

Vickers
Valiant
Large Parkjet



Photograph shown is the real aircraft.



Bomber

Construction Guide

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Valiant History

The Vickers Valiant was a British high-altitude jet bomber designed to carry nuclear weapons, and in the 1950s and 1960s was part of the Royal Air Force's "V bomber" strategic deterrent force. The Valiant was the first of the V bombers to become operational, and was followed by the Handley Page Victor and the Avro Vulcan. The Valiant was the only V bomber to have dropped live nuclear weapons (for test purposes).

On 18 May 1951, the first prototype, serial number WB210 took to the air for its maiden flight only 27 months since the contract had been issued.

The Valiant B.1 could carry a single 10,000-pound (4,500 kg) nuclear weapon or up to 21 1,000 lb (450 kg) conventional bombs in its bomb bay. It was designed for the early fission-based nuclear weapons and also the newer and larger thermonuclear hydrogen bombs.

A "clean" Valiant (one without underwing tanks) could climb straight to 50,000 ft after takeoff unless it had heavy stores in the large bomb bay.[citation needed]

In 1956, Valiants operating from Malta flew conventional bombing missions over Egypt for Operation Musketeer during the Suez Crisis. From 1956 until early 1966 the main Valiant force was used in the nuclear deterrence role in the confrontation between NATO and the Warsaw Pact powers. Other squadrons undertook aerial refuelling, aerial reconnaissance and Electronic Warfare.

In 1962, in response to advances in Soviet Union surface-to-air missile (SAM) technology, the V-force fleet including the Valiant changed from high-level flying to flying at low-level to avoid SAM attacks that they would have received if they were flying at high altitudes.

In 1964 it was found that Valiants showed fatigue and crystalline corrosion in wing rear spar attachment forgings. In late 1964 a repair programme was underway, but a change of Government led to the new Minister of Defence Denis Healey deciding that the Valiant should be retired from service, and this happened in early 1965. The Victor and Vulcan V-bombers remained in service until the 1980s.

Vic Flintham observed that: "There is a fine irony to the situation, for Vickers had produced the Type 673 B Mk 2 version designed as a fast, low-level pathfinder... The Air Ministry was not interested..." The Valiant was Vickers' last purpose-built military aircraft.

Designers Notes

Designed to take twin 64mm EDFs or quad 50mm EDFs along with a twin pusher option. This is the largest of the V bombers and the biggest Jetworks jet to date.

This is the first Jetworks jet with 3D printed wing retracts as nothing off the shelf comes close to the design of the original valiant.

With a high wing position it will be a stable flyer along with full aerofoil wings along with root intakes, it should have a no thrust vector problems and fly well.

The twin 64's are a bit shoe-horned into the wing, but I wanted to give it a good power-weight ratio along with a nicer efflux sound than the quad 50's. The other reason is one of simplicity.

This design completes the Jetworks V-bomber collection.

Happy flying.

Craig



Valiant



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 templates in case replacement parts need making. (the glue eventually dries and they don't stick together!)

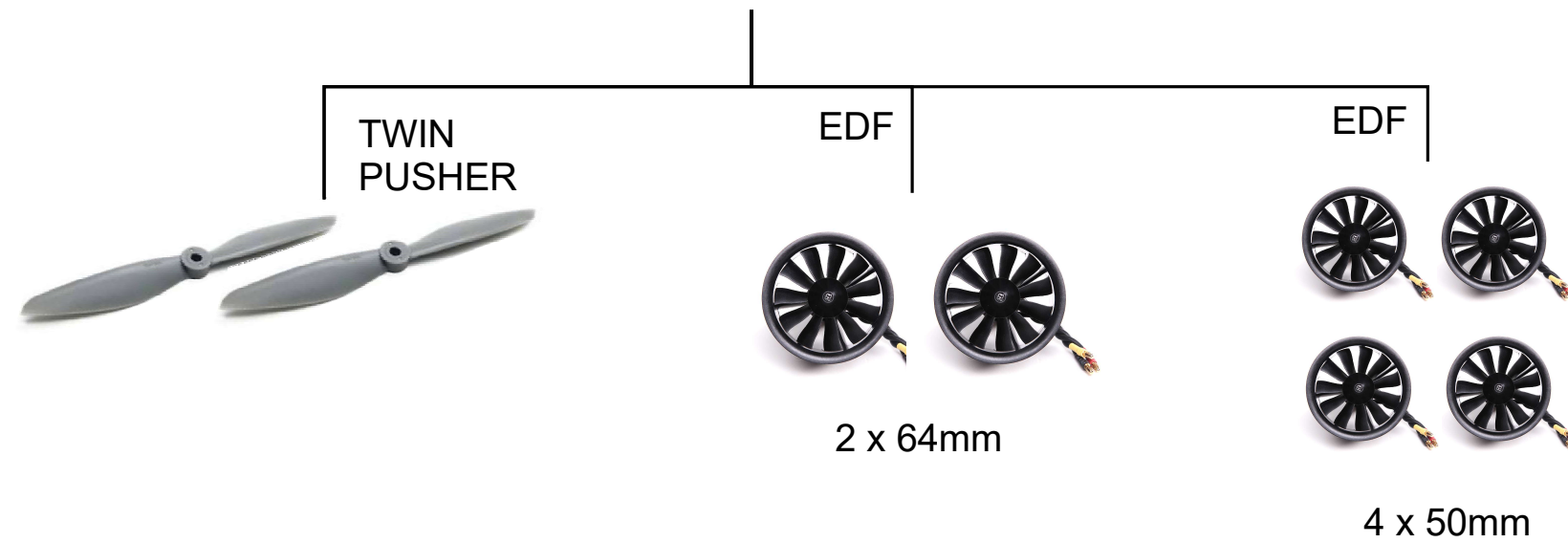
IMPORTANT Wherever the plans call for marking guidelines onto the depron, please ensure that you do otherwise it can cause problems later on. I suggest you use a Sharpie Fineline to transfer the lines.

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

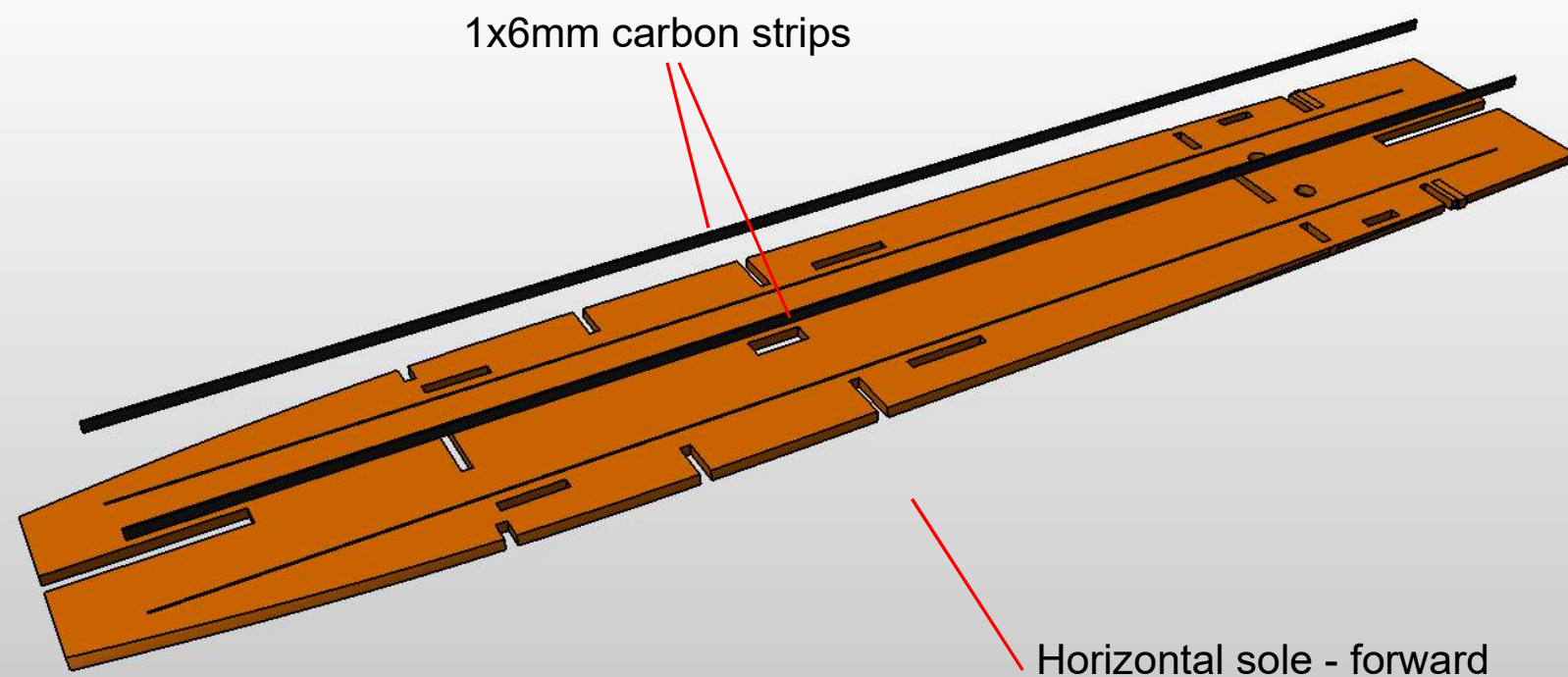


CHOOSE POWERTRAIN



Choose your preferred variant and its powertrain.

All versions



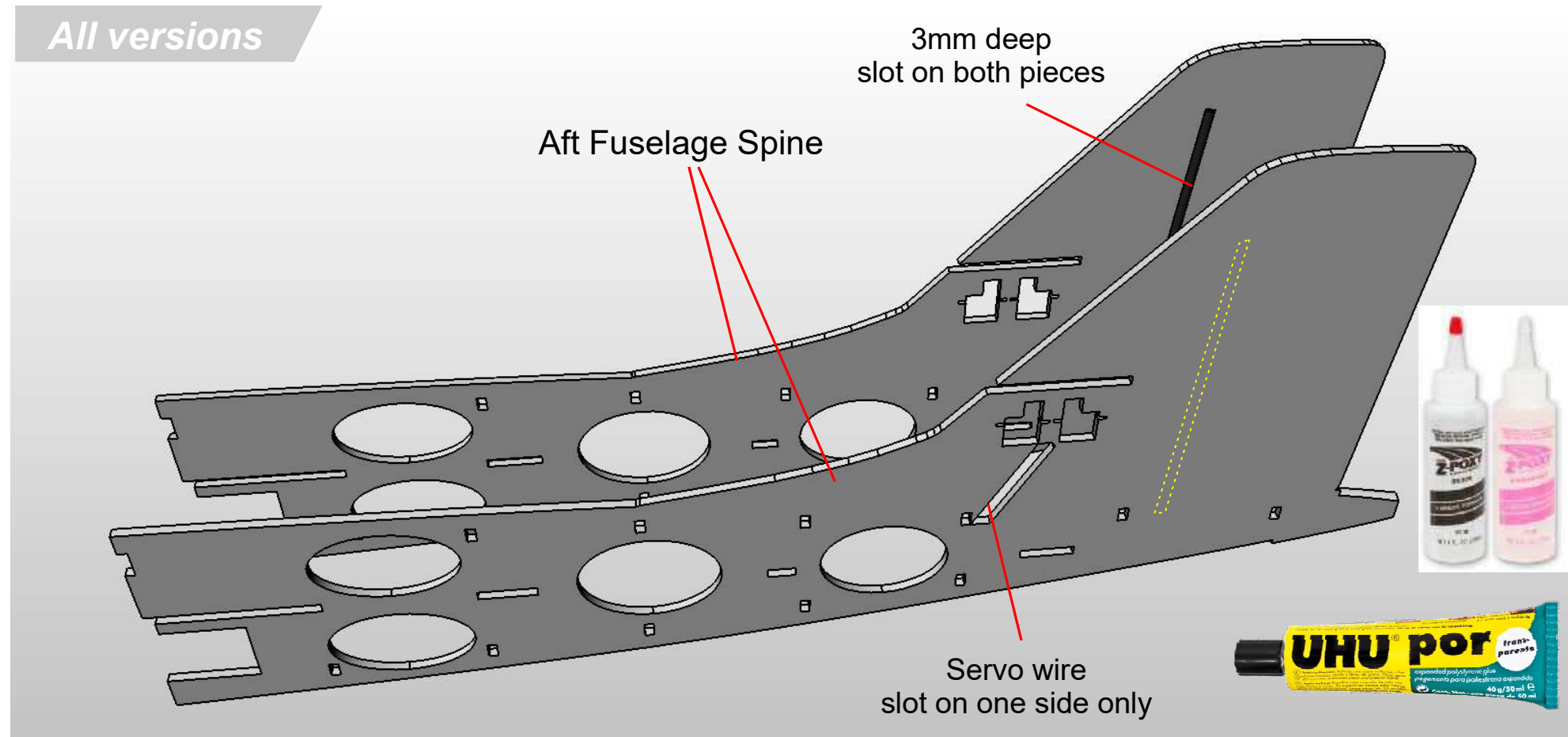
Epoxy the two carbon 1x6mm strips into the **Forward Horizontal sole** - Use masking tape to secure, then lay on a flat surface until the epoxy has set.



Valiant



All versions



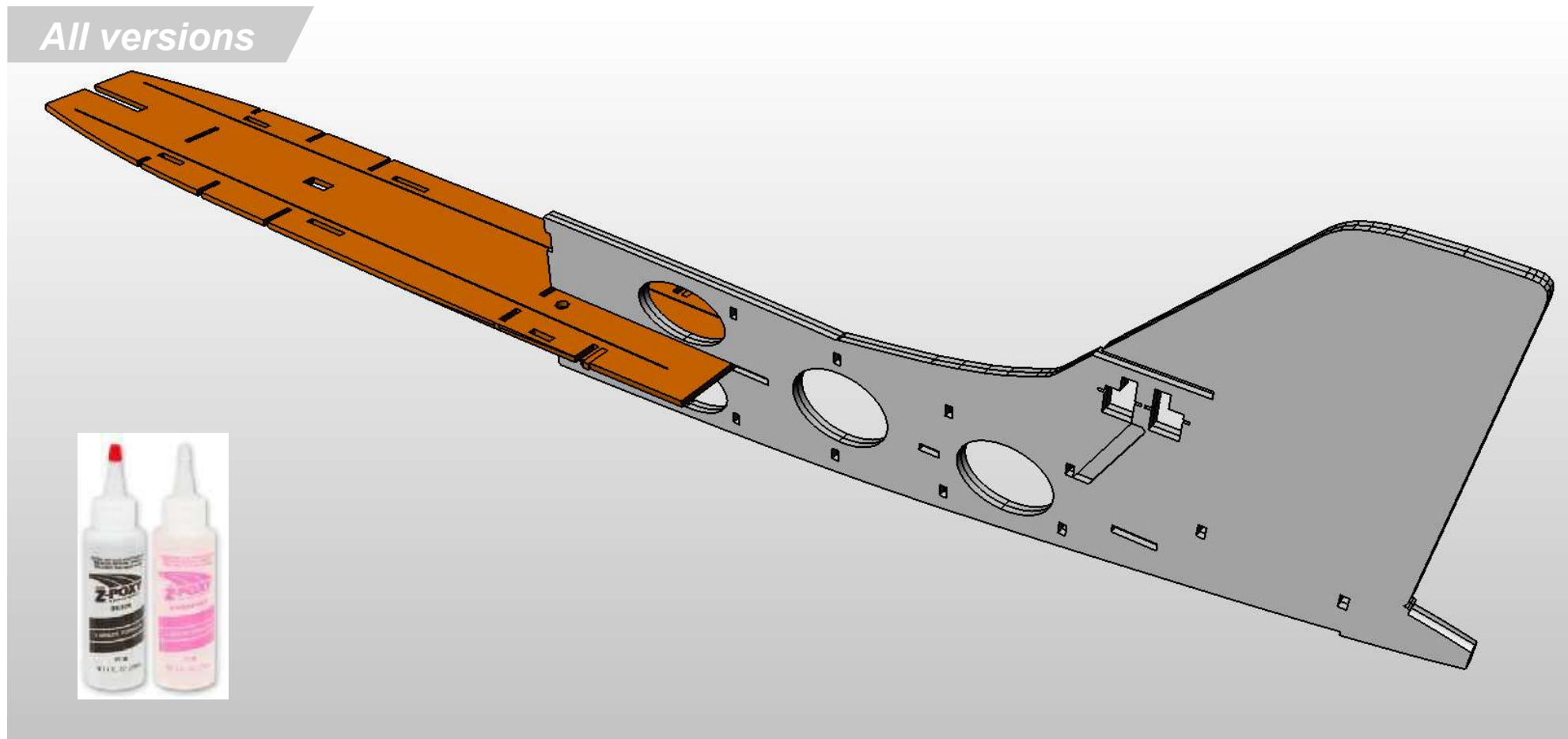
Rebate a 3mm slot in the inner faces of the **Aft Fuselage Spine** to support a 6mm spar. Cut the servo wire slot in one of the pieces.

Apply UHU por to the inside faces of both pieces and leave until they are ready to glue together.

Run some epoxy into the two slots and lay the 6mm carbon tube into one side.

Attach to the two pieces together.

All versions

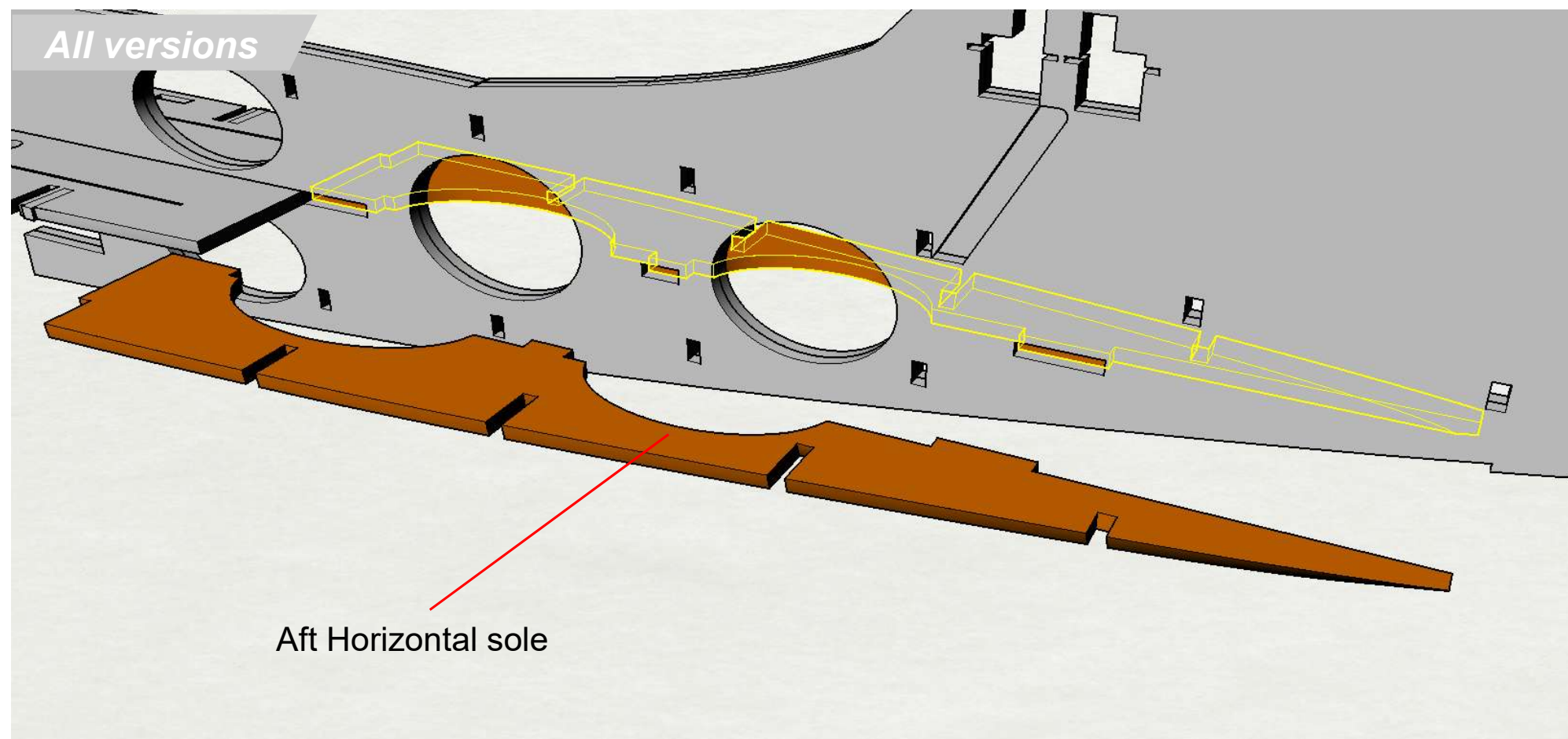


Using epoxy (sparingly) glue and slide the two pieces together.

Valiant



All versions



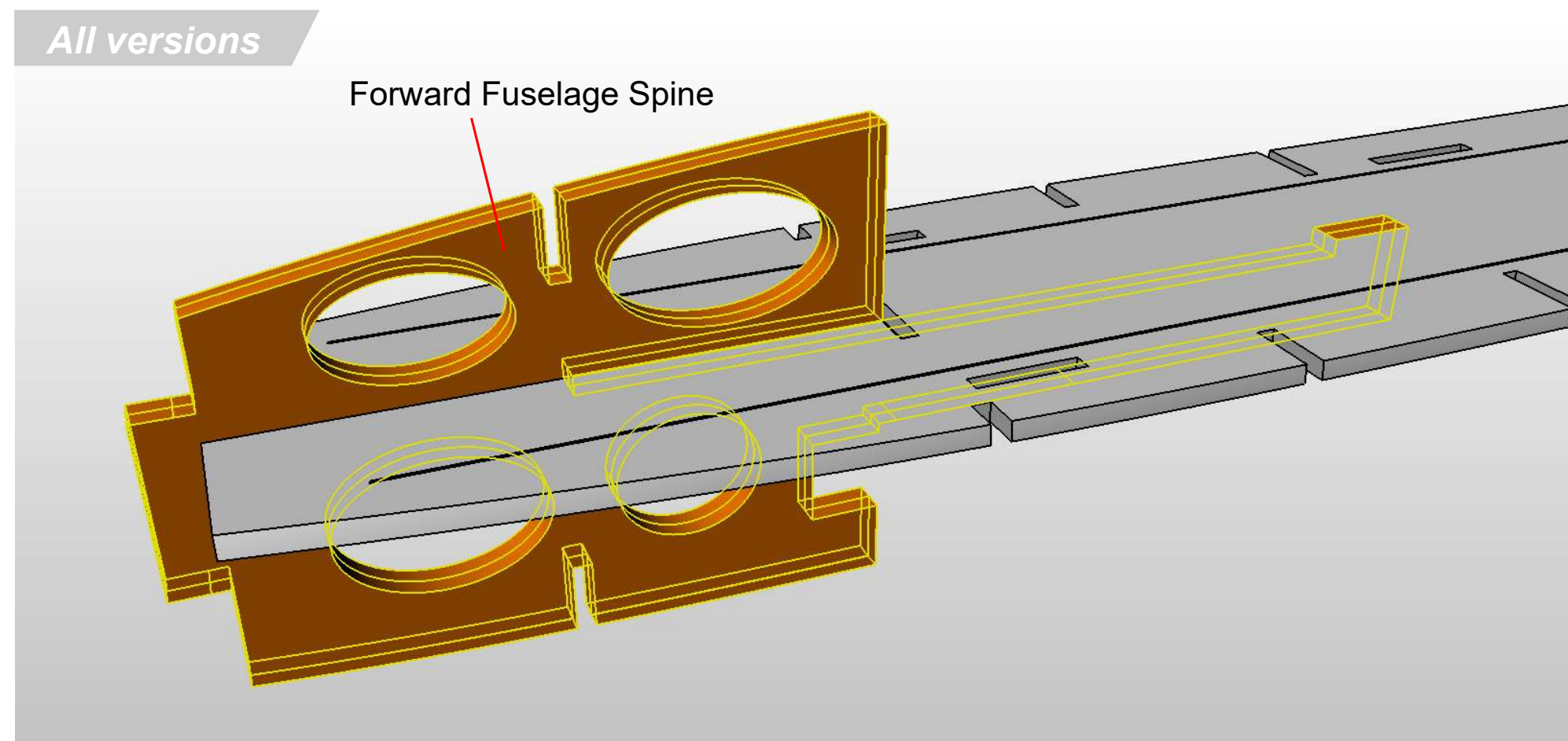
Aft Horizontal sole

Glue the two **Aft Horizontal sole** pieces to the assembly.

Use a drop of Epoxy onto the forward edge, Uhu Por along the length.



All versions



Forward Fuselage Spine

Glue the two **Forward Fuselage Spine** pieces together using UHU por, then to the assembly.

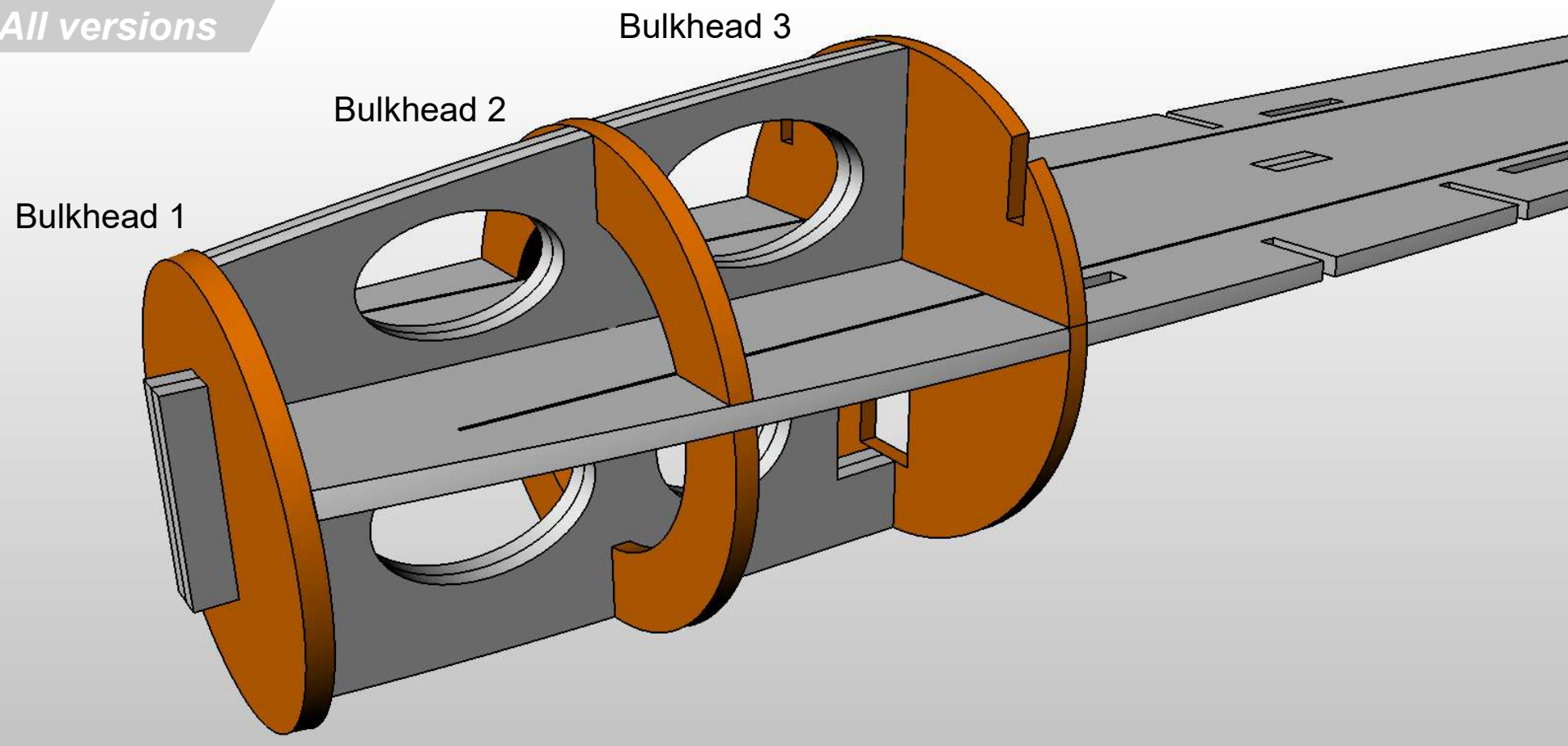
Use epoxy onto the areas that slide together, and Uhu Por on the rest.



Valiant



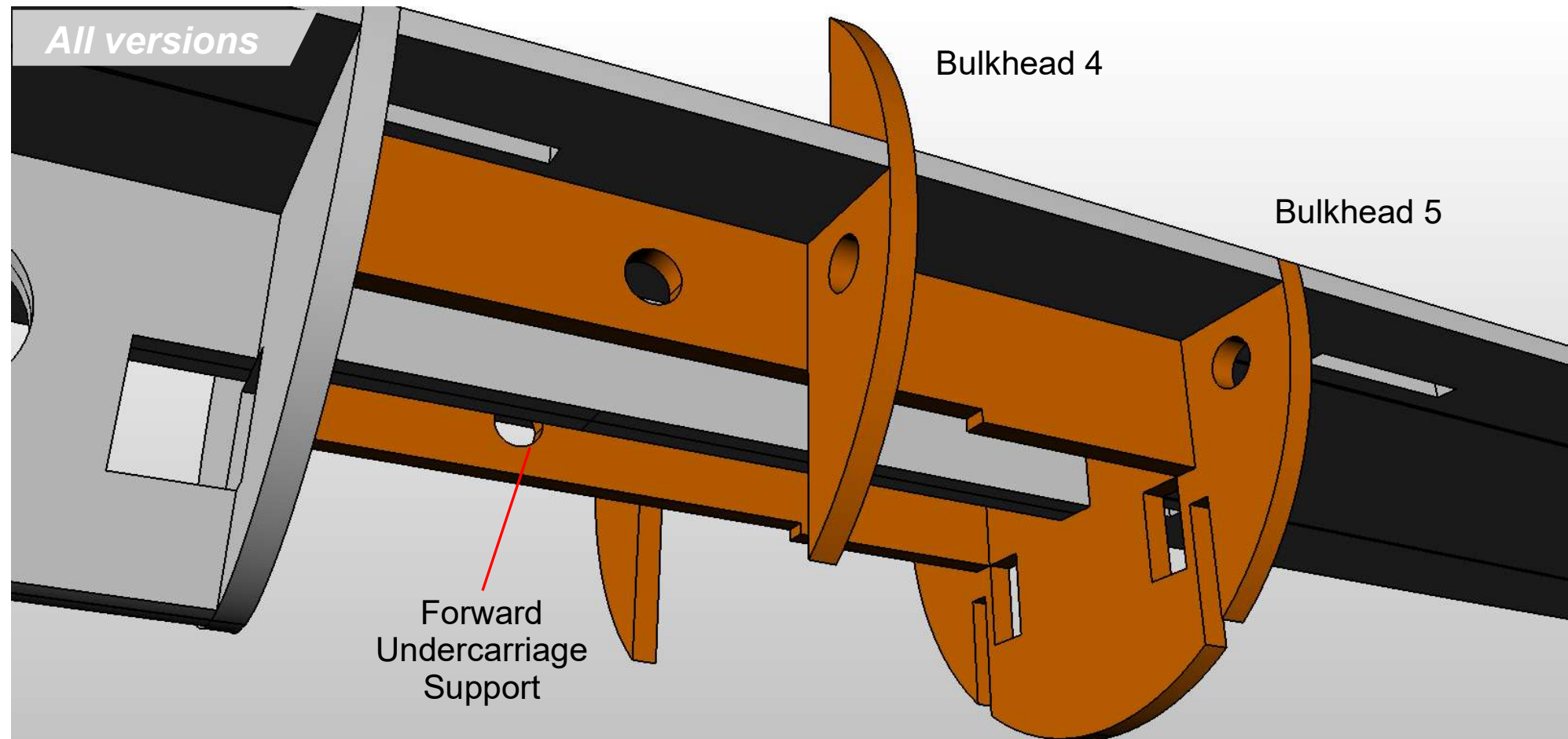
All versions



Glue the **Bulkheads 1,2 and 3** in place.



All versions



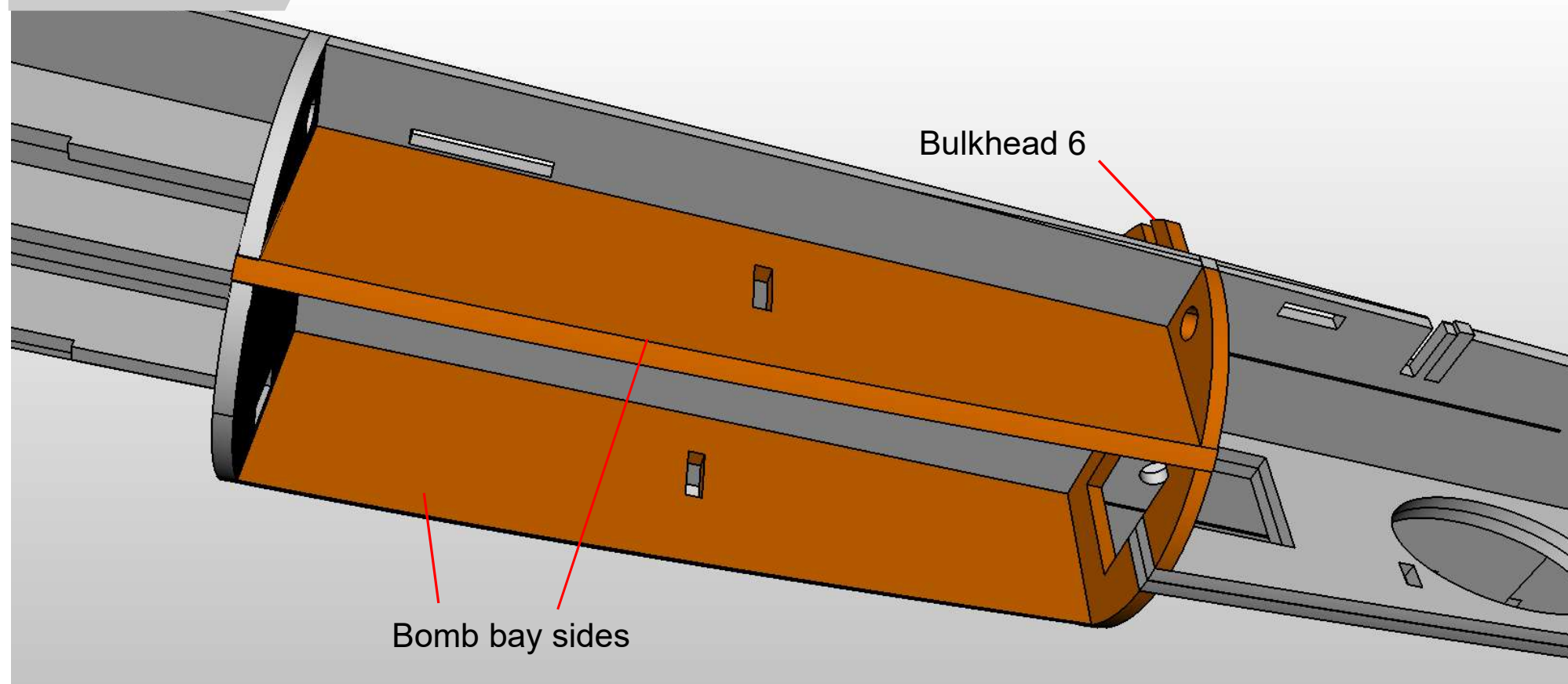
Glue the **Bulkheads 4,5** and the **Forward Undercarriage support** pieces in place.



Valiant



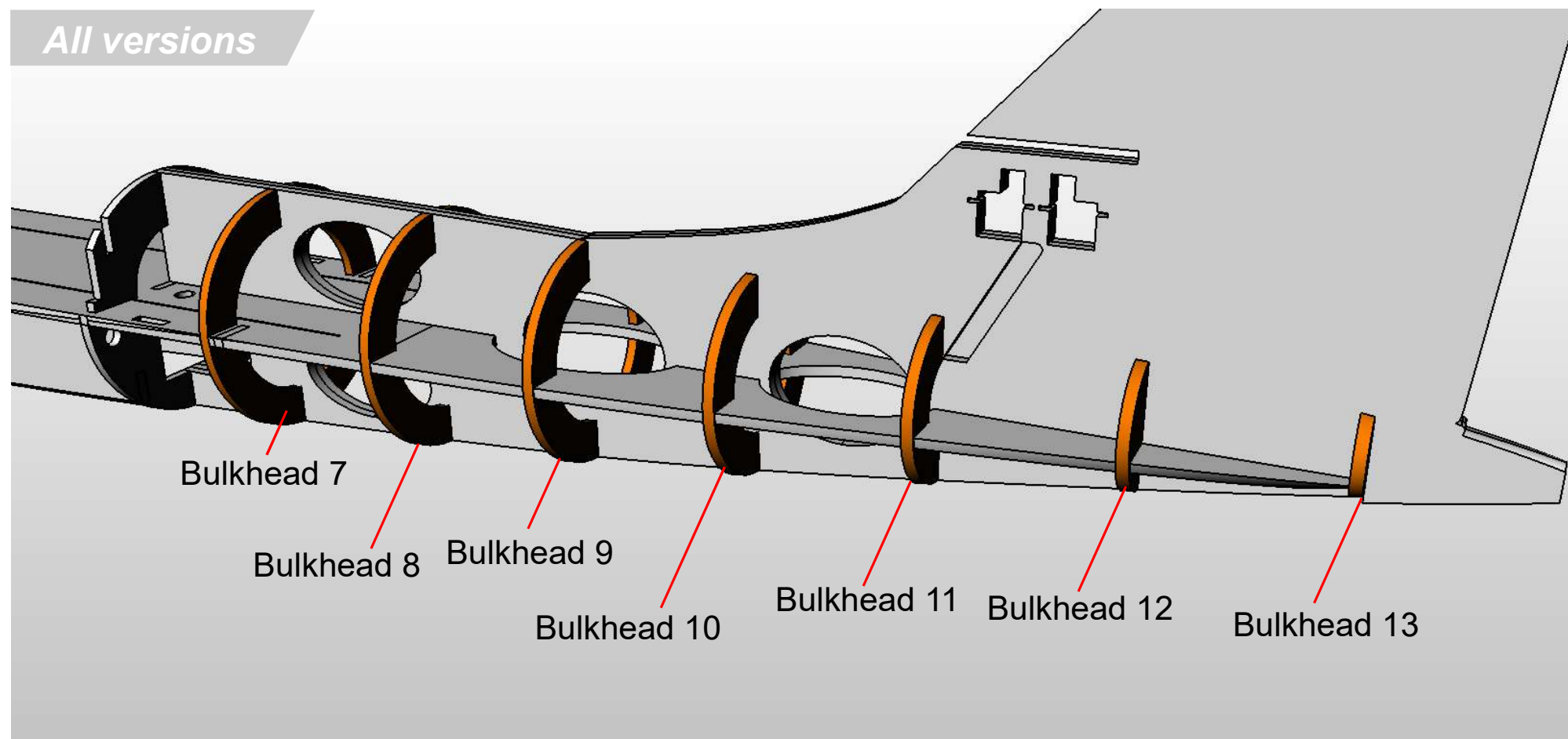
All versions



Glue the two pieces of **Bulkhead 6** to the assembly and then the two **Bomb bay Sides** in place.



All versions



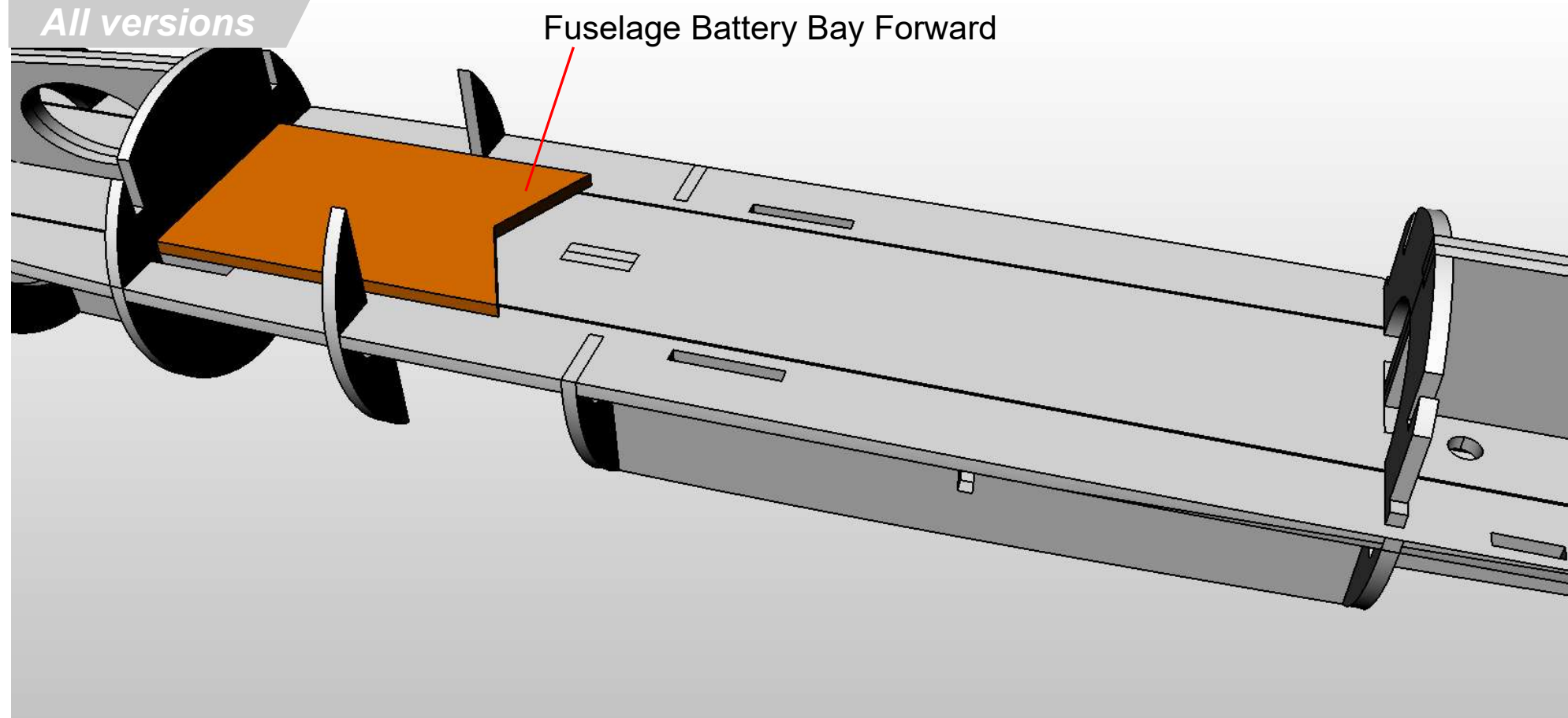
Glue **Fuselage 7 thru to 13** in place as shown



Valiant

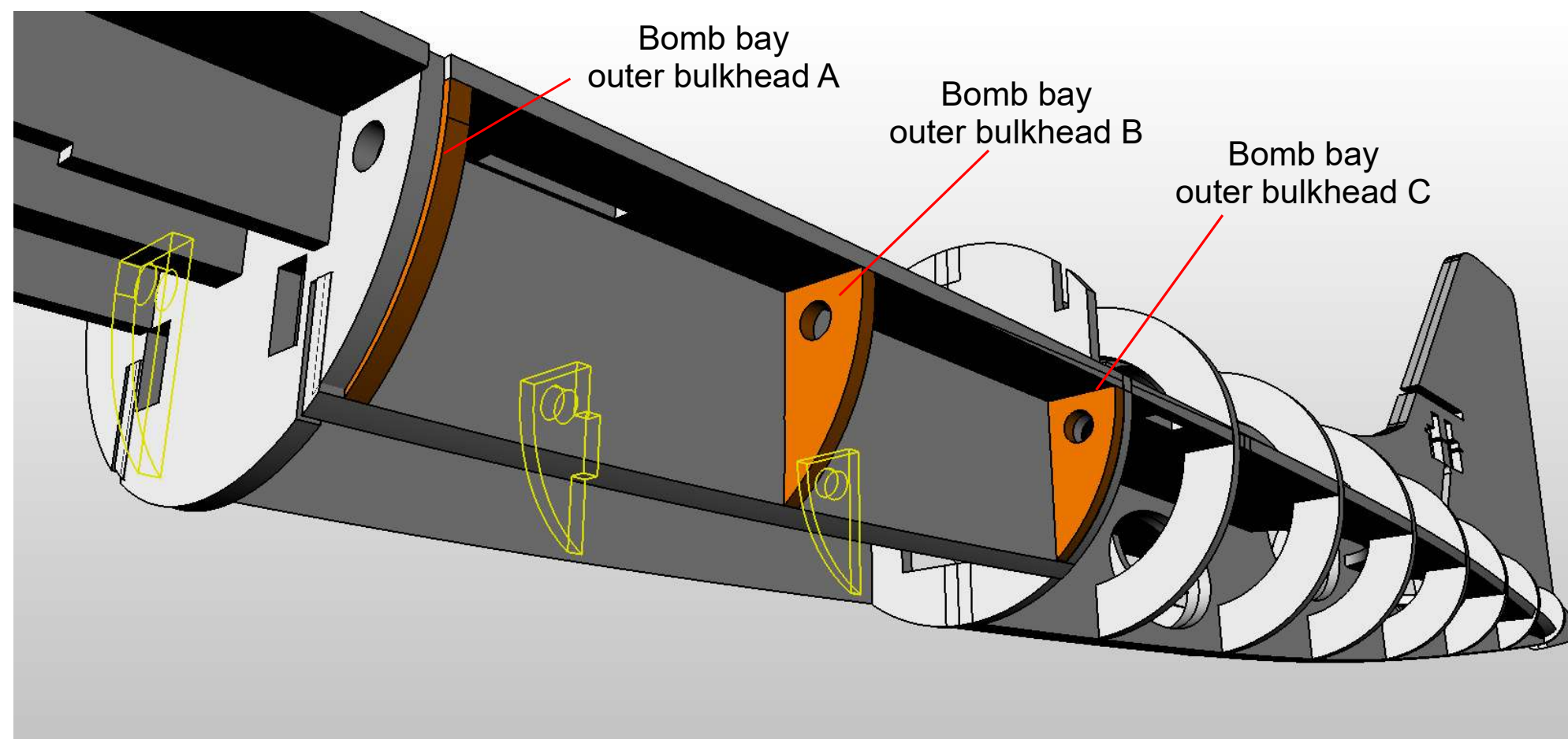


All versions



Glue the **Fuselage Battery Bay Forward panel** precisely in position as shown.

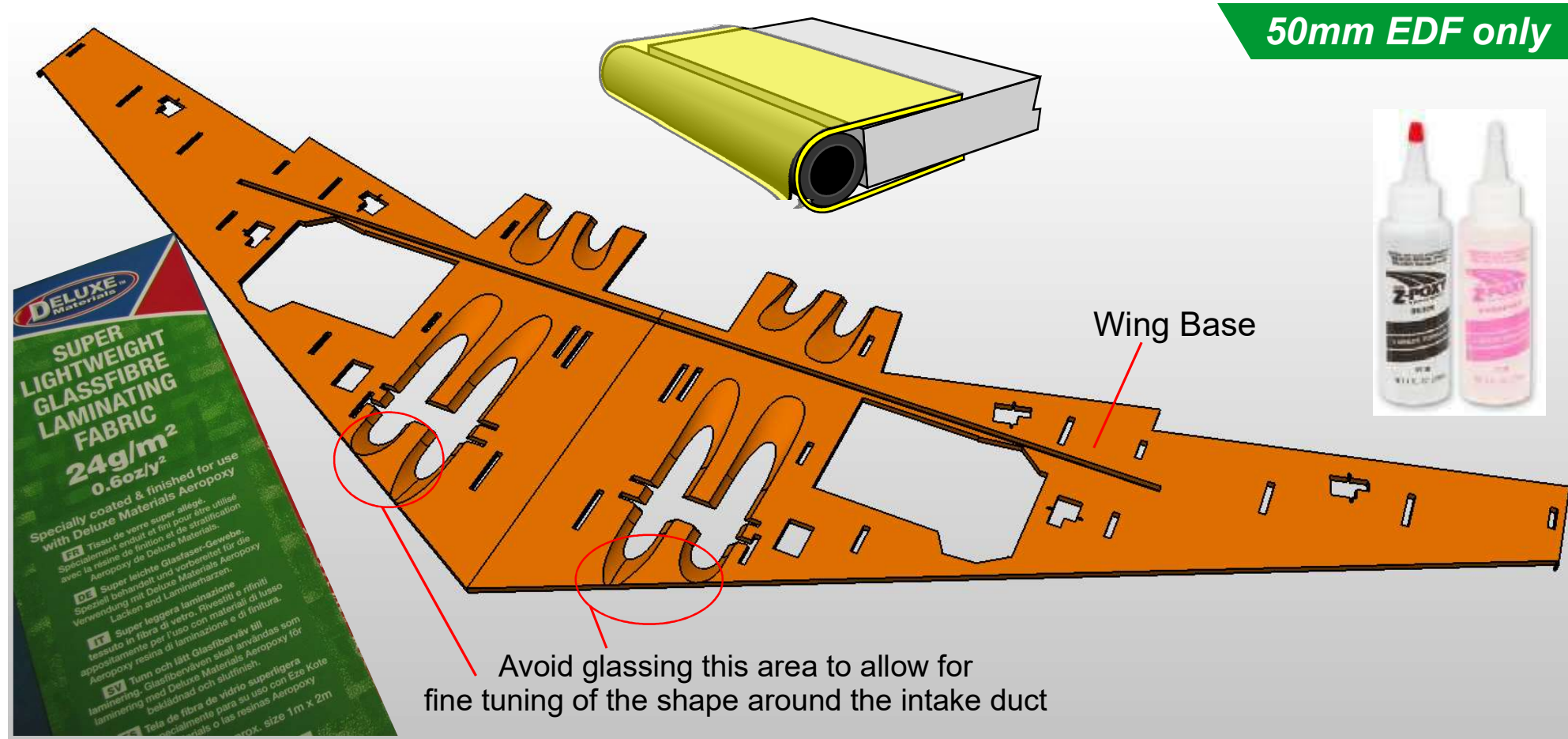
Glue the **Bomb Bay Outer Bulkheads** to the assembly.



