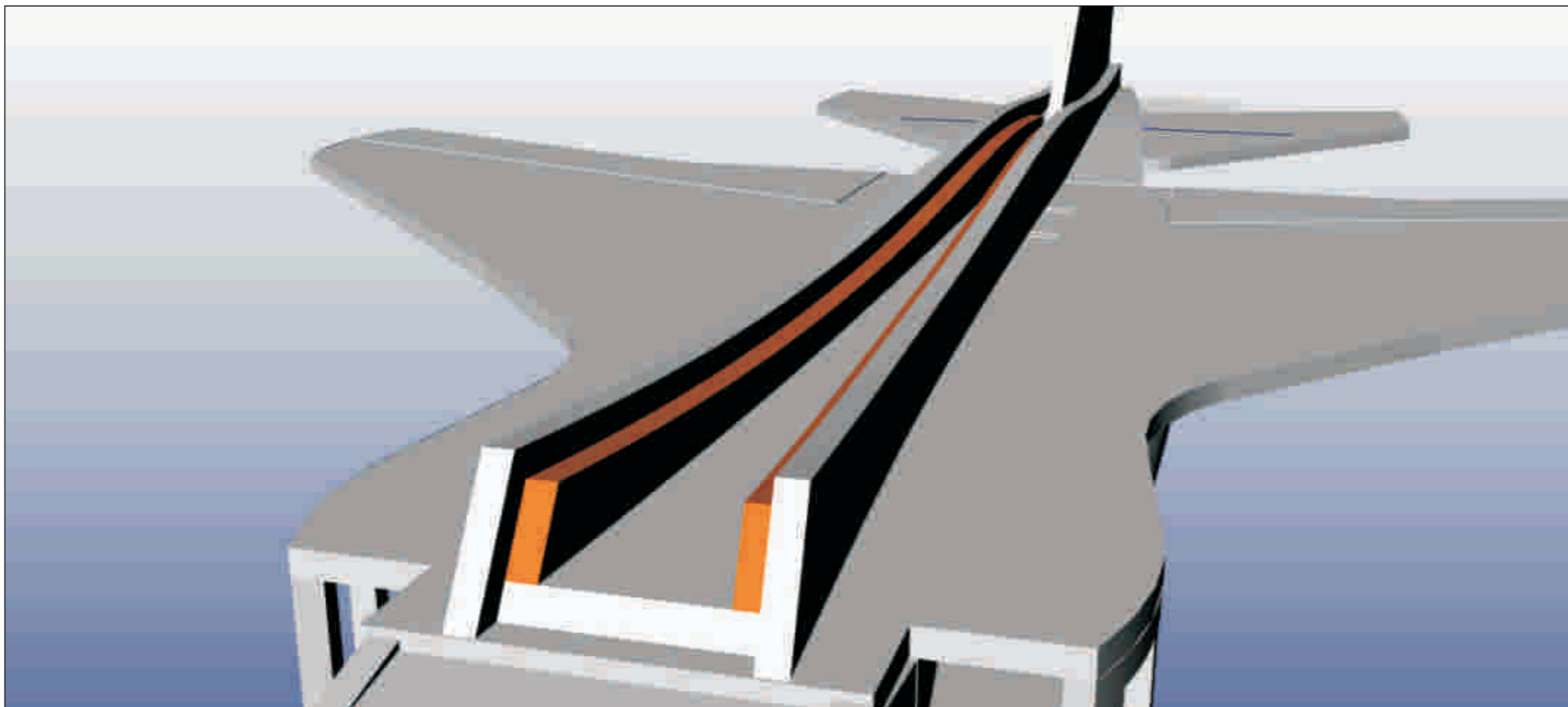


Centrally locate the turtledeck base, then glue in place.