Glue the three pairs of **Bomb Bay Outer Bulkheads** to the fuselage.

Valiant





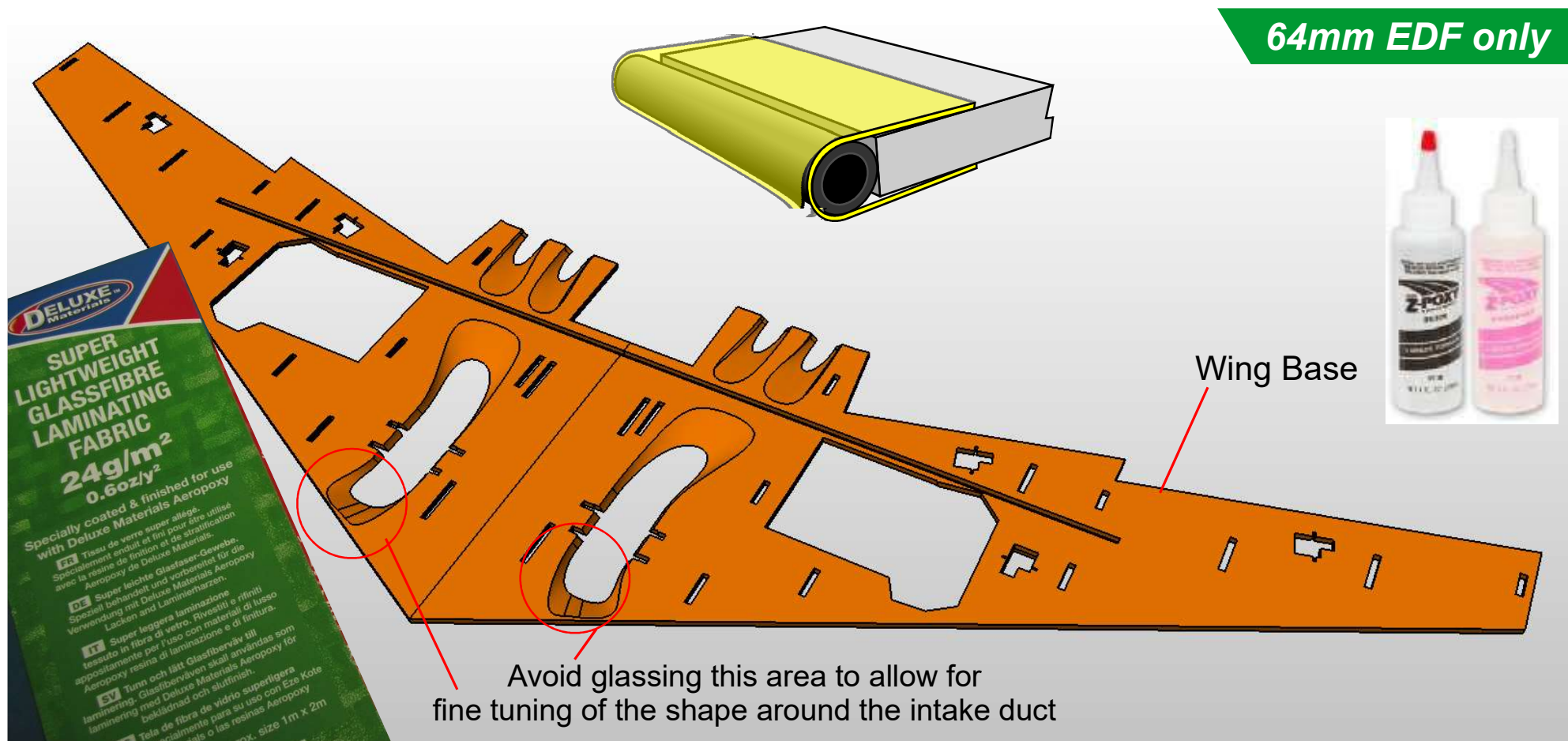
50mm EDF only

Glue the two wing pieces together (if made in two pieces) using epoxy.

Glue the rear carbon spar in place using epoxy and low-tack masking tape to contain the glue.

Glue the leading edge carbon spar to the leading edge of the wings. wrap low tack masking tape around as illustrated to contain it until it sets.

Once set, remove the tape, then wrap 0.6oz fiberglass around in the same way as the tape previously. Use WBPU as 'resin' to adhere it to the wings.



64mm EDF only

Glue the two wing pieces together (if made in two pieces) using epoxy.

Glue the rear carbon spar in place using epoxy and low-tack masking tape to contain the glue.

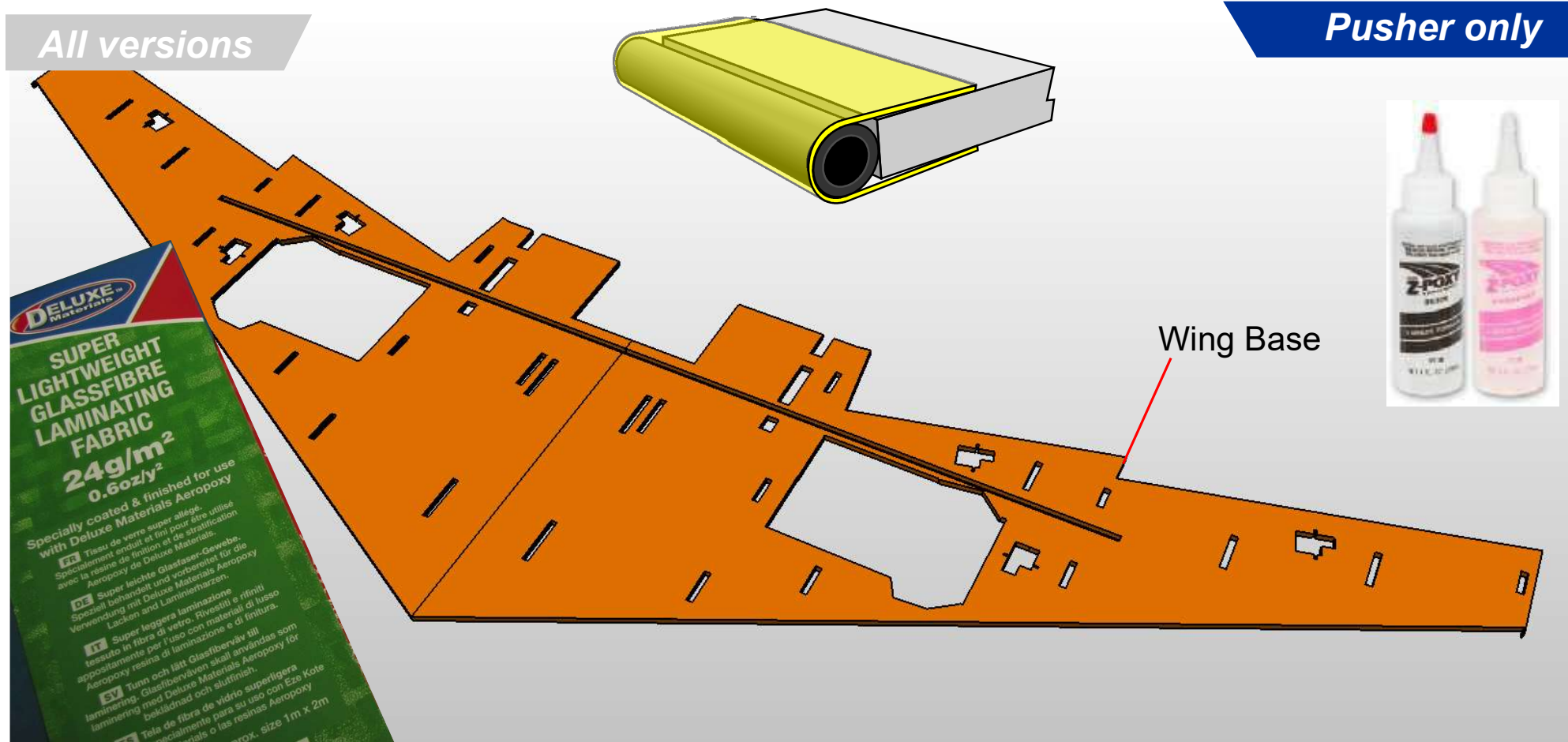
Glue the leading edge carbon spar to the leading edge of the wings. wrap low tack masking tape around as illustrated to contain it until it sets.

Once set, remove the tape, then wrap 0.6oz fiberglass around in the same way as the tape previously. Use WBPU as 'resin' to adhere it to the wings.

Valiant



All versions



Pusher only

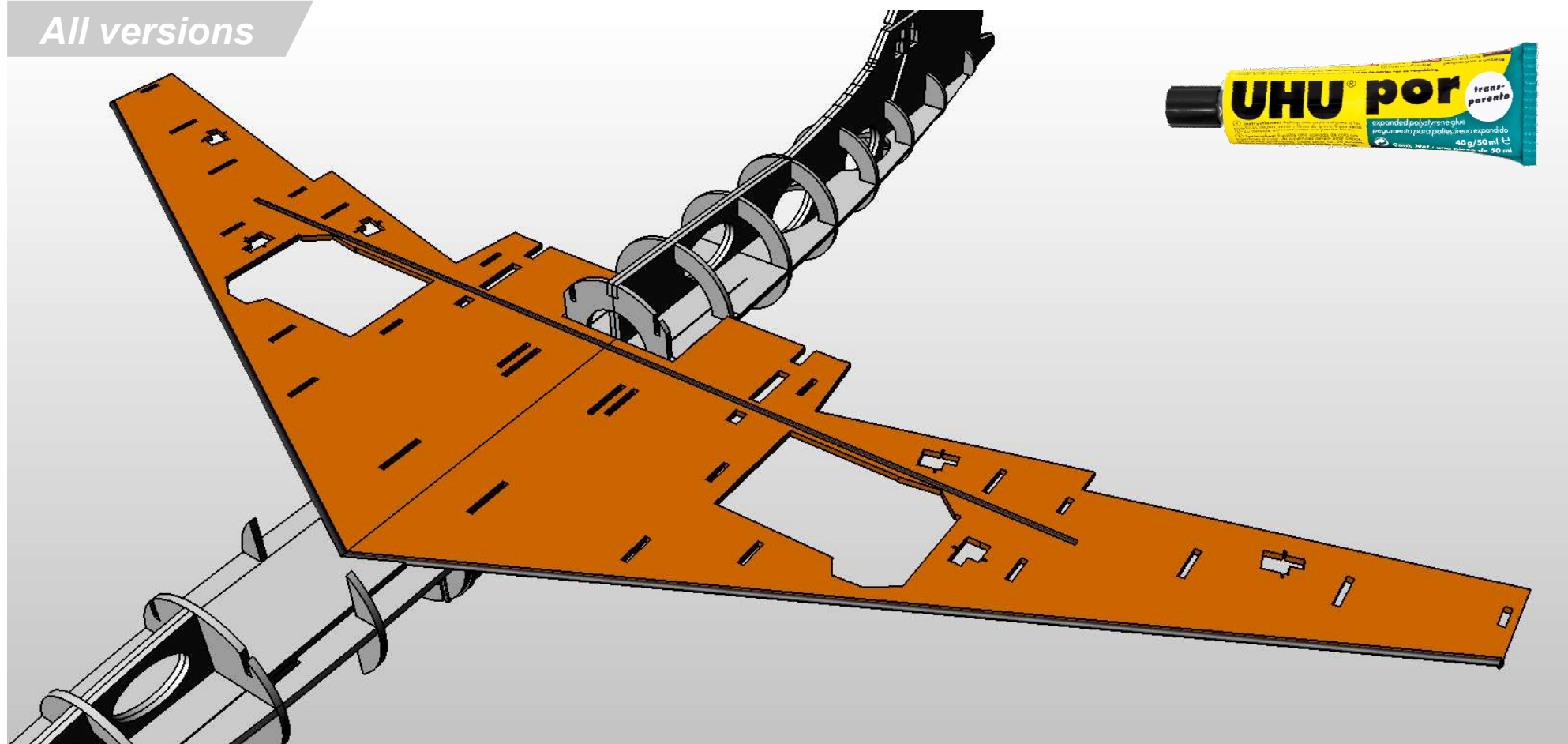
Glue the two wing pieces together (if made in two pieces) using epoxy.

Glue the rear carbon spar in place using epoxy and low-tack masking tape to contain the glue.

Glue the leading edge carbon spar to the leading edge of the wings. wrap low tack masking tape around as illustrated to contain it until it sets.

Once set, remove the tape, then wrap 0.6oz fiberglass around in the same way as the tape previously. Use WBPU as 'resin' to adhere it to the wings.

All versions

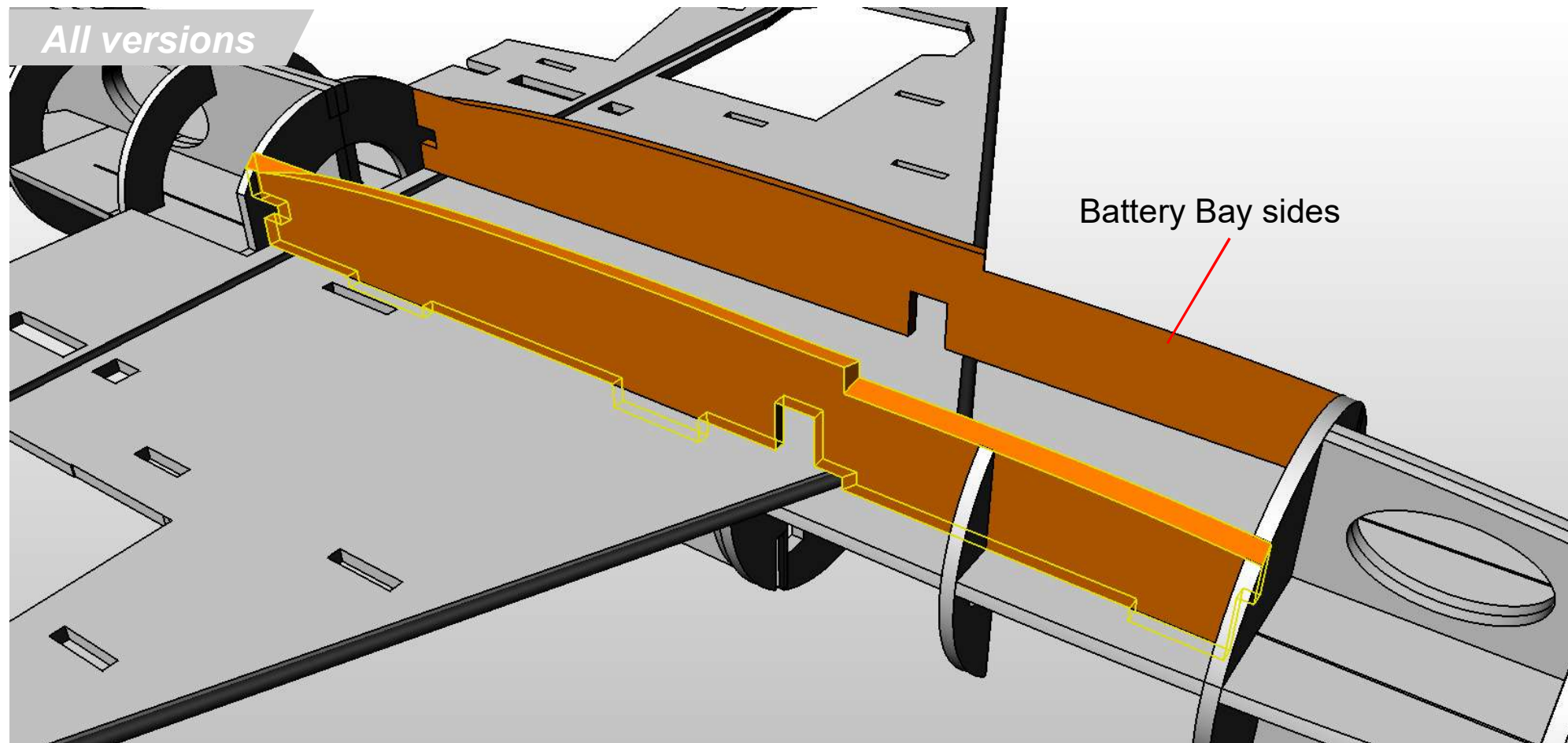


Fix the wing into the recess on the fuselage

Valiant

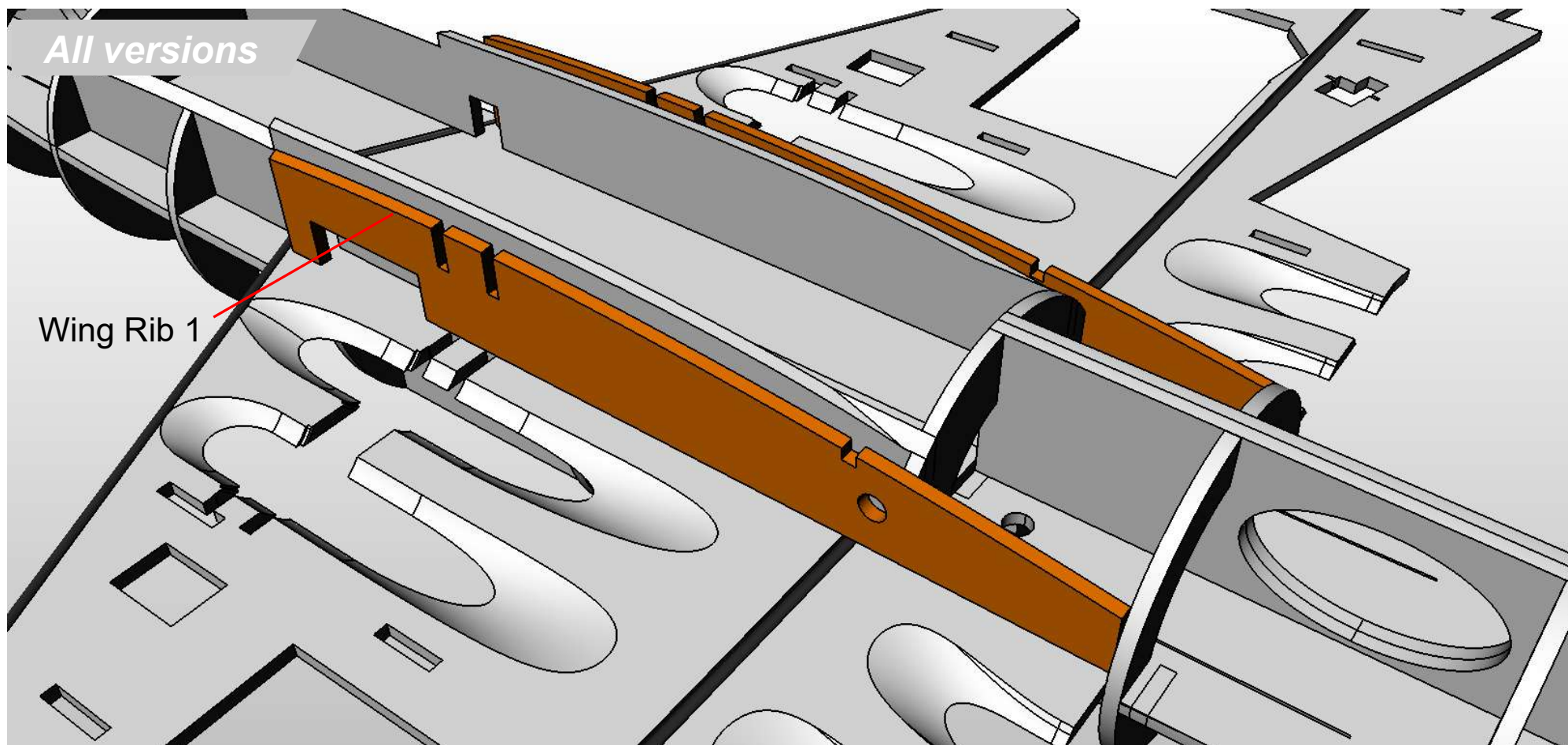


All versions



Glue the two **Battery Bay sides** to the assembly.

All versions



Glue the two **Wing Rib 1 Pieces** in place.

Trim the depron to fit your ESC's in the space provided - read ahead in the build guide to see where they go.

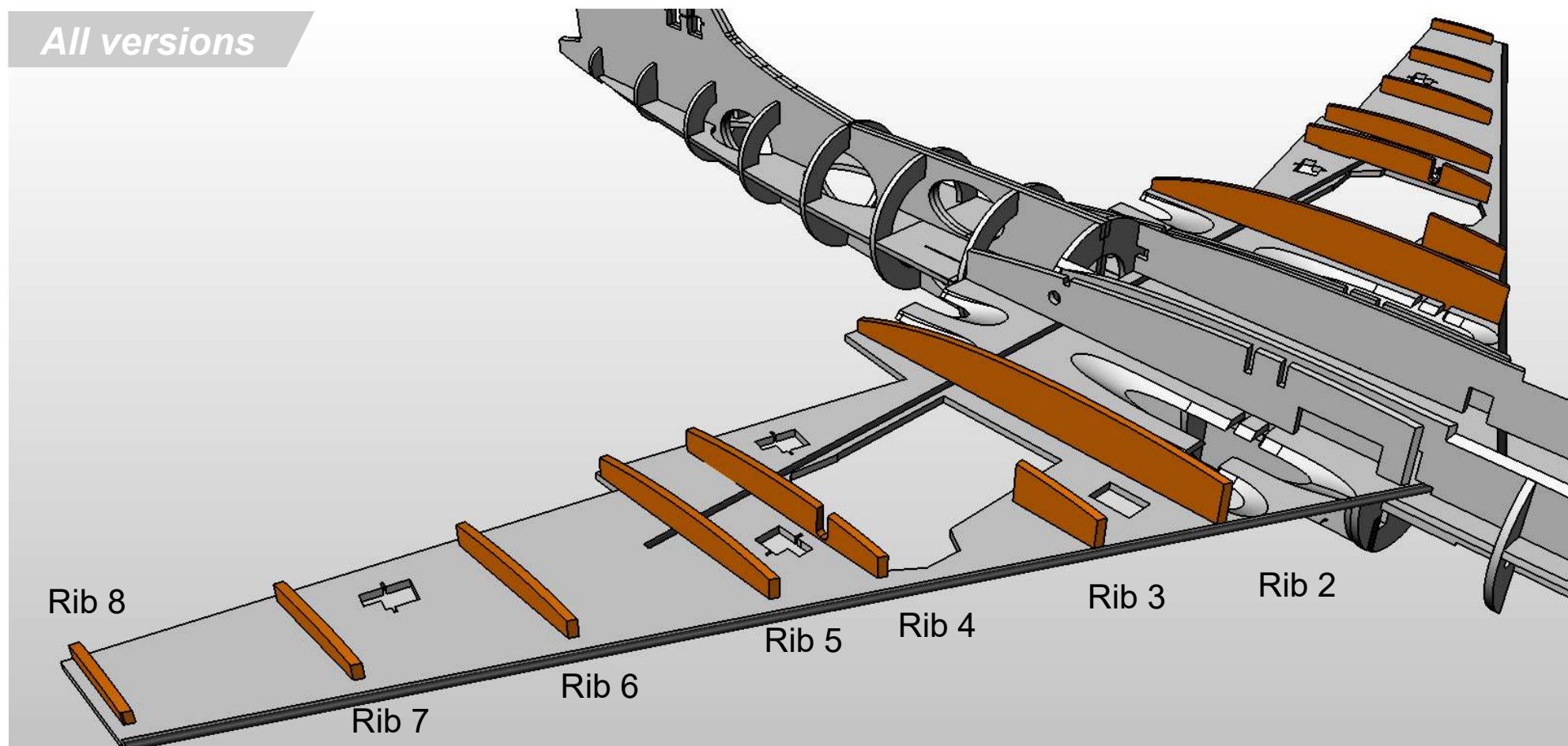
Aim to have the flat side of the ESC flush with the outside face of Wing rib 1.



Valiant



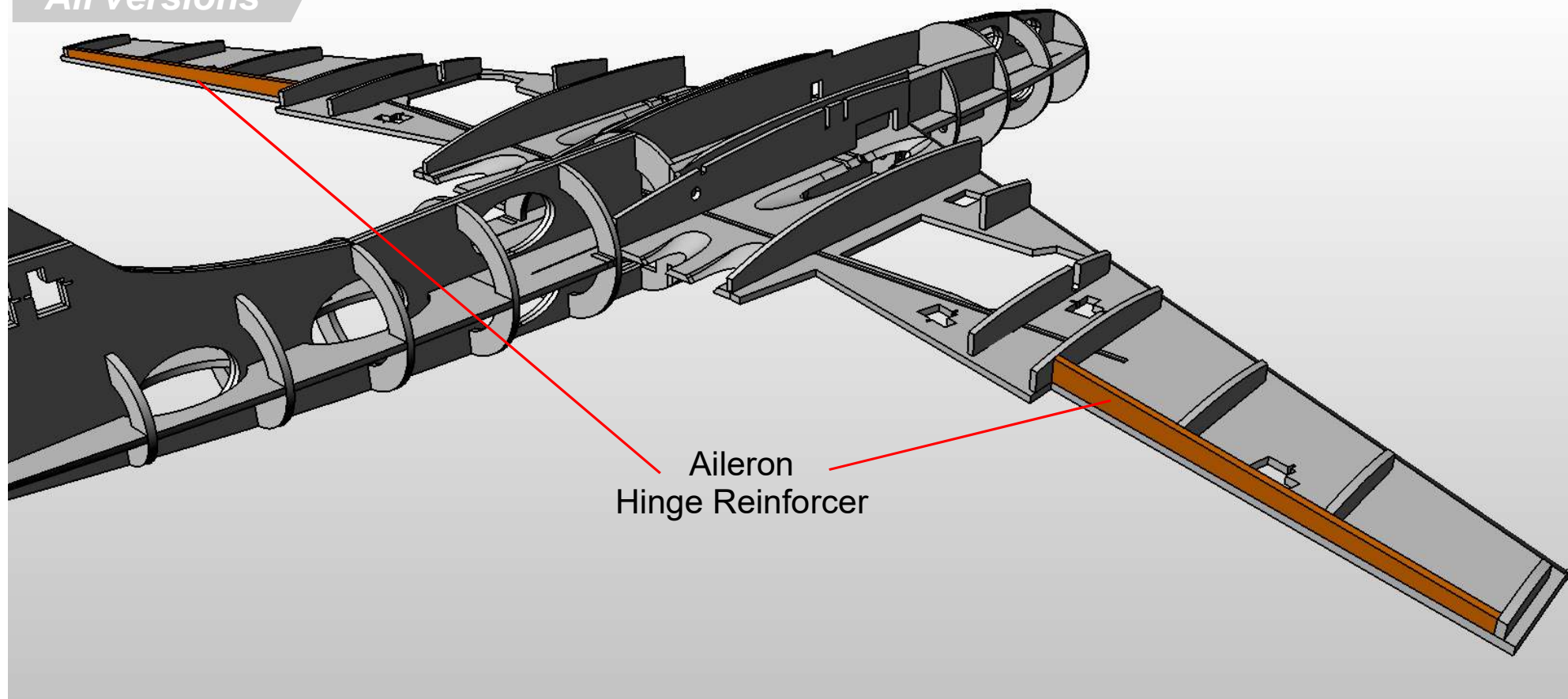
All versions



Glue the two **Wing Ribs** to the assembly.



All versions



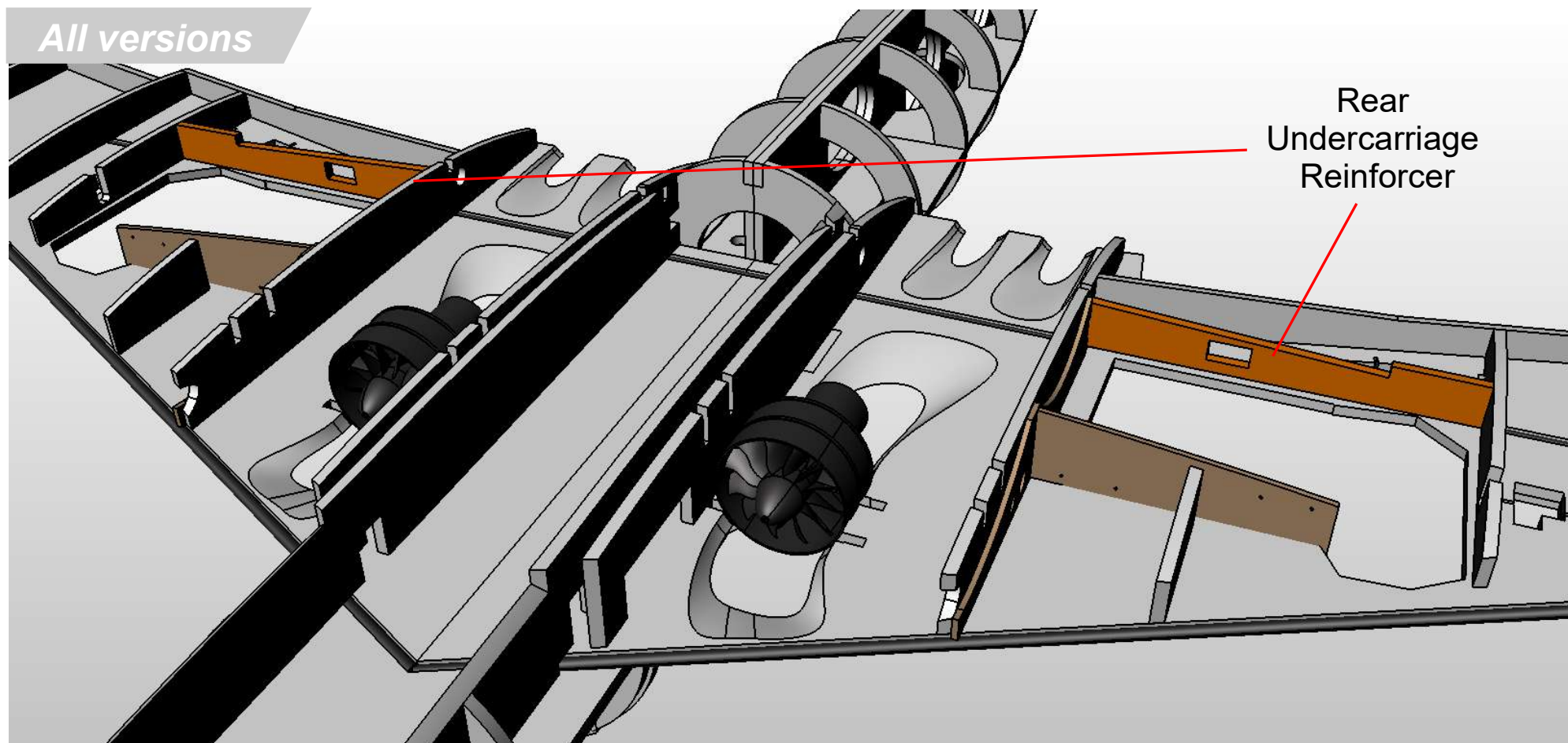
Glue the **Aileron Hinge Reinforcer** pieces to the assembly.



Valiant



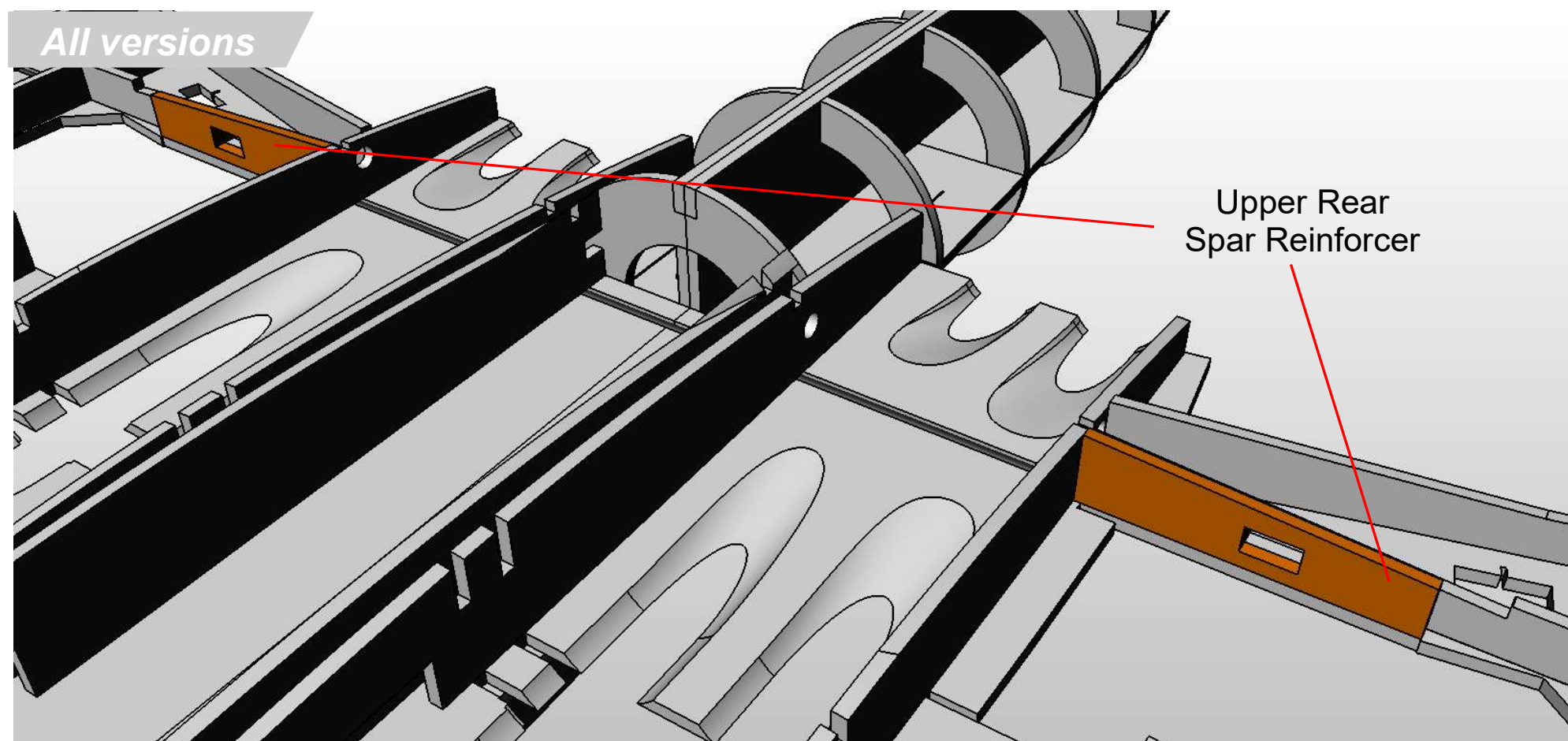
All versions



Glue the **Rear Undercarriage Reinforcer** pieces to the assembly.



All versions



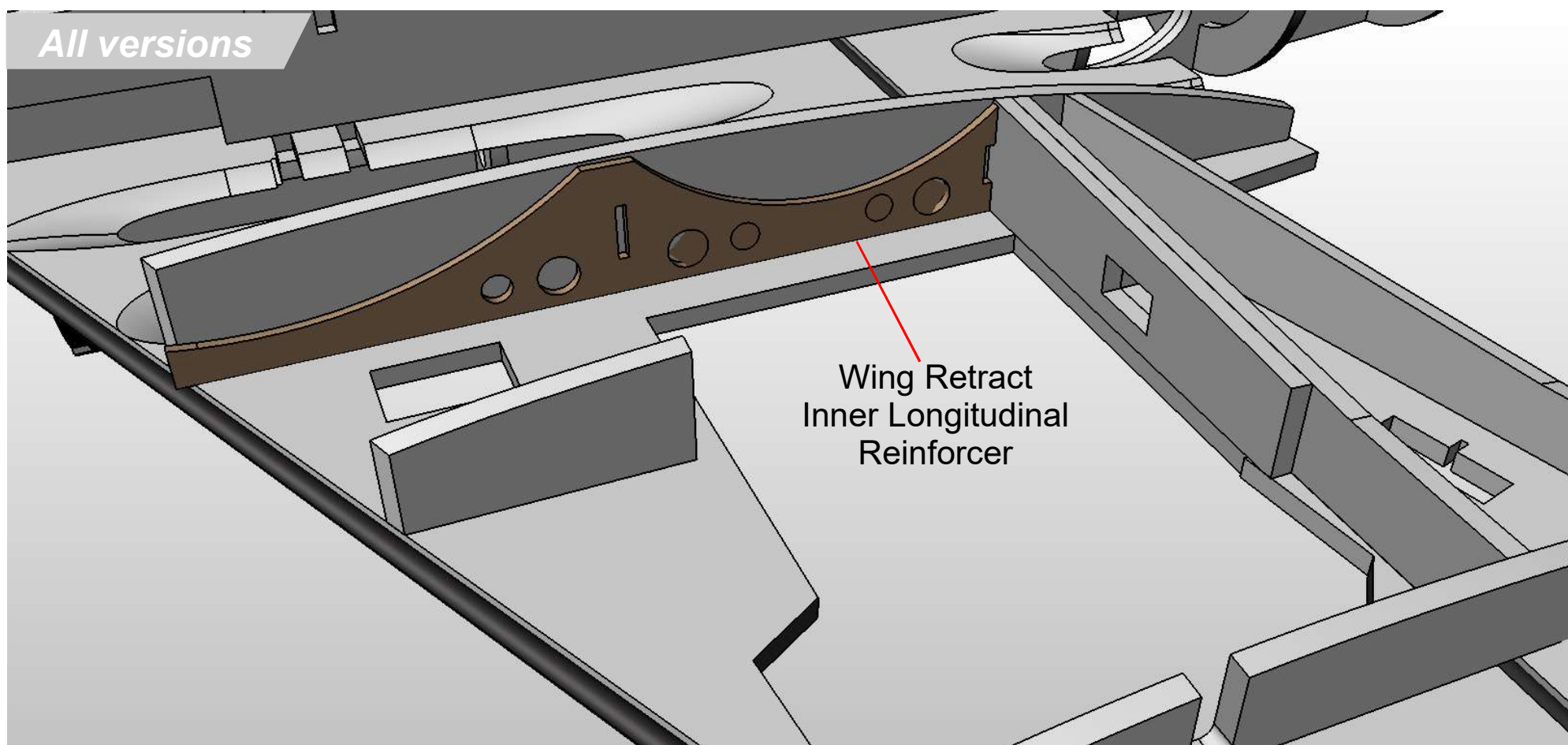
Do NOT Glue the **Upper Rear Spar Reinforcers** pieces to the assembly, but tape them in place using masking tape **until the upper wing spar is bonded in** - they are used as spacers for the next step.



Valiant



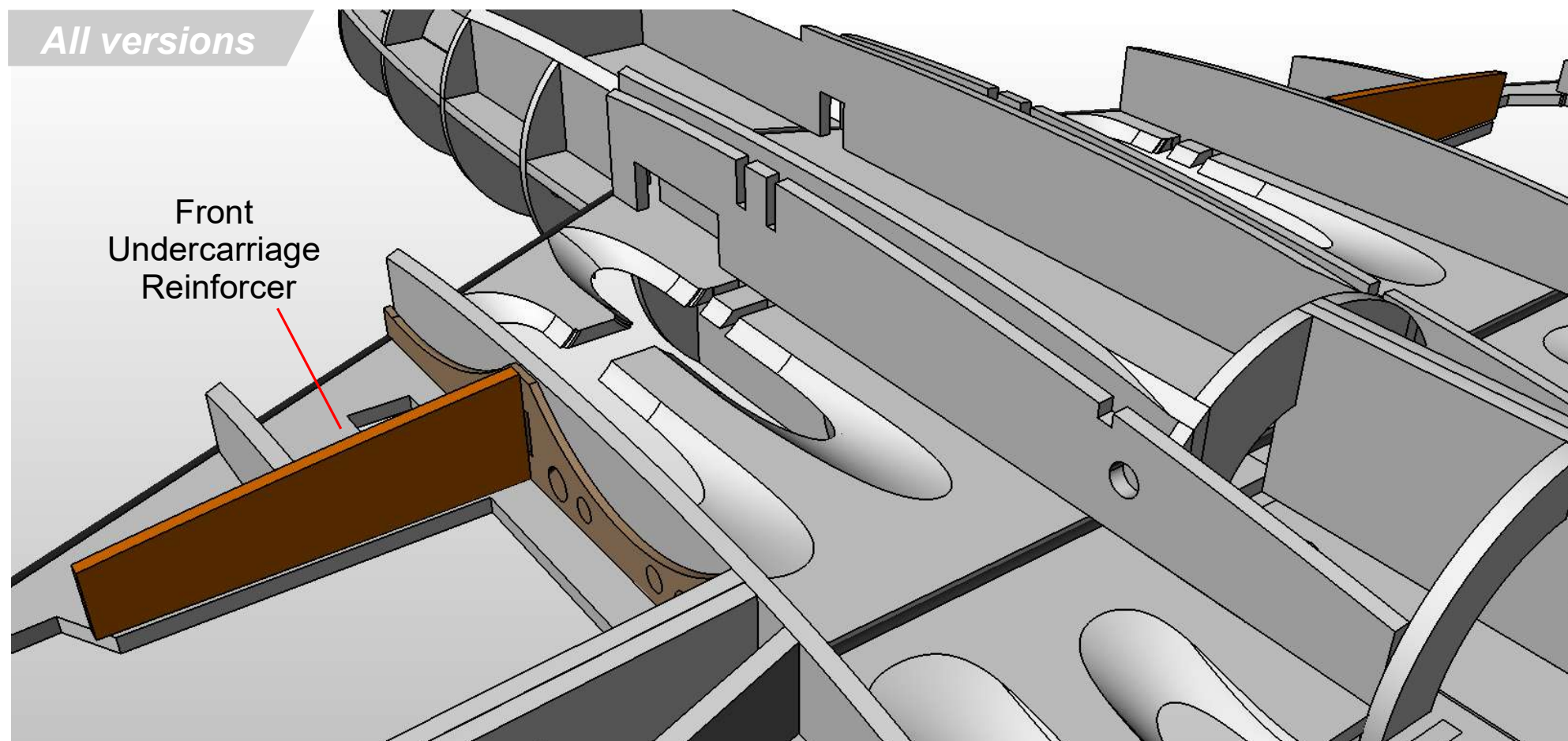
All versions



Glue the **3mm Liteply Wing Retract Inner Longitudinal Reinforcer** pieces to both wings.



All versions



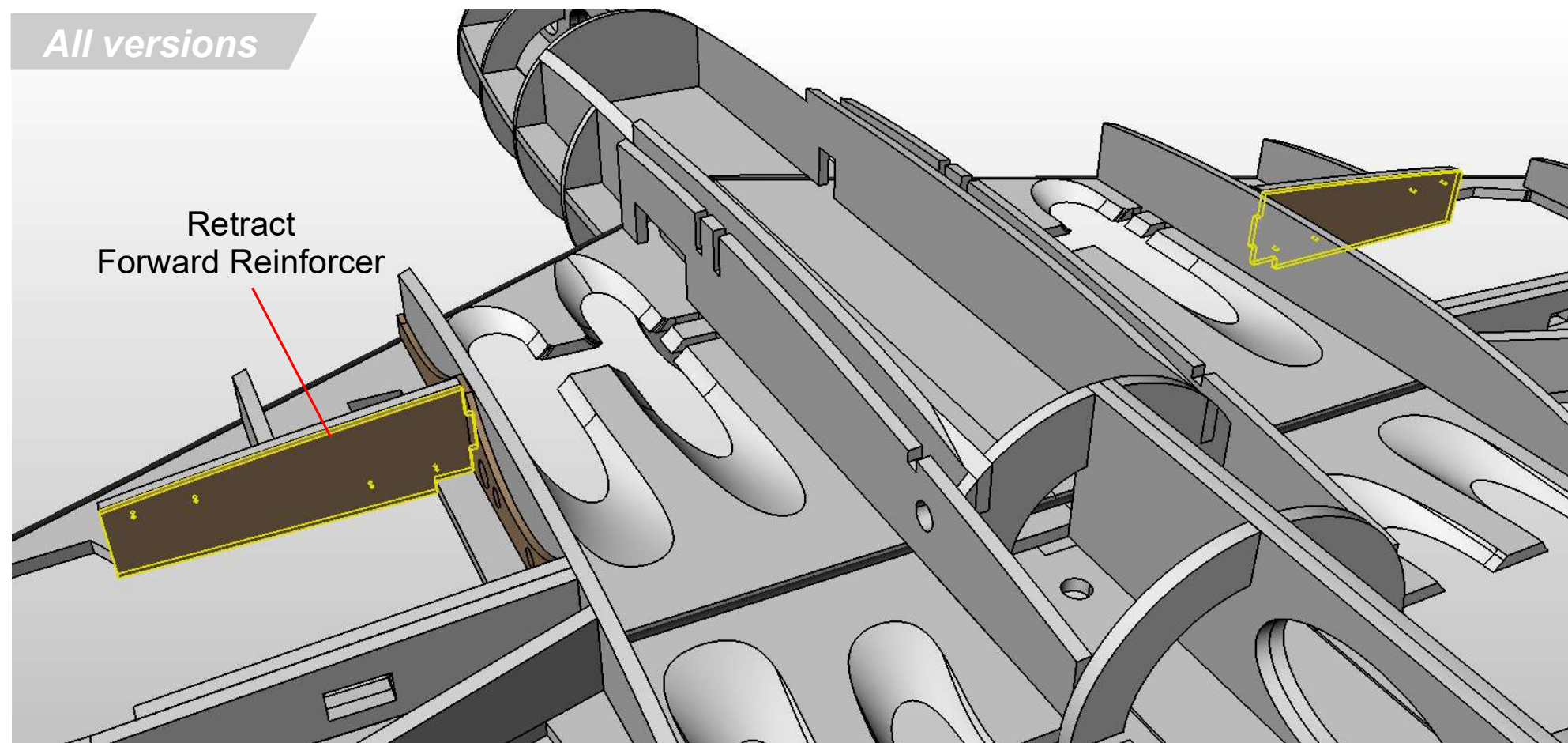
Glue the **Front Undercarriage Reinforcer** pieces to wing.



Valiant



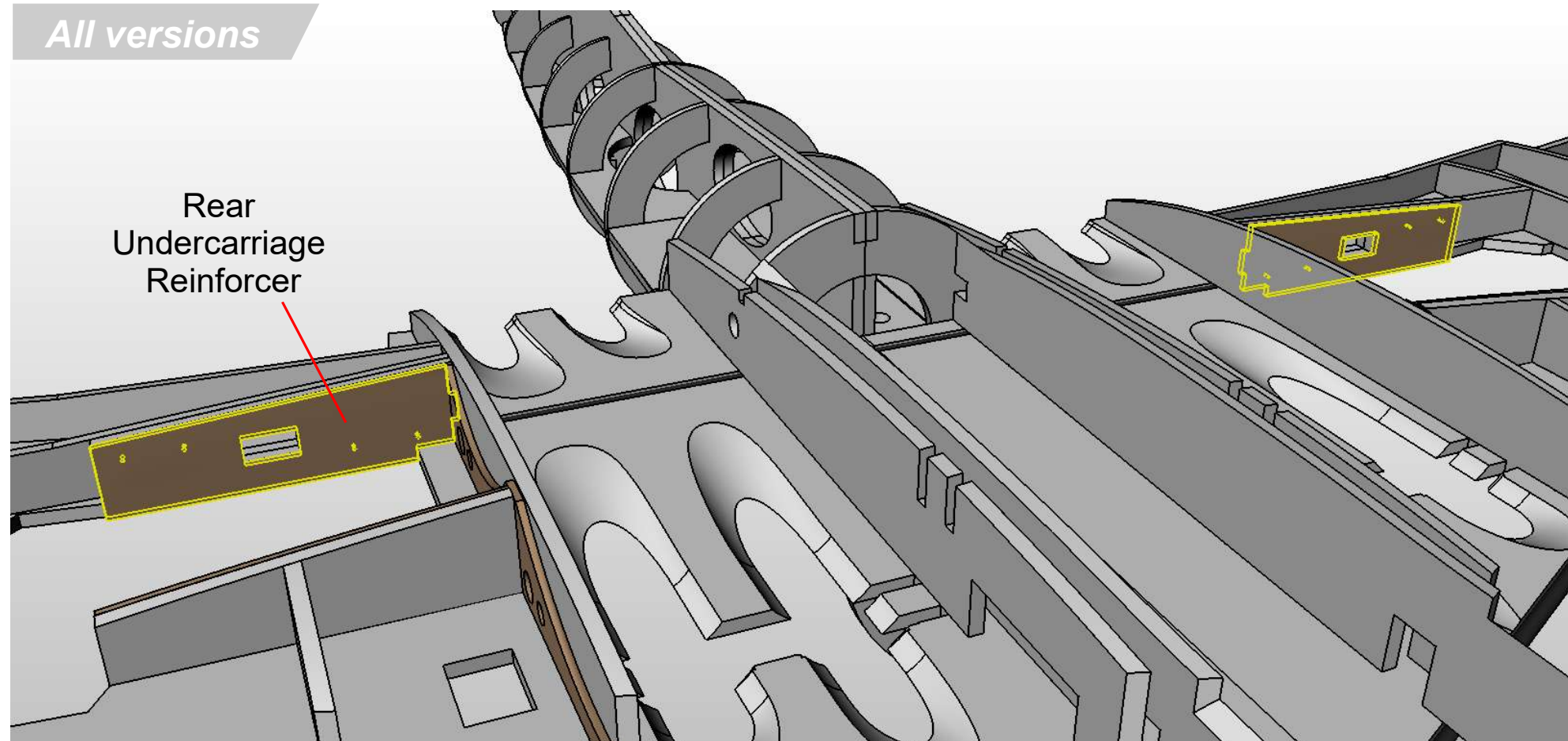
All versions



Glue the 3mm Liteply Retract Forward Reinforcer pieces to wing, ensure the tab is located within the receiving slot.



All versions



Glue the 3mm Liteply Retract Rear Reinforcer pieces to the Upper Rear Spar Reinforcers but don't glue to the fuselage **until the upper wing spar is bonded in.**

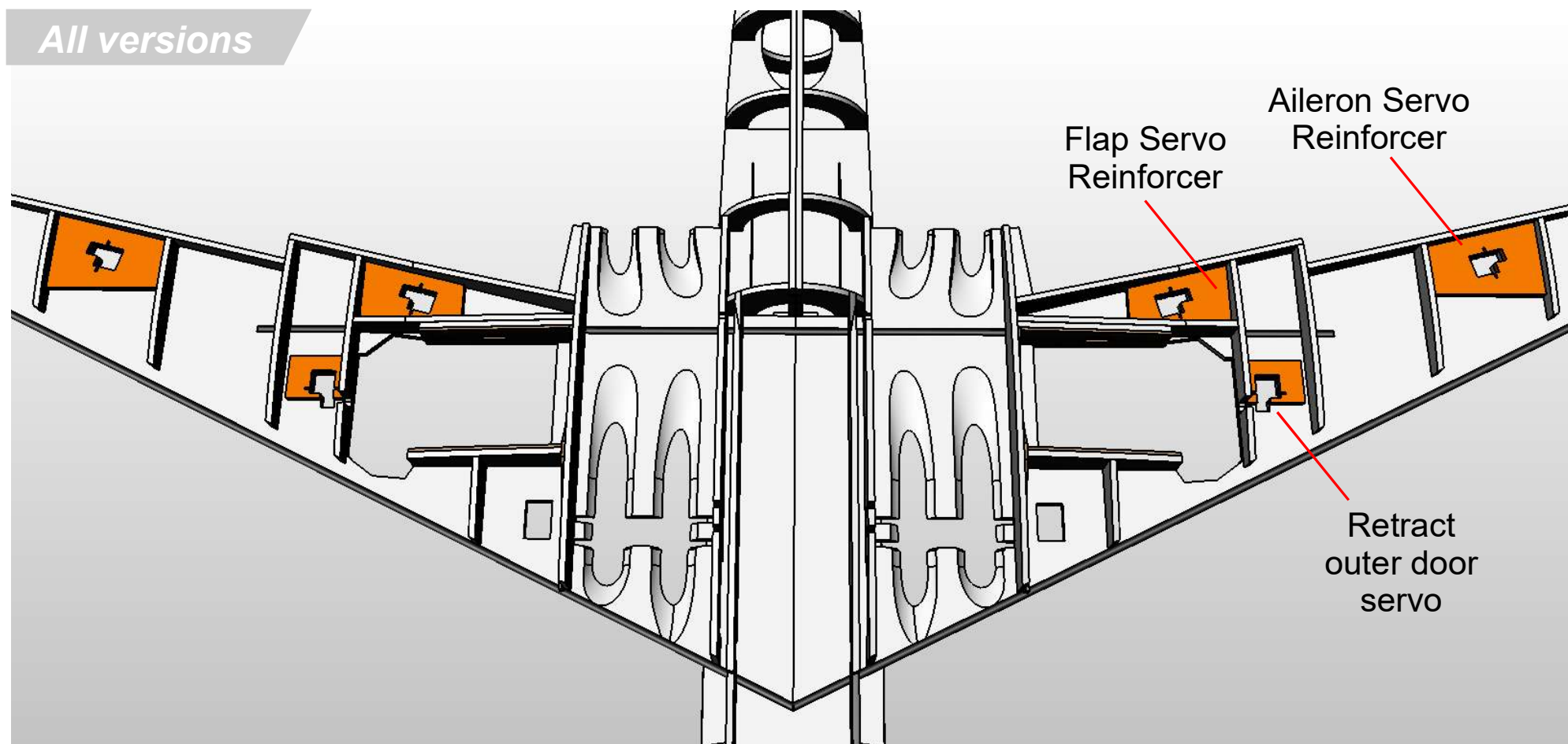
Tape in place - the tab is located within the receiving slot.



Valiant



All versions

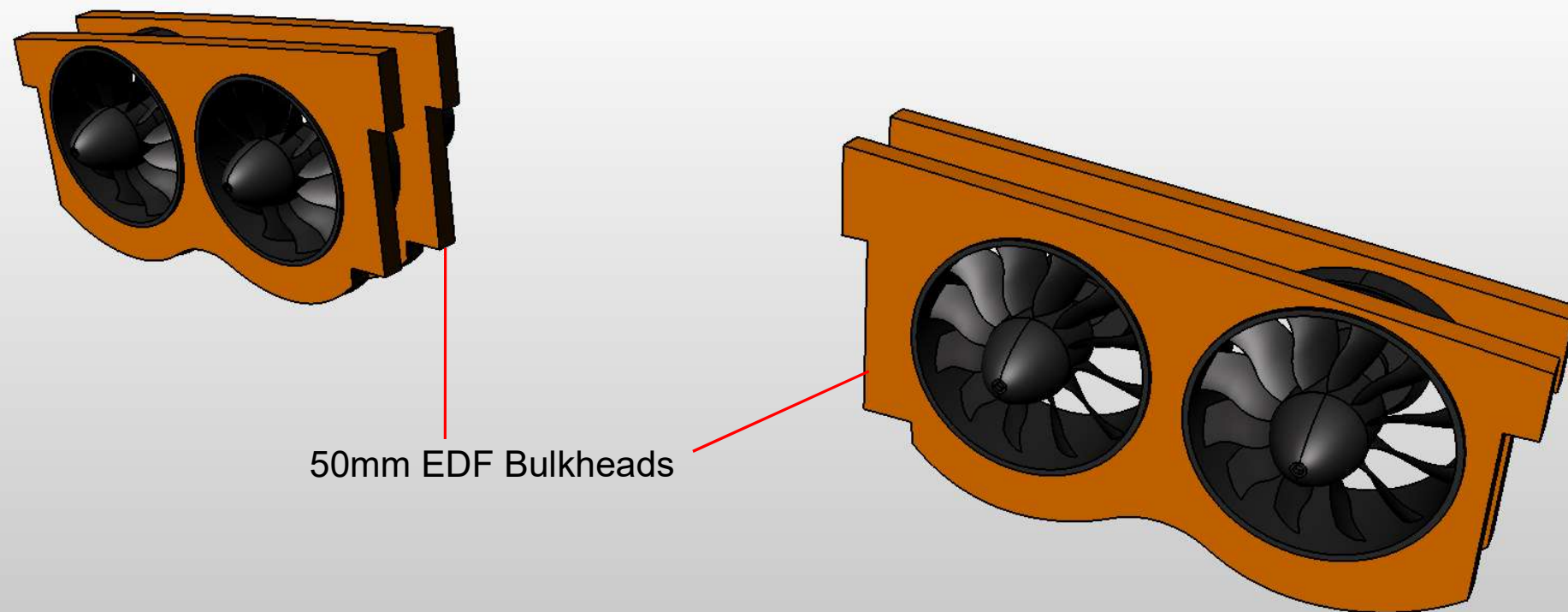


Glue the **Servo Reinforcer** pieces to the wing.



All versions

50mm EDF only



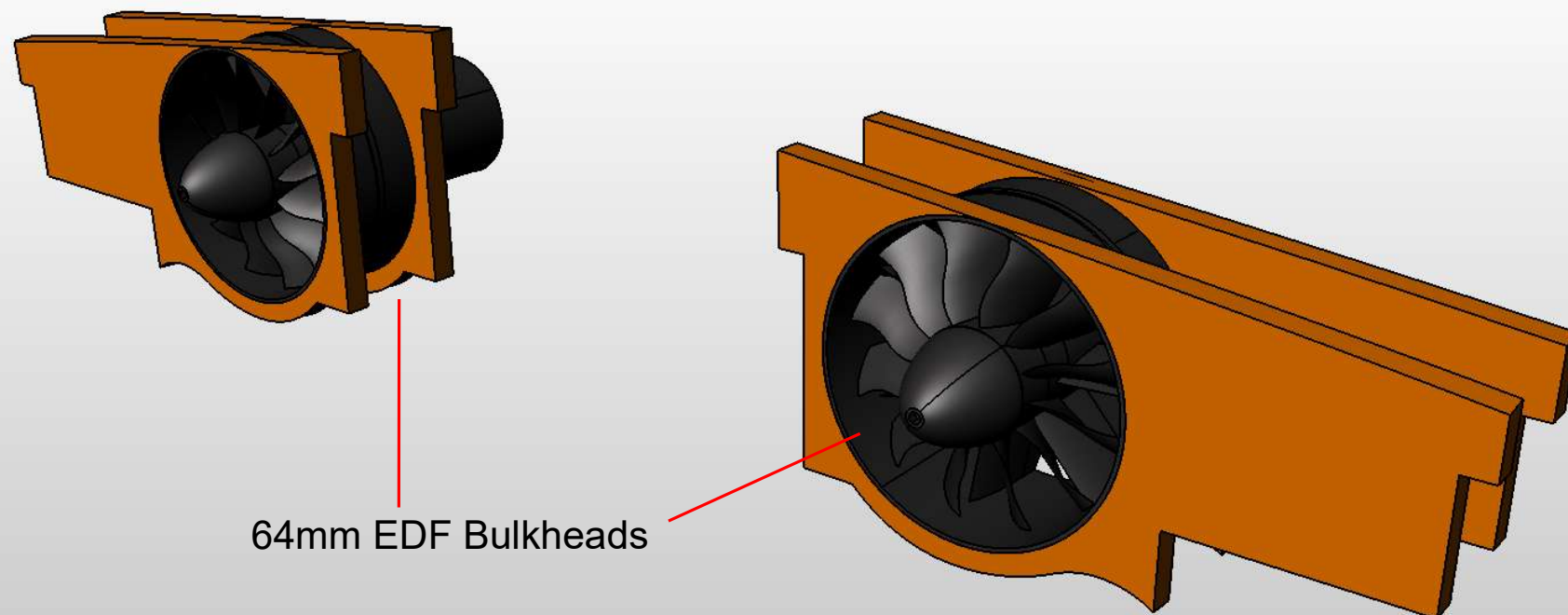
Dry fit the **50mm EDF Bulkheads** around the 4 EDF units as shown.



Valiant



64mm EDF only



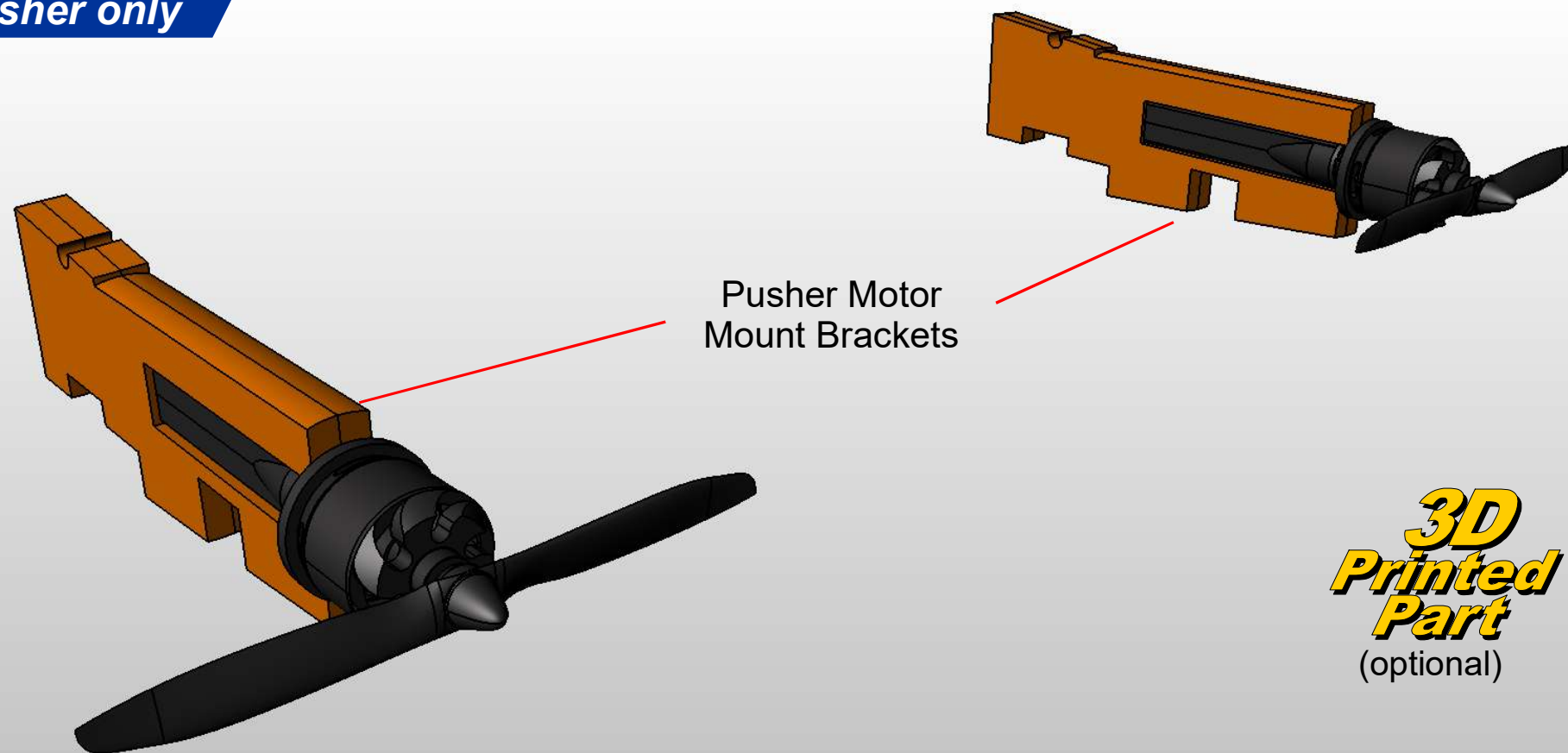
64mm EDF Bulkheads

Dry fit the **64mm EDF Bulkheads** around the 2 EDF units as shown.

Due to the tight fit of the EDF's into the wing, the bulkheads are very thin at the top and bottom. Once they are located in the wing they will provide the necessary structure.



Pusher only



Pusher Motor Mount Brackets

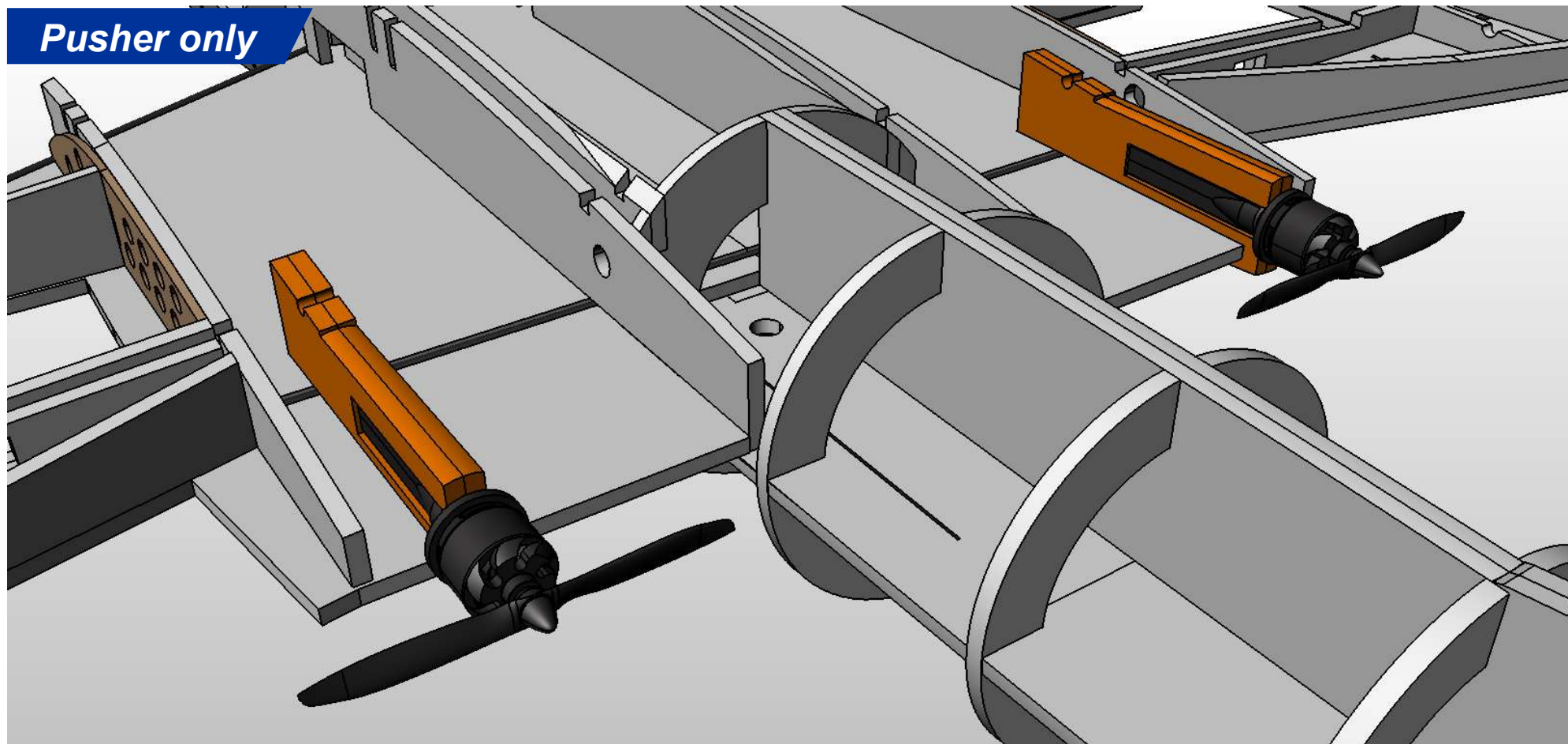
**3D
Printed
Part**
(optional)

Glue the **Pusher Motor Mount Brackets** together, then hot melt the Stick Motor mount into the slot.

Attach the motors, but leave the props off for now.



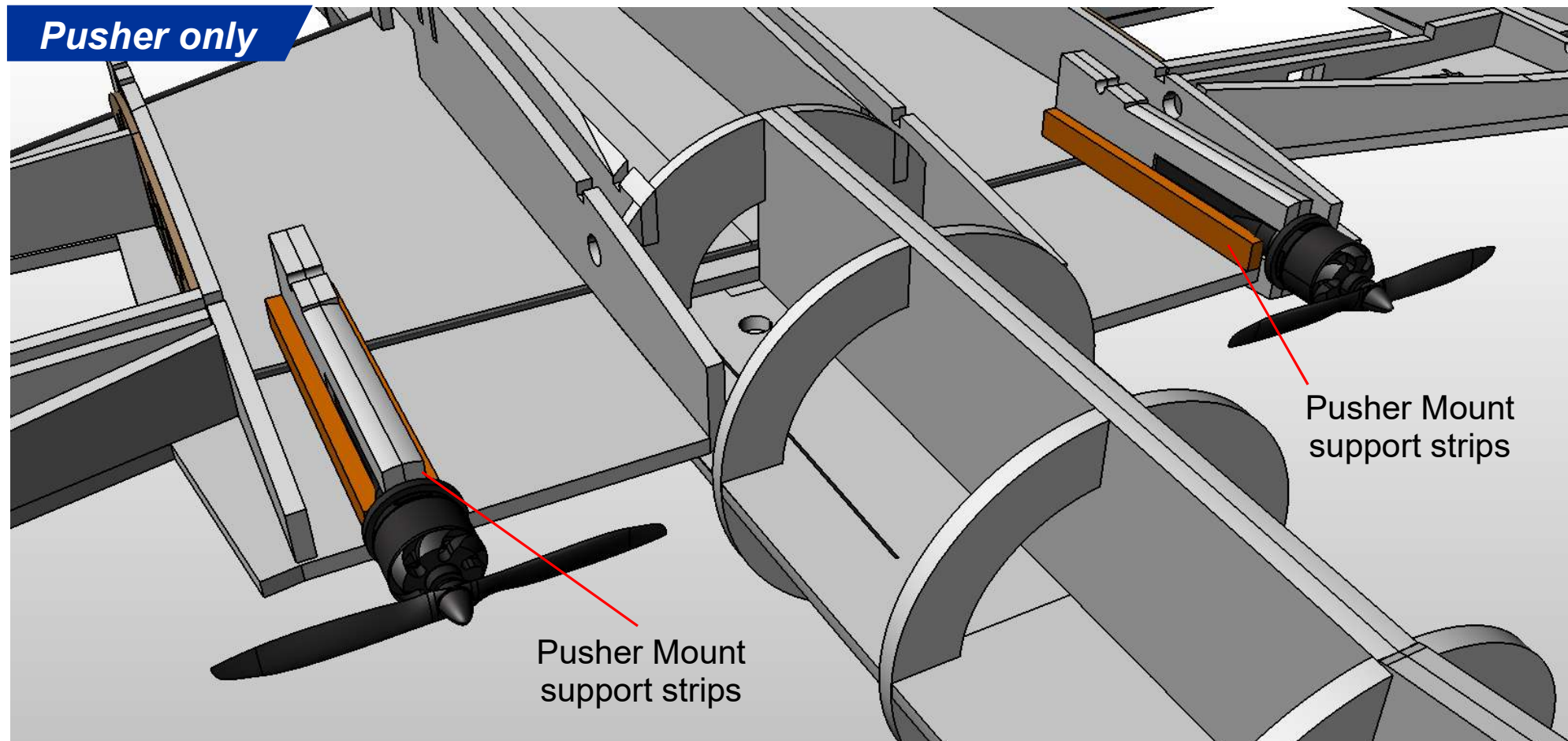
Pusher only



Glue the Pusher motor assemblies into the slots in the Wing Base.



Pusher only

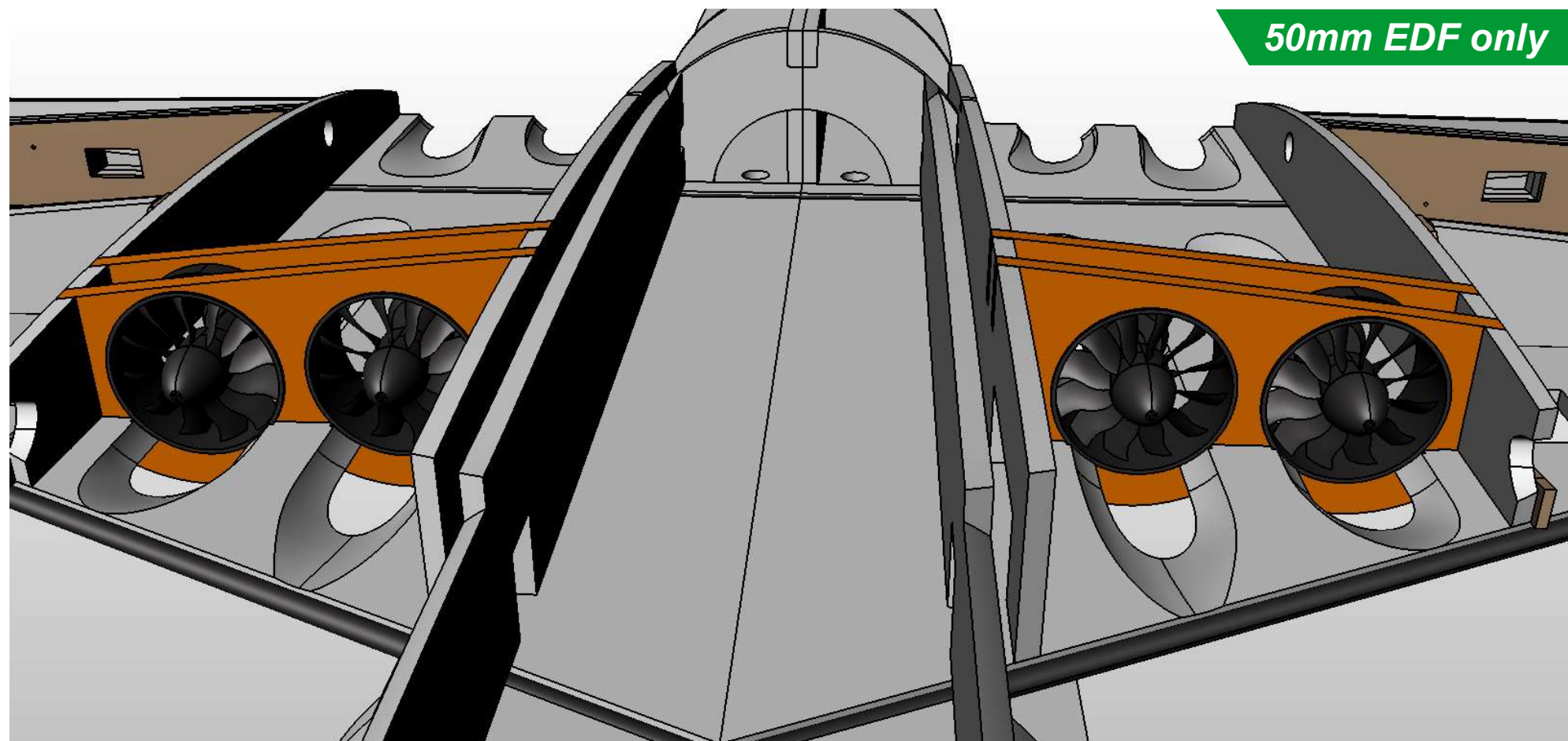


Glue the **Pusher Mount Support Strips** to the assembly.



Valiant



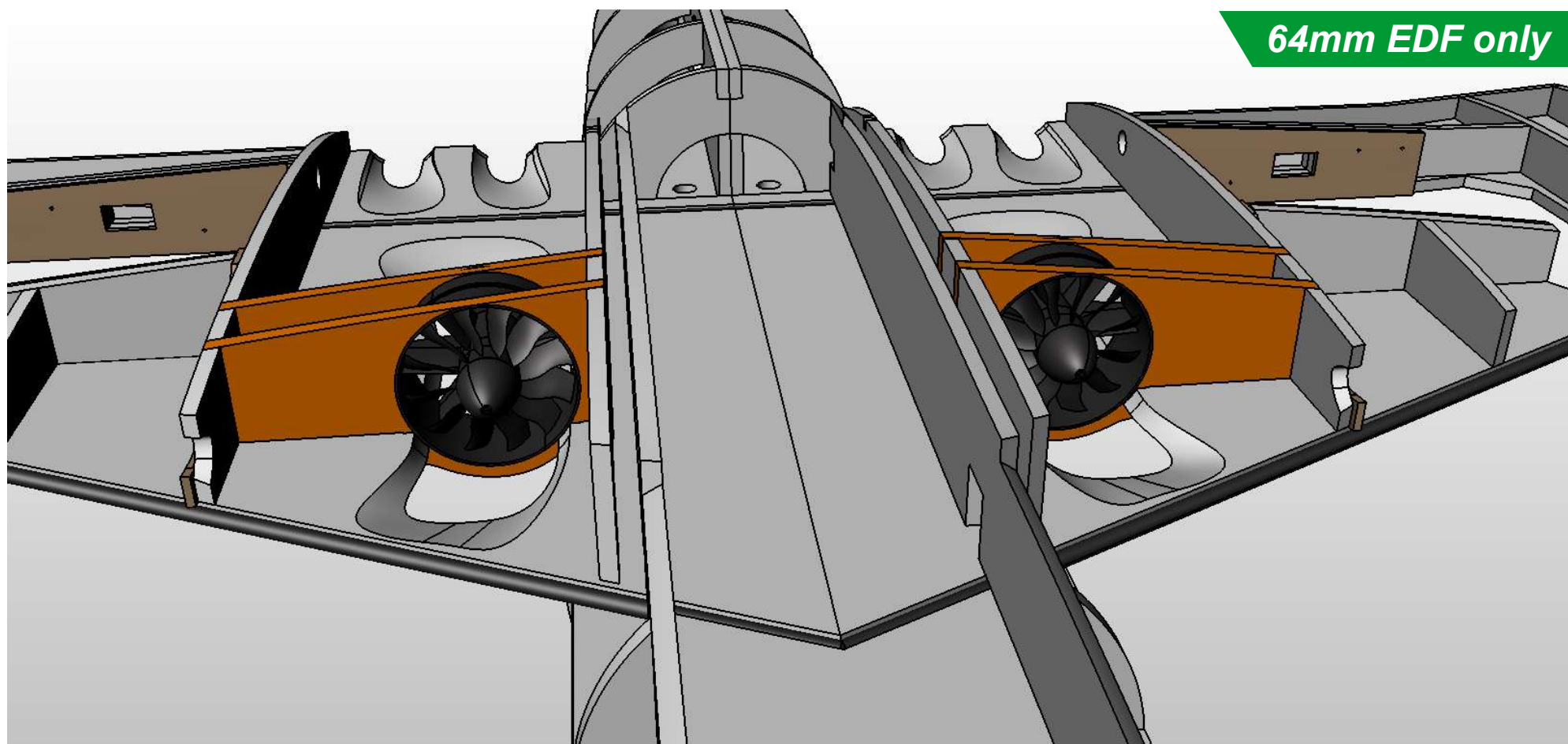


50mm EDF only

Glue the EDF assemblies into the wings using epoxy (sparingly).

Glue the EDF units to the bulkheads using hot melt glue.

Be sure to leave gaps for the 3D printed ducting lips if you are using them.



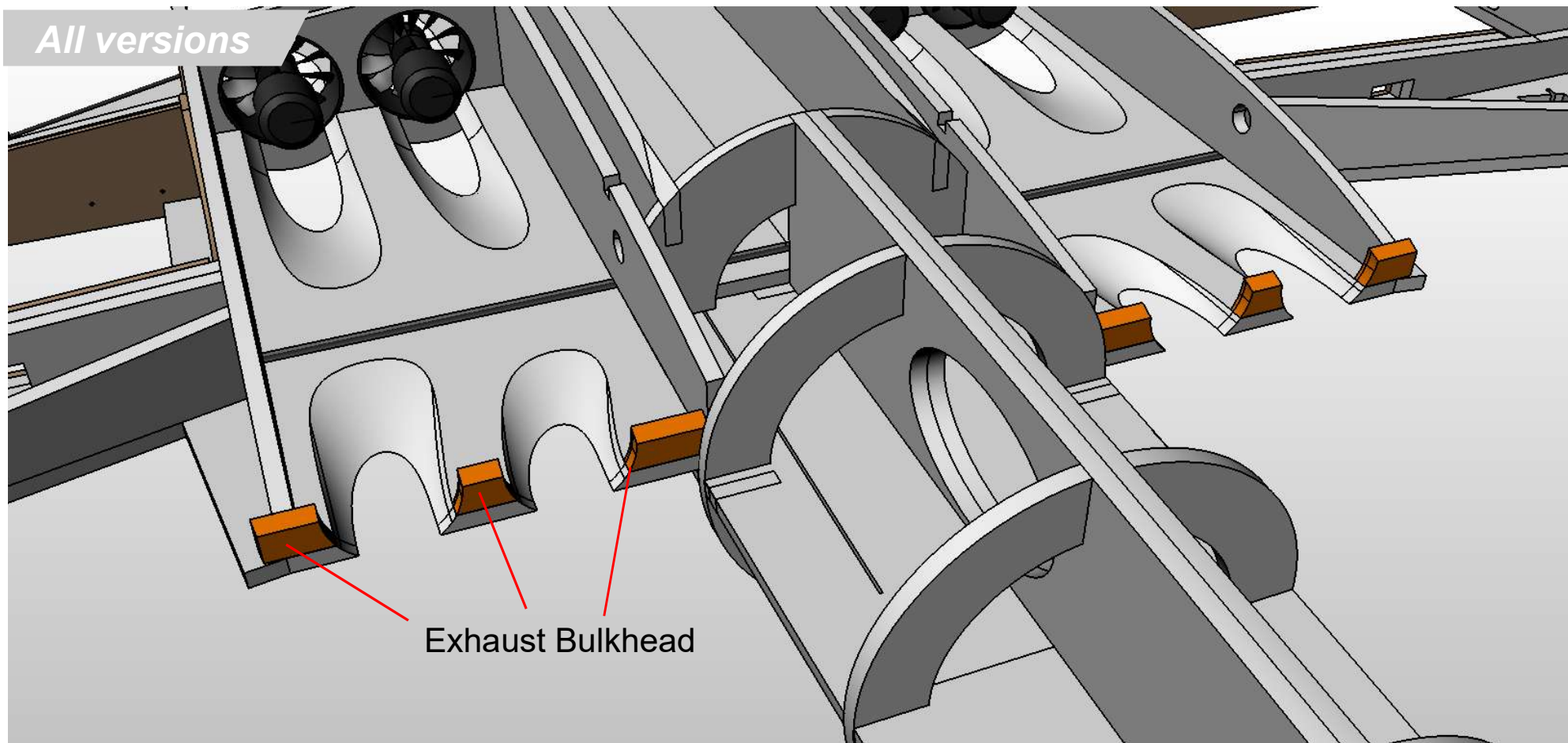
64mm EDF only



Valiant



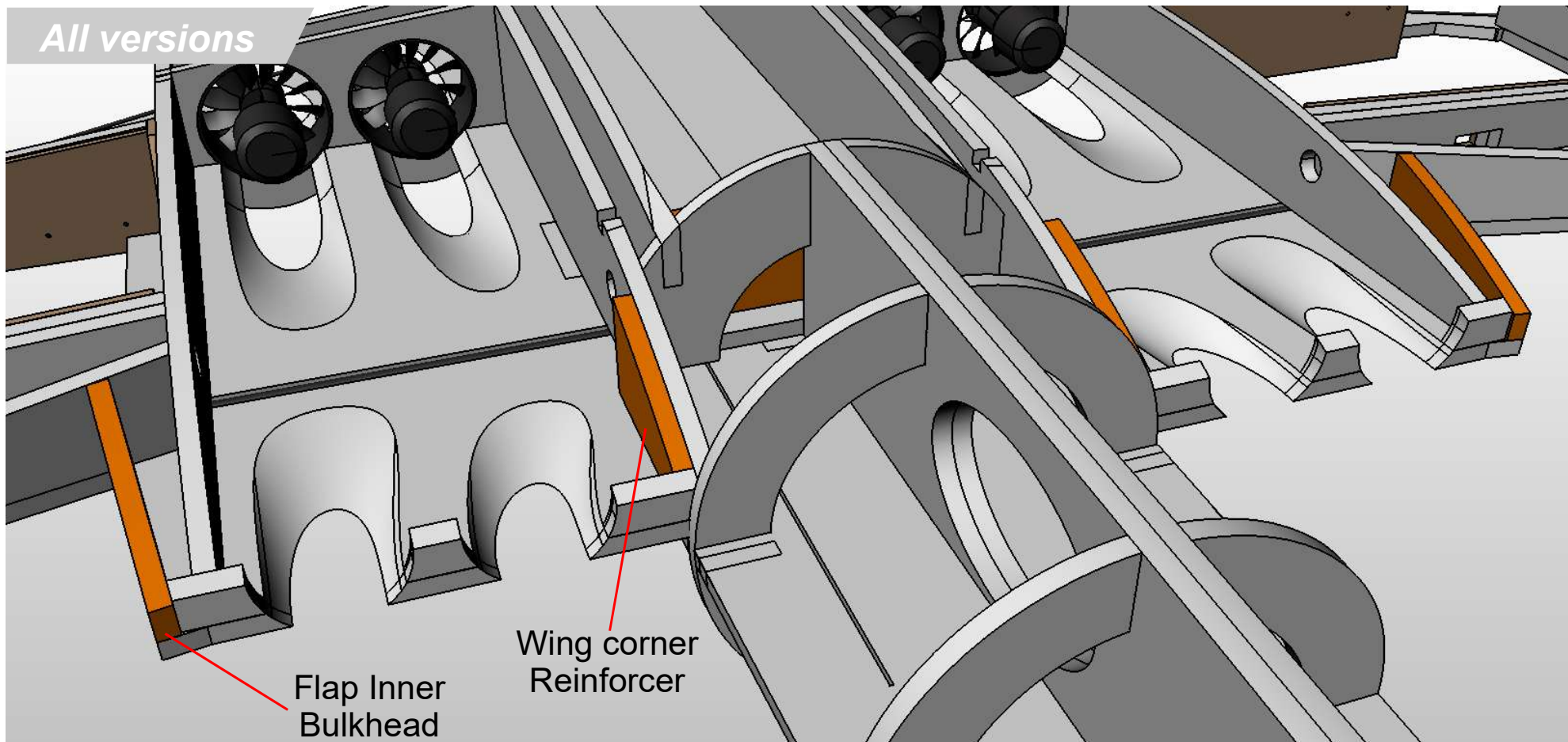
All versions



Glue the **Exhaust Bulkhead** parts in place.



All versions

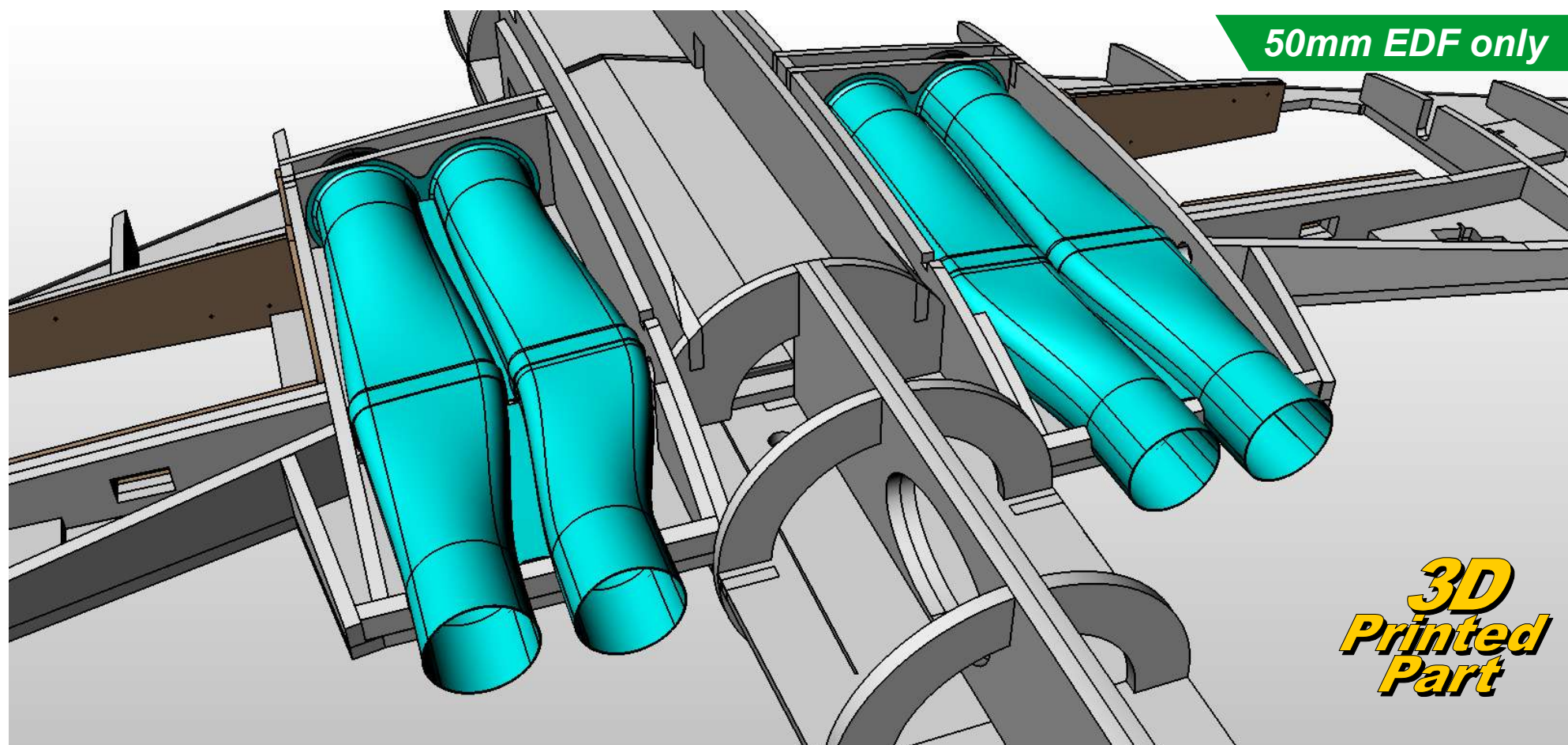


Glue the **Flap Inner Bulkhead**, and the **Wing Corner Reinforcer** parts in place.



Valiant



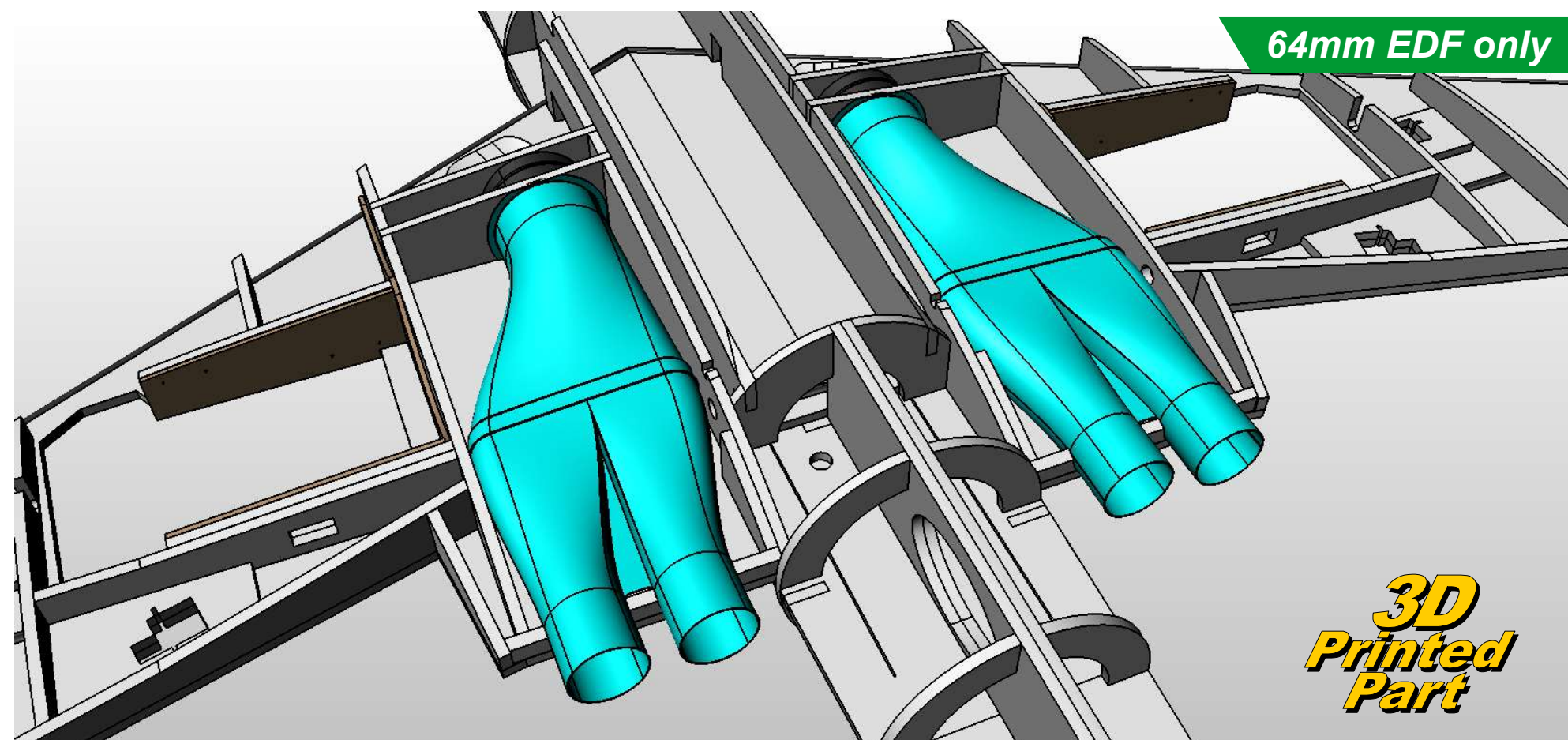


Dry Fit the pair of 3D printed parts to ensure good fitment.

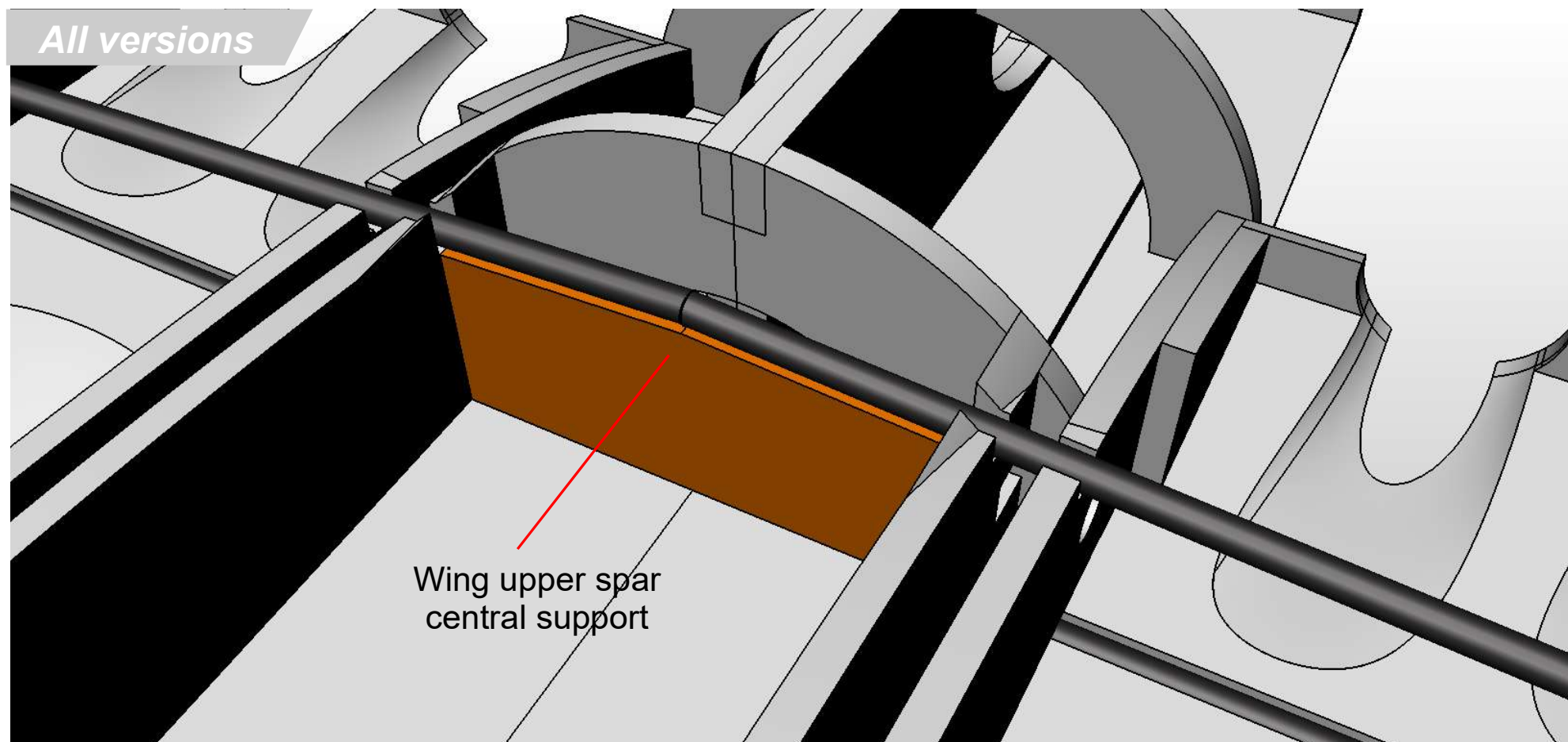
Test them in the wing, sanding away the depron if required to sit them comfortably.

Using epoxy, glue the two pieces of the thrust tubes together. do this whilst sitting vertically on the bench to ensure that they are perfectly aligned and not sagging in the middle.

Once set, glue in place with UHU por.



All versions

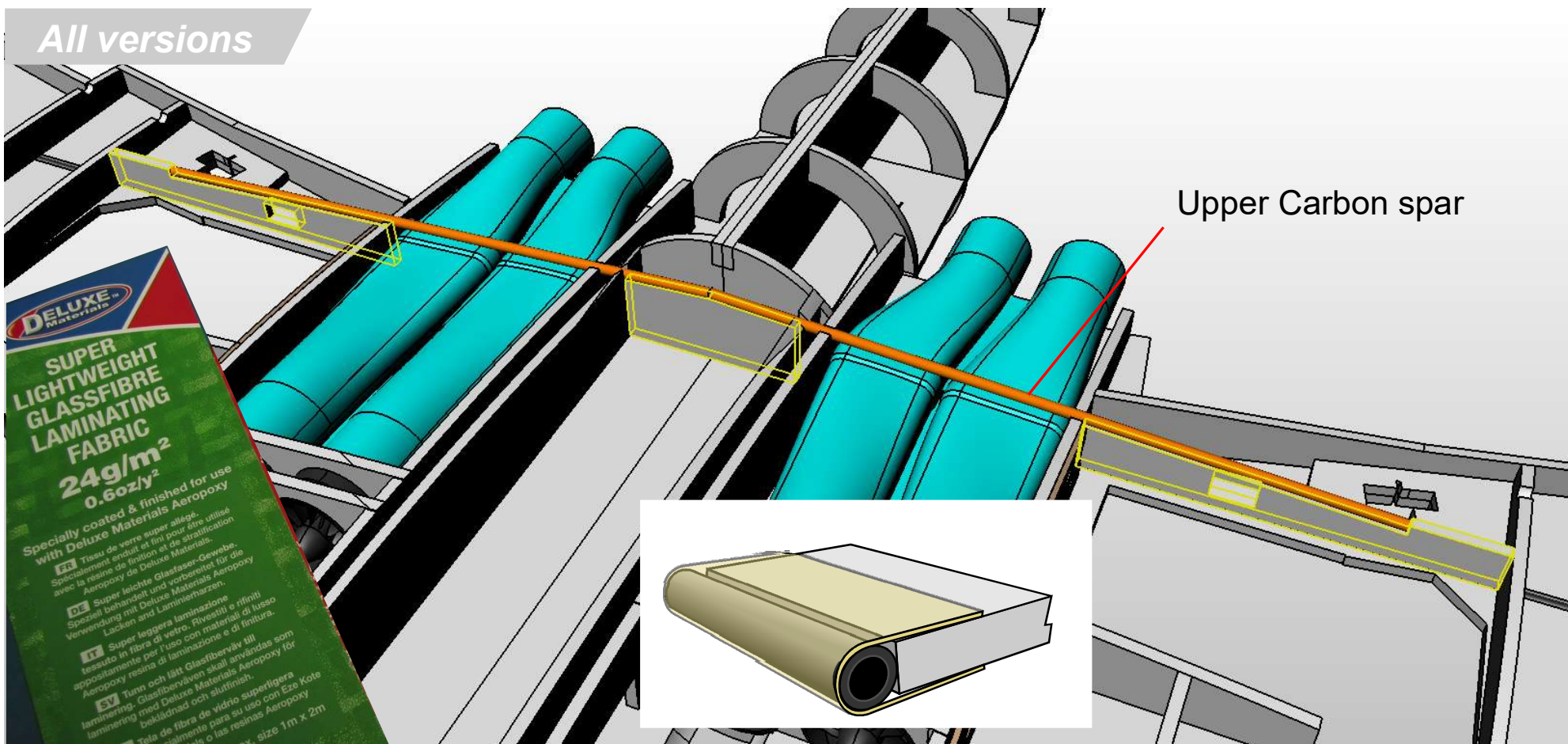


Wing upper spar
central support

Glue the **Wing upper spar central support** over the top of the spar in the wing base.