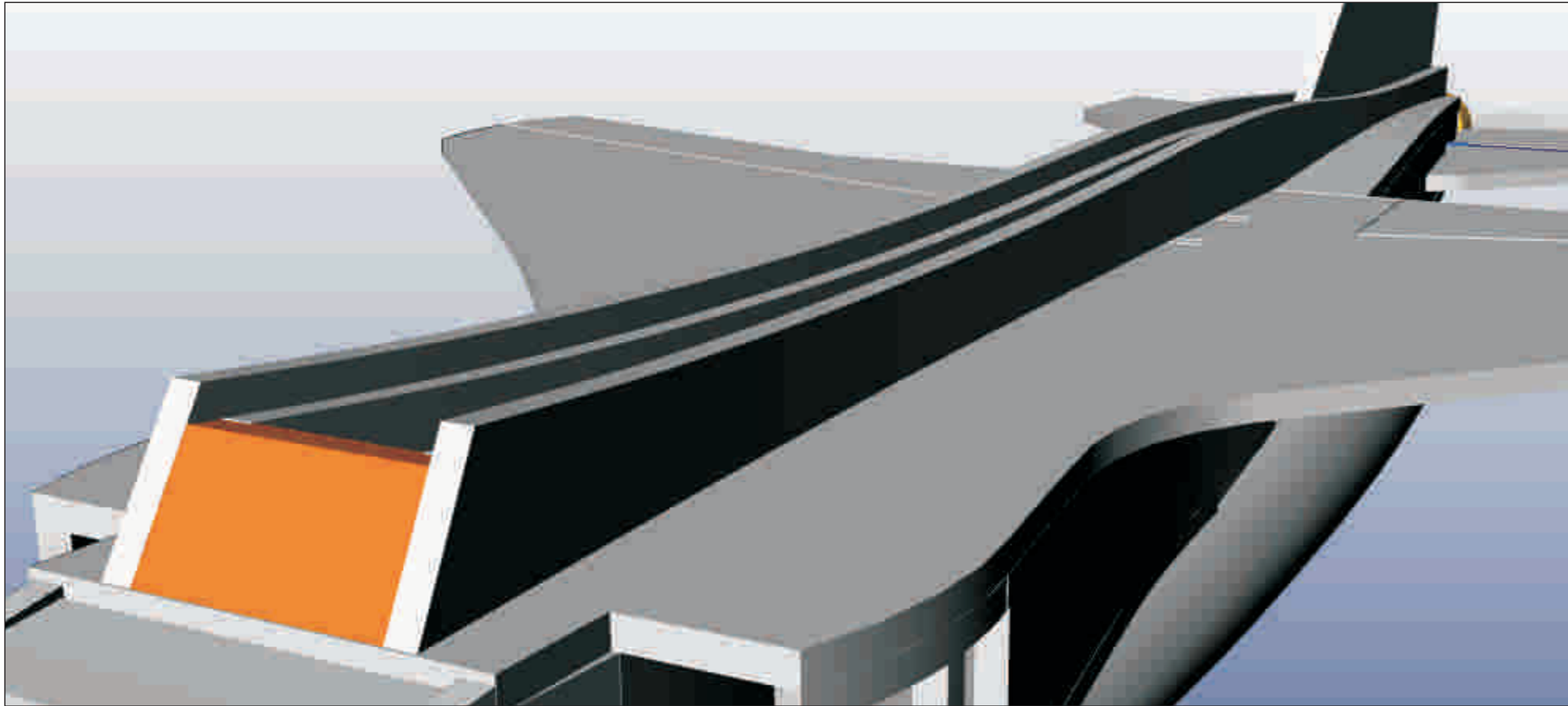


Glue the two turtledeck sides in place using the base for alignment.