All versions



Upper Carbon spar

Using epoxy, glue the two pieces of the carbon 6mm tube upper wing spar to the highlighted pieces as shown.

Use WBPU to fibreglass them together.

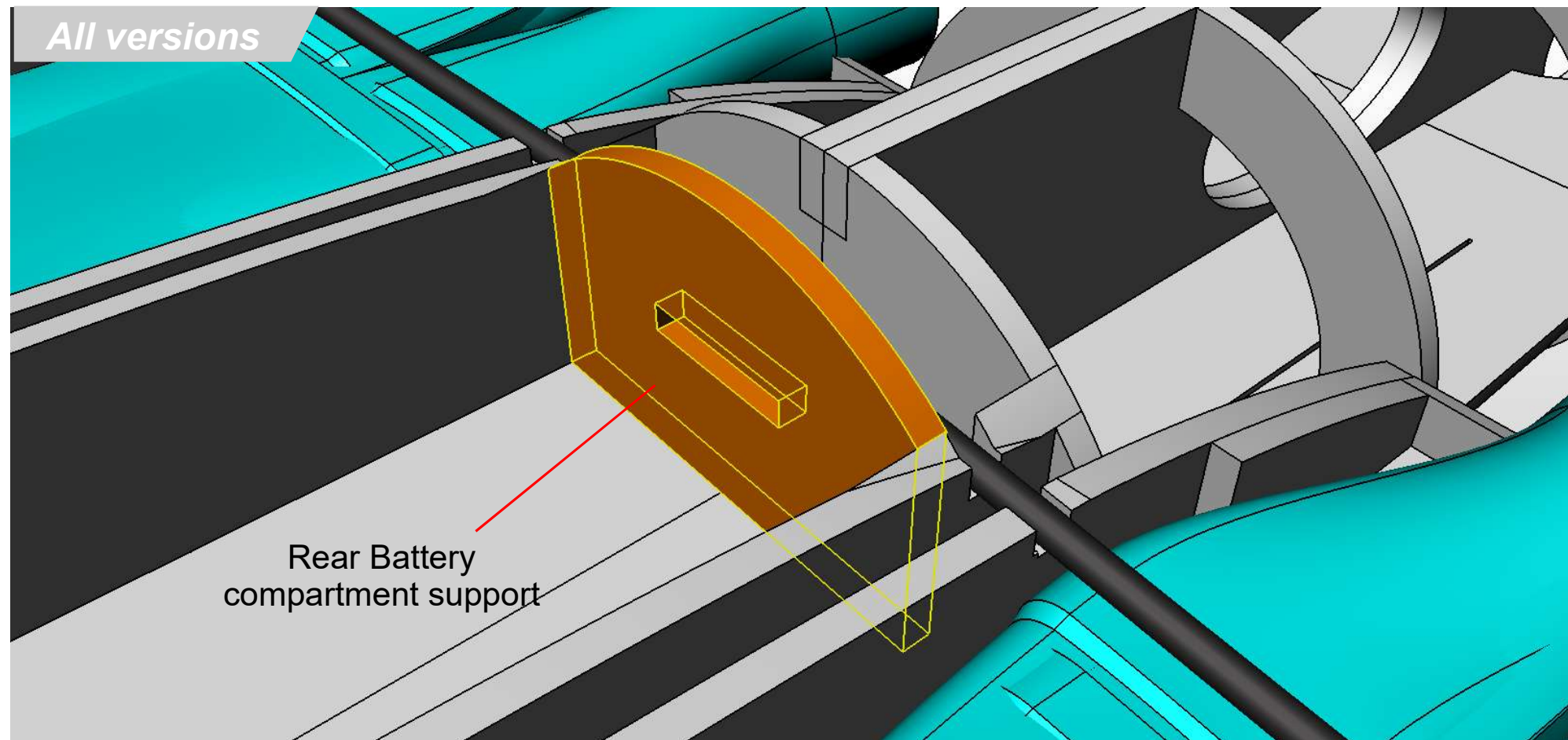
Once set, **glue the Upper Rear Spar Reinforcers in place** (not shown) that were taped in place previously - use UHU por.



Valiant



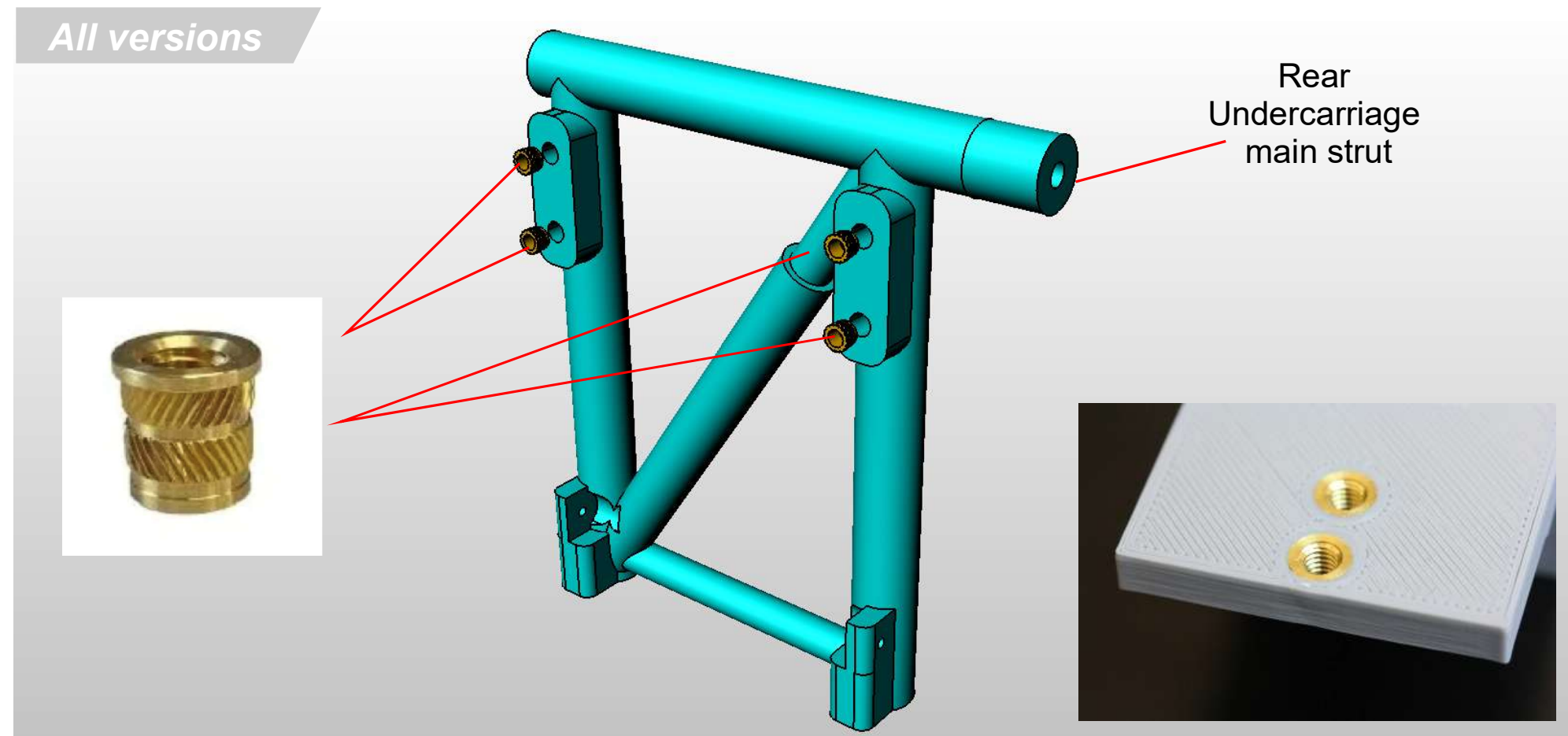
All versions



Glue the **Rear Battery compartment support** against the spar support bulkhead.



All versions



Use 4 x Brass M3 Threaded inserts for 3D printing and fit into the holes in the **Rear Undercarriage Main Strut** provided using a soldering iron to heat them up.

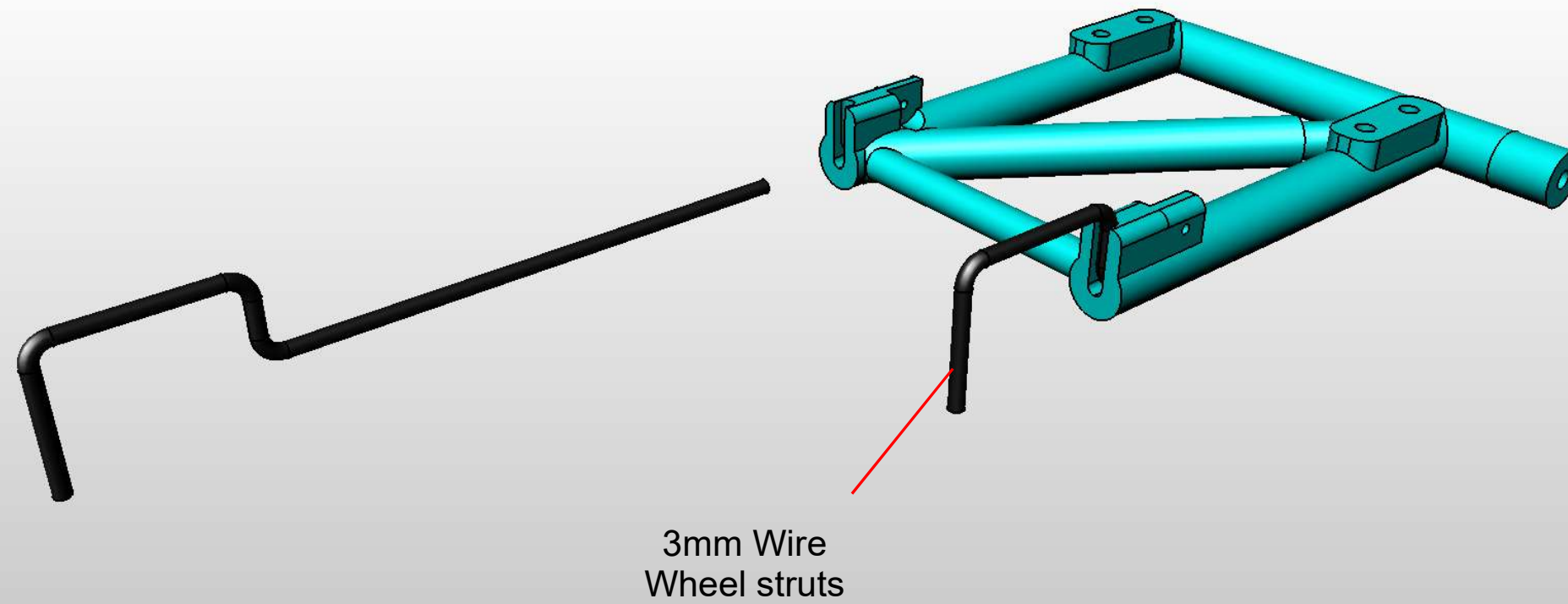
If you haven't done this before I recommend watching videos on the subject and practicing on scrap parts beforehand.

**3D
Printed
Part**

Valiant



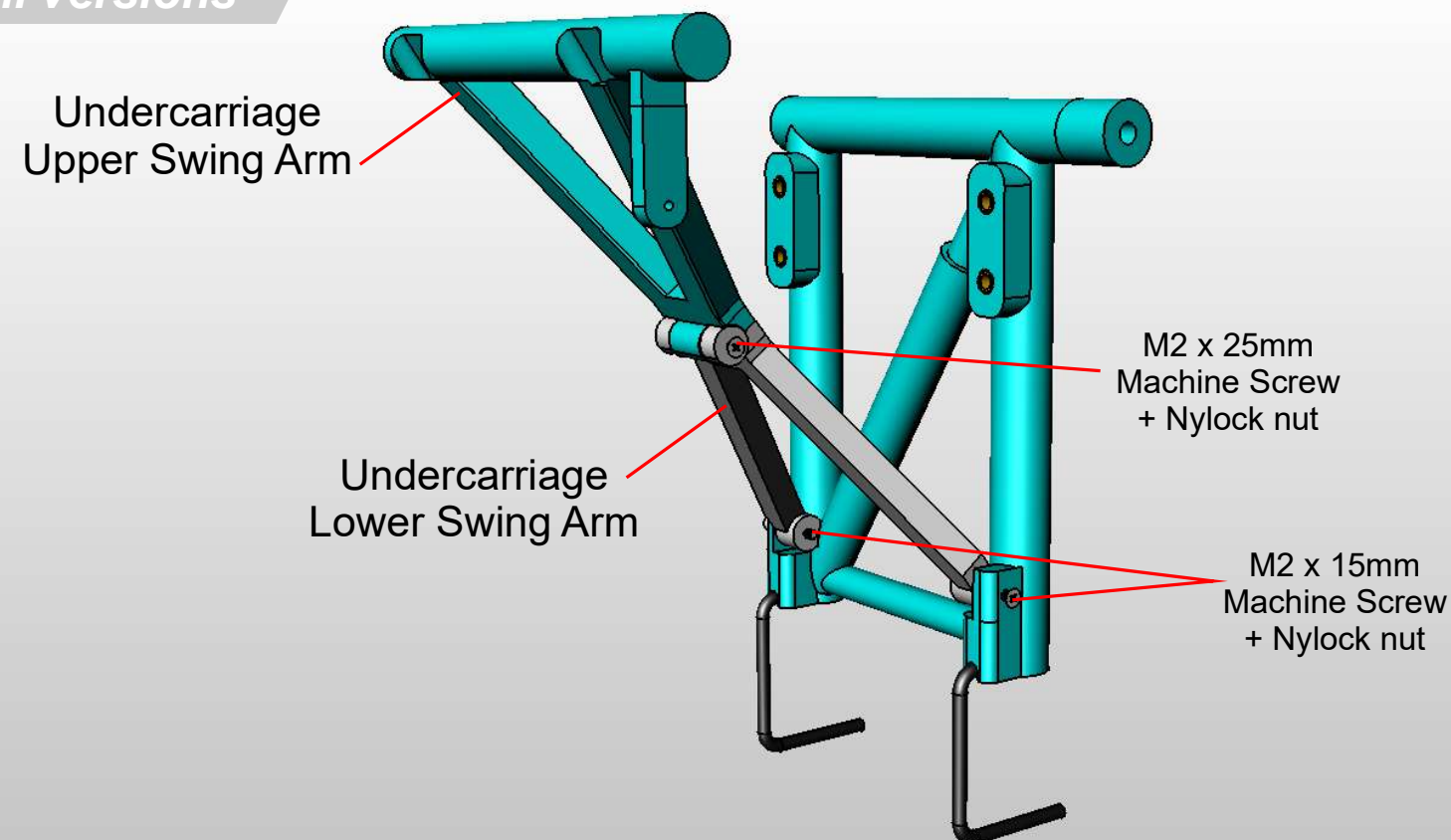
All versions



Make the Wheel struts. Carefully bend 3mm wire to match the shape of the plans. Be as precise as possible.

Use 3mm Grub screws to retain them in place within the Main Strut.

All versions



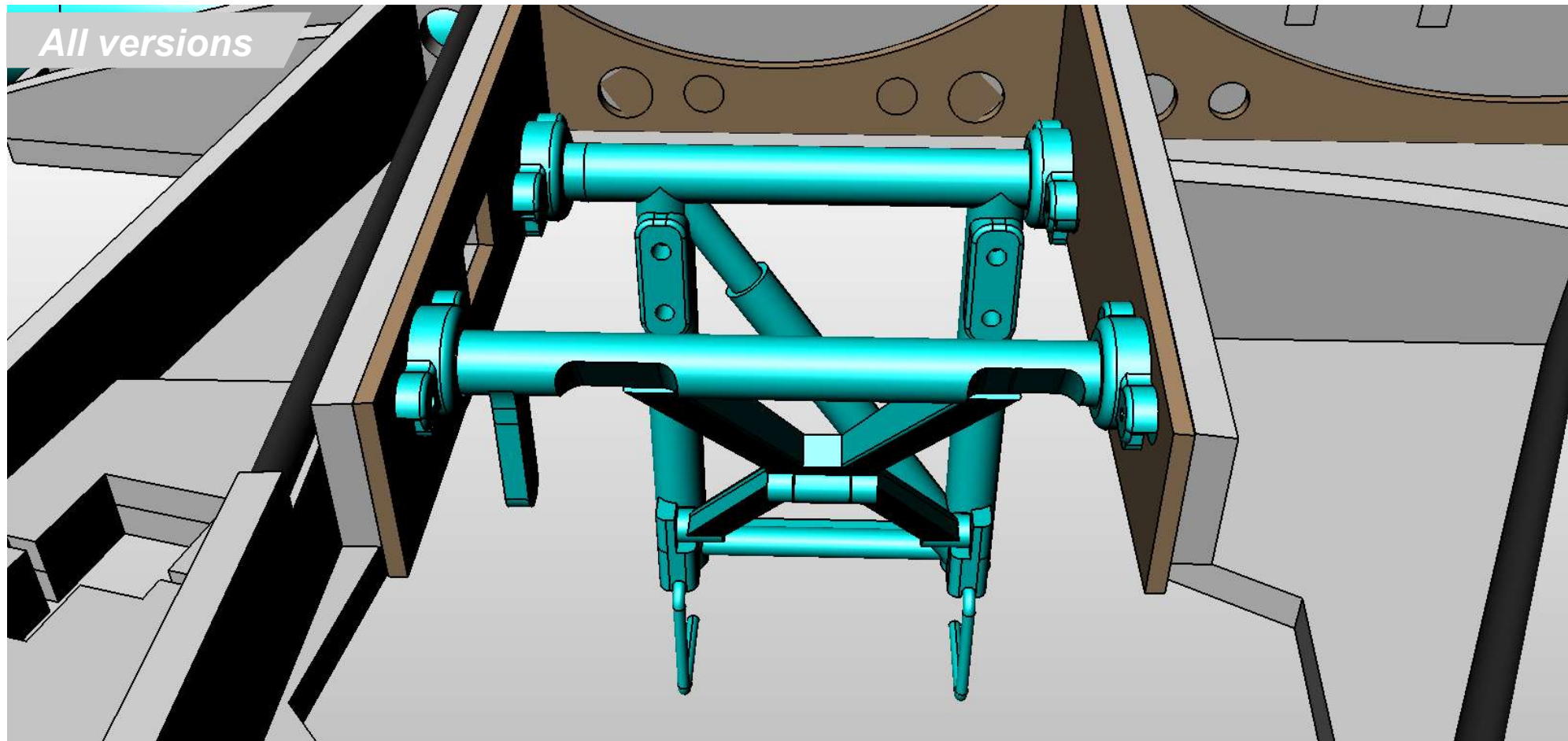
Fix the Upper and Lower Swing arm together and then to the Main Undercarriage Strut.

Ensure a smooth operation.

**3D
Printed
Part**



All versions

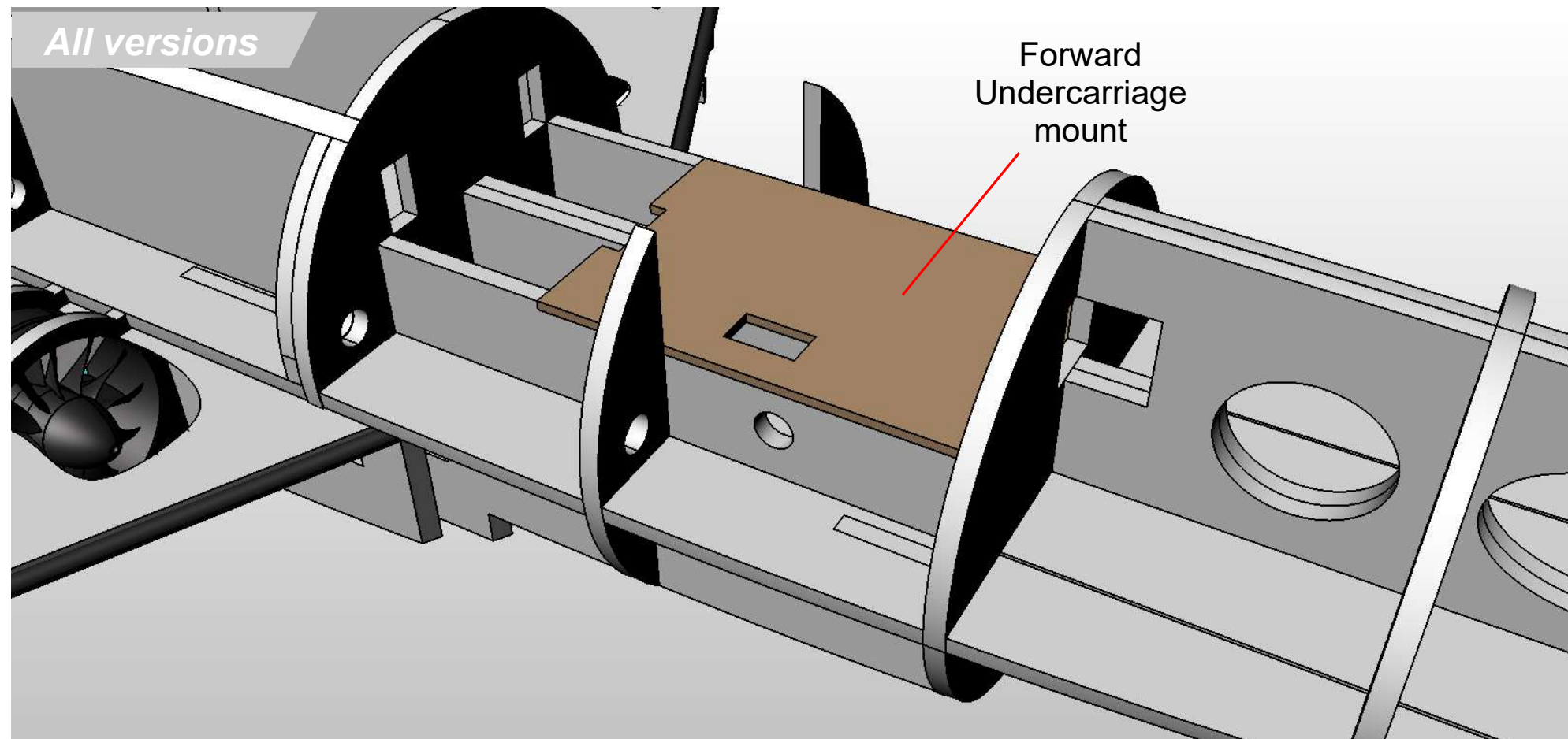


Use White lithium, PTFE, or silicone based grease as a lubricant and slot the Undercarriage into the bushings.

Screw the bushings to the Wings, using woodscrews



All versions



You might want to add extra 3mm liteply pads on the hidden side of the 3mm Liteply **Forward Undercarriage mount** to reinforce the retract screws. (see next step).

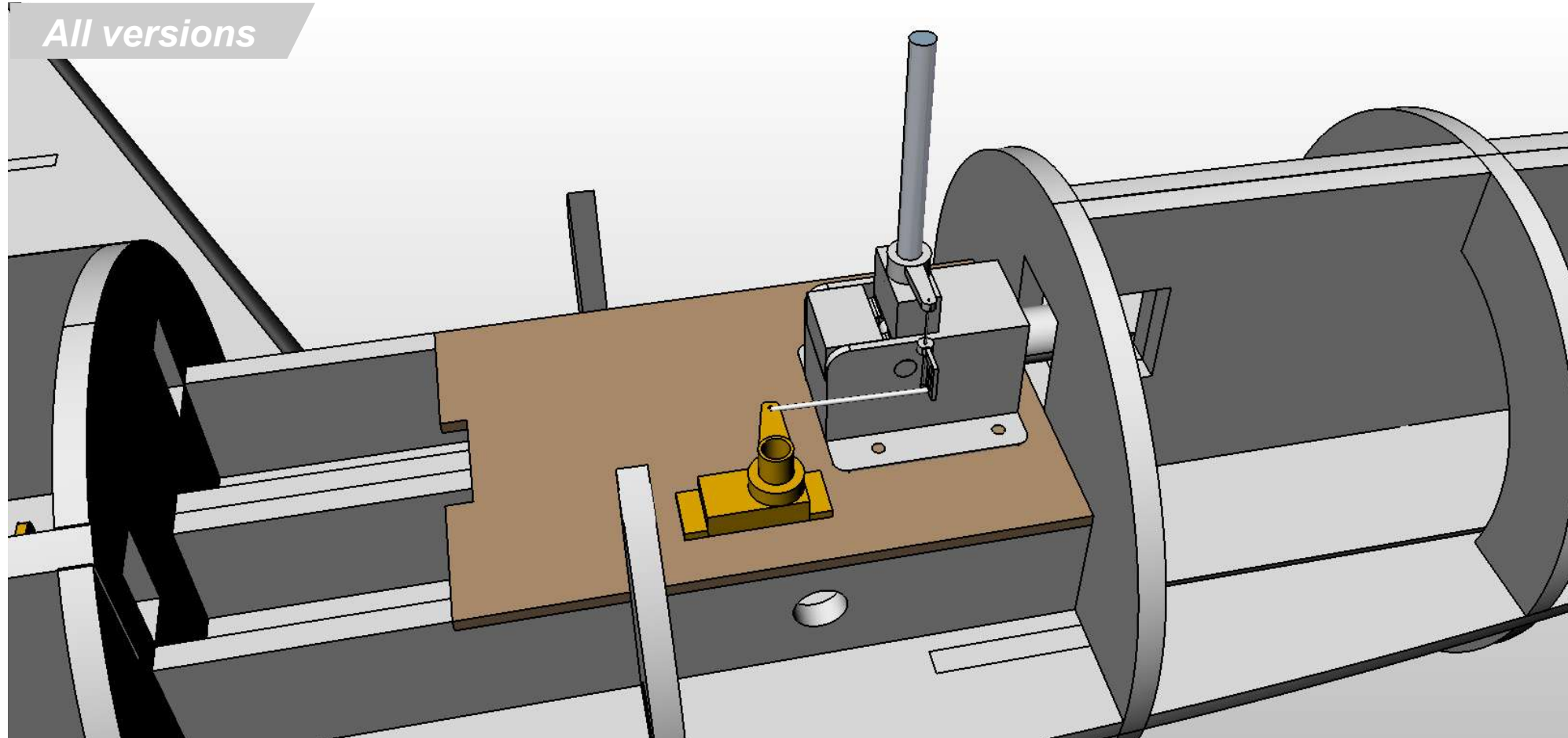
Glue the to the underside of the fuselage.



Valiant



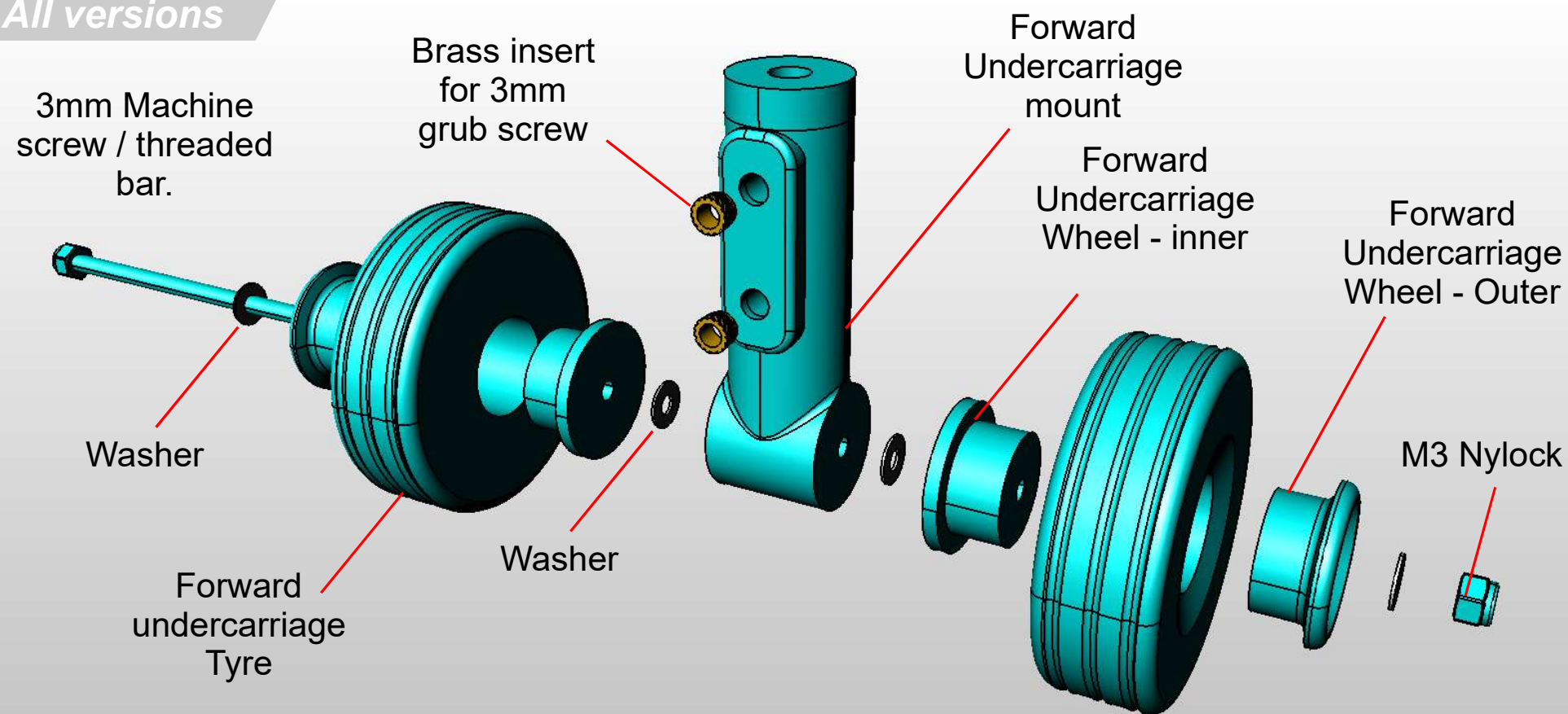
All versions



Fit the forward undercarriage retract so that the shaft aligns with the plans.

Connect the steering servo.

All versions



Print the Tyres in TPU filament.

Assemble the Forward Undercarriage as shown. Don't overtighten so that the nut so that wheels spin freely.

Use M3 Grub screws to attach to the retract spindle.

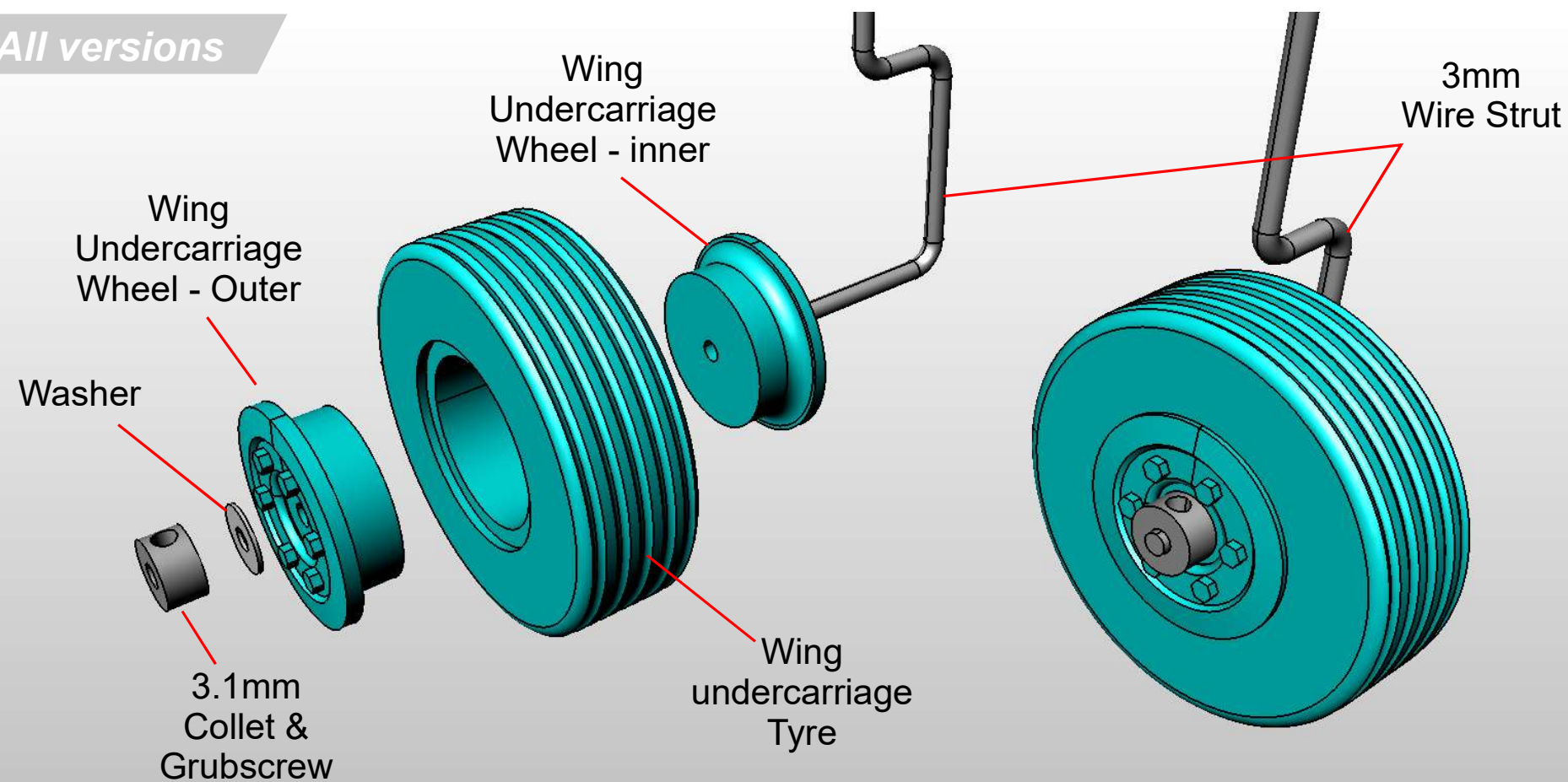
Grind a flat onto the spindle if necessary.

**3D
Printed
Part**

Valiant



All versions



Print the Tyres in TPU filament.

Assemble the Wing Undercarriage as shown. Don't overtighten the collet so that wheels spin freely.

Use M3 Grub screws to attach to the retract spindle.

Grind a flat onto the spindle if necessary.



All versions

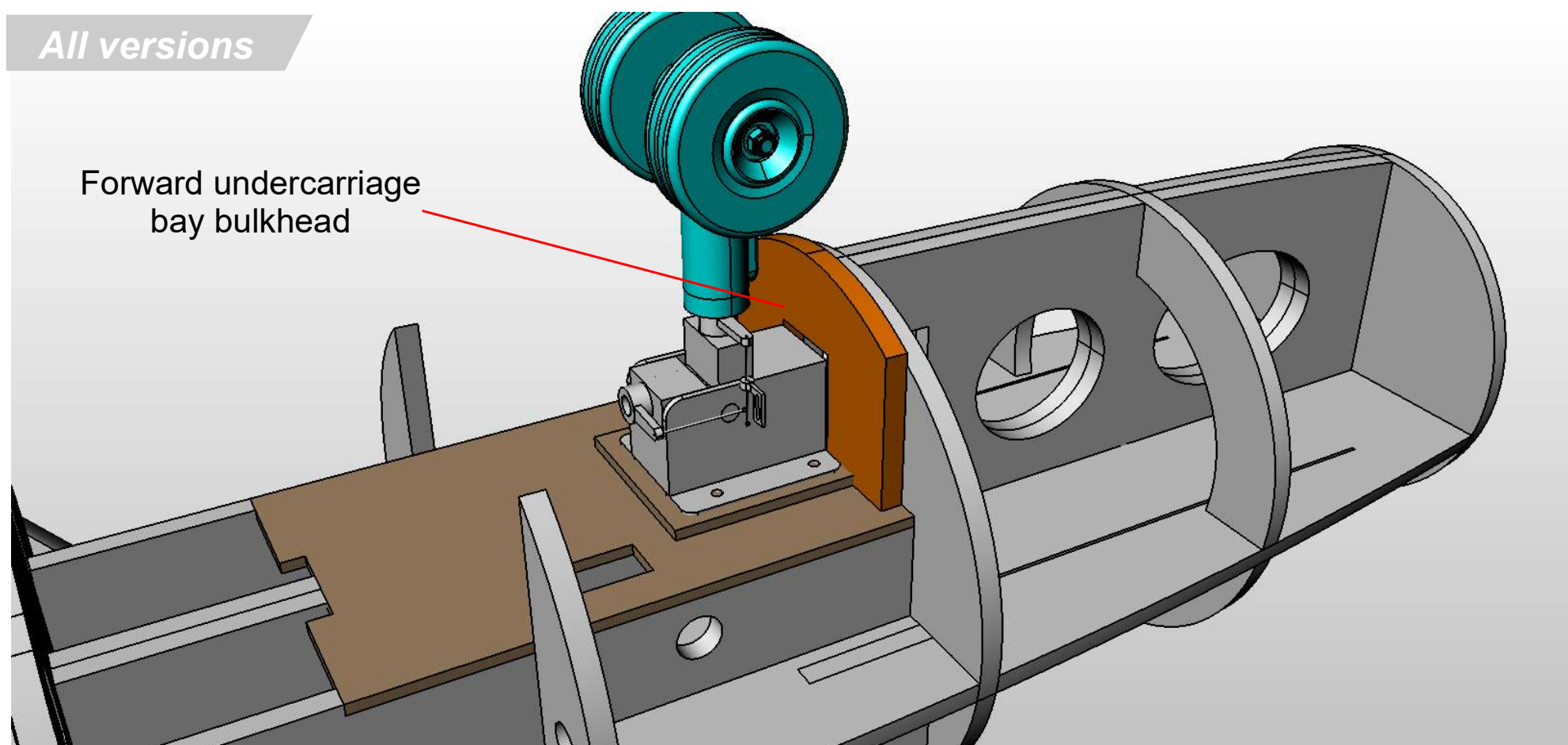


Alternately use off-the-shelf wheels. Choose 55mm and 45mm Diameter wheels.

Please note :
The 55mm wing wheels, cannot be wider than 18mm or the undercarriage doors will not close. Please also note that the collet may also collide.



All versions

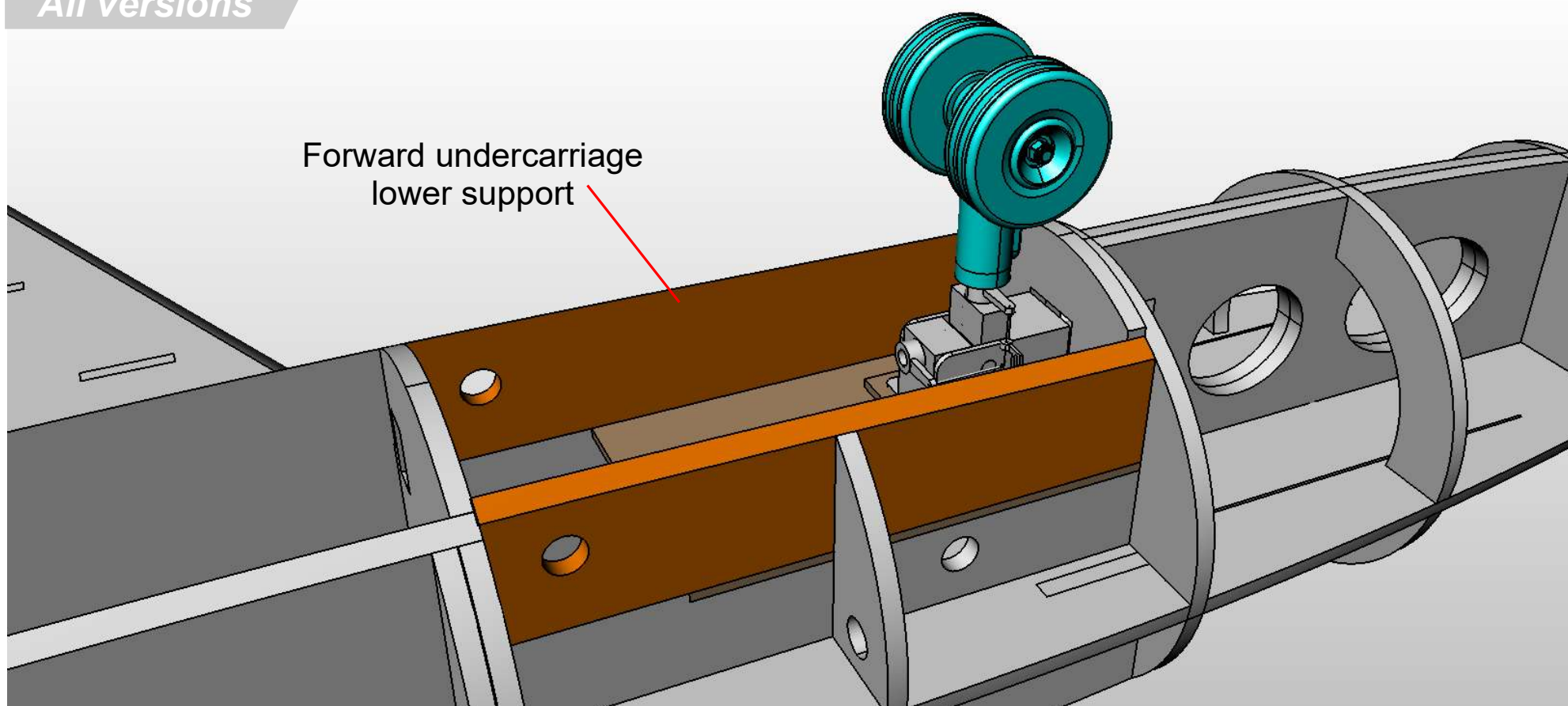


Glue the **Forward Undercarriage Bay Bulkhead** in place.

Note: It sits 3mm proud of bulkhead 3



All versions



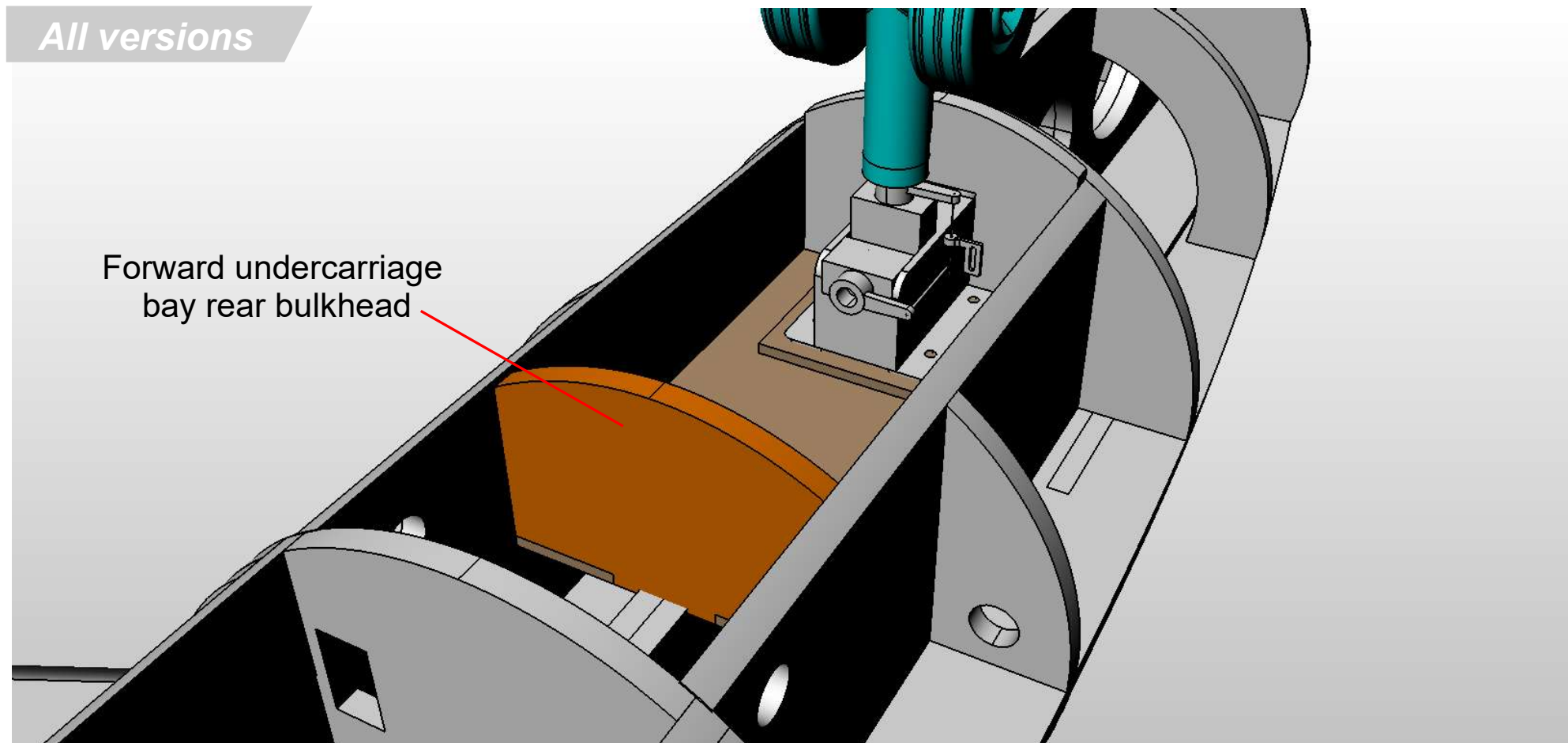
Glue the two **Forward Undercarriage Lower Support** pieces to the fuselage.



Valiant



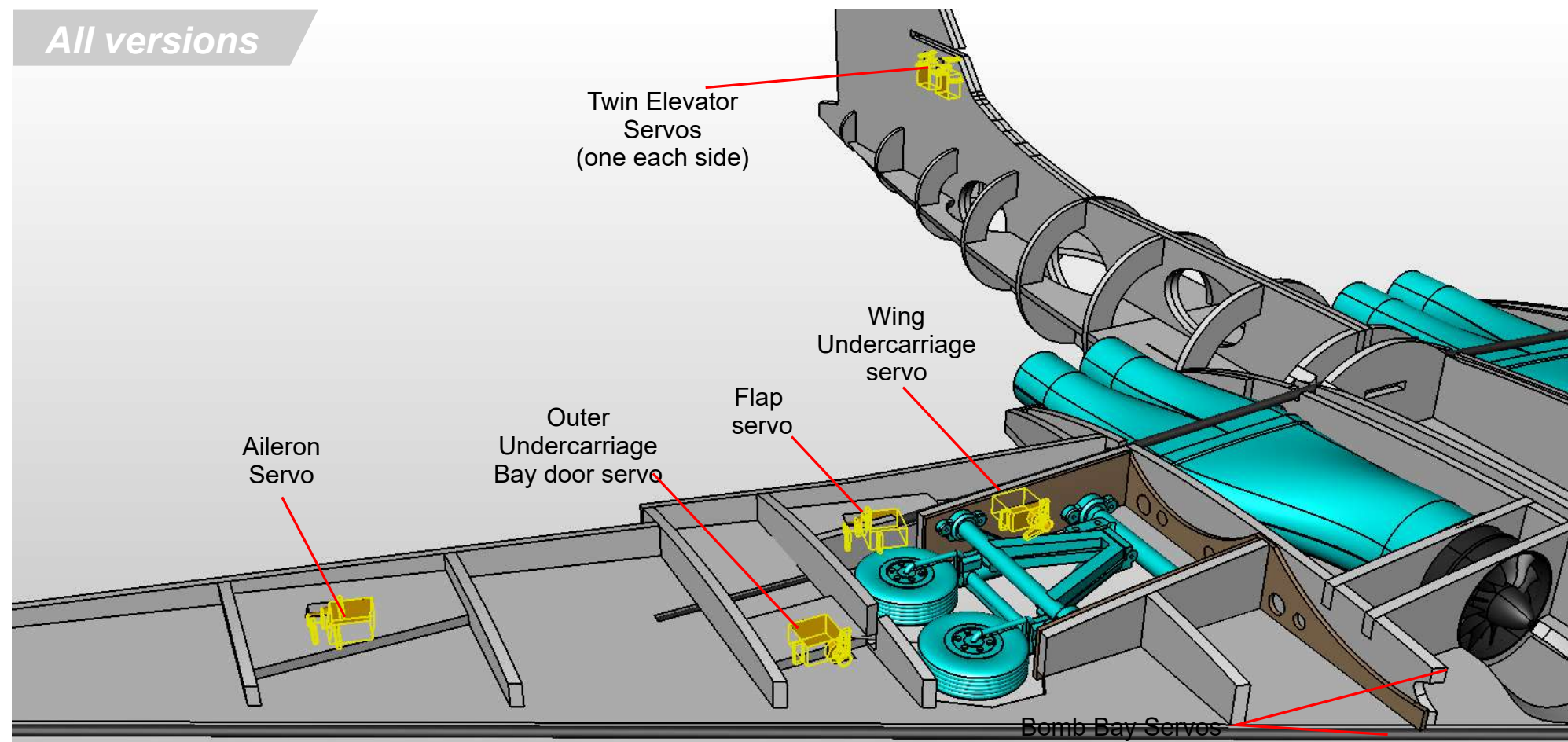
All versions



Glue the **Forward Undercarriage Bay Rear Bulkhead** to the assembly.



All versions



Glue the various servos in place using hot melt glue.

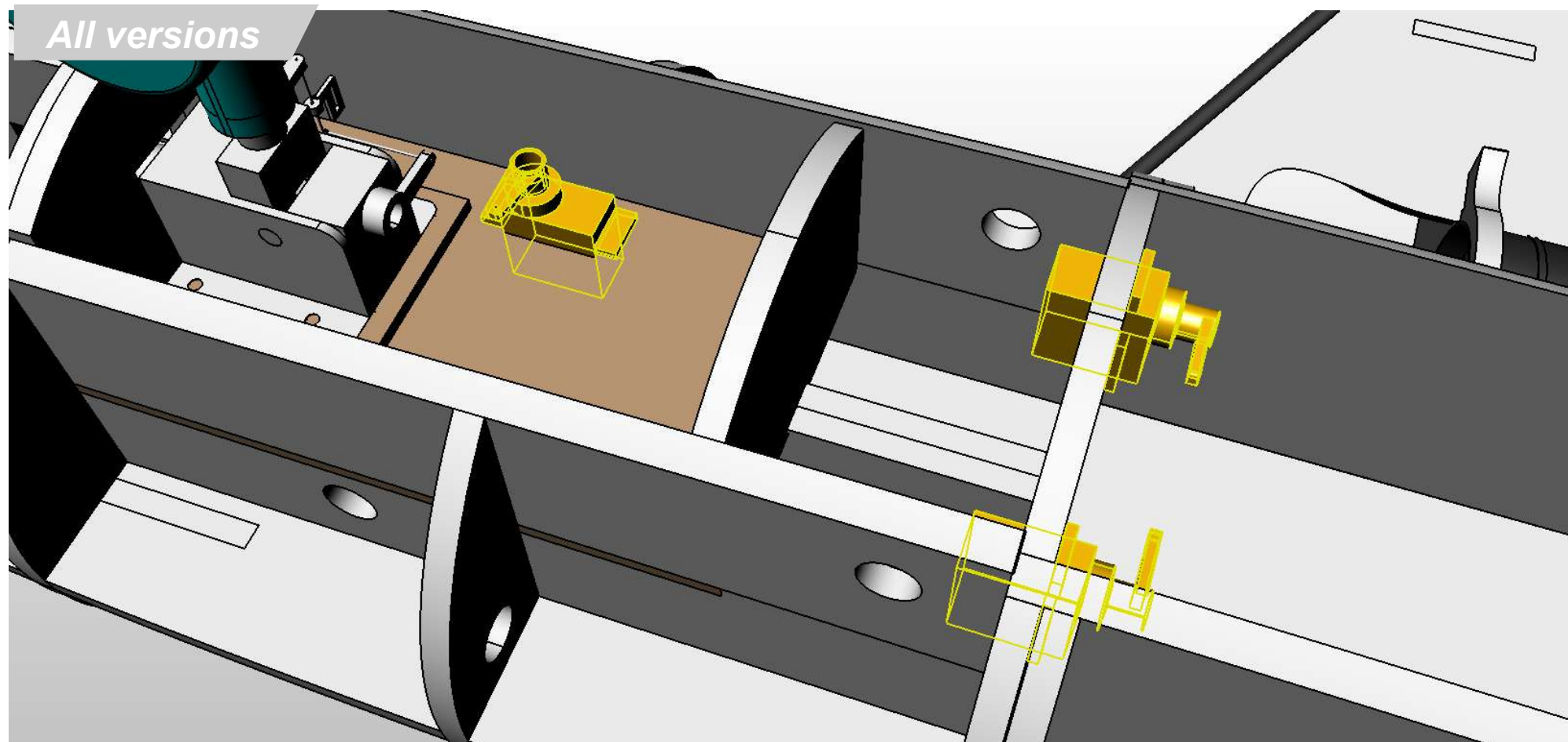
Due to the large number of servos in this model, try to use lightweight servos wherever possible, excluding the main undercarriage servo which will need to be stronger type, metal geared.



Valiant



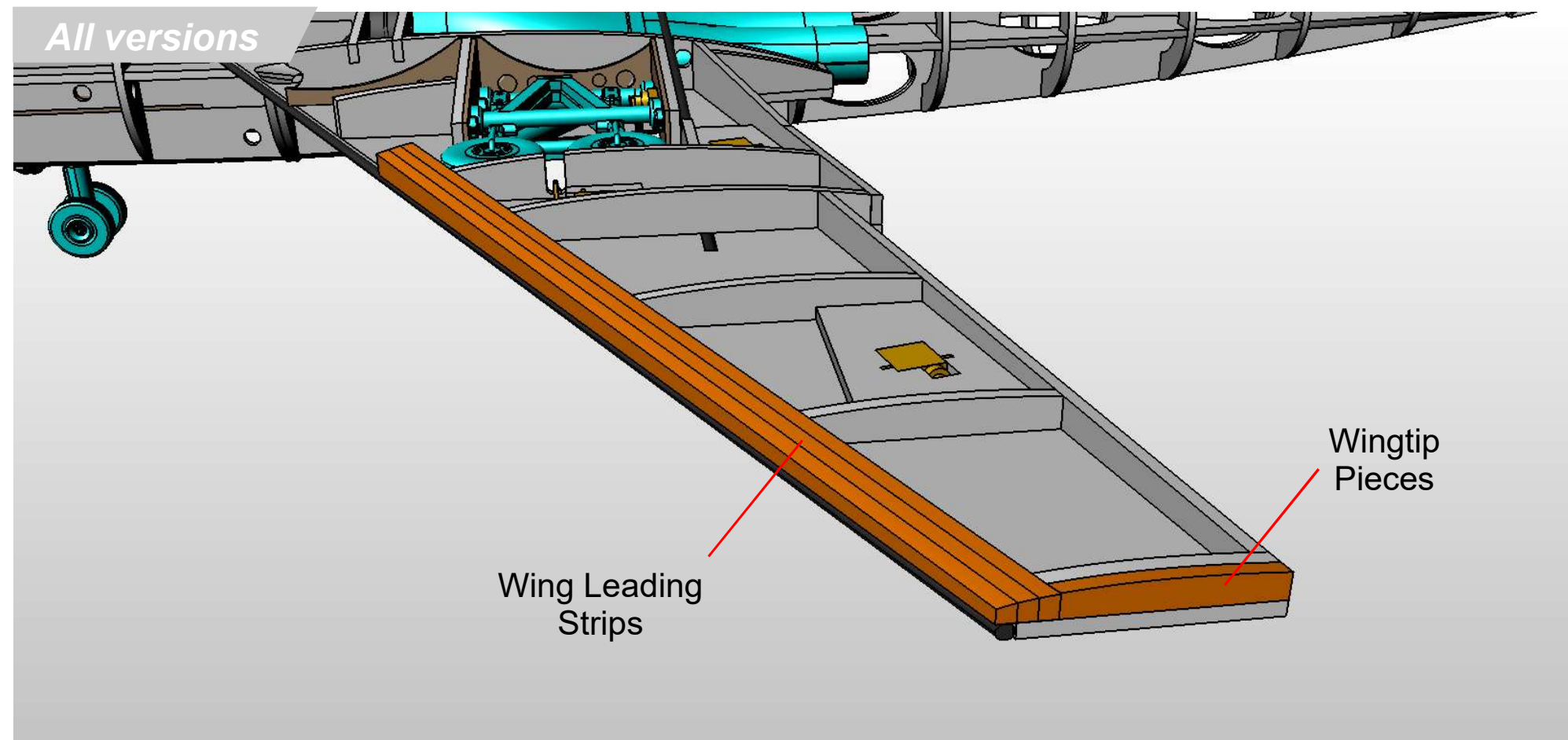
All versions



Glue the forward retract servo and Bay door servos in place.



All versions



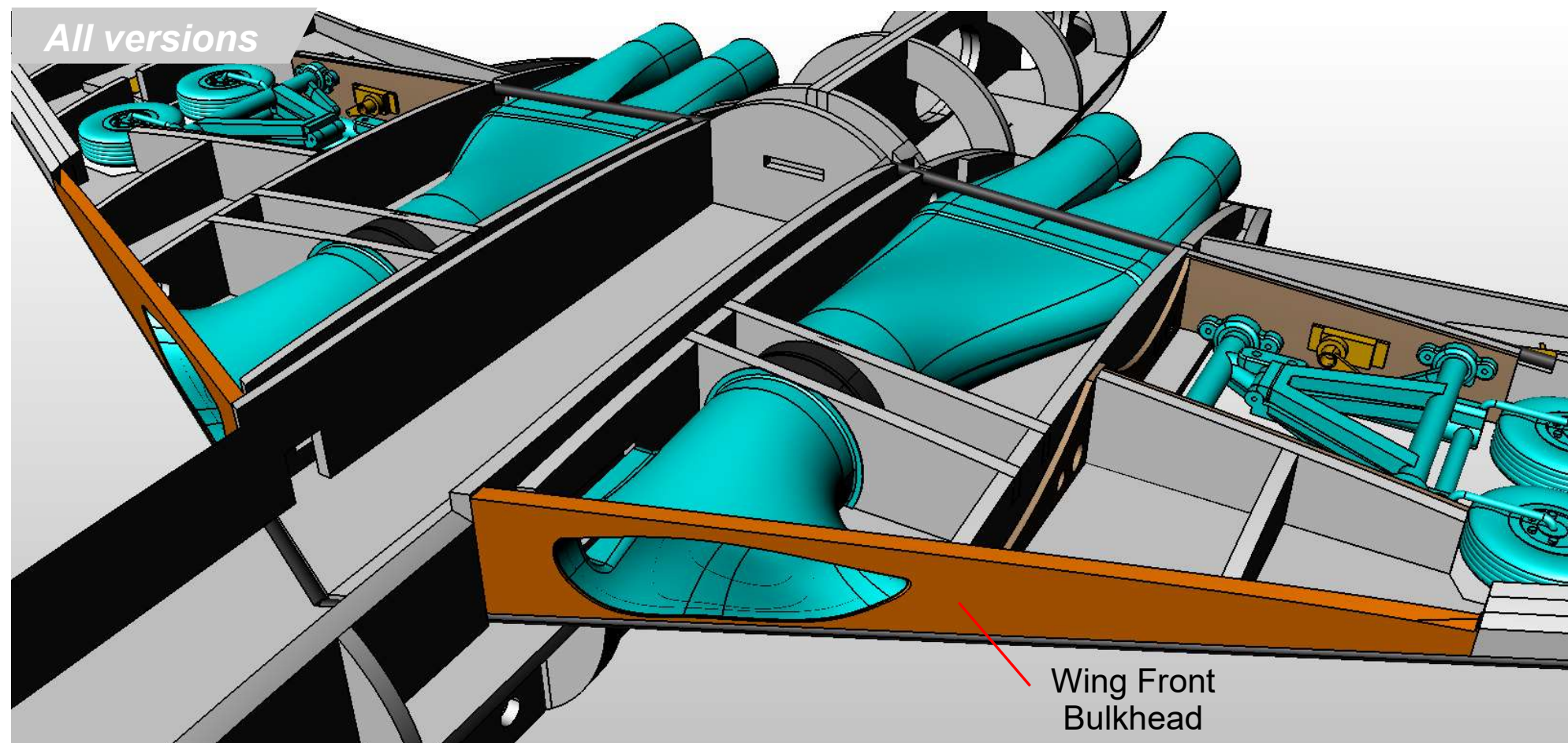
Glue the **Wing Leading Edge** pieces together and onto the wing as shown.

Glue the **Wingtip** pieces on.

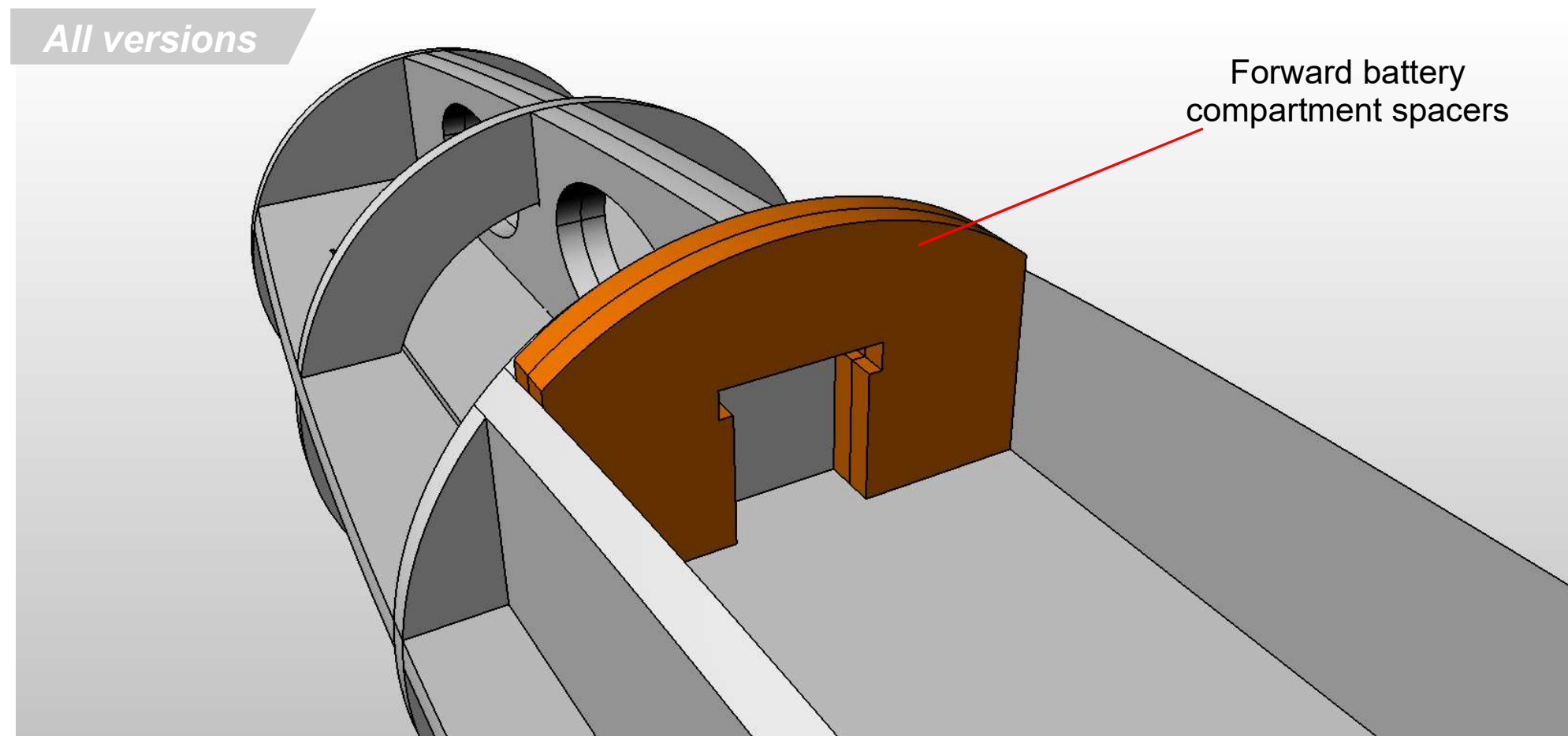


Valiant





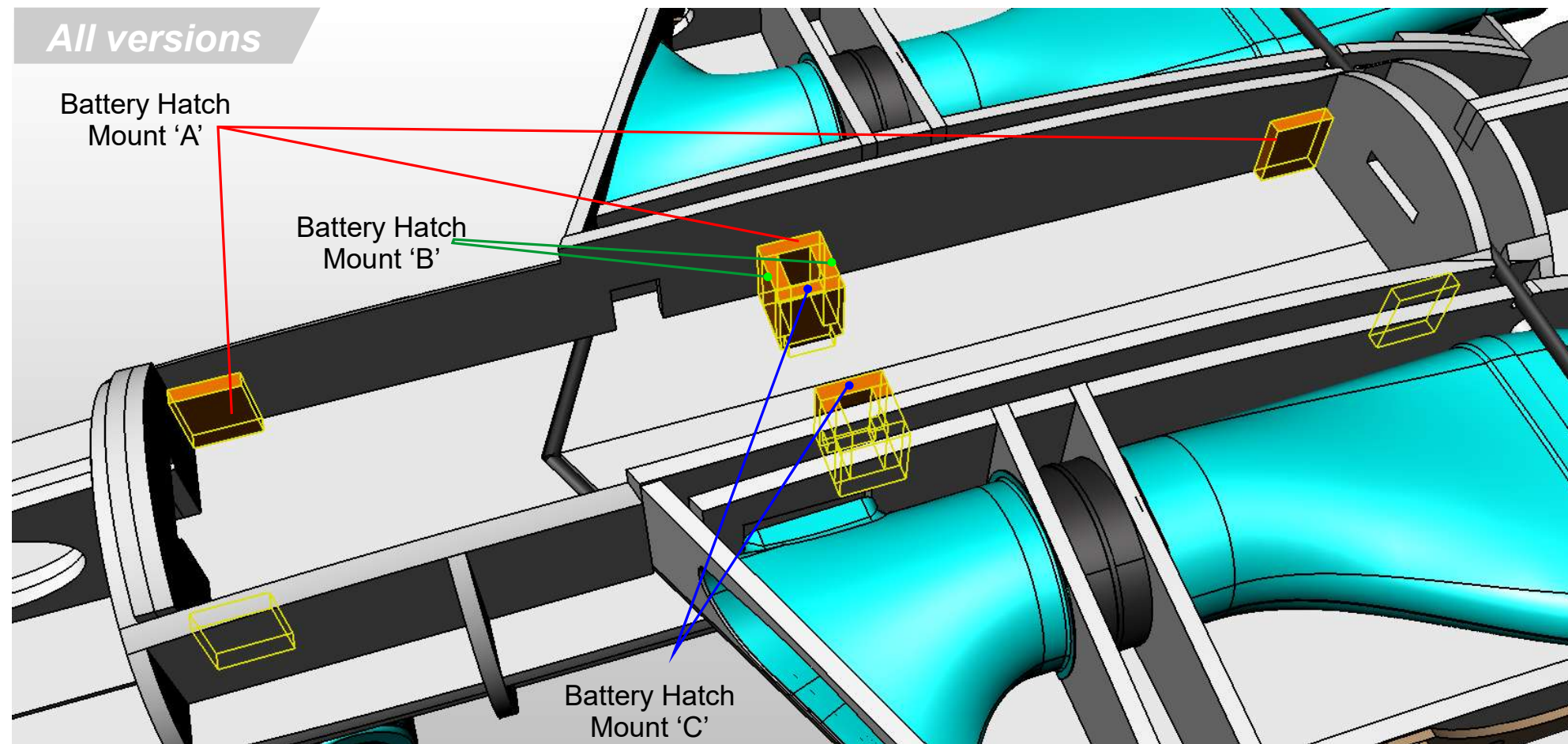
Glue the **Wing Front Bulkhead** in place over the top of the leading edge spar.



Glue the two **Forward battery compartment spacer** pieces together, then onto the rear face of bulkhead 3.

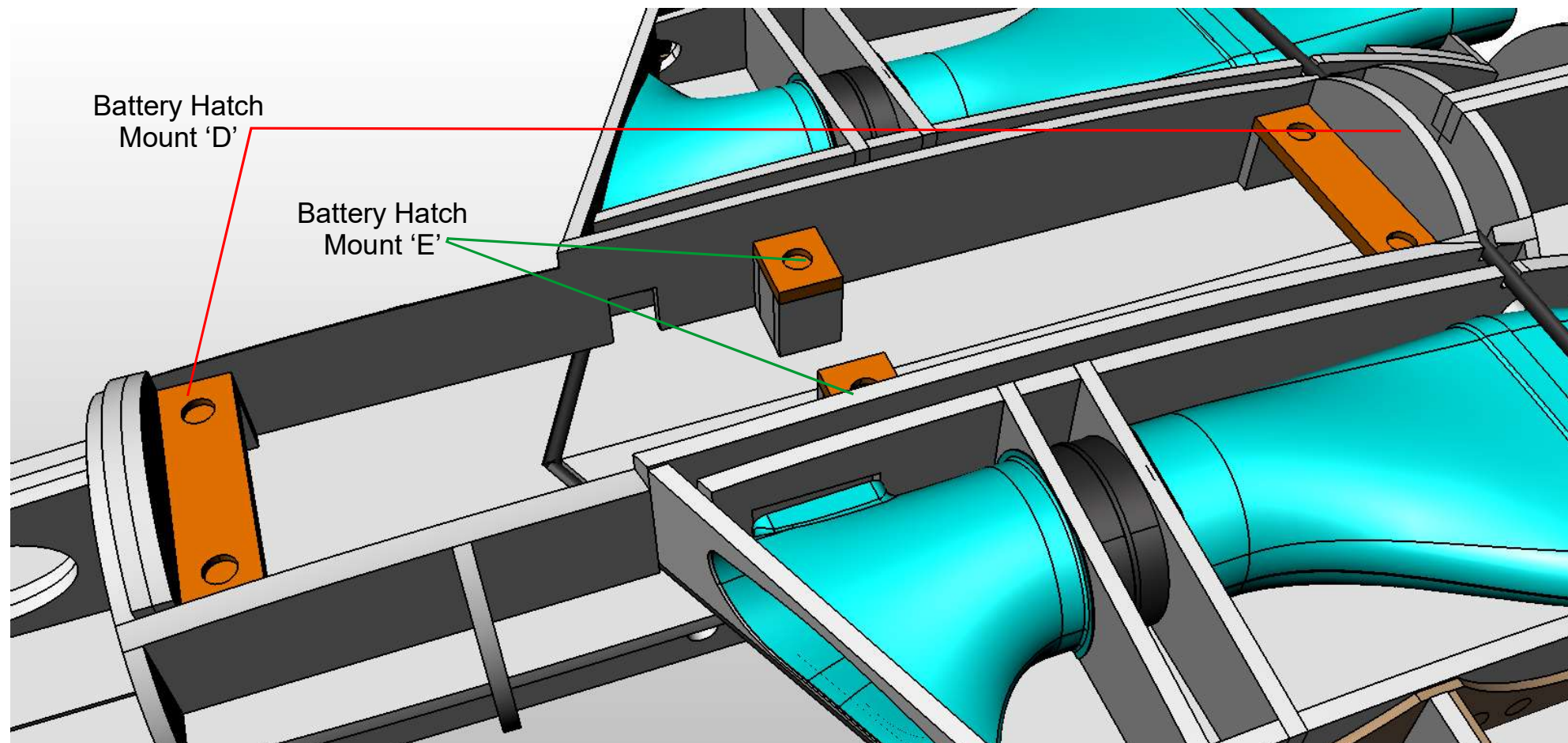


All versions



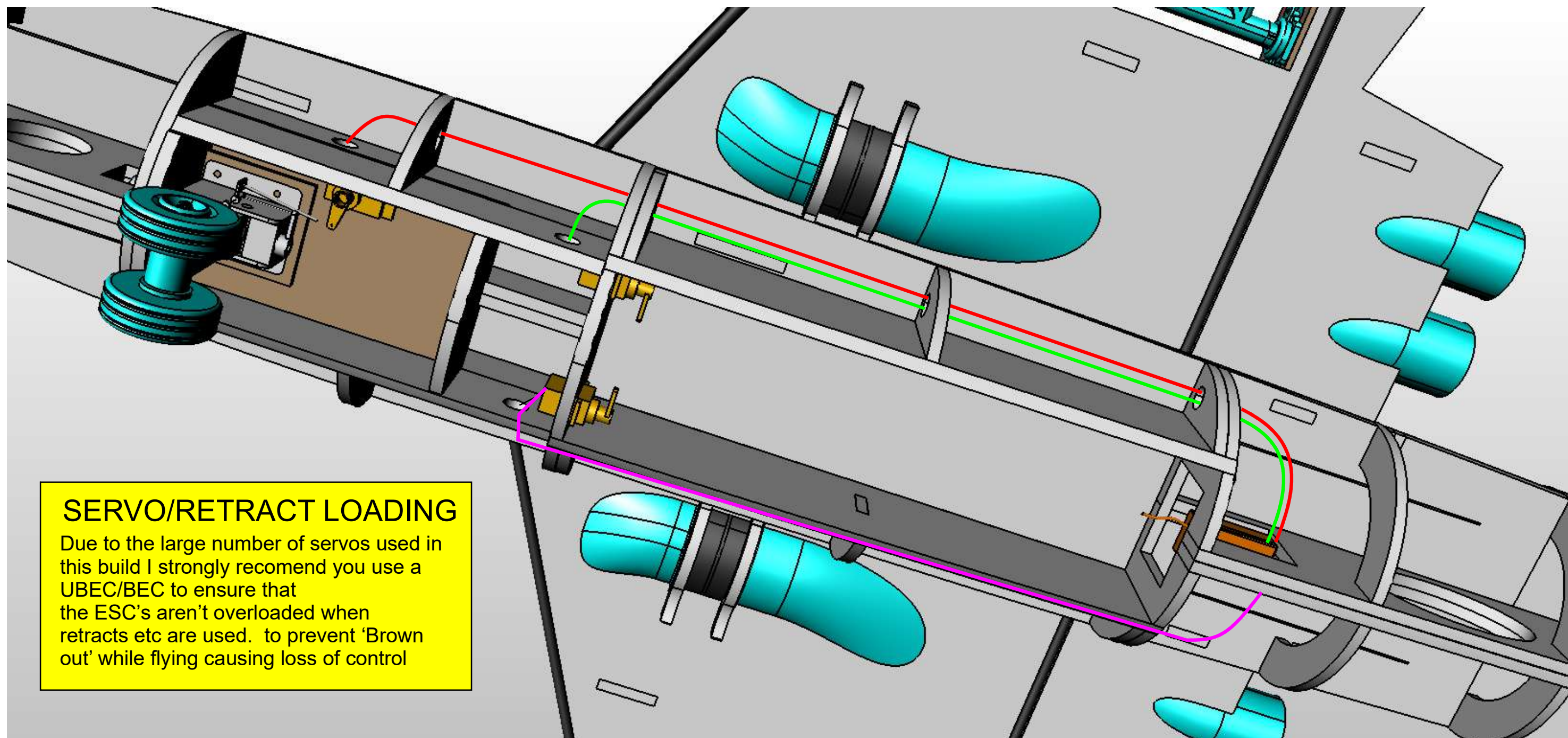
Using the slots in the wing base glue the 'A', 'B' and 'C' **Battery hatch parts** and fit them in as shown.

(note: they are in 'portrait' orientation)



Glue the 'D' and 'E' **Battery hatch parts** and fit them in as shown.





From the underside of the aircraft, connect the forward retract to the Receiver (RX) via a 3 way servo splitter lead to enable the wing servos to operate on the same channel.

Connect the and retract steering servo to the Rudder channel of the RX,

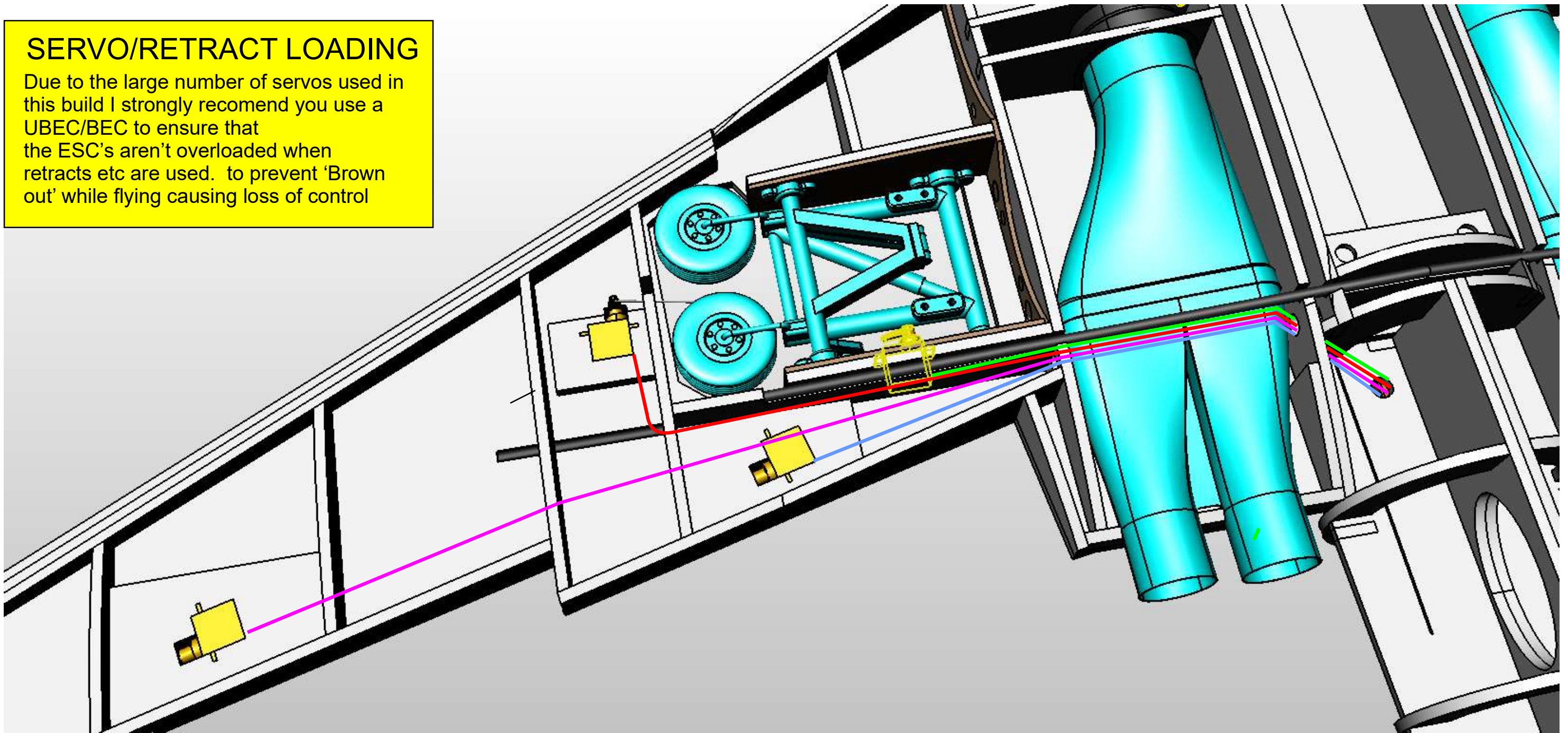
Connect the two Bomb bay servos into a 'Y' servo lead, then connect to the RX

Use Servo extension leads to help you span the distance.



SERVO/RETRACT LOADING

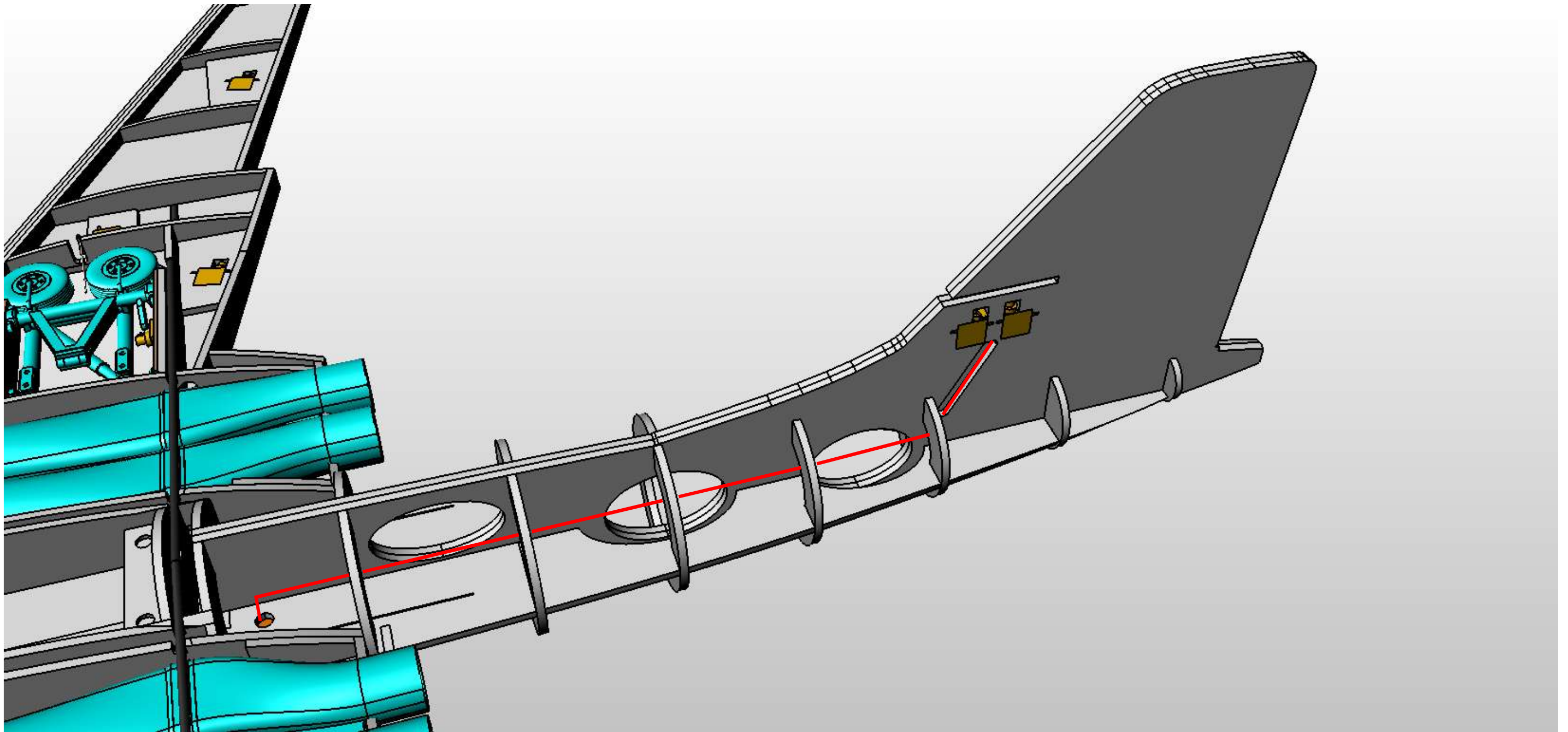
Due to the large number of servos used in this build I strongly recommend you use a UBEC/BEC to ensure that the ESC's aren't overloaded when retracts etc are used. to prevent 'Brown out' while flying causing loss of control



Cut recesses in the top's of the ribs in the wing to pass the cables through. Connect all the wing servos to the RX, Rub the leads via 'Y' leads so you can connect the opposing wing's servos into a single channel per servo pair.

Use Servo extension leads to help you span the distance.

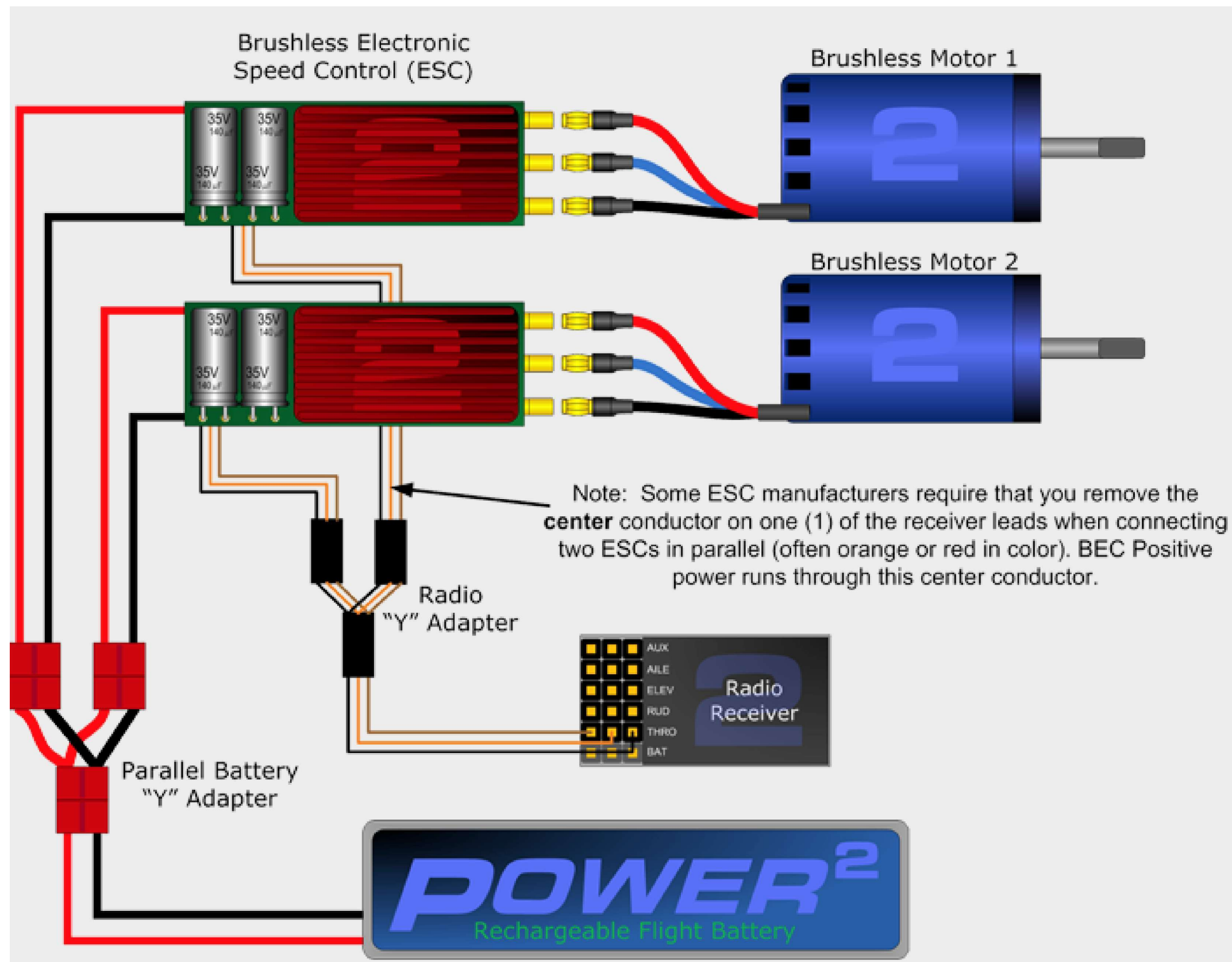




Run the two Elevator servos into a single 'Y' servo lead and then to the elevator channel in your RX

Use Servo extension leads to help you span the distance.



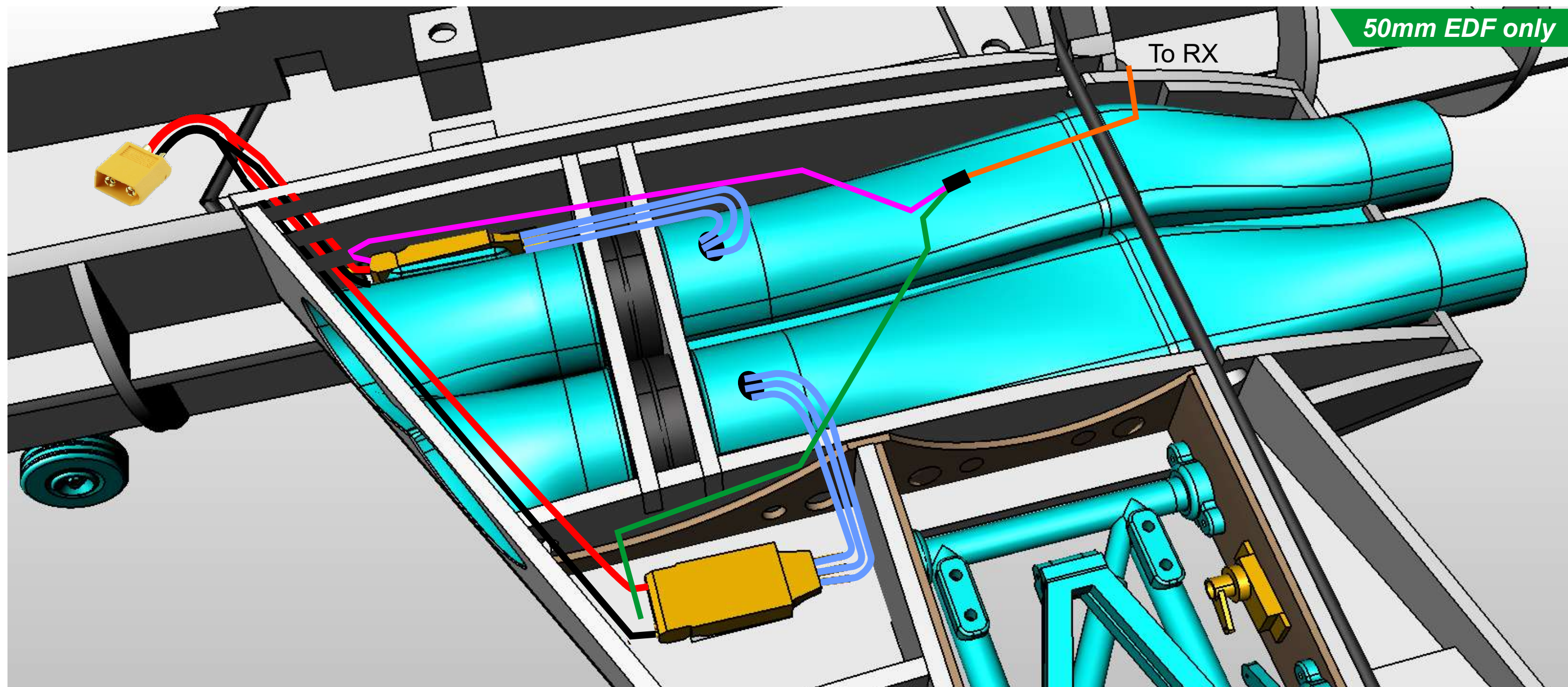


I found this image on the internet - I am not sure who created it, but it is a clear diagram of how to set up a single battery / twin motor setup.

Be sure to investigate with your RX manufacturer whether you need to have a single or can have dual power feeds from your ESC's.

If in any doubt, remove one red wire terminal from the ESC and tape it to prevent it touching anything.

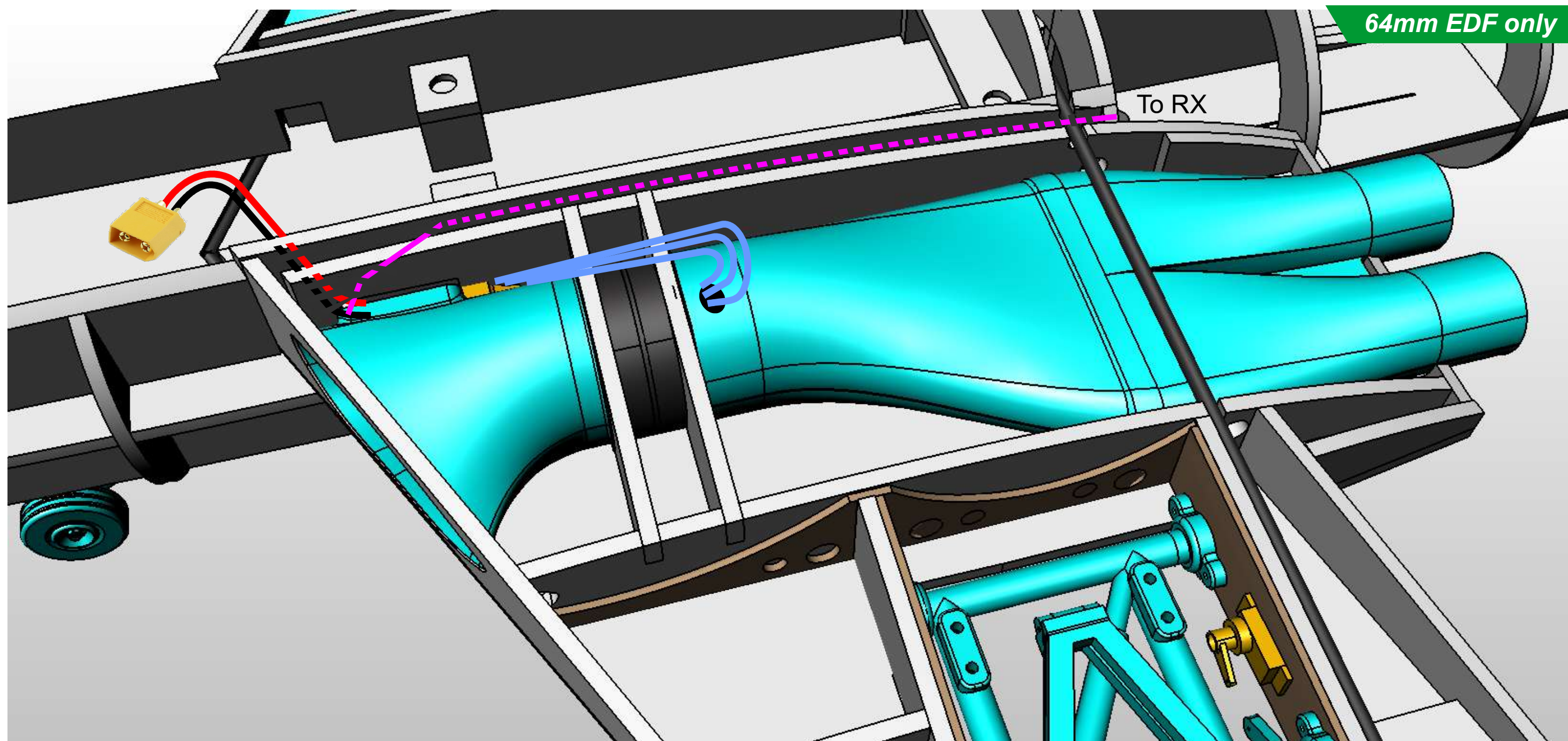




Use a soldering iron to make a hole on the 3D printed thrust tubes and poke the motor wires through. When extending your wires, always aim for longer motor wires instead of longer power wires. Connect the ESC's to the EDF's using bullet connectors. Connect the Power cables together to come to a single Battery connector. Either solder them as shown or use an off-the-shelf connector (image opposite) - choose the correct terminals as most common are the opposite way round. If you extend power cables, use the same rated wire. (usually written on the side)
Run the servo wire into a servo 'Y' splitter, then both wings into another 'Y' splitter to bring 4 EDF's into a single servo plug - and plug into the Throttle channel on your RX.

Make little recesses in the depron to pass the cables. Mount the ESC's in place using hot melt glue.



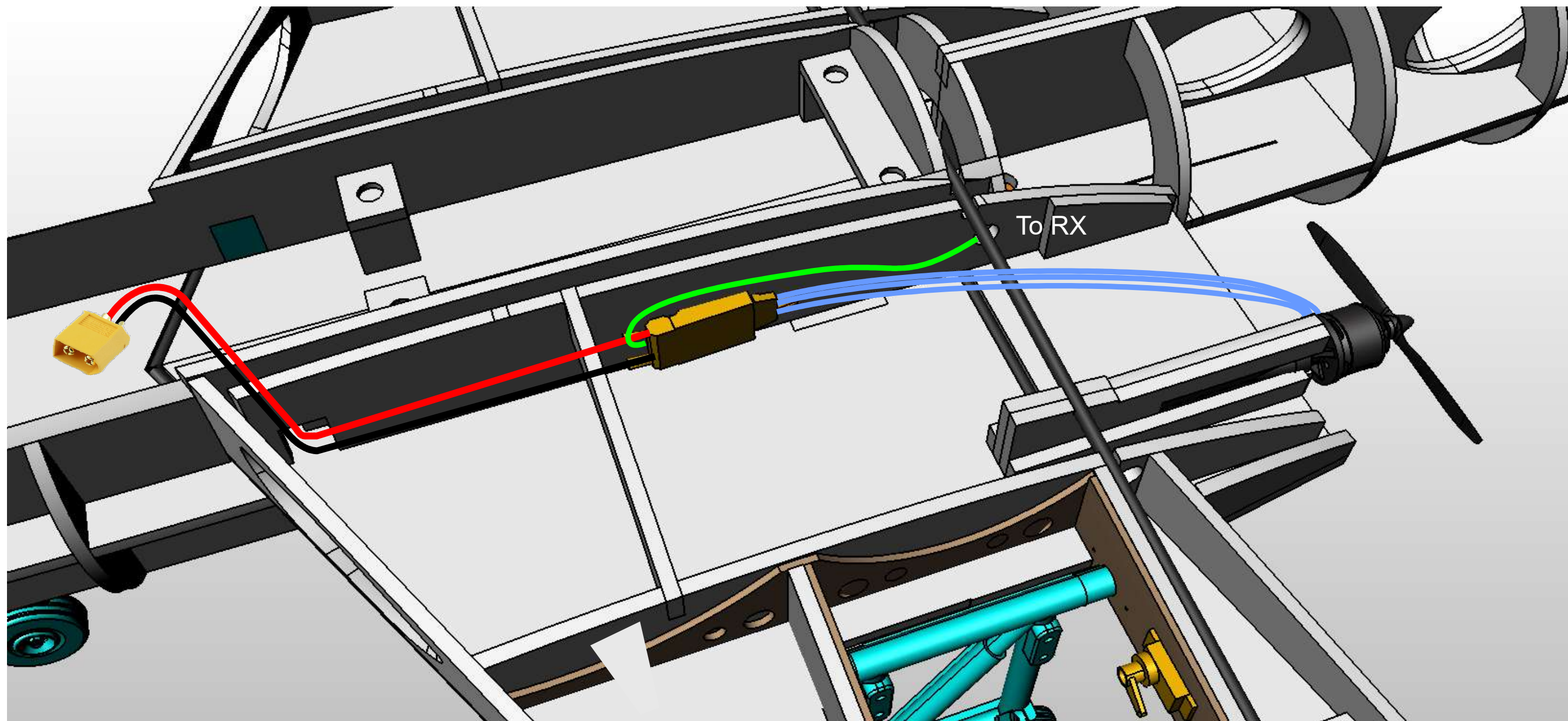


Use a soldering iron to make a hole on the 3D printed thrust tubes and poke the motor wires through. When extending your wires, always aim for longer motor wires instead of longer power wires. Connect the ESC to the EDF using bullet connectors. If you extend power cables, use the same rated wire. (usually written on the side)

Run the servo wire into a 'Y' splitter to bring 2 EDF's into a single servo plug - and plug into the Throttle channel on your RX.

Make little recesses in the depron to pass the cables. Mount the ESC's in place using hot melt glue.