Glue the Turtledeck corner reinforcement pieces in place as shown



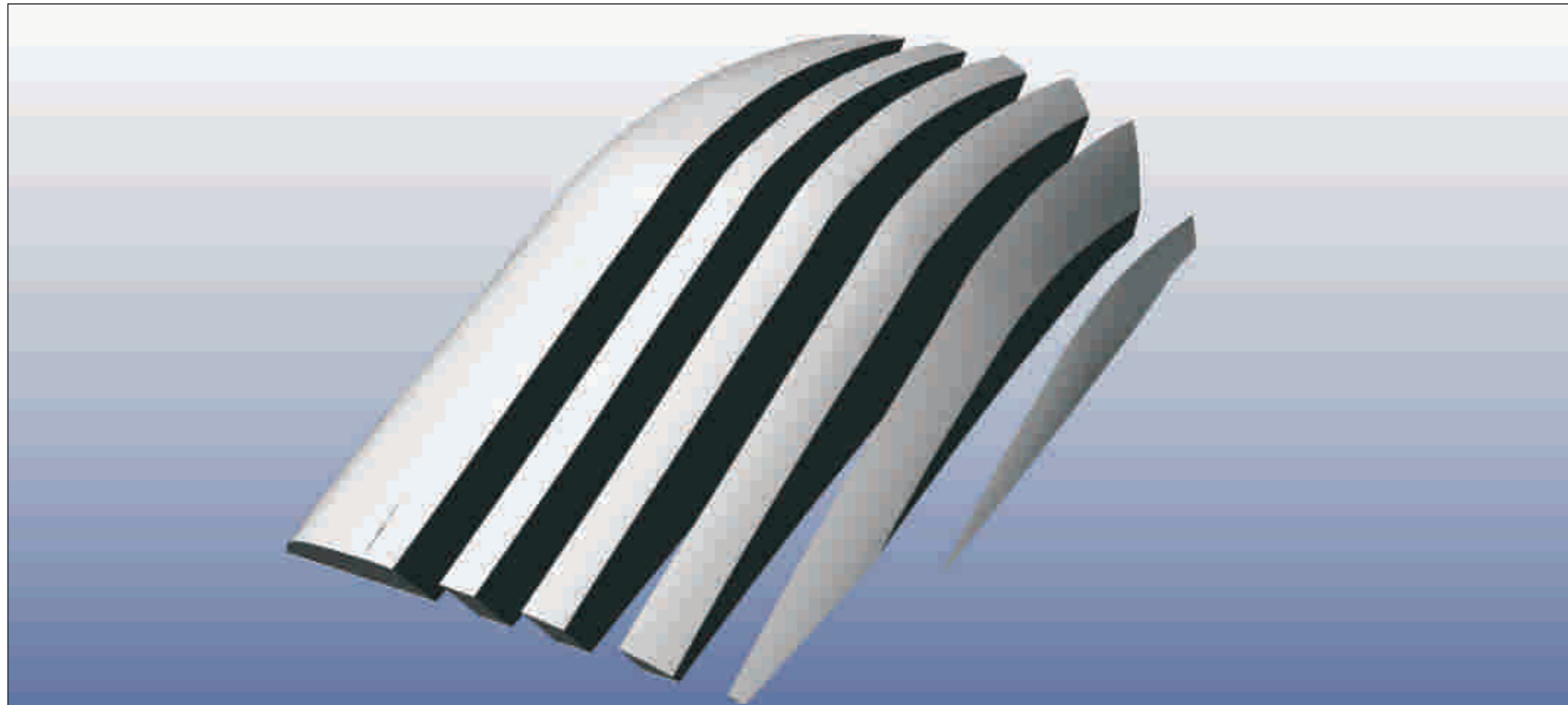


Glue the Turtledeck bulkhead in place as shown.