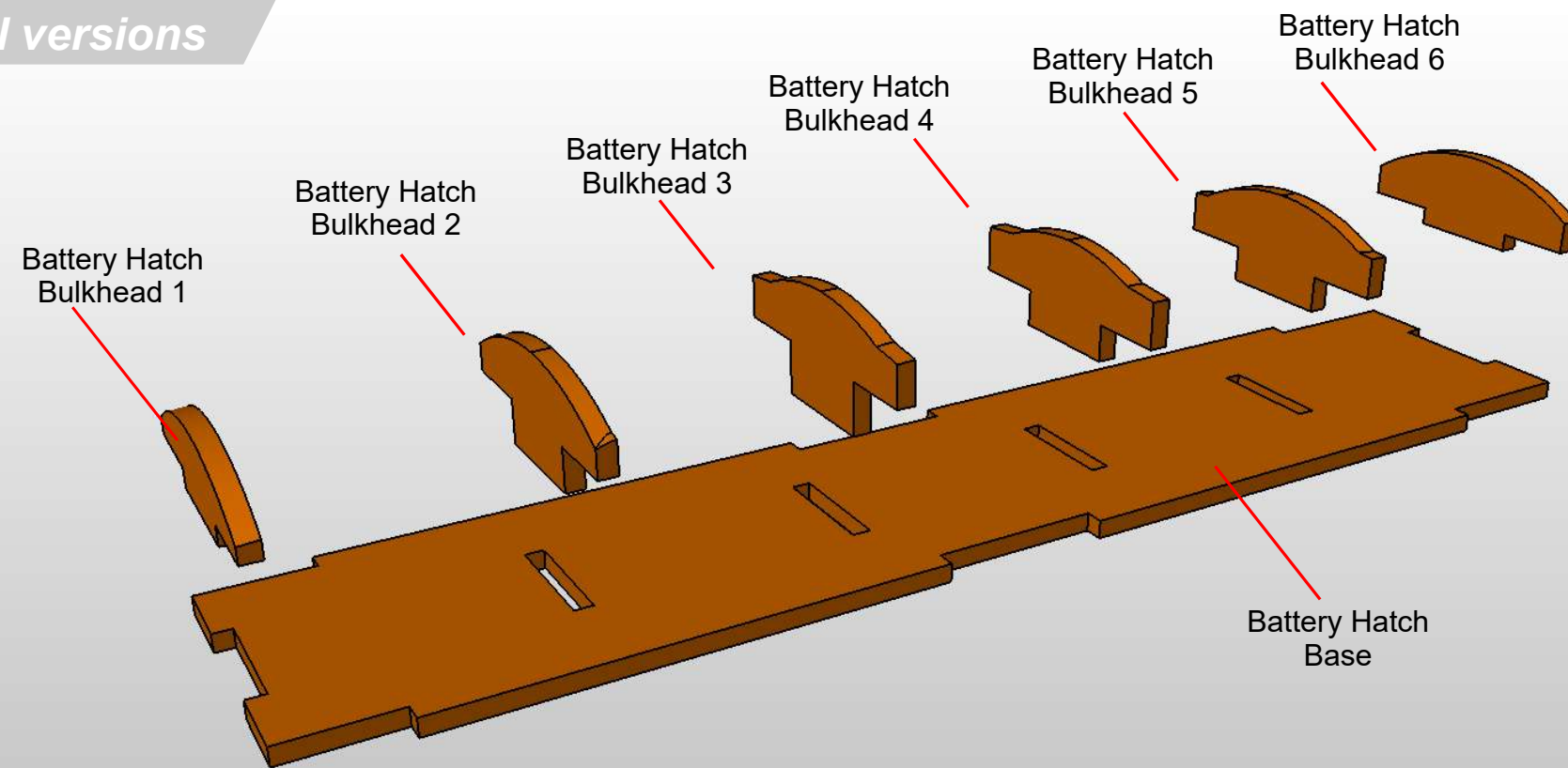
Connect the ESC to the motor using bullet connectors. When extending your wires, always aim for longer motor wires instead of longer power wires. If you extend your wires, use the same rated wire. (usually written on the side)

Run the servo wire into a 'Y' splitter to bring 2 motors into a single servo plug - and plug into the Throttle channel on your RX.

Make little recesses in the depron to pass the cables. Mount the ESC's in place using hot melt glue.



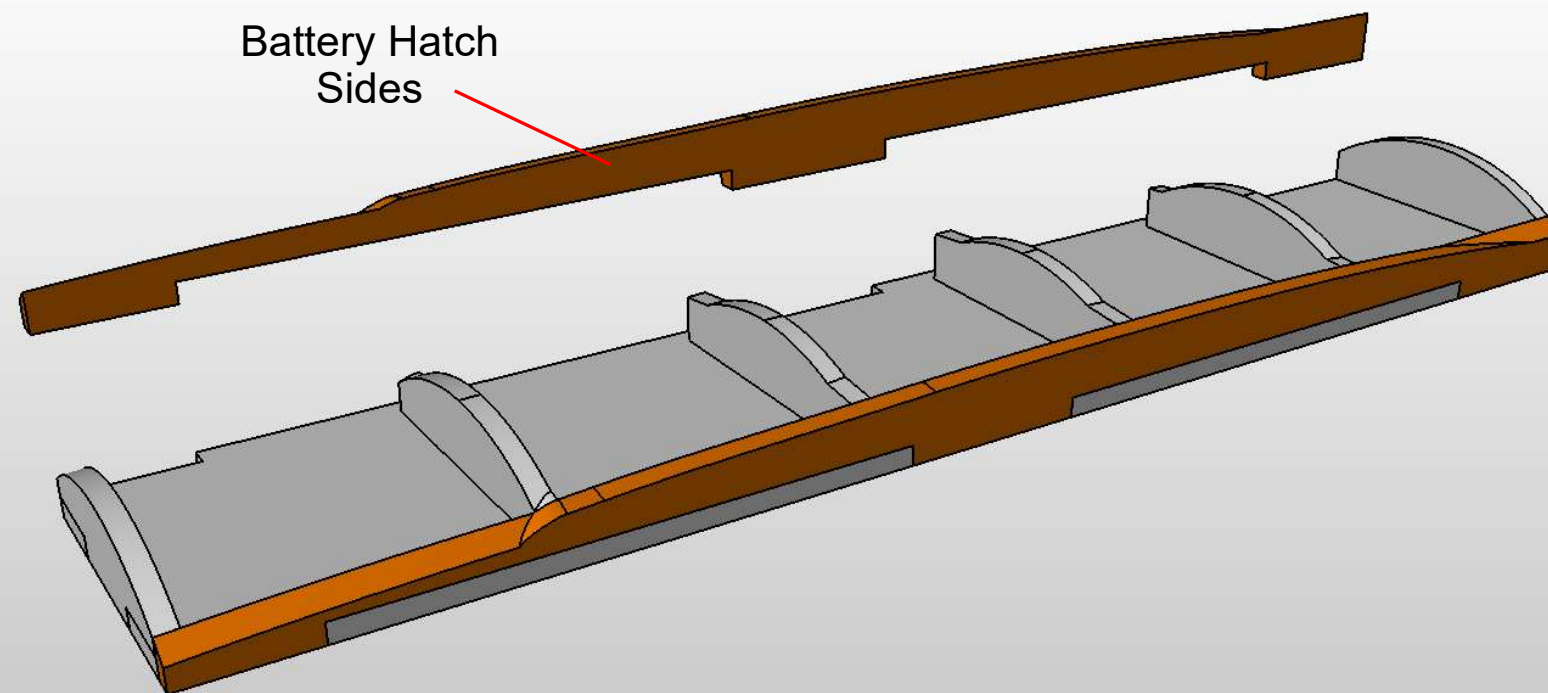
All versions



Glue the **Battery Hatch Bulkheads** into the **Battery Hatch Base**.



All versions

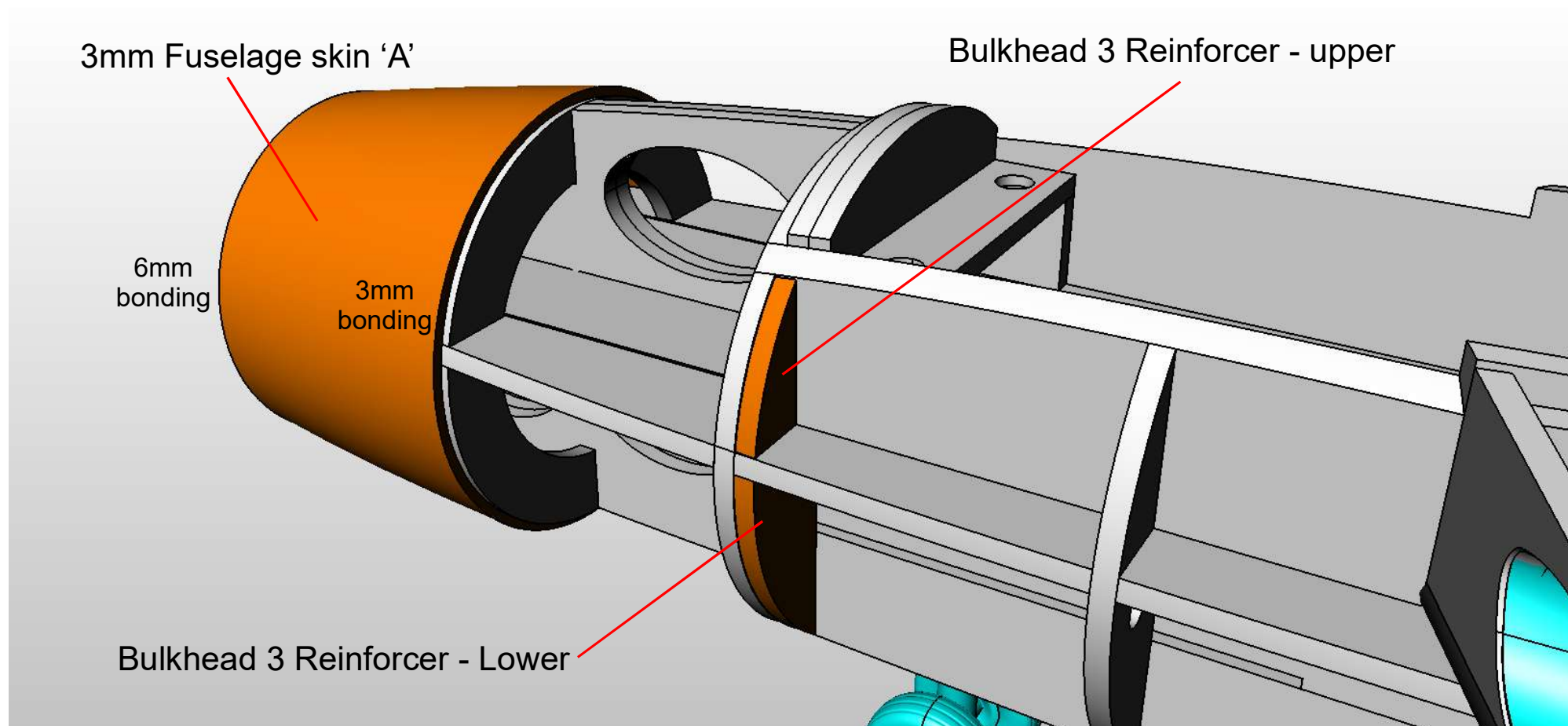


Glue the **Battery Hatch sides** onto the Battery Hatch assembly.



Valiant

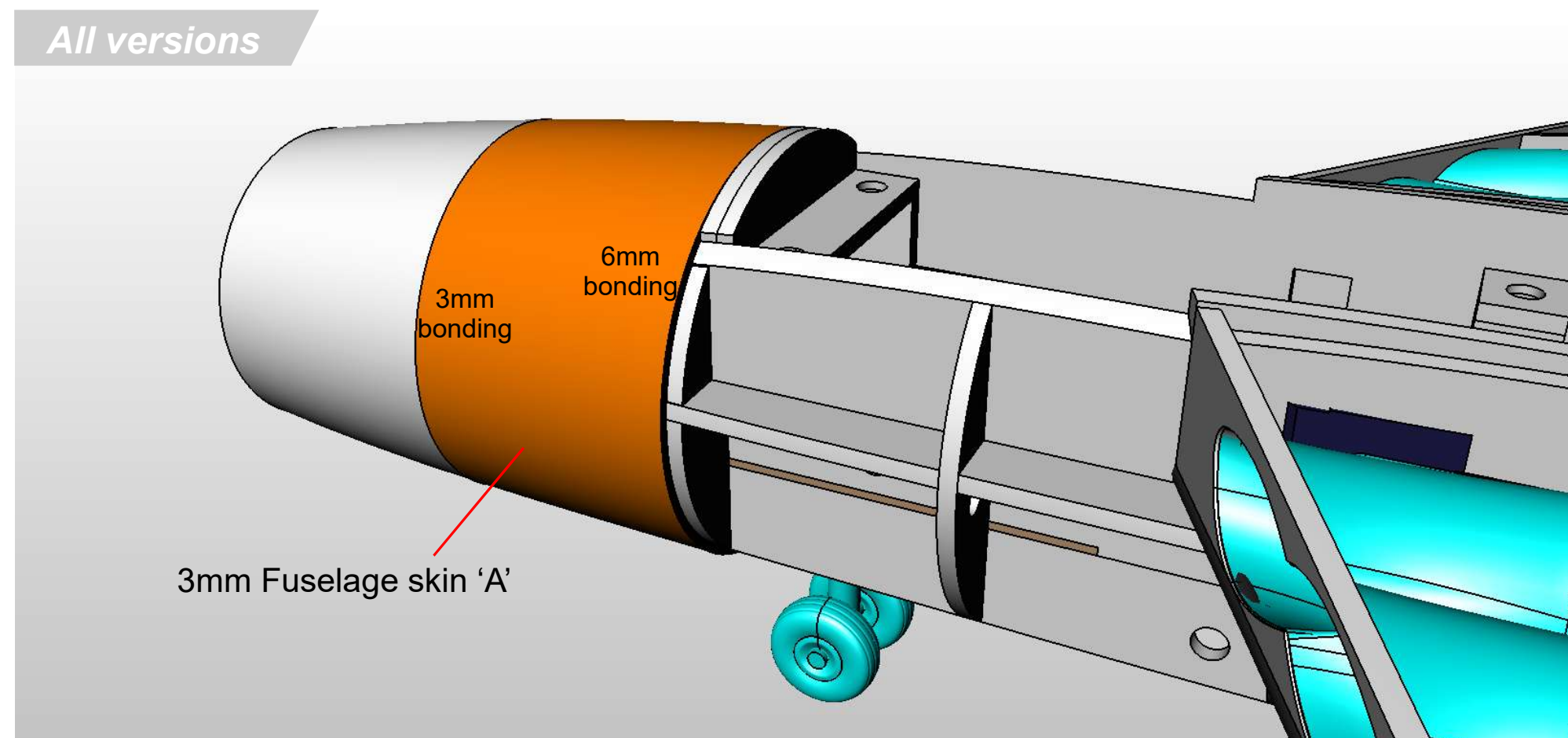




Cut the **Fuselage Skin 'A'** out -
overside to adjust the fit and glue to
the assembly.

Allow 3mm gap along the edge of
Bulkhead 2 for Skin 'B'.

Glue the **Bulkhead 3 Reinforcers** in
place.

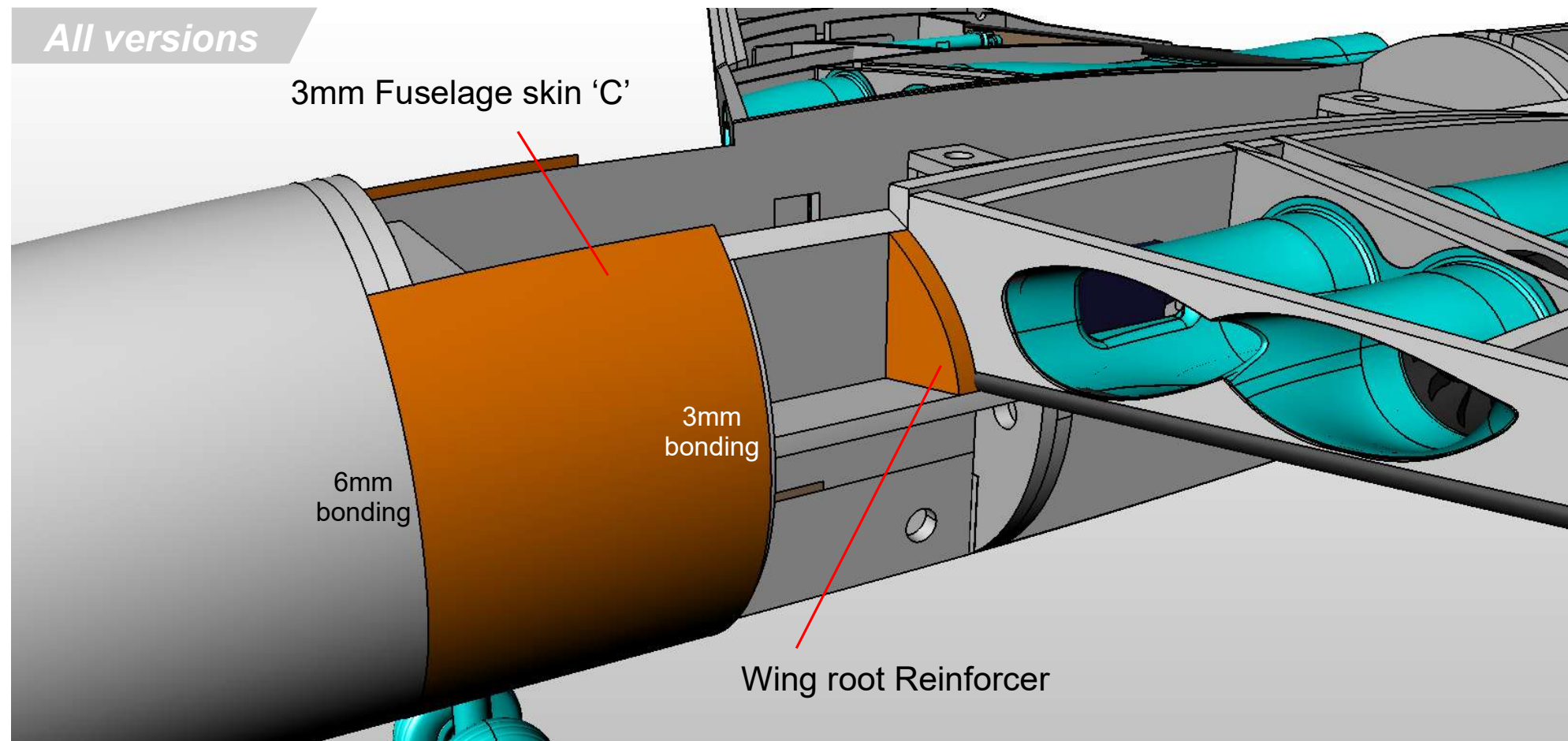


Cut the **Fuselage Skin 'B'** out -
overside to adjust the fit and glue to
the assembly.

Allow 3mm gap along the edge of
Bulkhead 3 for Skin 'C'.



All versions



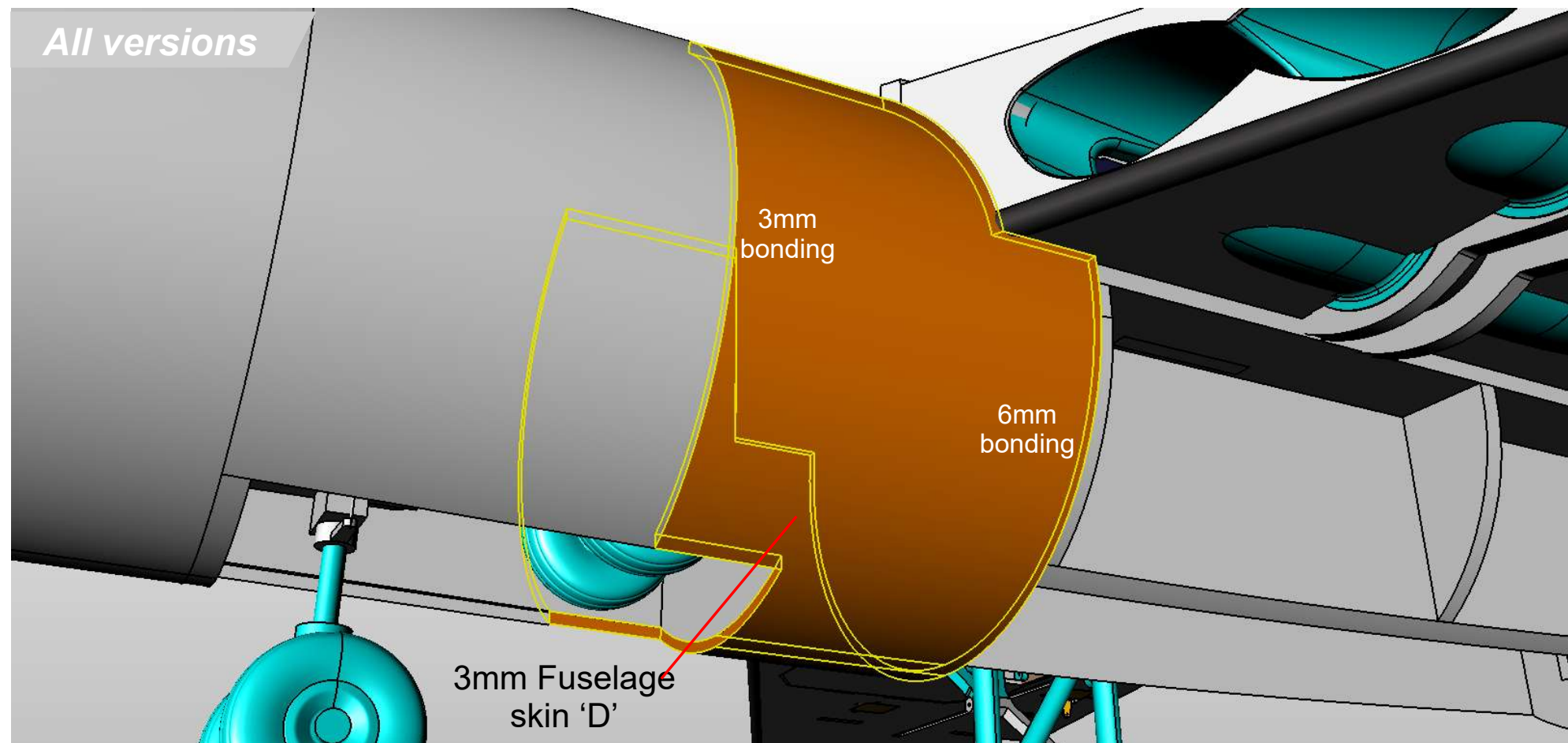
Cut the **Fuselage Skin 'C'** out -
overside to adjust the fit and glue to
the assembly.

Allow 3mm gap along the edge of
Bulkhead 4 for Skin 'D'.

Glue the **Wing Root Reinforcers** in
place.



All versions



Cut the **Fuselage Skin 'D'** out -
overside to adjust the fit and glue to
the assembly.

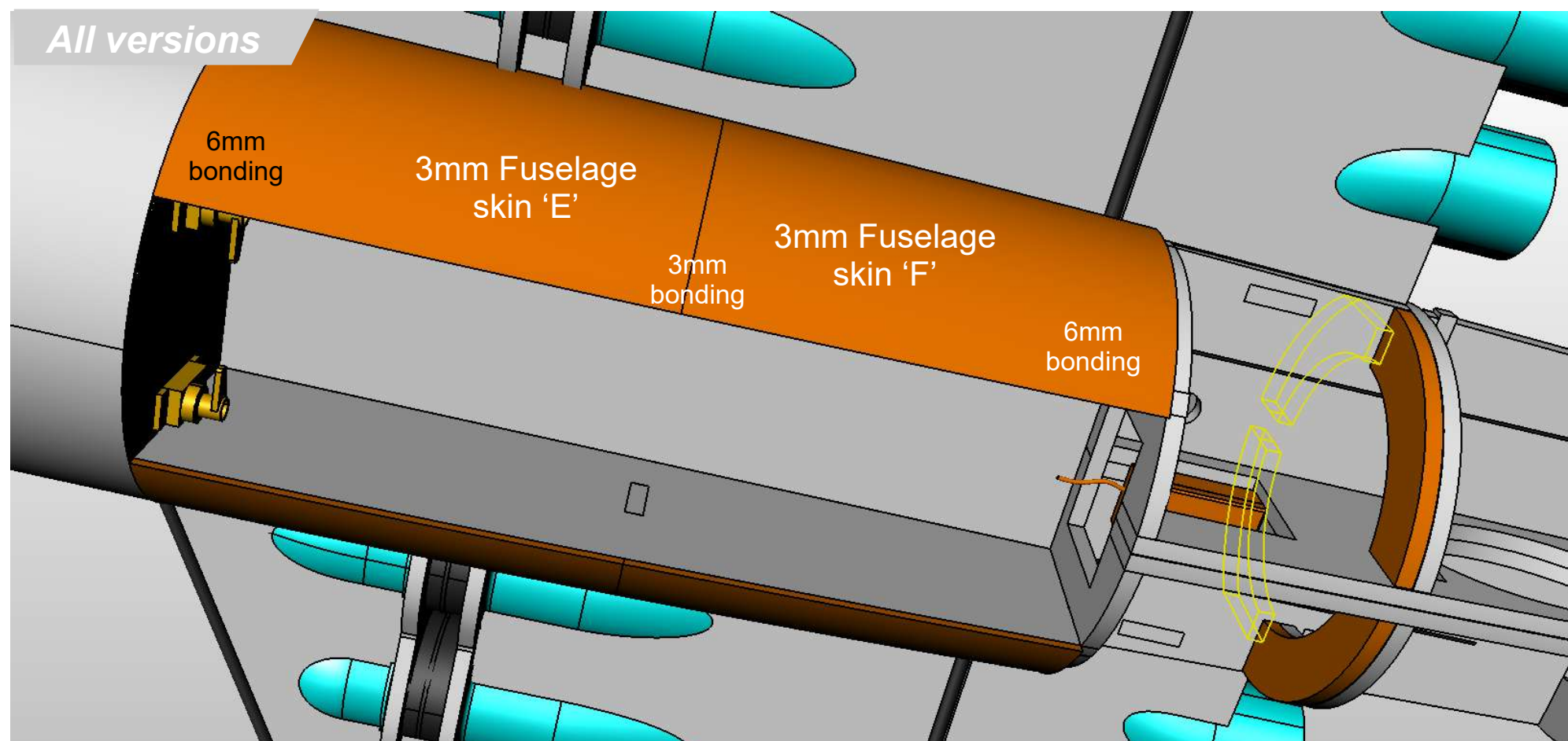
Allow 3mm gap along the edge of
Bulkhead 5 for Skin 'E'.



Valiant



All versions



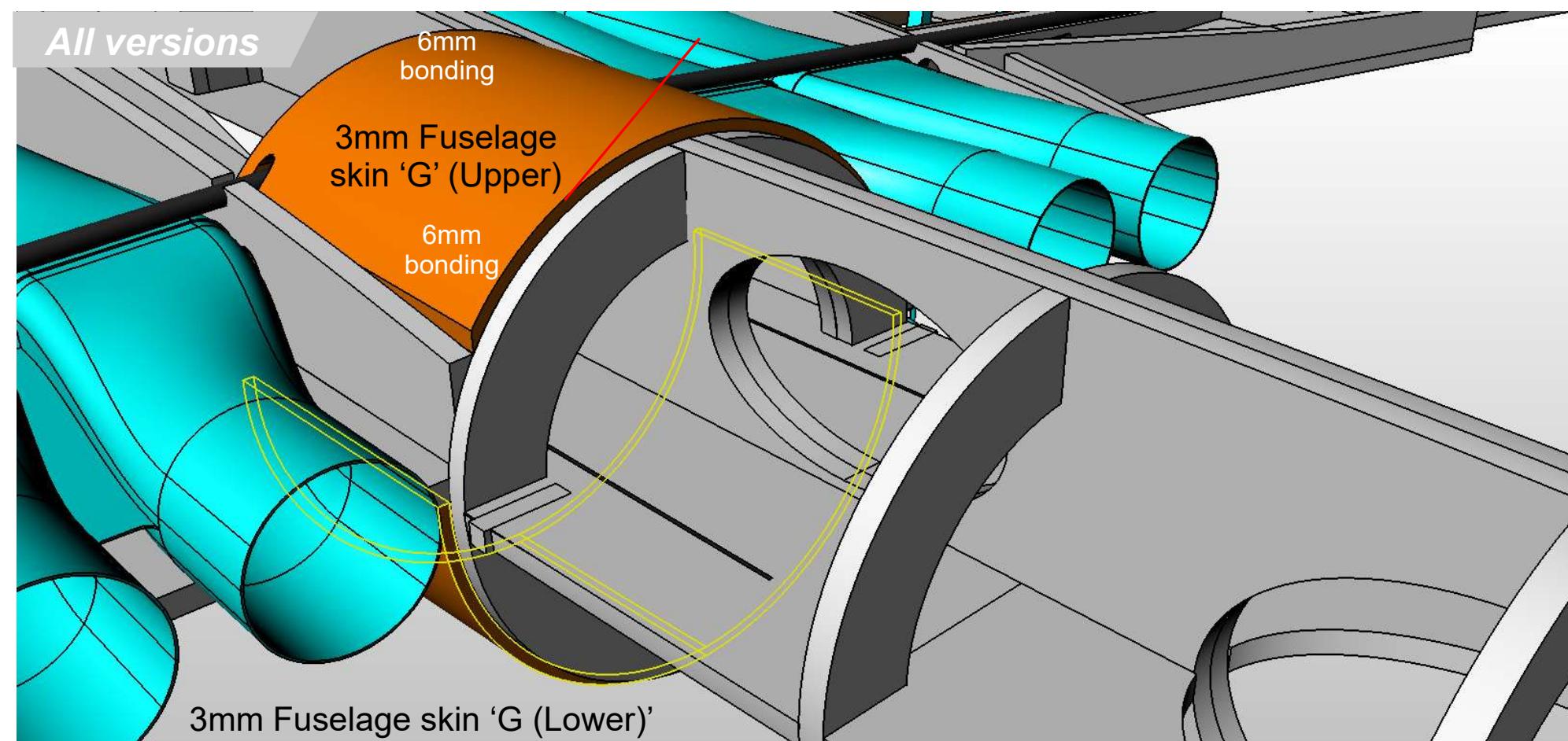
Cut the **Fuselage Skin 'E' and 'F'** out - overside to adjust the fit and glue to the assembly.

Allow 6mm gap along the edge of Bulkhead 6 for Skin 'G'.

Glue the four **Bulkhead 8 Reinforcers** onto the forward face of Bulkhead 8



All versions



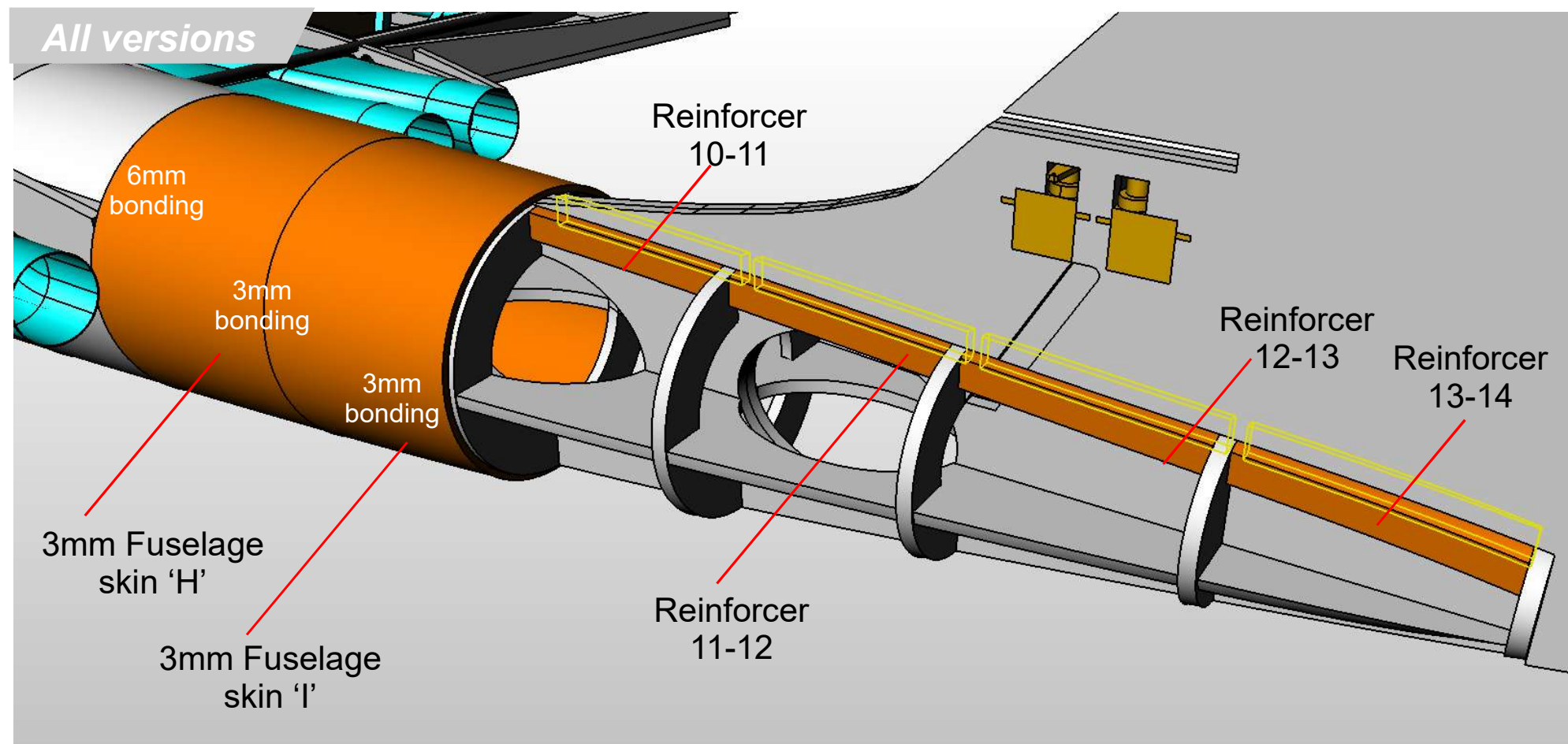
Cut the **Fuselage Skin 'G' Upper and Lower** out - overside to adjust the fit and glue to the assembly.

Allow 6mm gap along the edge of Bulkhead 2 for Skin 'H'.



Valiant

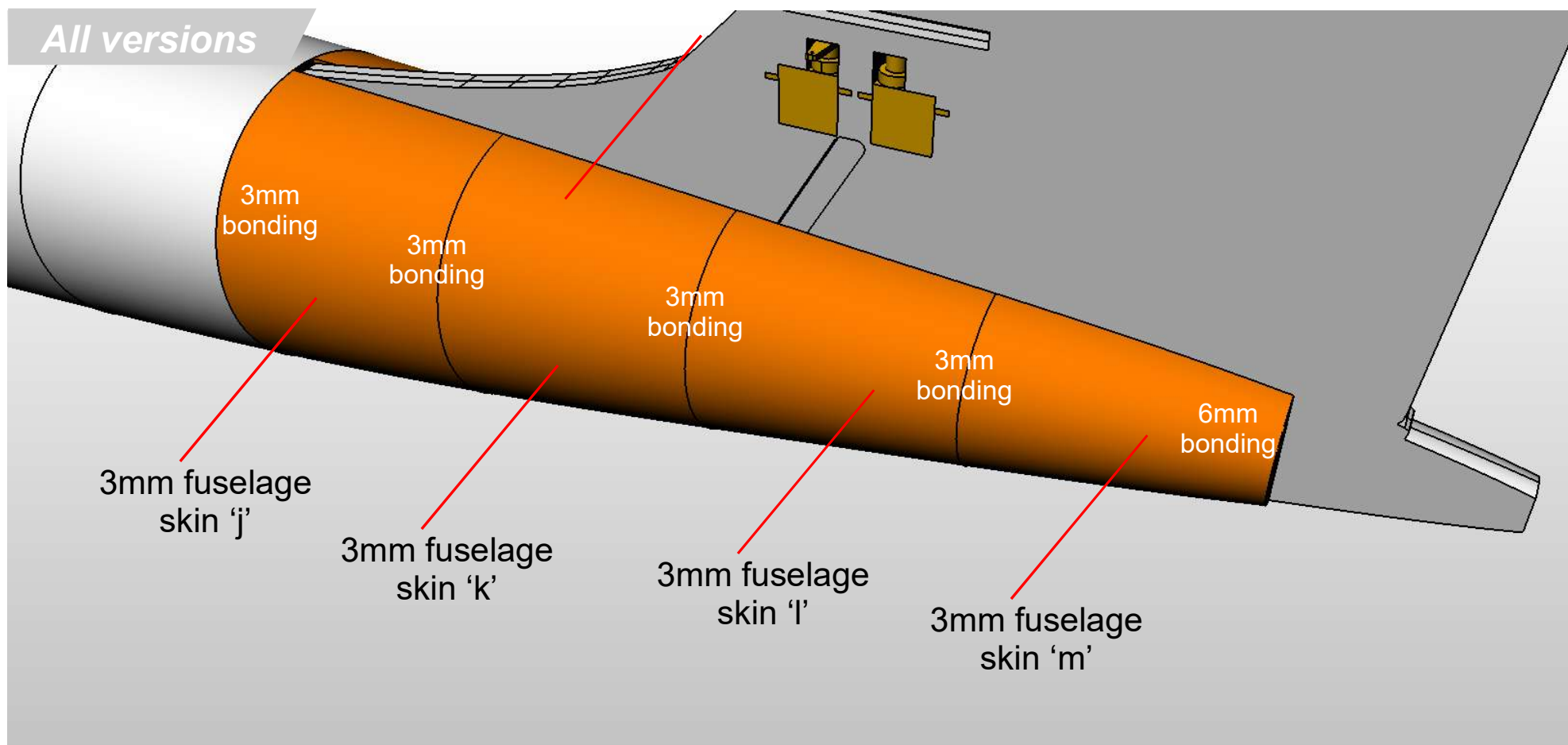




Cut the **Fuselage Skin 'E' and 'F'** out - overside to adjust the fit and glue to the assembly.

Allow 3mm gap along the edge of Bulkhead 10 for Skin 'G'.

Glue the four reinforcing strips onto Aft Spine, between the bulkheads as shown. (both sides)



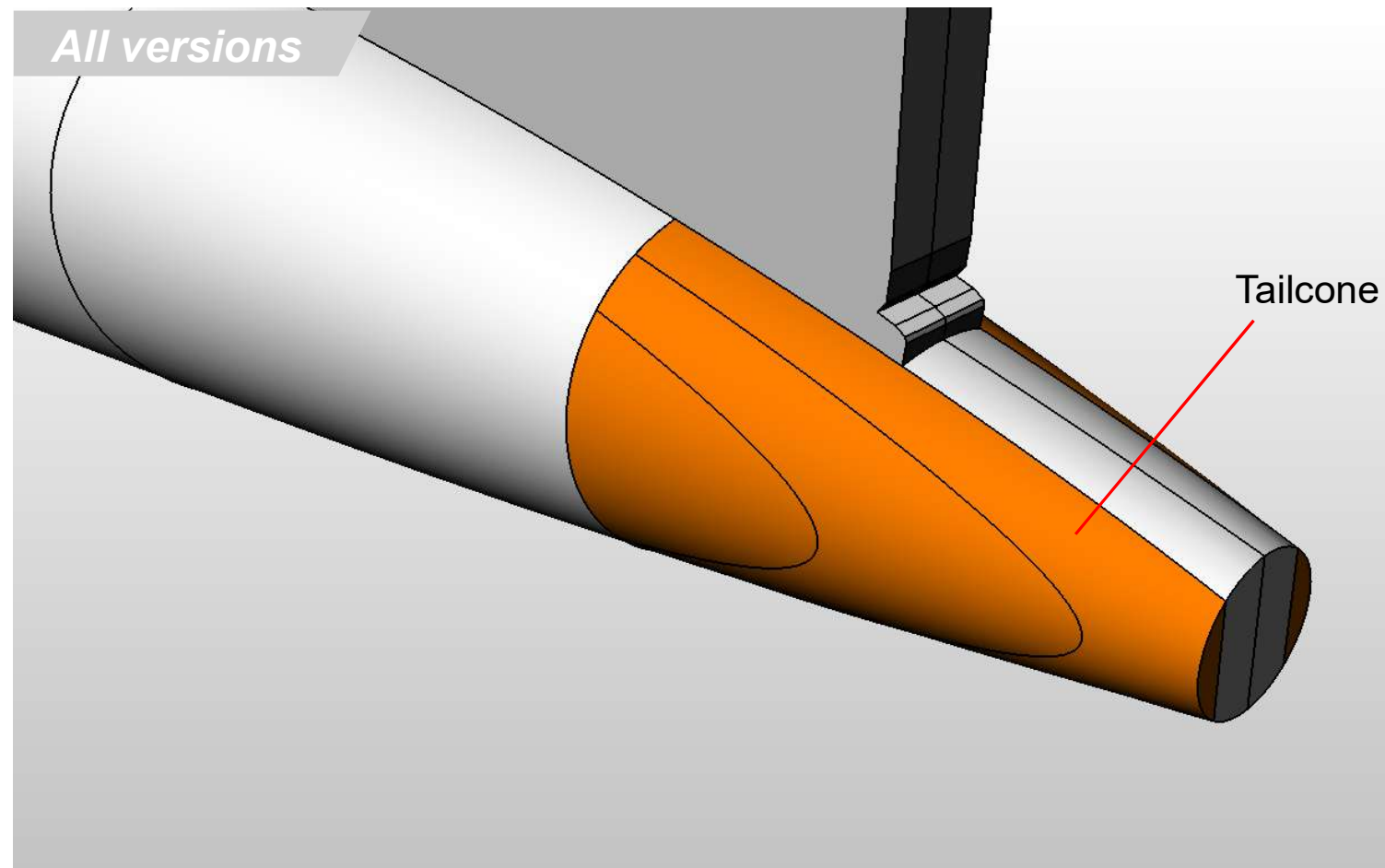
Cut the **Fuselage Skin 'J - M'** to size and glue to the assembly.



Valiant



All versions

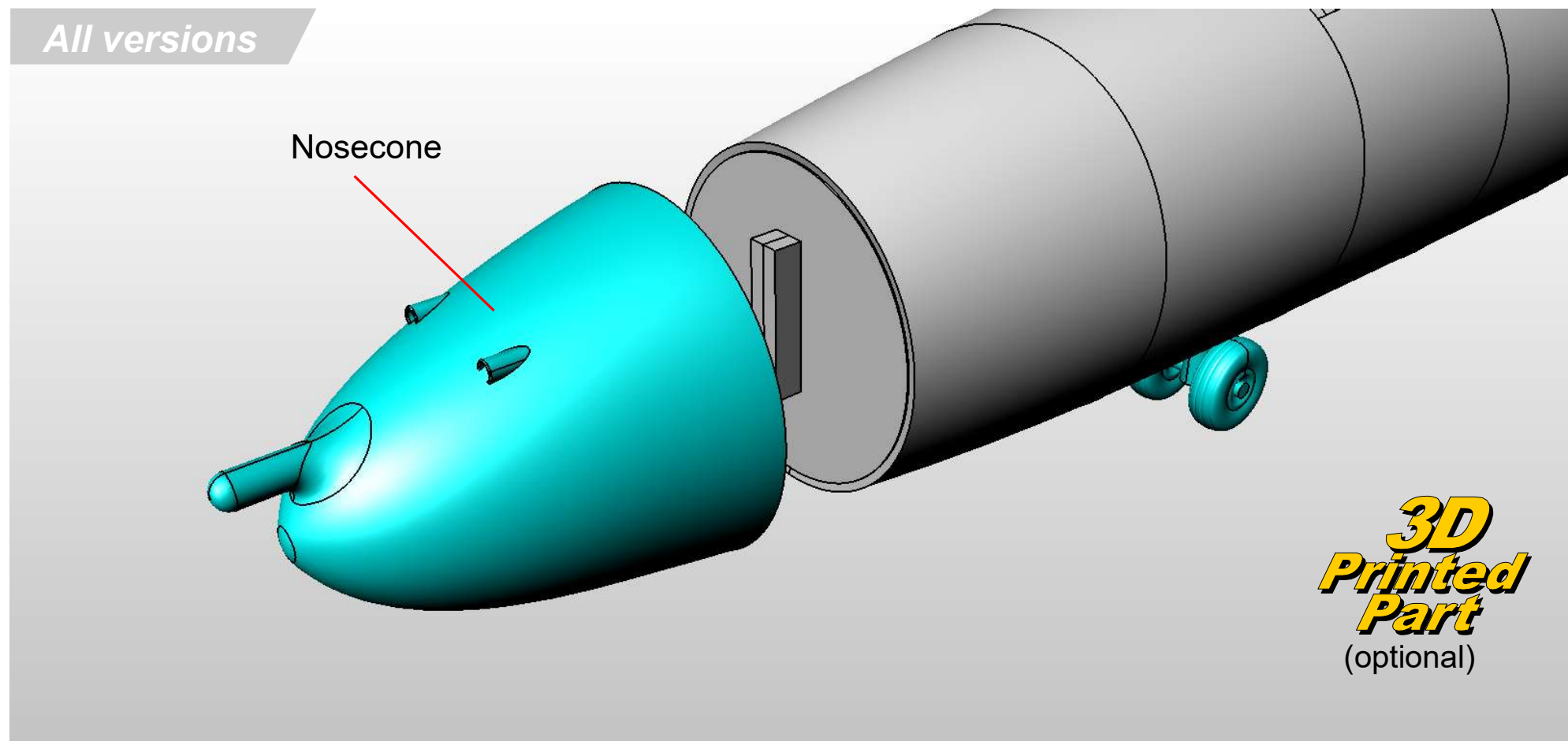


Cut the **Tailcone** Pieces, glue together to form two parts.

Glue to the fuselage and sand to shape.



All versions



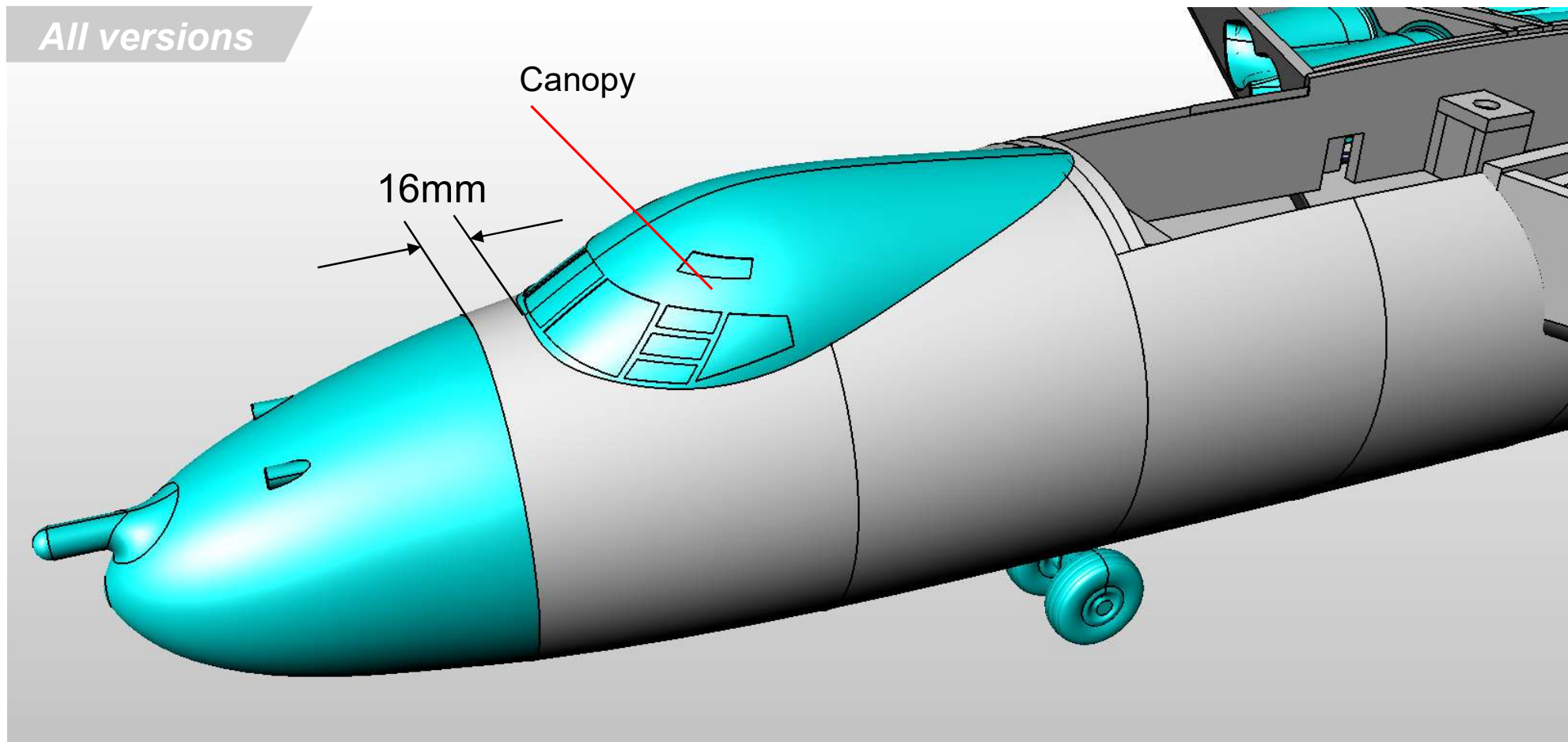
Glue the **Nosecone** to the Assembly



Valiant



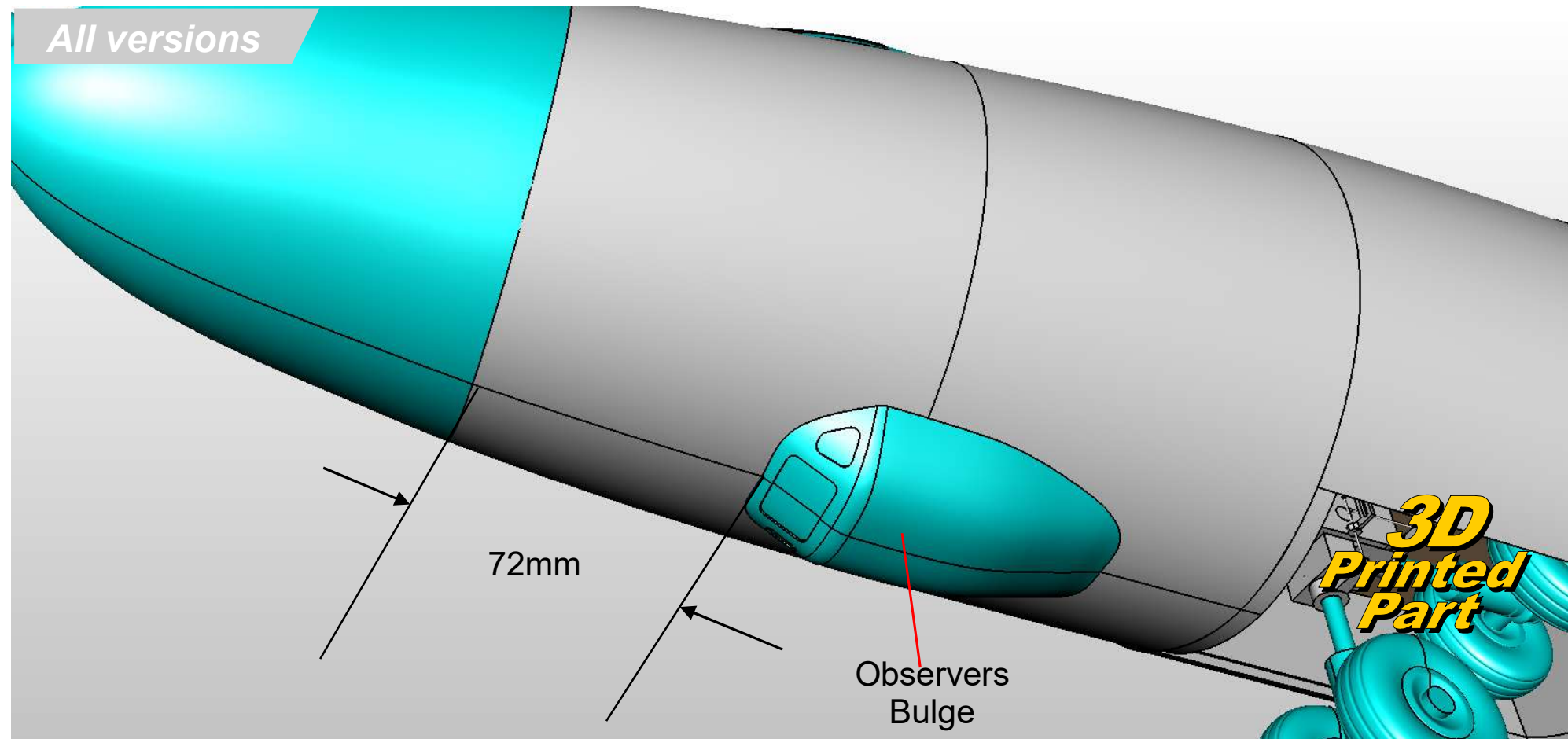
All versions



Glue the **Canopy** to the Assembly, 16mm from the nosecone.