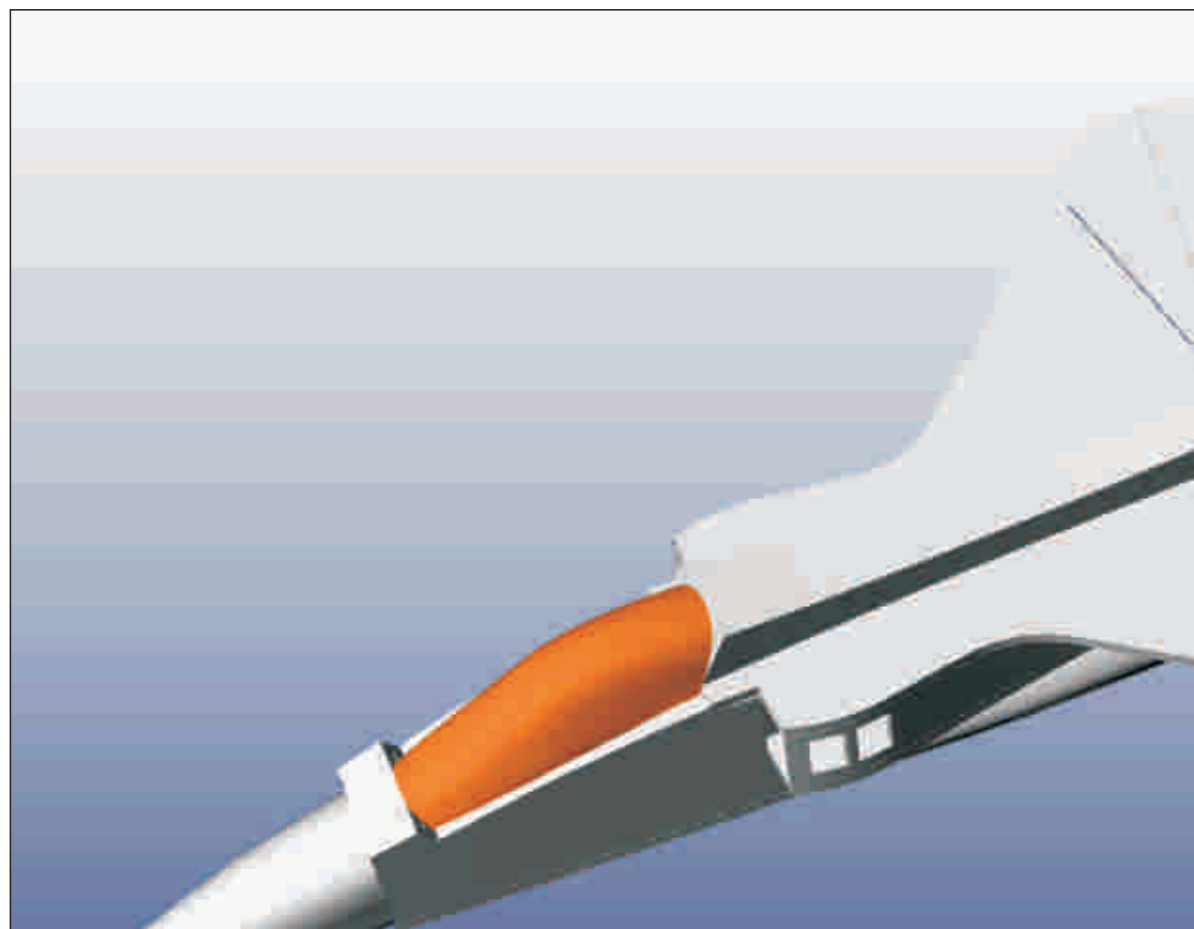


Glue the turtledeck top in place as shown

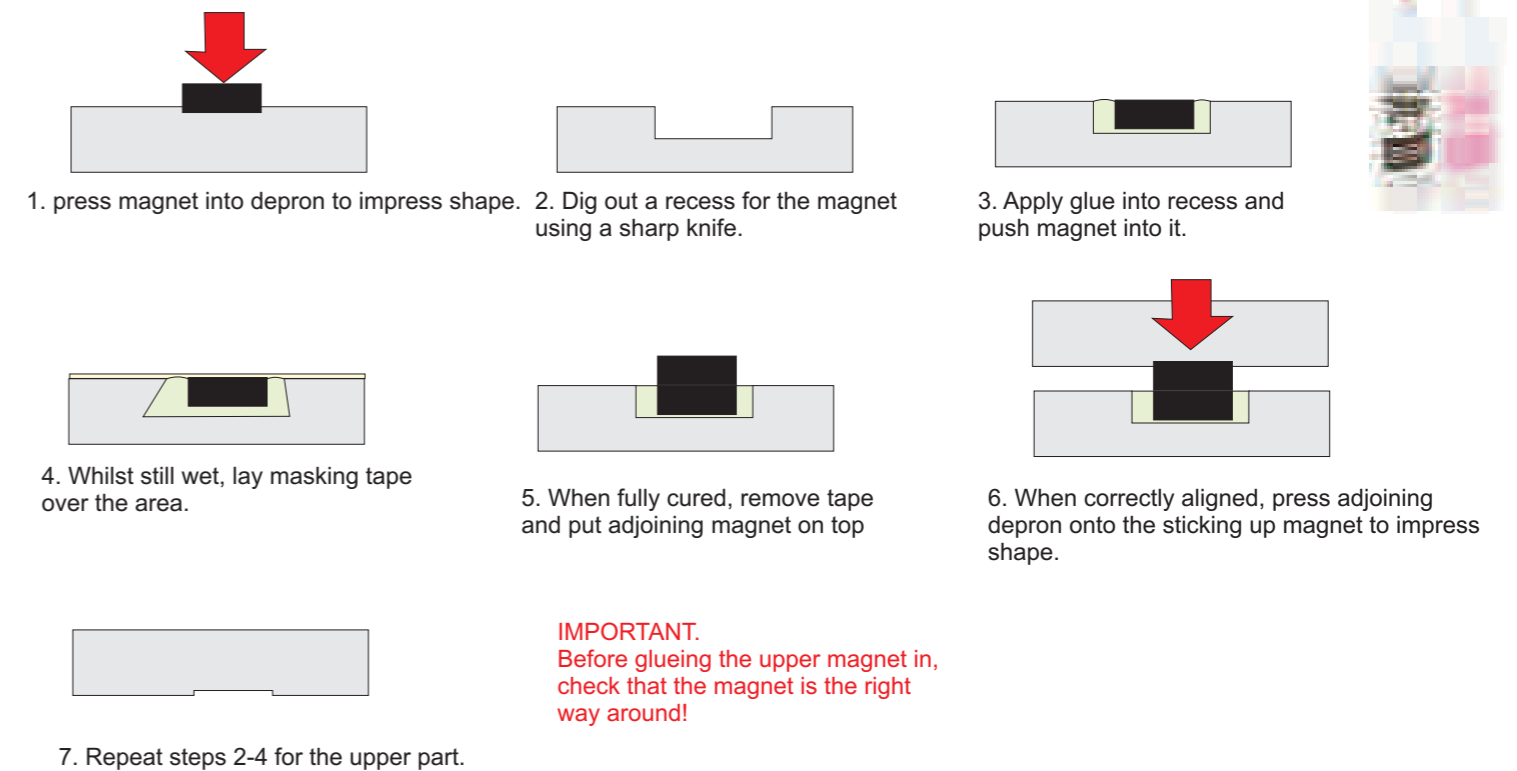