All versions



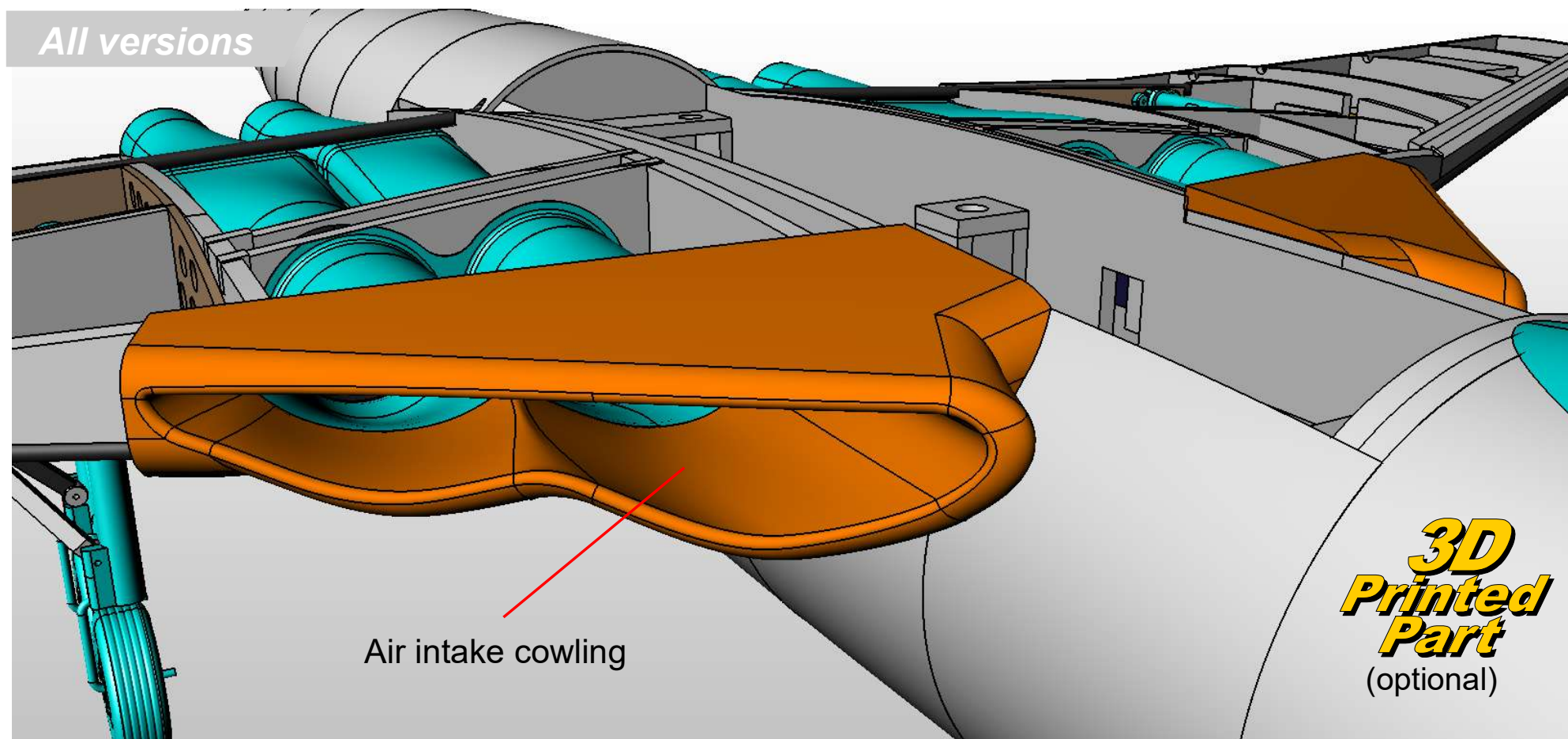
Glue the **Observers Bulge** to the Assembly, 72mm from the nosecone.



Valiant



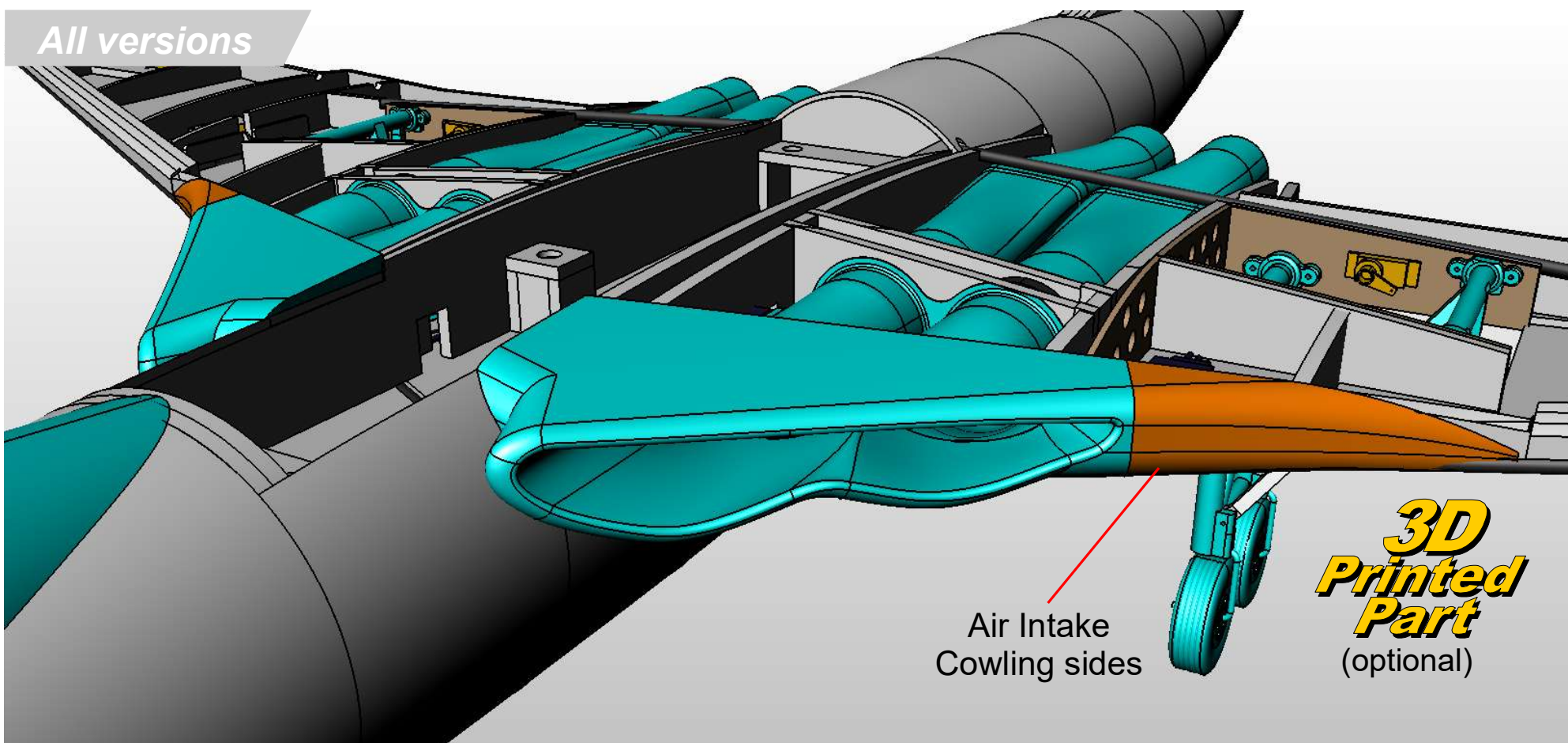
All versions



Glue the two **Air Intake Cowlings** to the Assembly, aligned to the Air intake ducts. They should be 3mm higher than the Forward wing bulkhead, to allow for the wing skin to butt up to it.



All versions



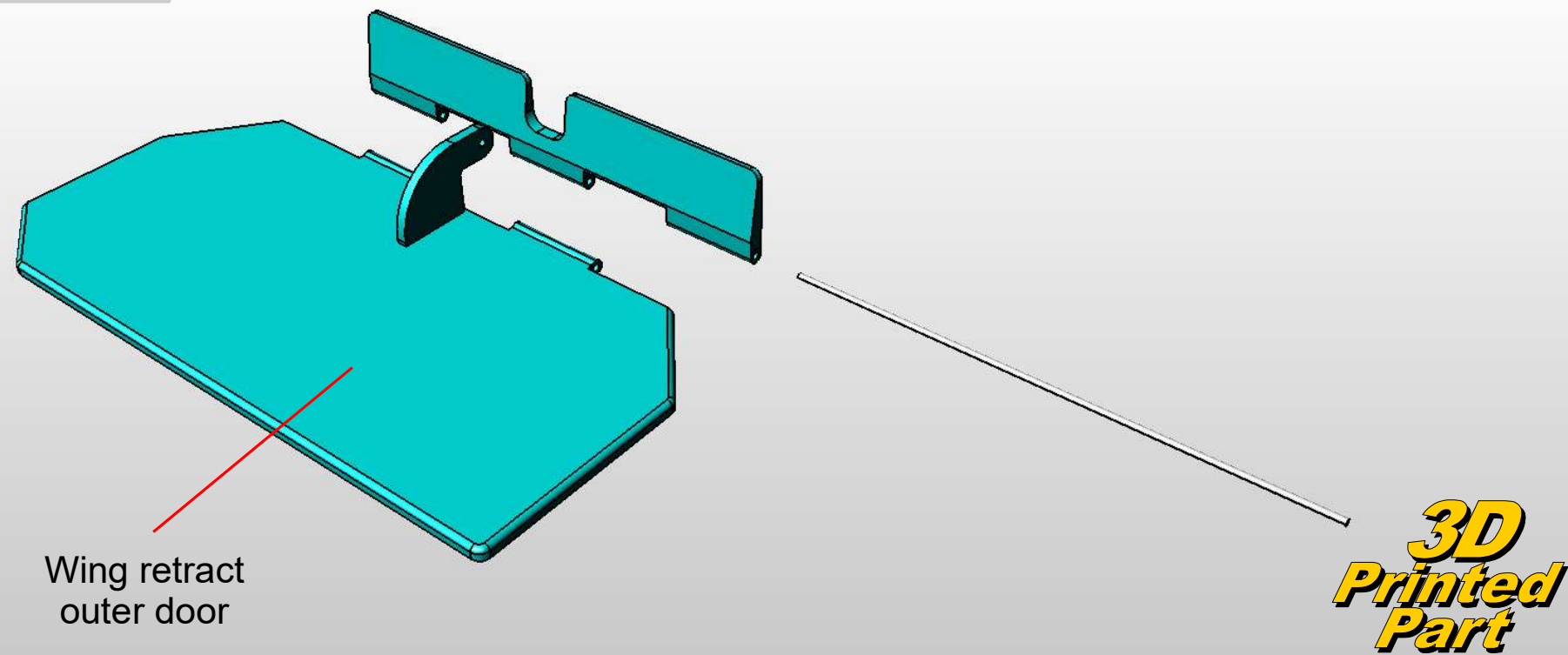
Glue the **Air intake Cowling sides** to the aircraft. 3mm above the wing forward bulkhead, running parallel to the forward wing carbon spar



Valiant



All versions

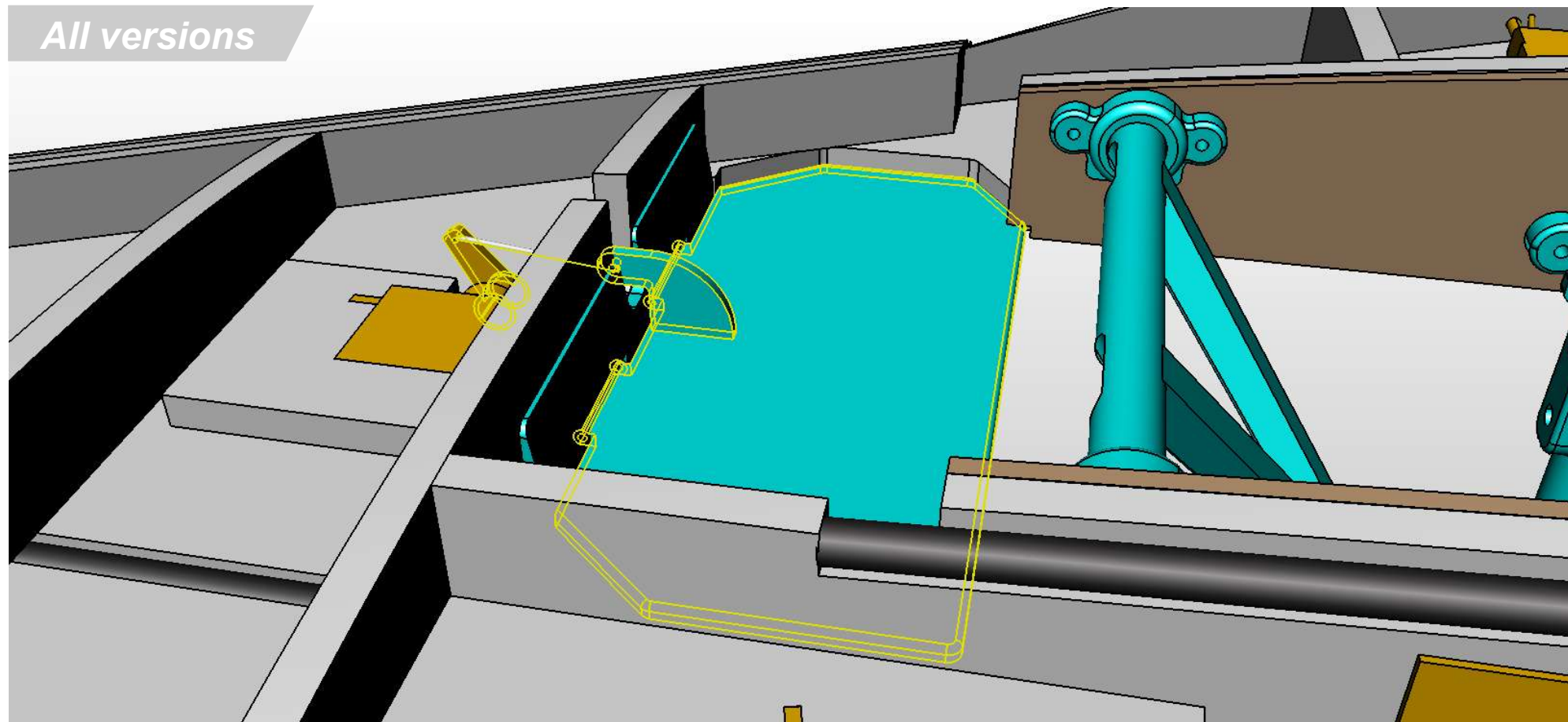


Connect the two parts of the Wing Retract outer Doors together using a 1mm x 100mm steel rod through the hinge.

Put a couple of drops of CA glue at the rod ends to prevent the hinge pin from moving.



All versions



Glue the Retract door mechanism to Rib 4 - aligned so that the door will be completely flush to the underside of the wing.

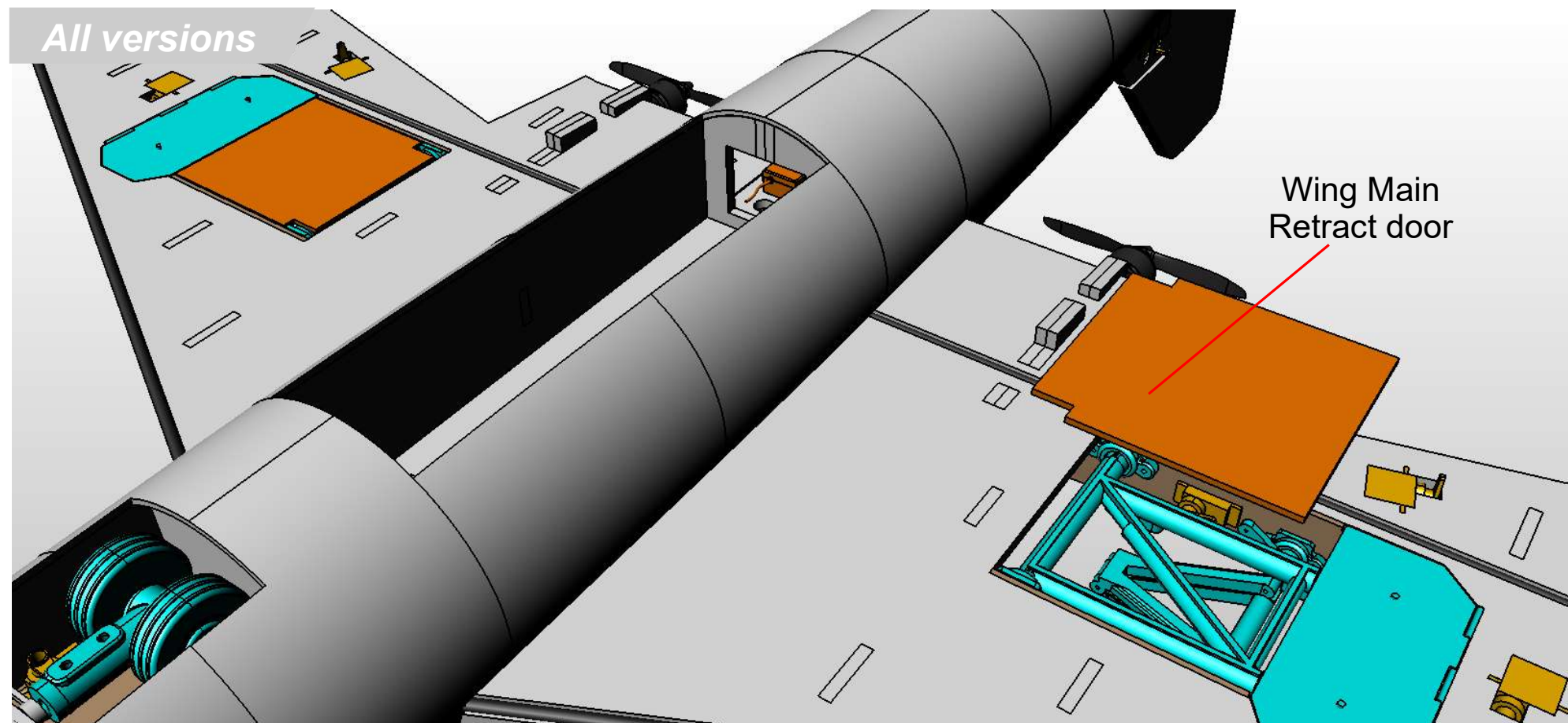
Connect the servo to the door's control horn using piano wire with Z bend.

Adjust the RX/Control horn settings to ensure that the flap will open 90 degrees.



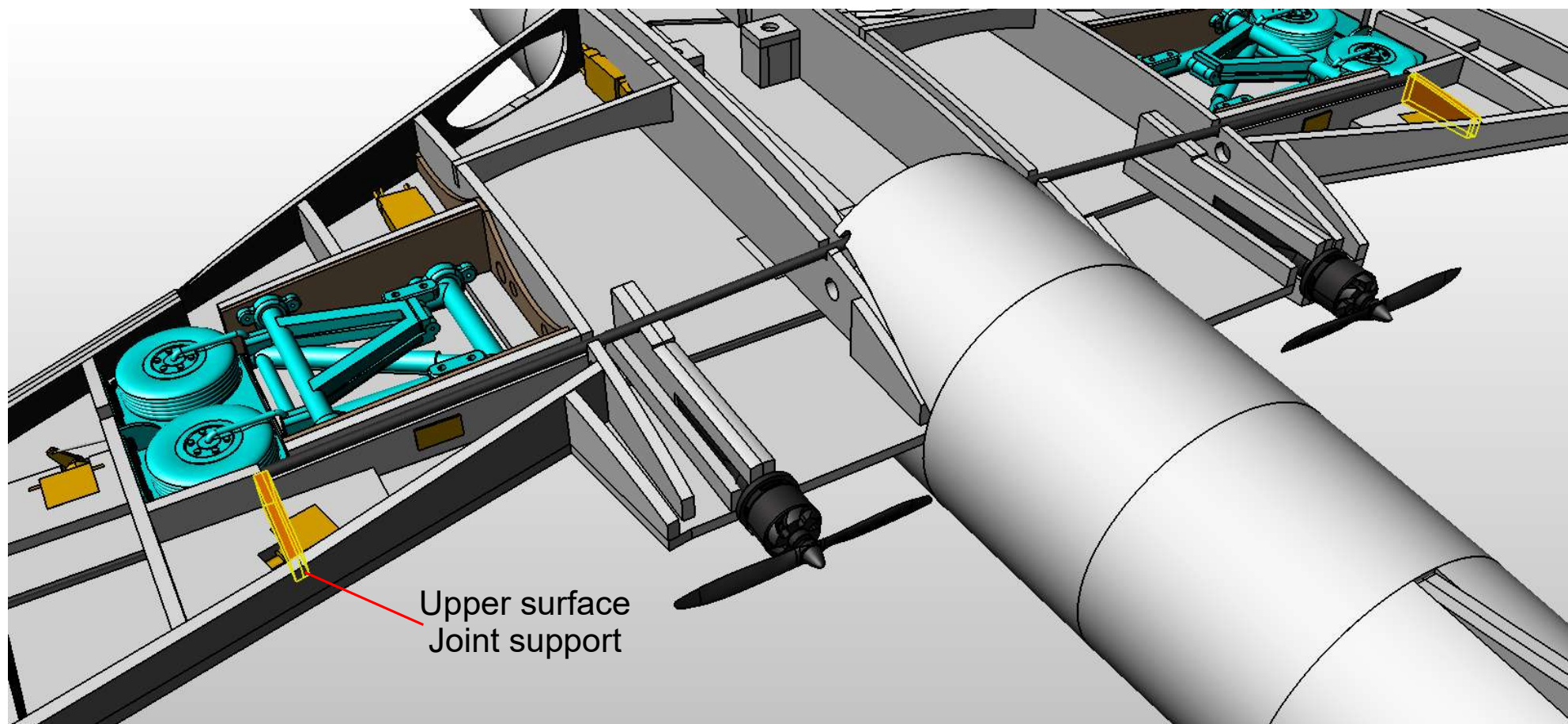
Valiant





Glue the two 3mm Depron **Wing main retract doors** to the 3d printed main undercarriage strut. There is a flat surface designs to glue to.

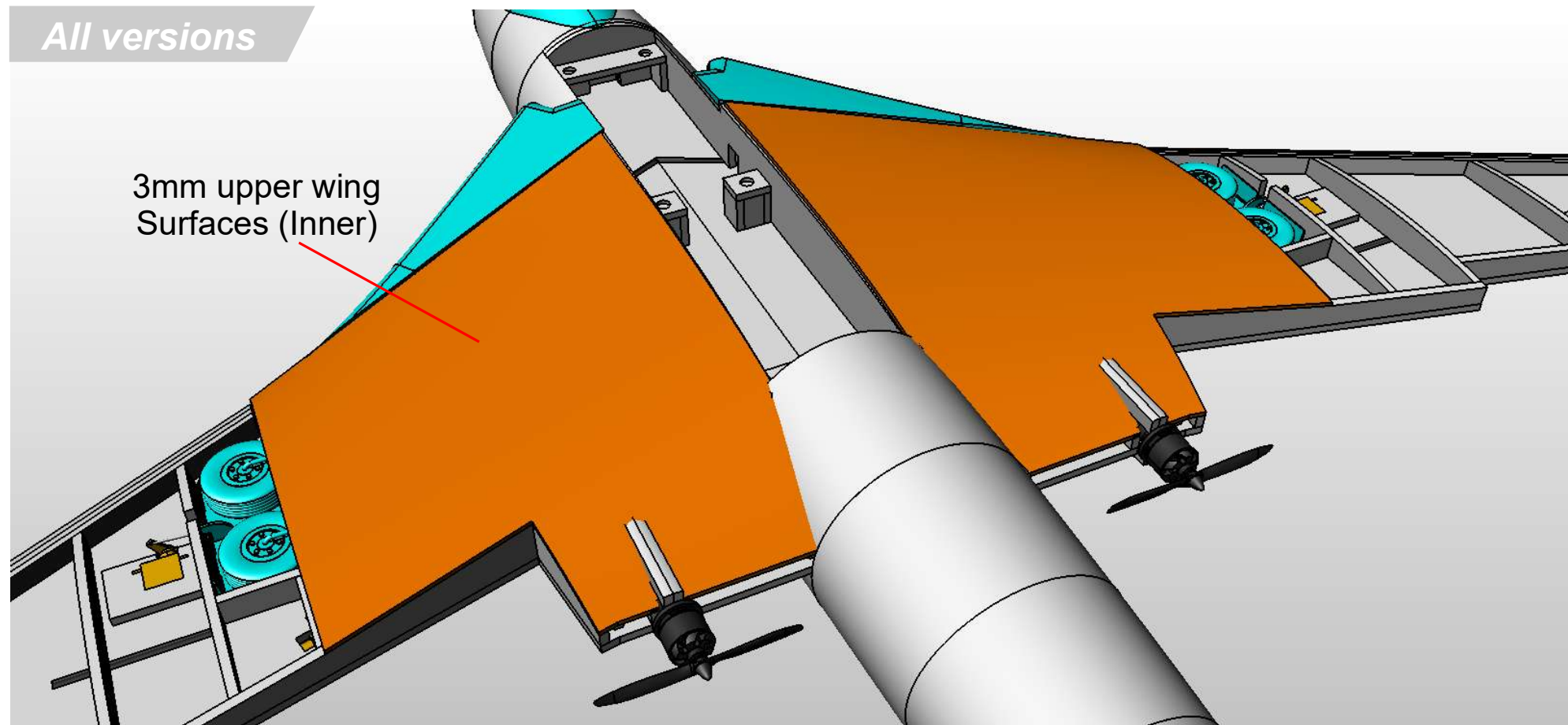
It should fit neatly within a mm, to the front, rear edge and against the 3d printed outer doors. The inboard edge gap is slightly wider to allow the door space to open.



Glue the two **Upper surface Joint support** pieces to the wing directly under where the two 3mm wing pieces meet to give the upper wing surfaces something to support it.



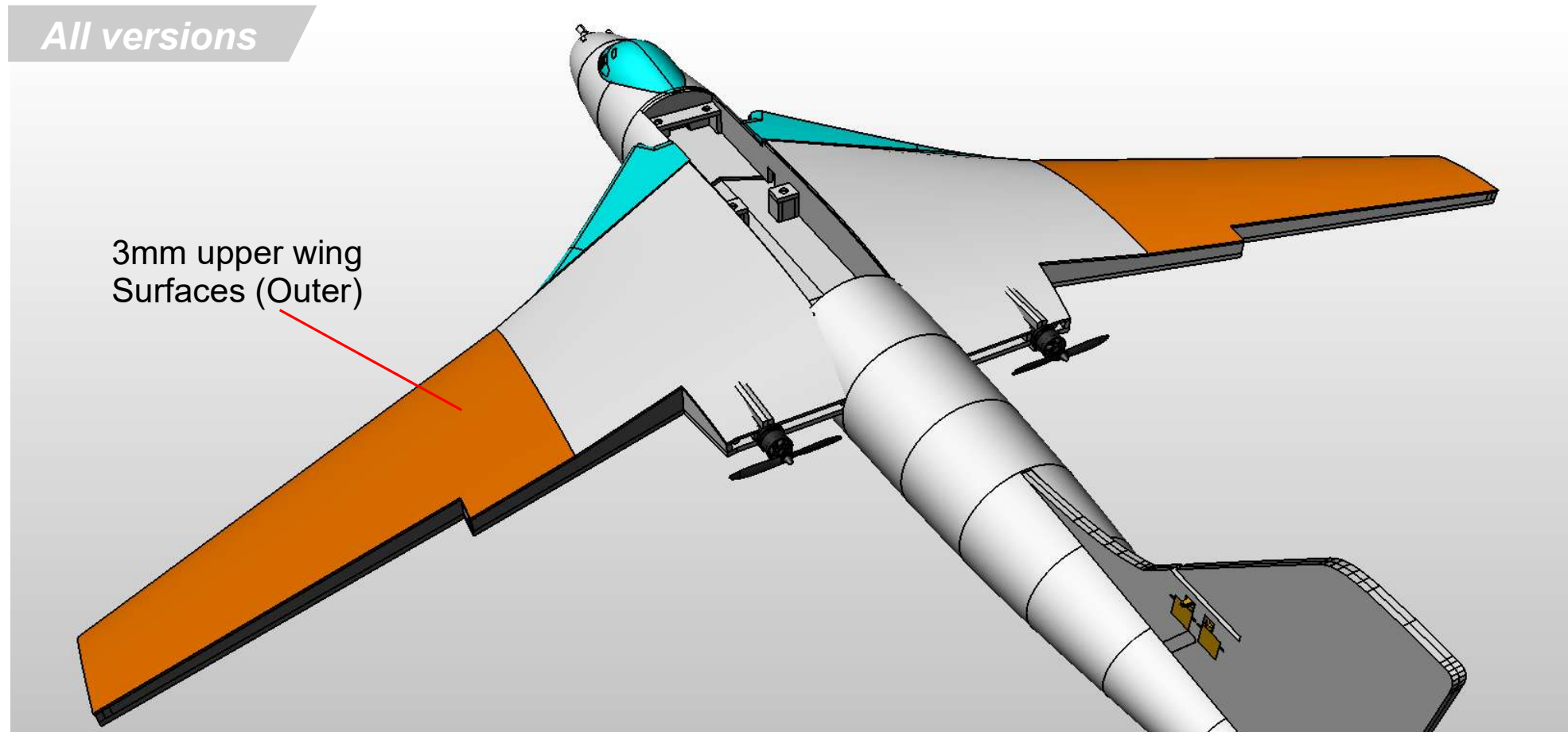
All versions



Trim to fit, then glue the **3mm Upper wing surfaces (Inner)** to both wings as shown,



All versions



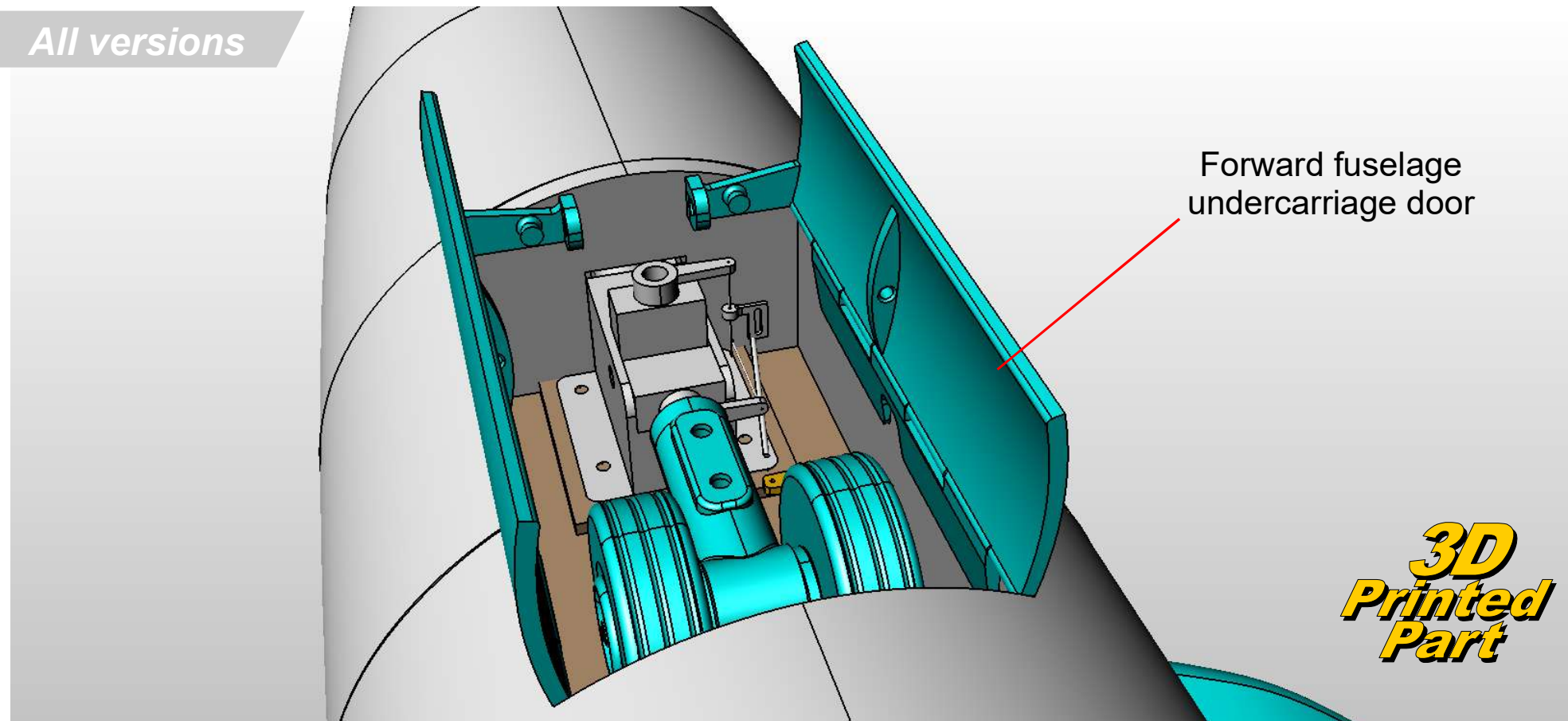
Trim to fit, then glue the **3mm Upper wing surfaces (Outer)** to both wings as shown,



Valiant



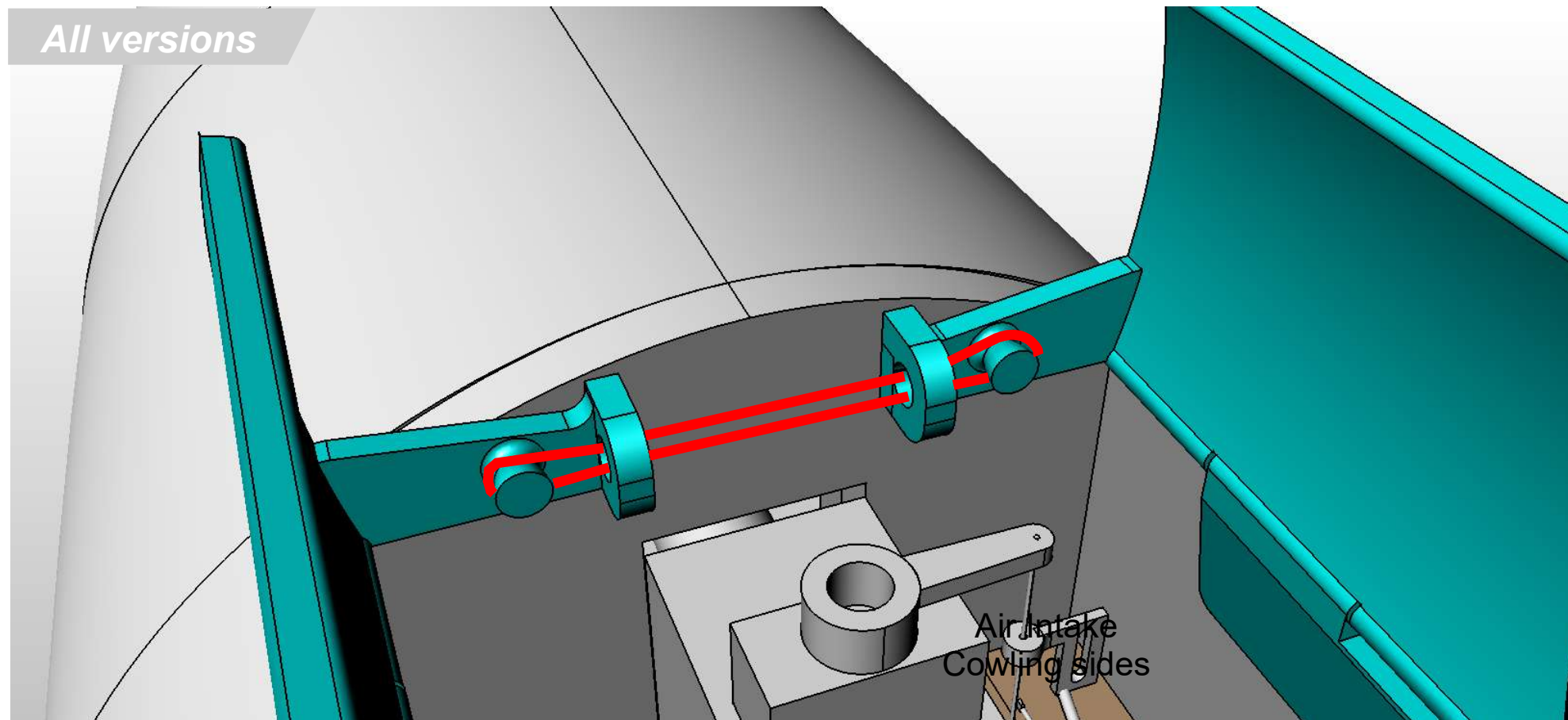
All versions



In the same way as the wing outer retract doors, create the hinge on the **Forward Fuselage Undercarriage Doors**, test fit and glue the doors onto the outer faces of the undercarriage well. - ensure good alignment with the outer fuselage shape.



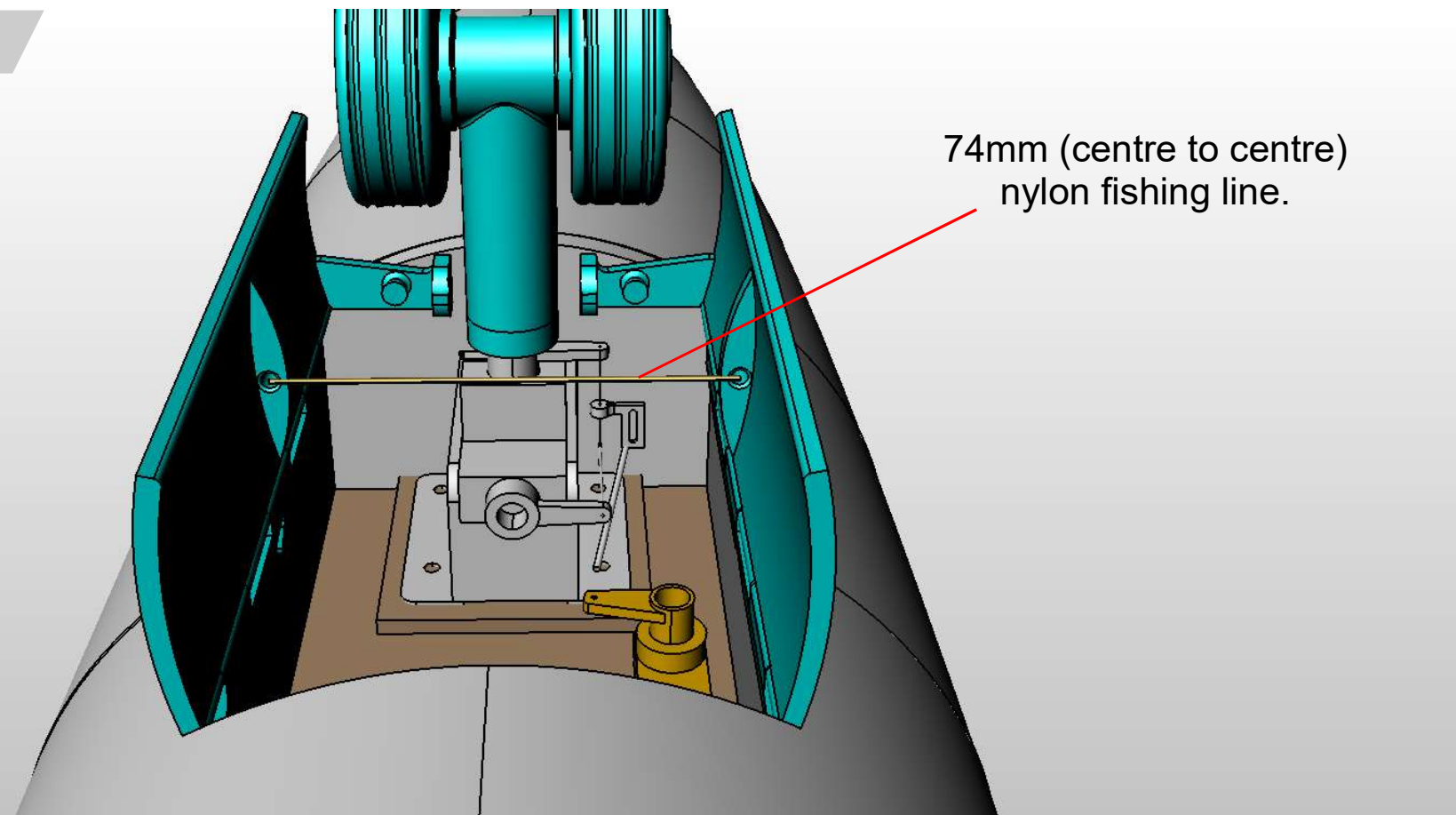
All versions



Attach a rubber band to the door mechanism as shown. You might need to experiment with different sized rubber bands to get the best operation.

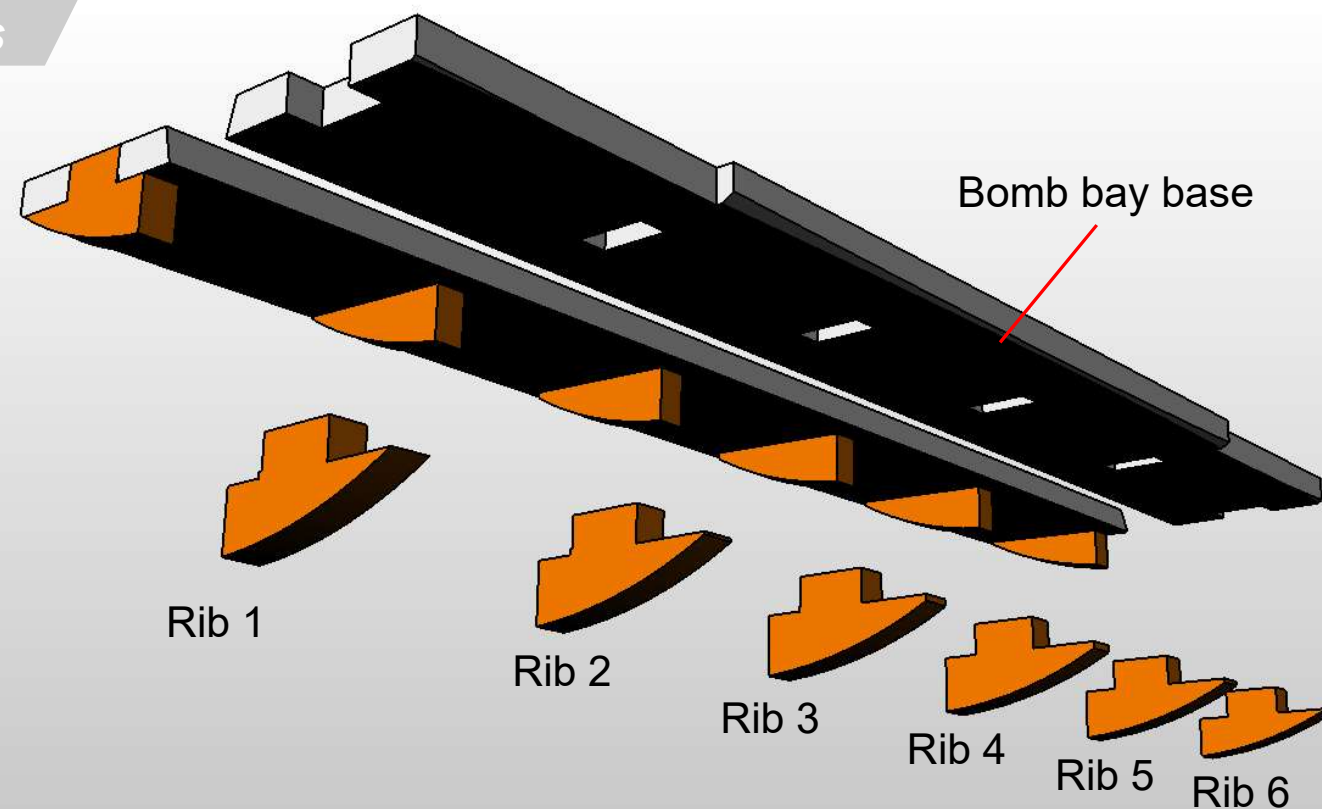


All versions



It might need some experimentation.
Fit the tie string with approximately
74mm distance between them until the
retract mechanism shuts the door as
the retract closes.

All versions



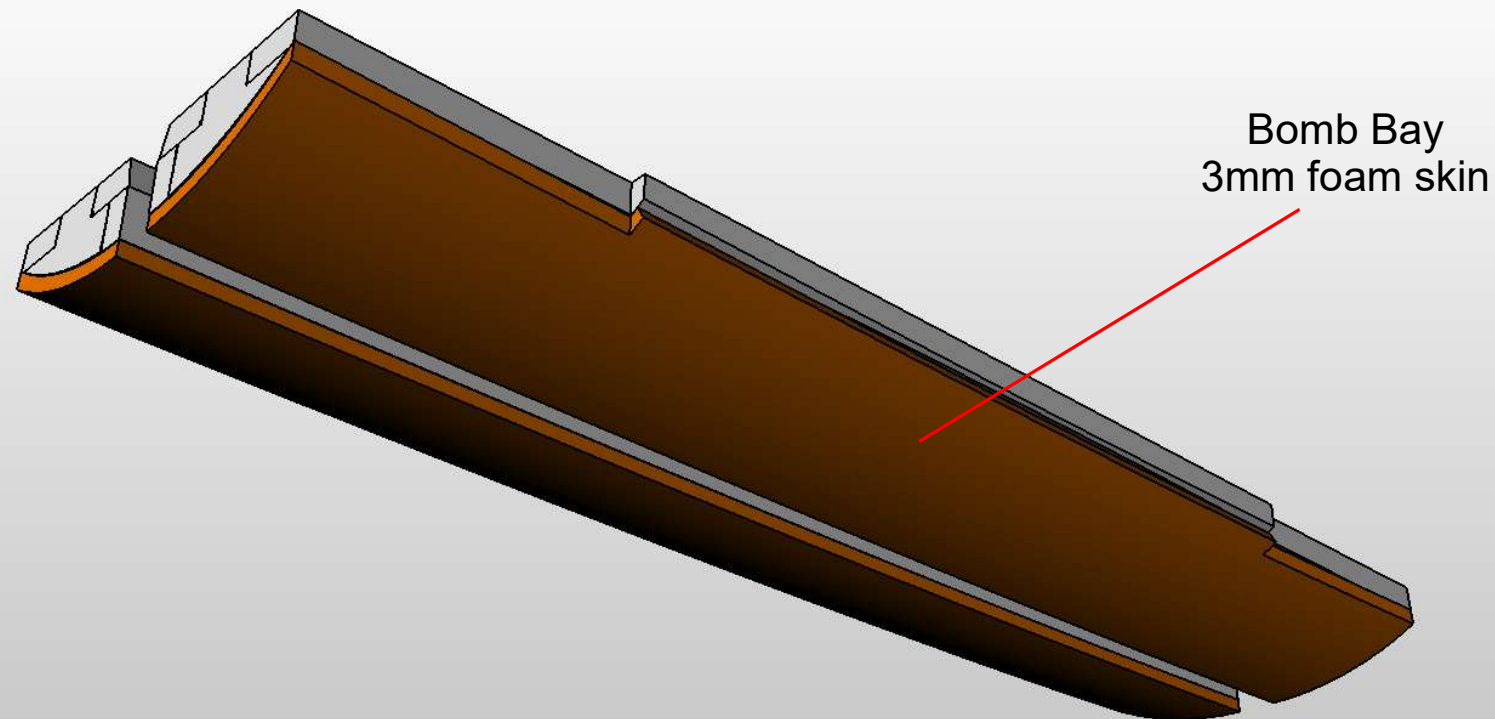
Glue the **Bomb Bay Ribs** to both
Bomb Bay Bases



Valiant



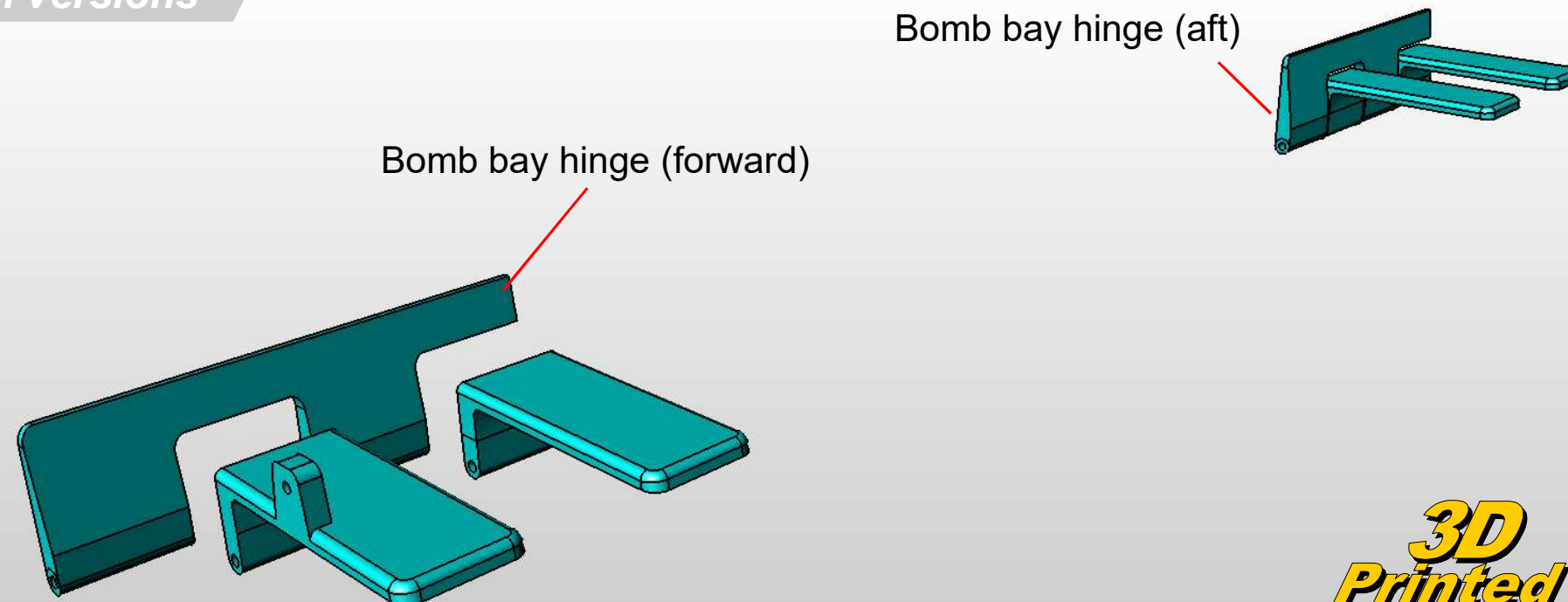
All versions



Glue the two **Bomb Bay 3mm skins** to the bomb bay doors.