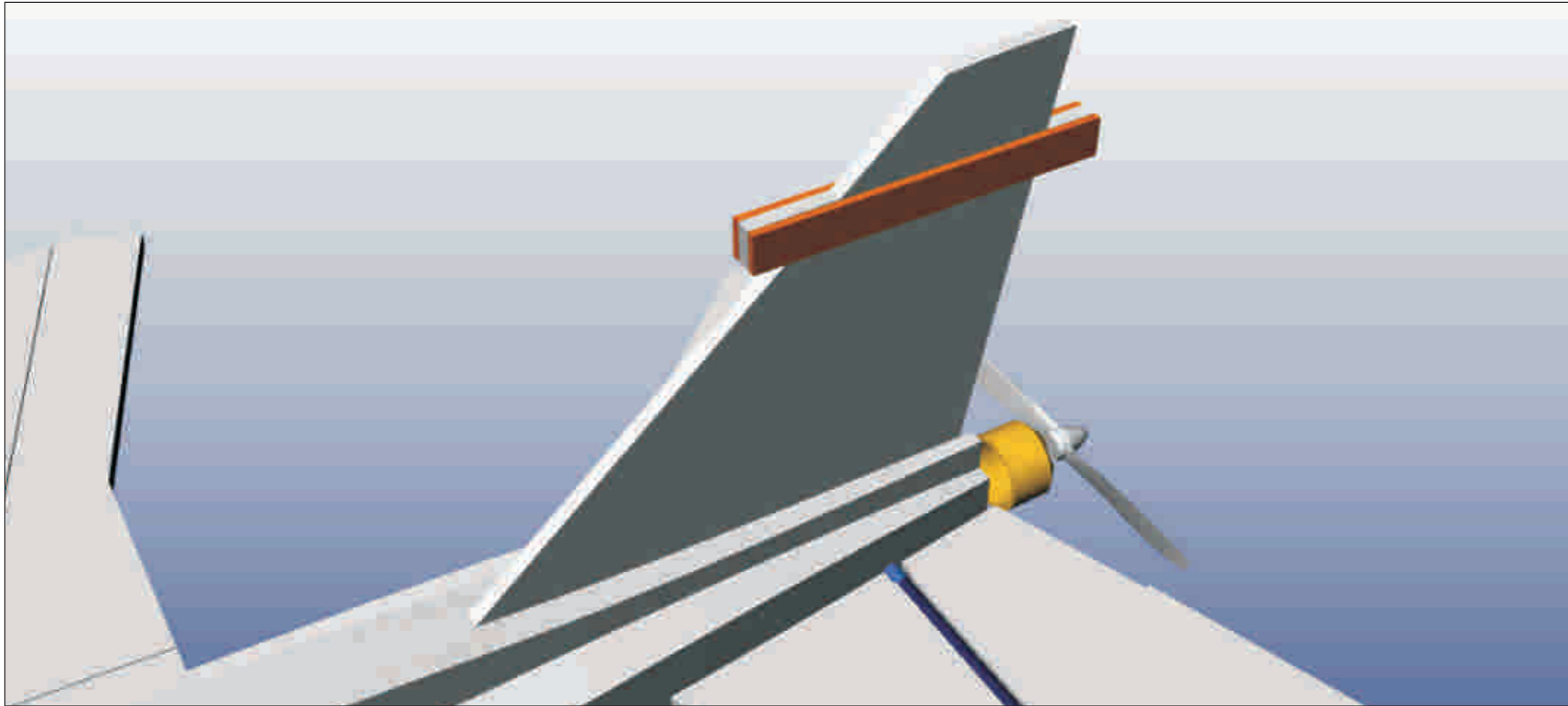


Laminate the canopy pieces together as shown



Using a 3mm liteply 'tongue' at the front and 2 magnets at the rear attach the removable canopy,



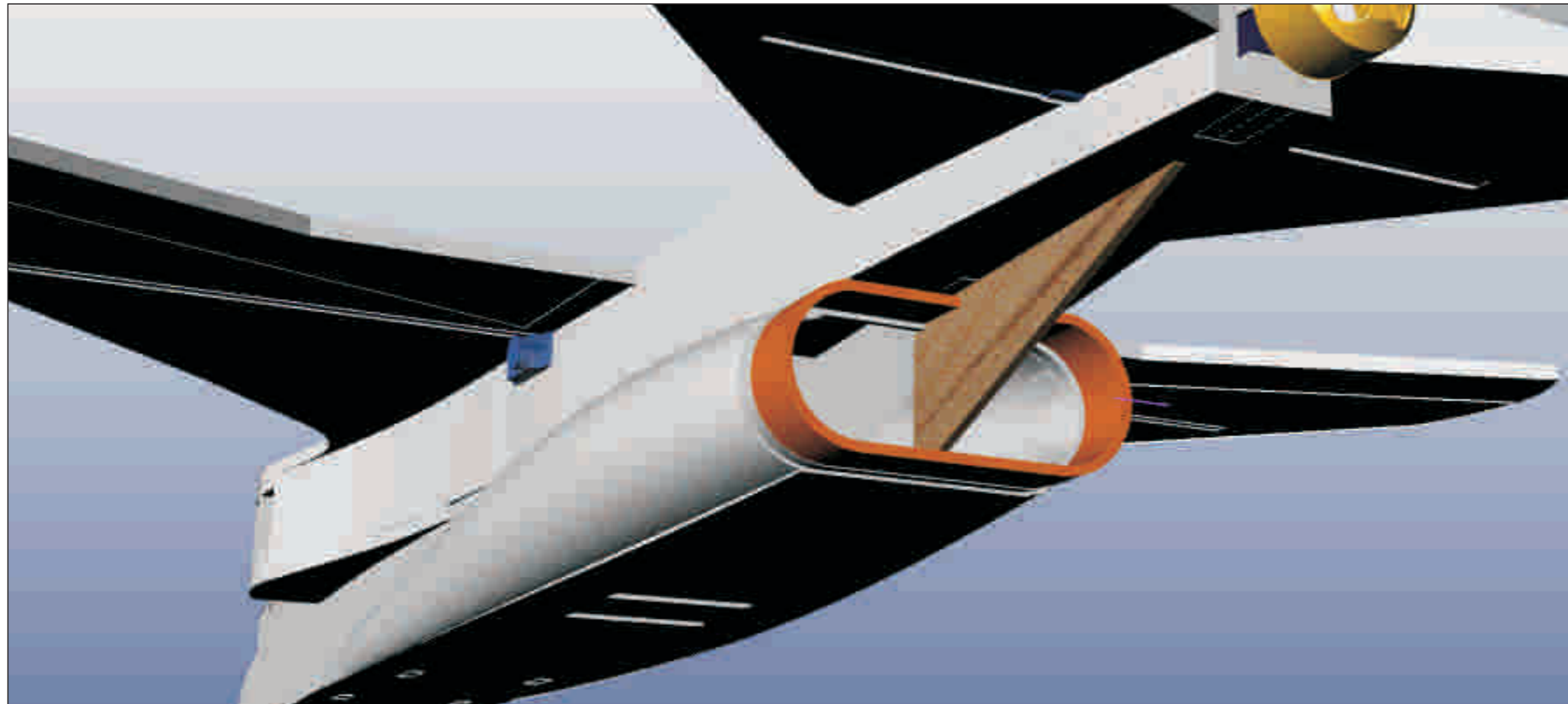


Glue the 3mm depron sides to the Radar detected band on the vertical stabiliser.



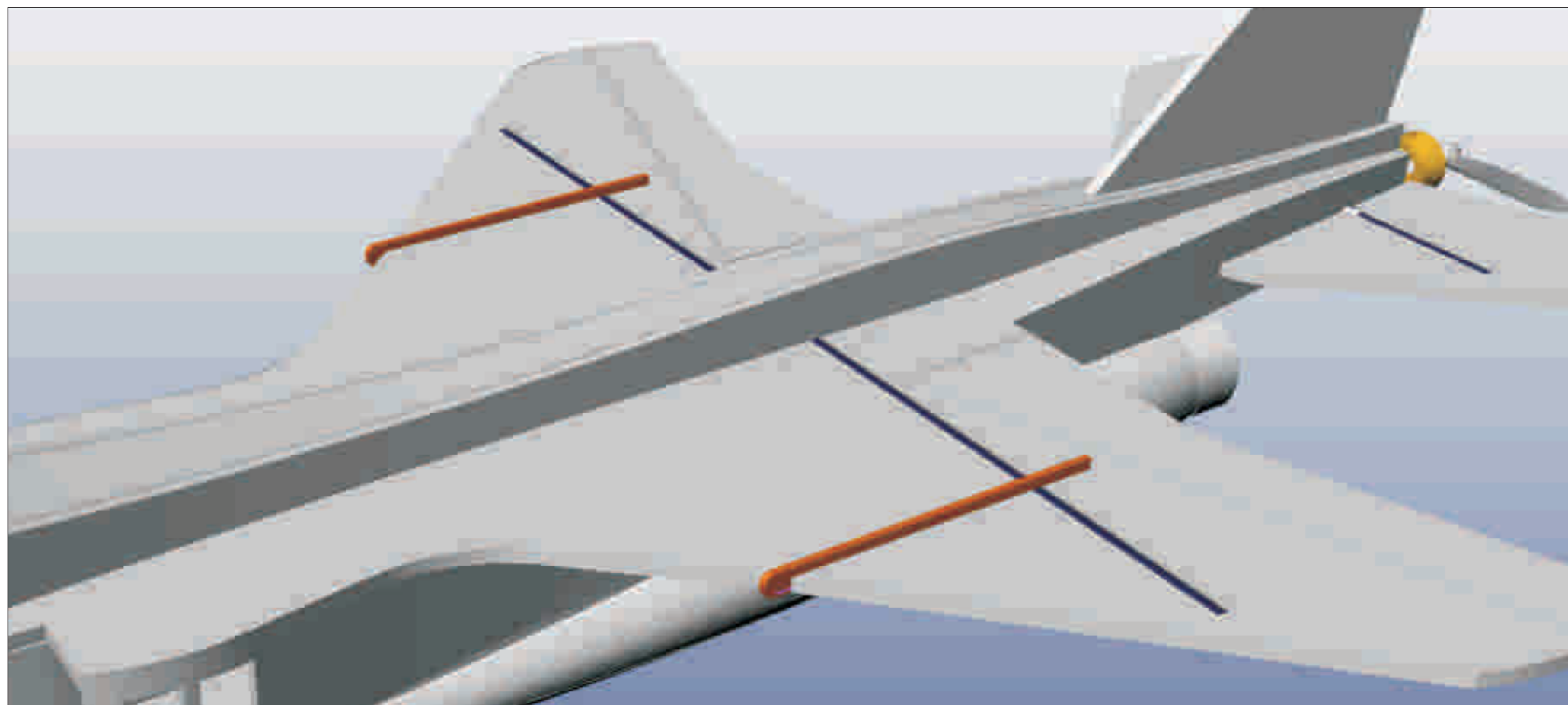
Glue the 3mm lite ply exhaust splitter in place.





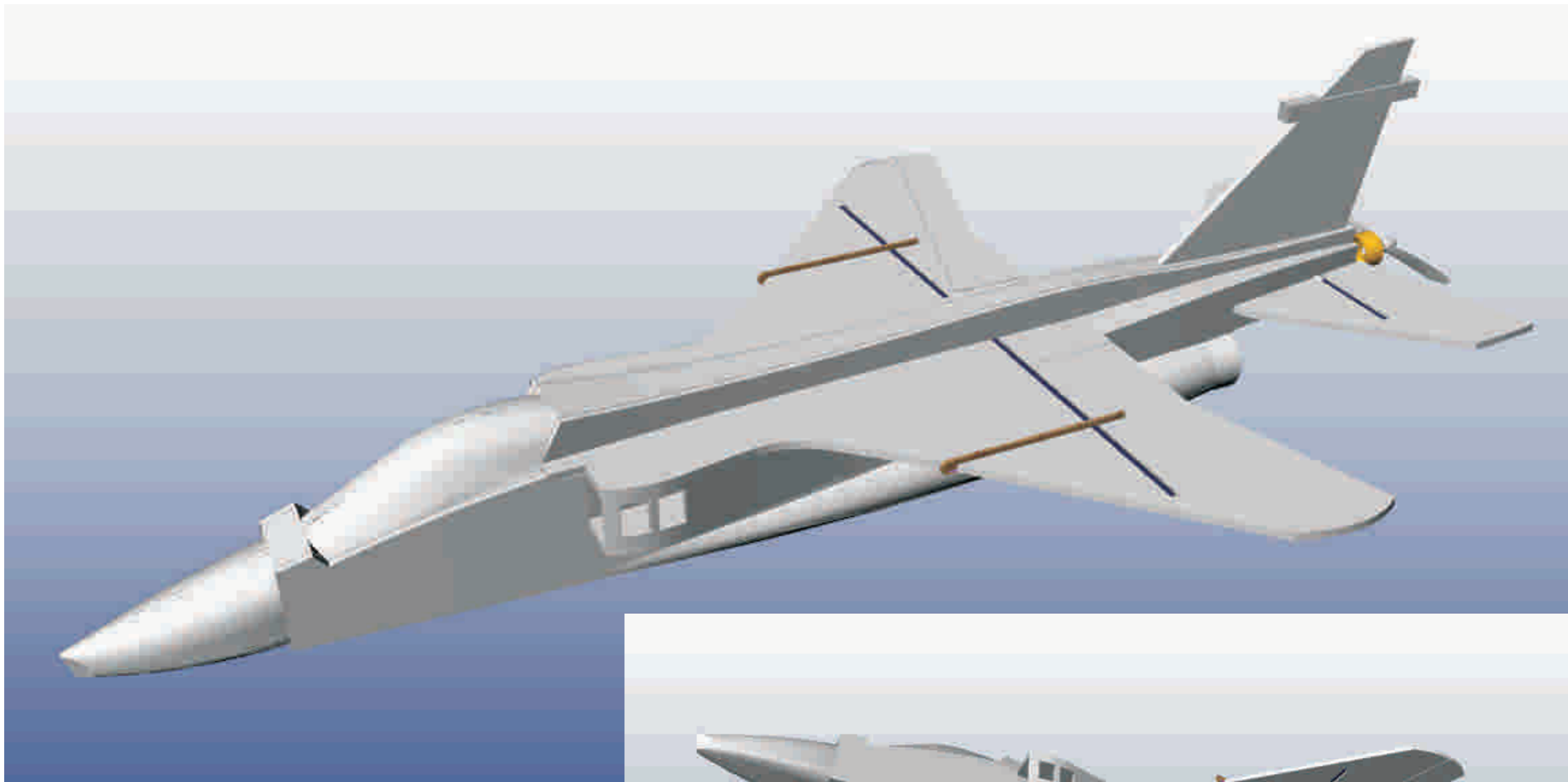
Using flexible grey depron, form the approximate shape of exhaust nozzles and glue to the assembly.

EDF - stick on the outer edges of the exhaust bulkhead to reduce the chance of any thrust deflection.



Using the notches in the wing as your guide - fit the overwing hard-points/fences in 3mm depron or lite-ply.





Your model is now complete.

EDF. Cut out the air intake holes as shown, and cut a cheater hole in the belly according to the parts sheet.





Sand and shape your model to represent the real thing. Use photos as reference



Sand and shape your model to represent the real thing. Use photos as reference