All versions



Using a 1mm piano wire, construct the two pairs of **Bomb Bay Hinges**.

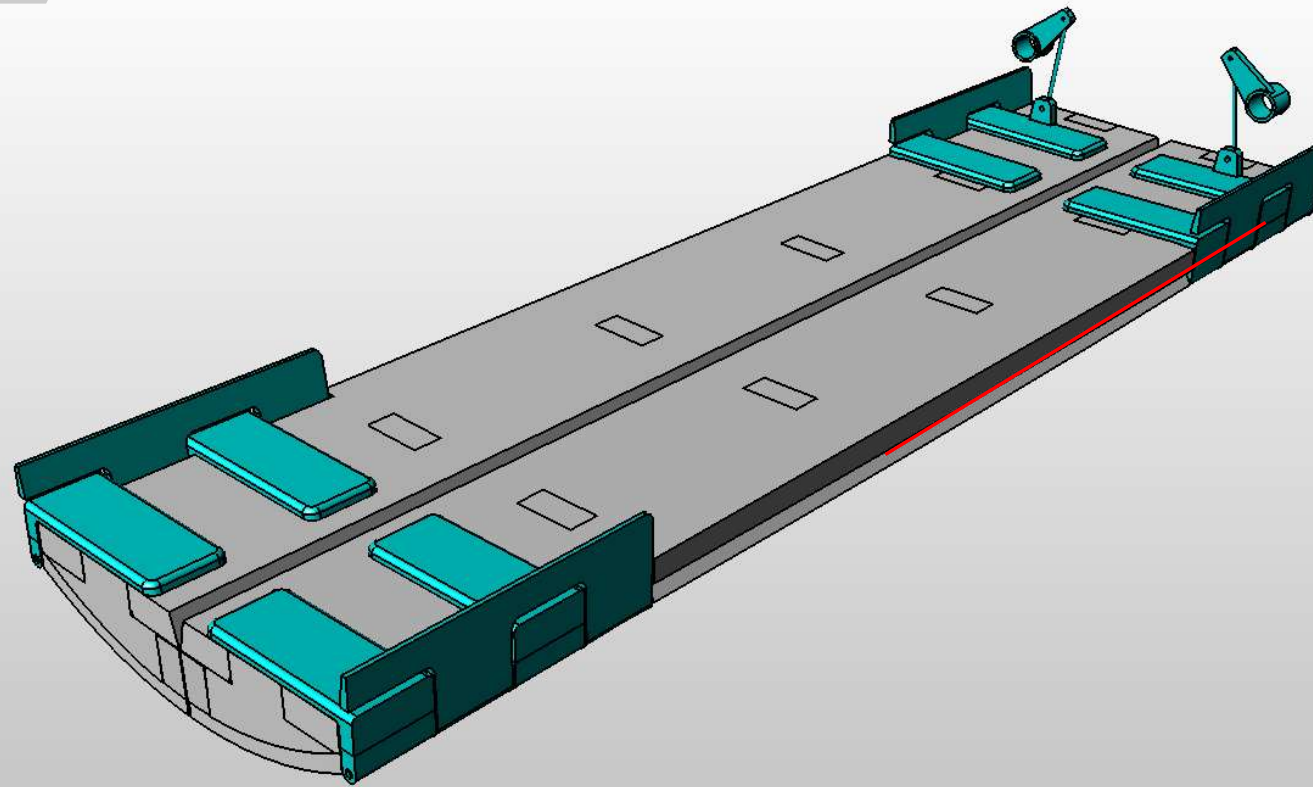
3D
Printed
Part



Valiant



All versions

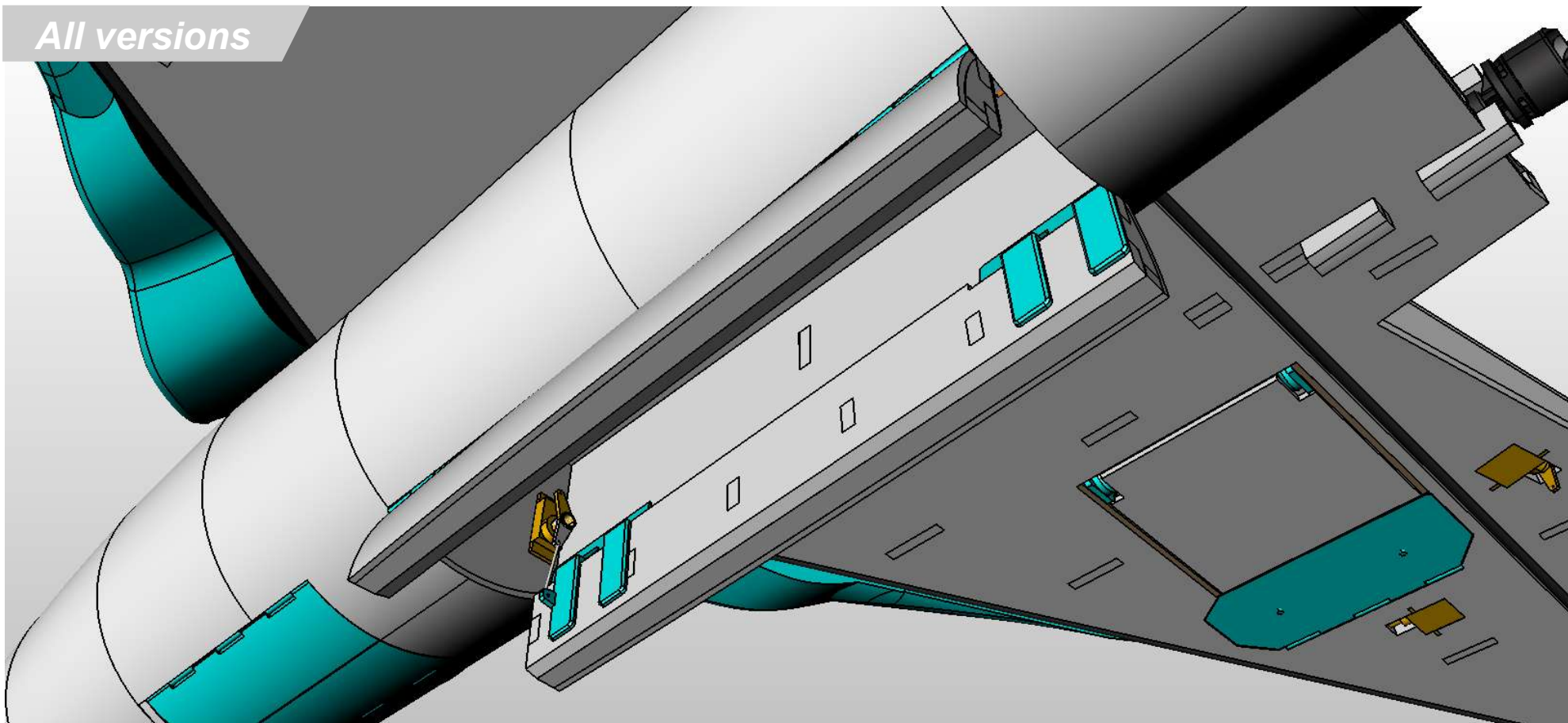


Check the fit into the fuselage, sand to increase tolerance if necessary. Glue the two Bomb bay hinges on to the bomb bay doors.

Prepare the push rod wire links and control horns. (approx 30mm centres)



All versions



Glue the Bomb bay doors to the fuselage and adjust the servo travel etc until it operates smoothly.



Valiant

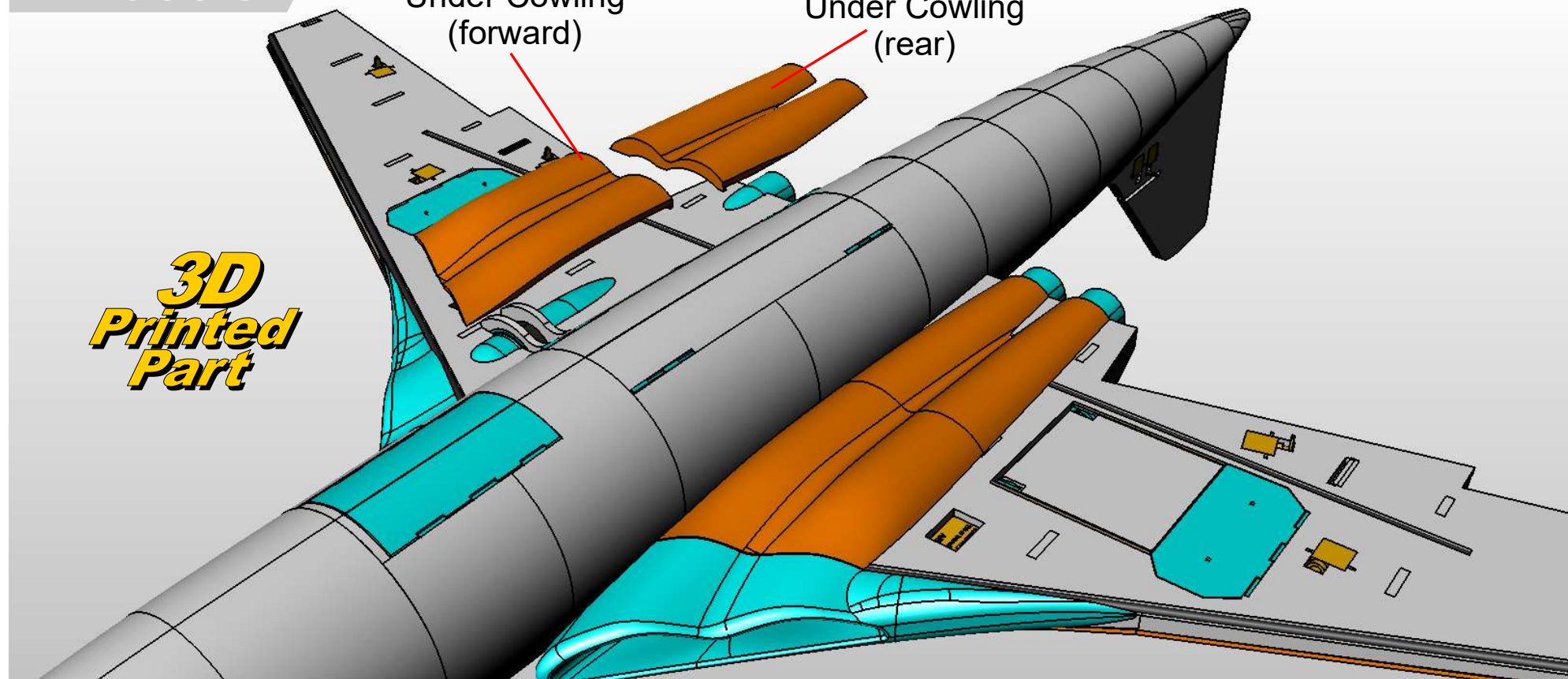


All versions

**3D
Printed
Part**

Under Cowling
(forward)

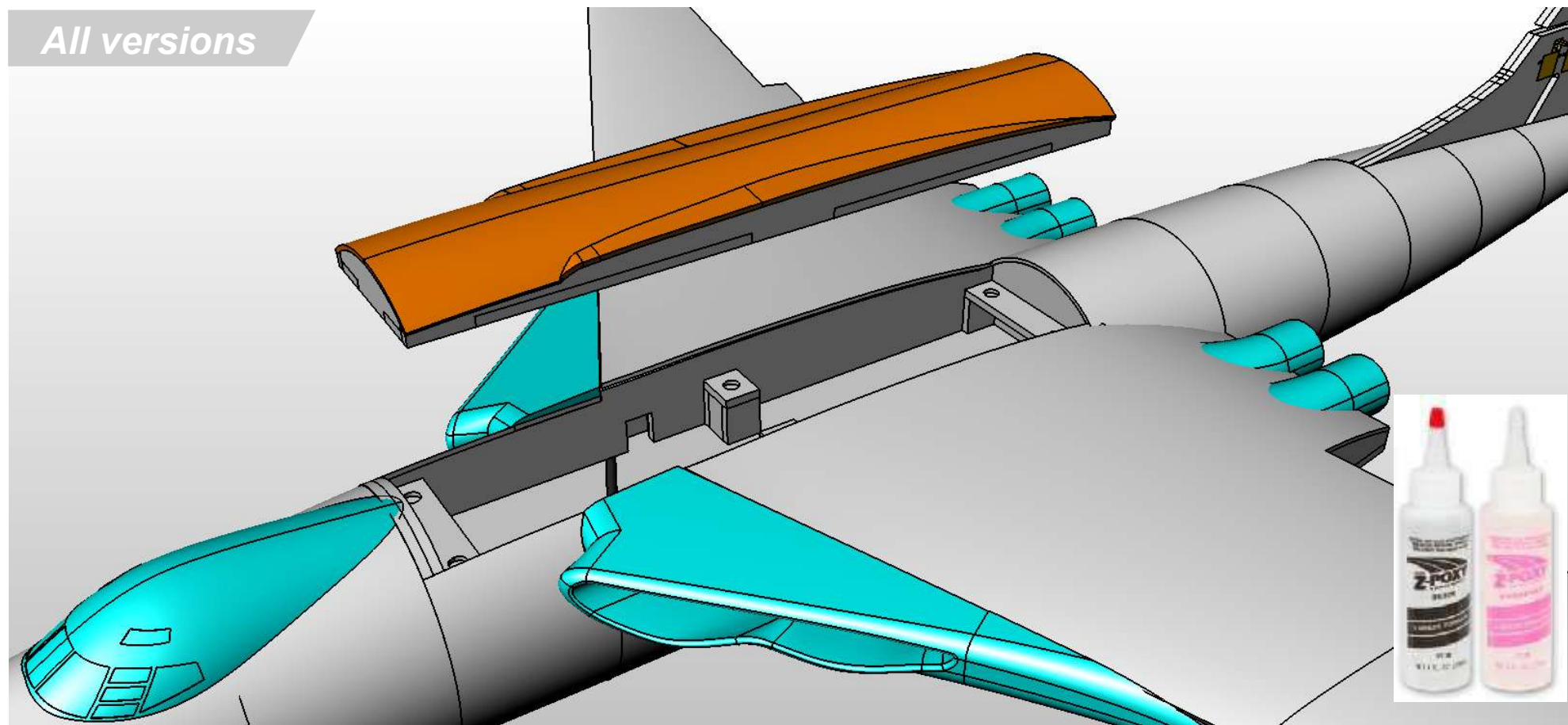
Under Cowling
(rear)



Glue the **Under Cowlings** to the assembly as shown.



All versions



Glue 3mm foam skin onto the Battery hatch, shaping to match the wing intersection as shown. Use either a fake antenna or strong thread to allow access to open the hatch.

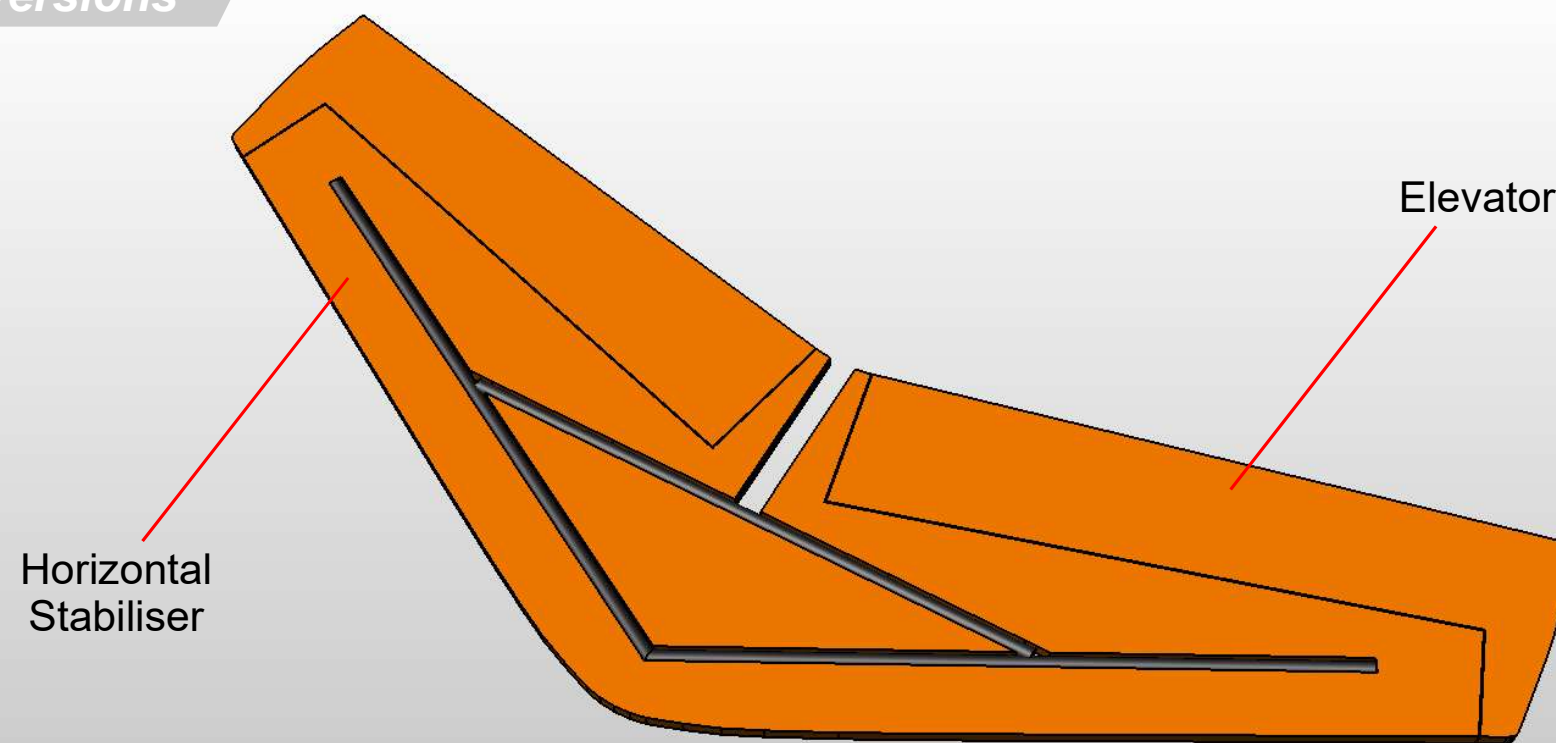
Recess and add button magnets (epoxy) to align with the fuselage magnets. - Be careful not to glue the hatch to the fuselage!! Sometimes I add masking tape over the magnets for weeks until the epoxy has completely gone hard.



Valiant



All versions



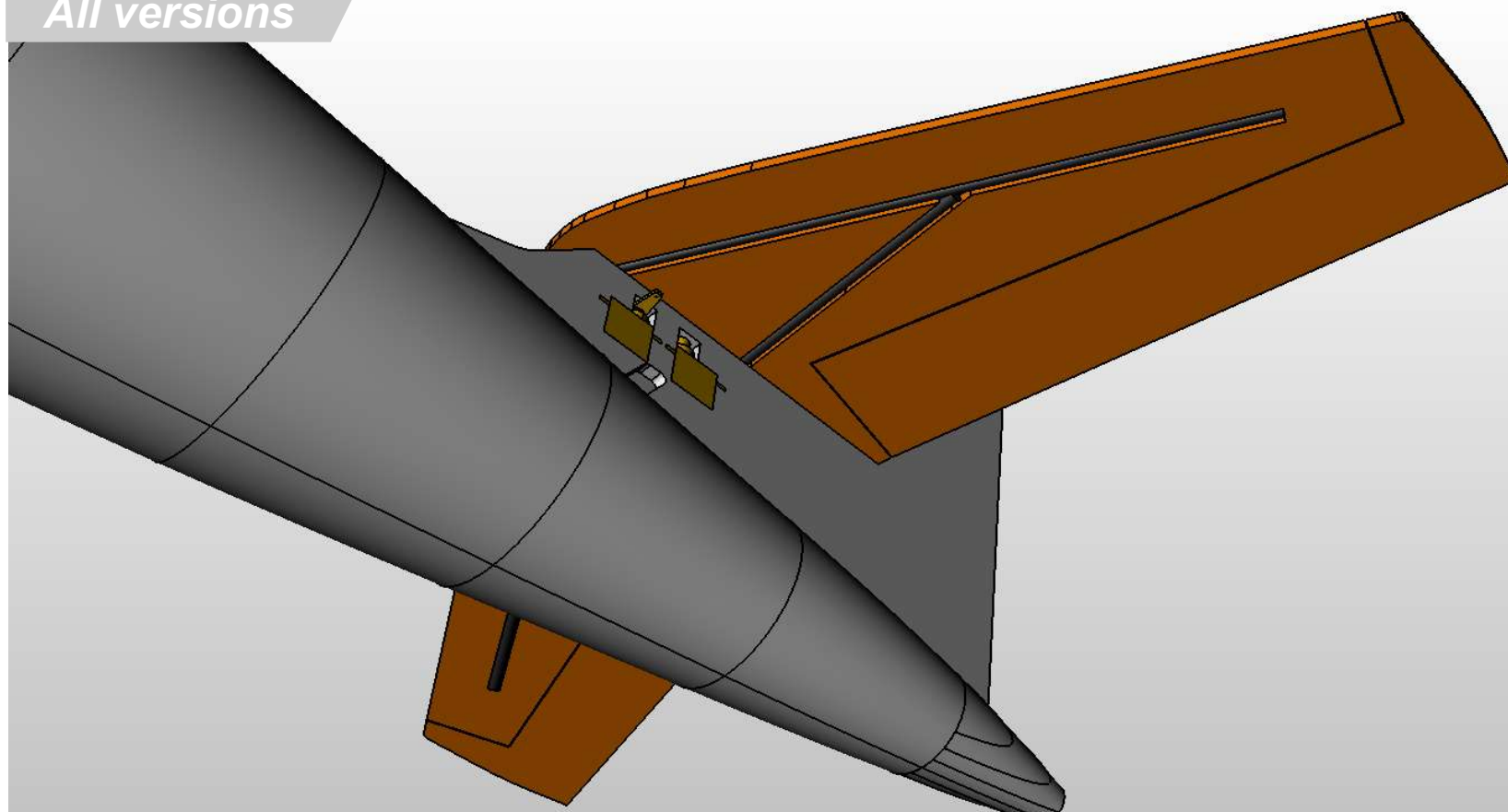
Glue the 6mm carbon tube spars into the Horizontal stabilizer

Hinge the elevators and glue to the Horizontal stabilizer,

Add control horns.



All versions



Create makeshift props to hold the elevator assembly completely horizontal. Epoxy into place.

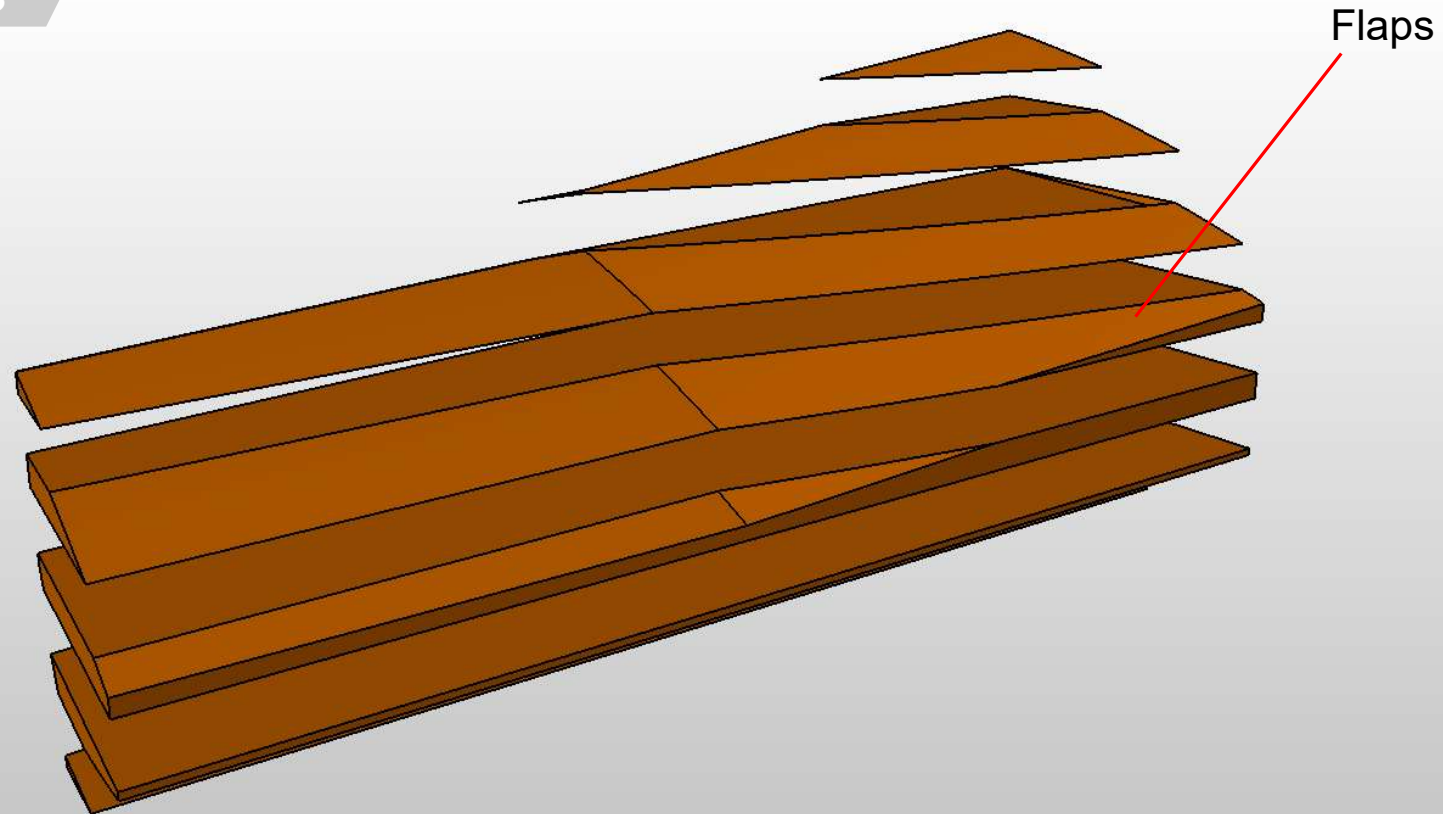
Connect elevators to control horns. Ball links may be useful to overcome the slight twist.



Valiant



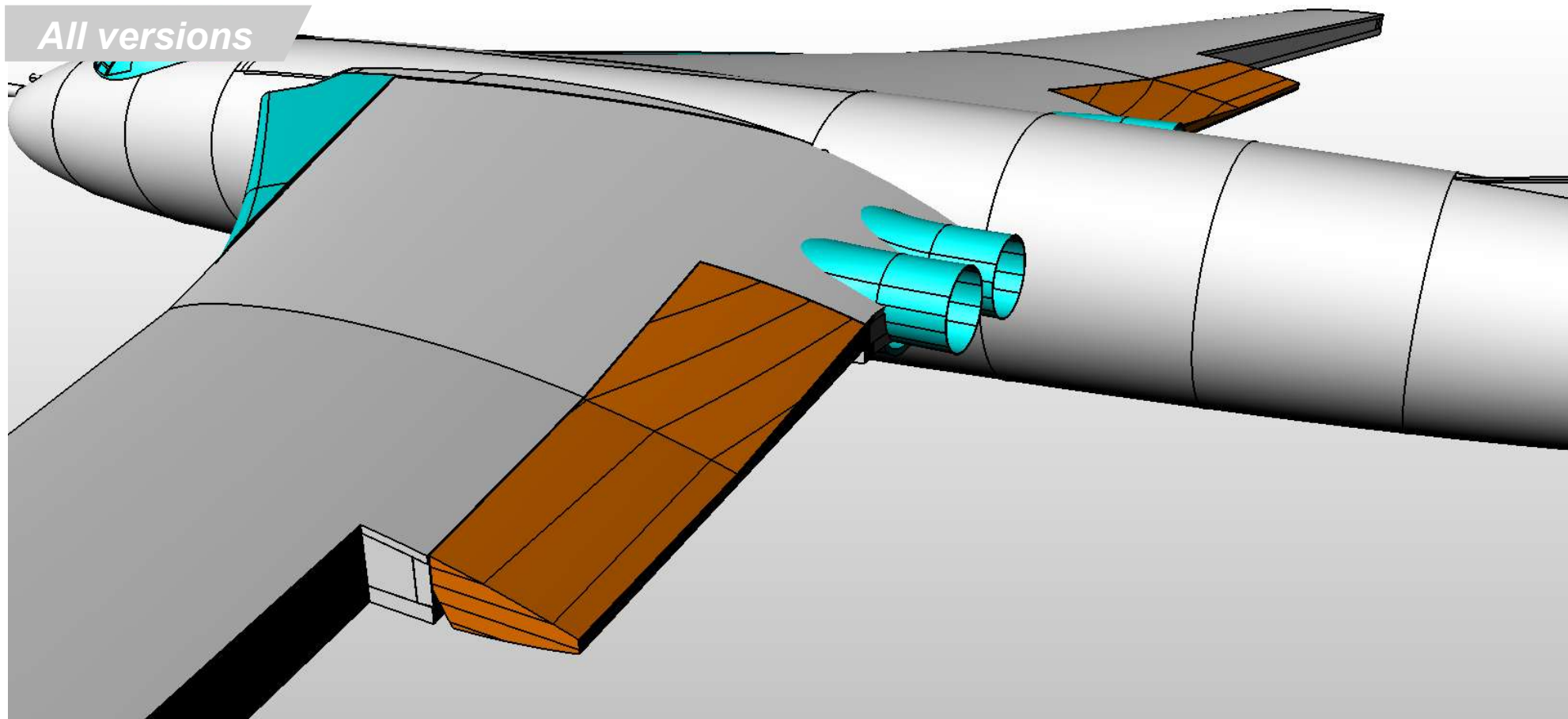
All versions



Laminate and shape the Flaps match the wing aerofoil shape.



All versions

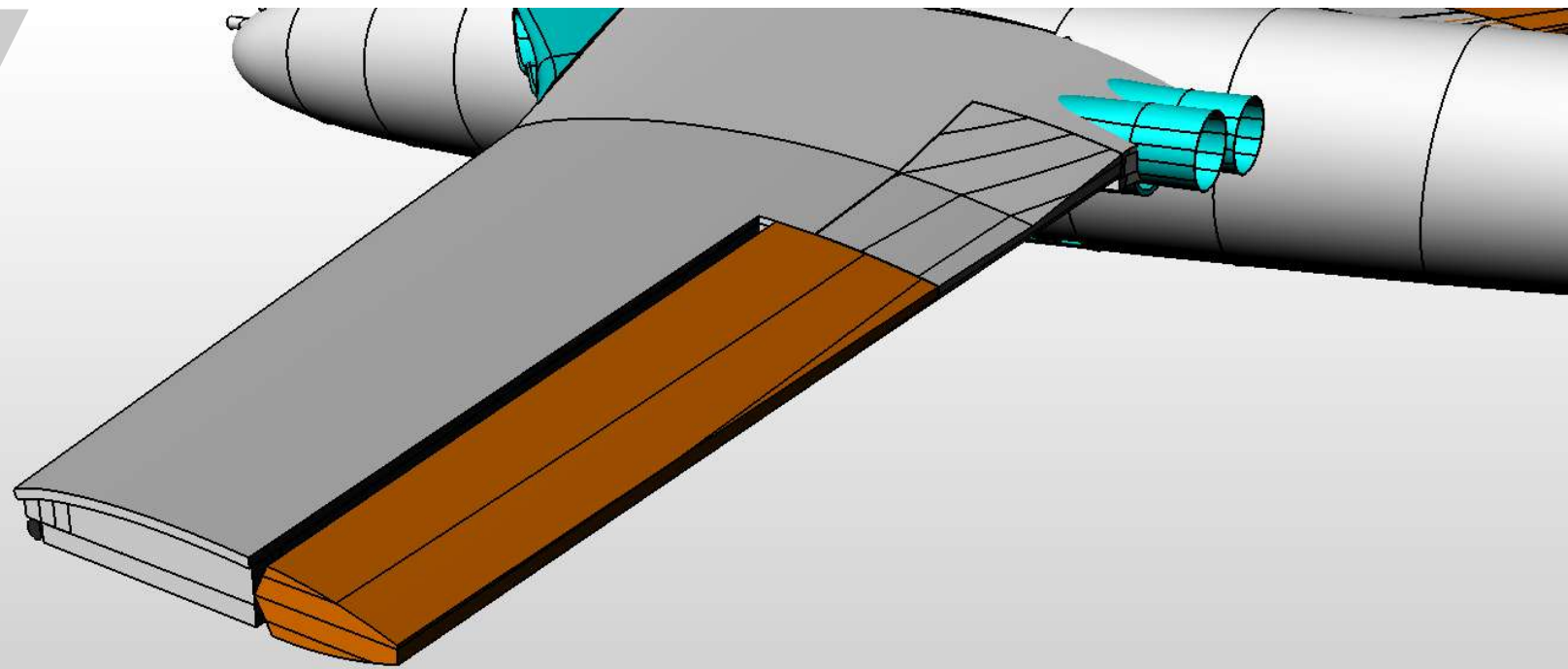


Attach the flaps to the wing, using robust hinges. Chamfer the lower forward edge to allow them to drop down without restriction.

Valiant



All versions



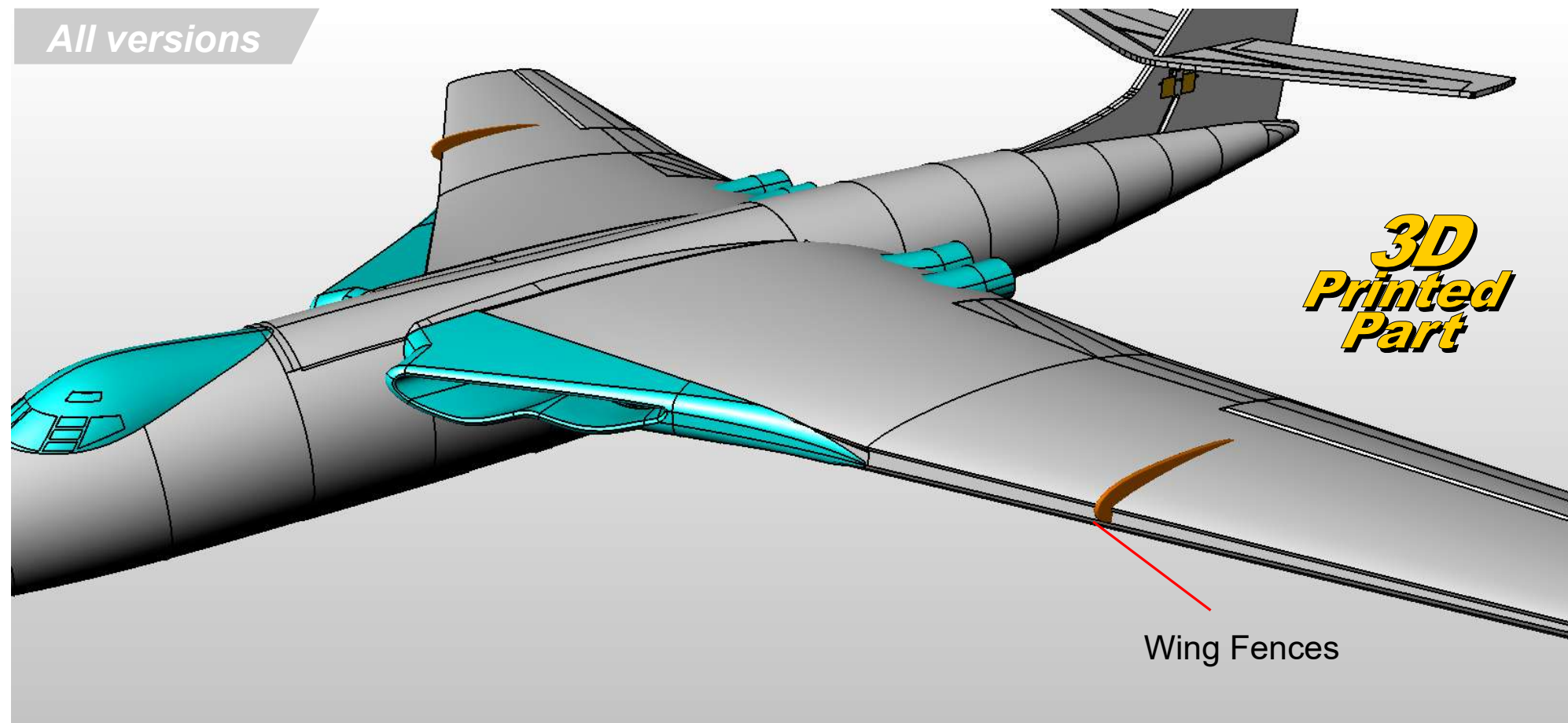
Follow the same process for the Ailerons as the flaps.

Laminate together, sand to match the aerofoil.

Attach to the wing using robust hinges.



All versions



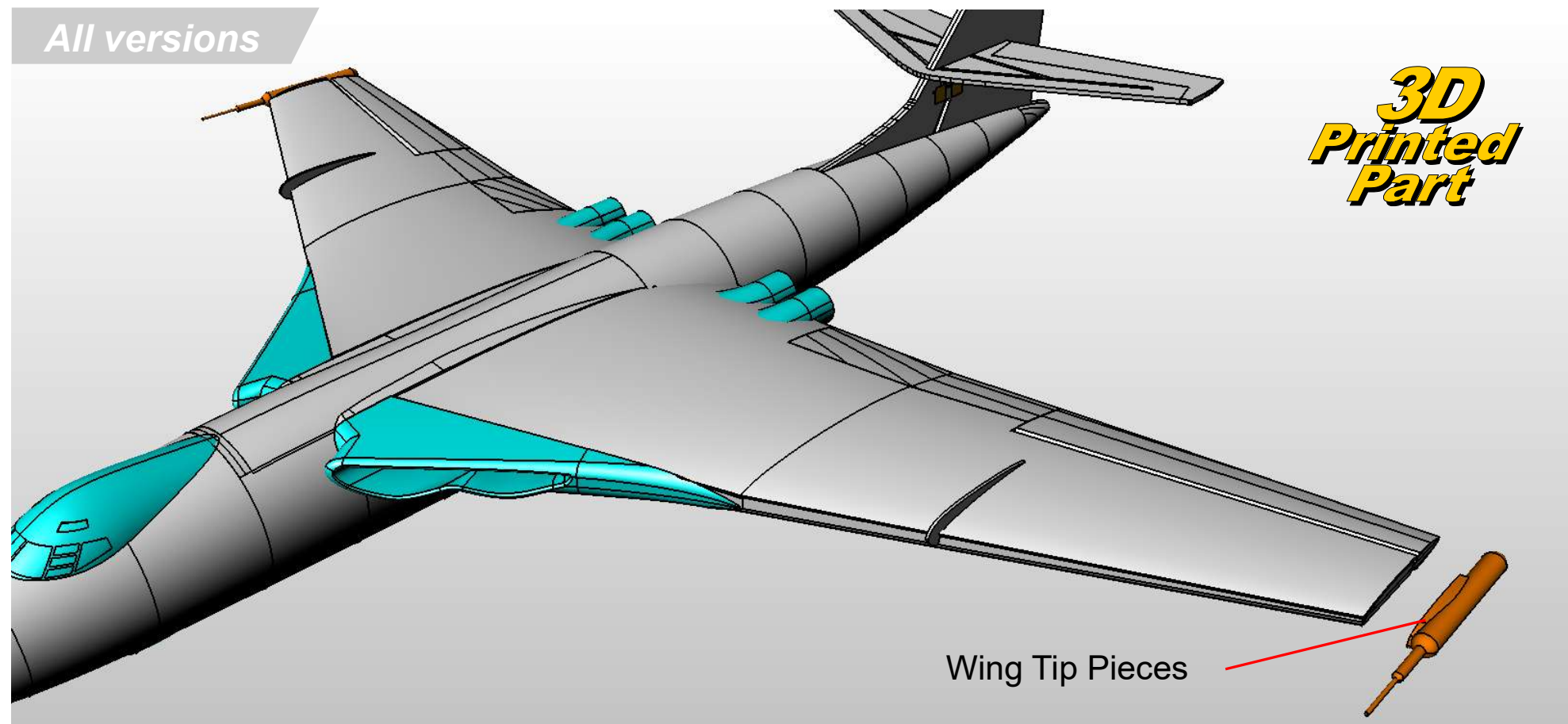
Sand the leading edge of the wing (foam parts only) to create a smooth aerofoil shape, guided by the shape of the Wing **Fences**.



Valiant



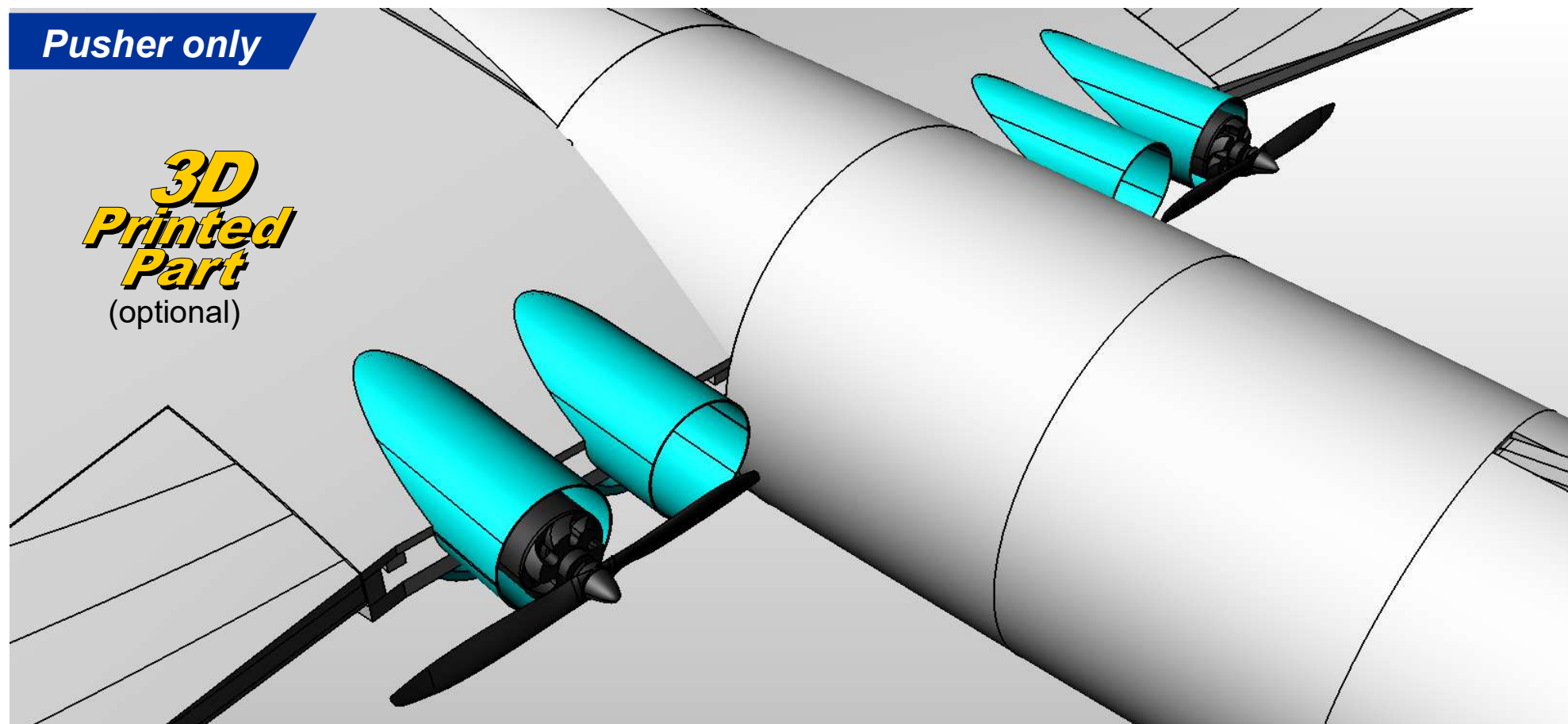
All versions



Glue the 3D printed **Wing Tip Pieces** to the ends of the wings.



Pusher only



PUSHER ONLY

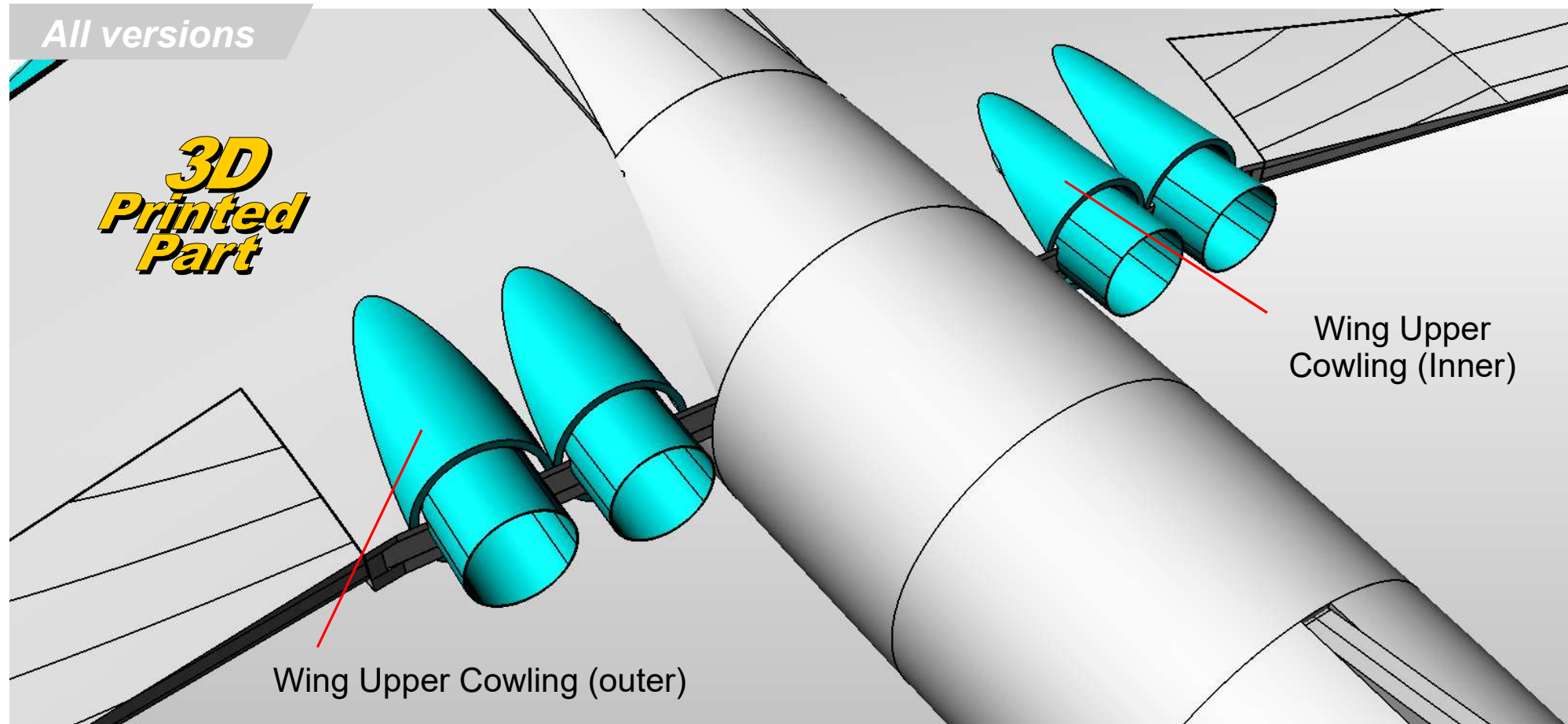
Glue the 3D printed **Pusher Exhausts** over the Pusher mount and onto the wings.

Valiant



All versions

**3D
Printed
Part**

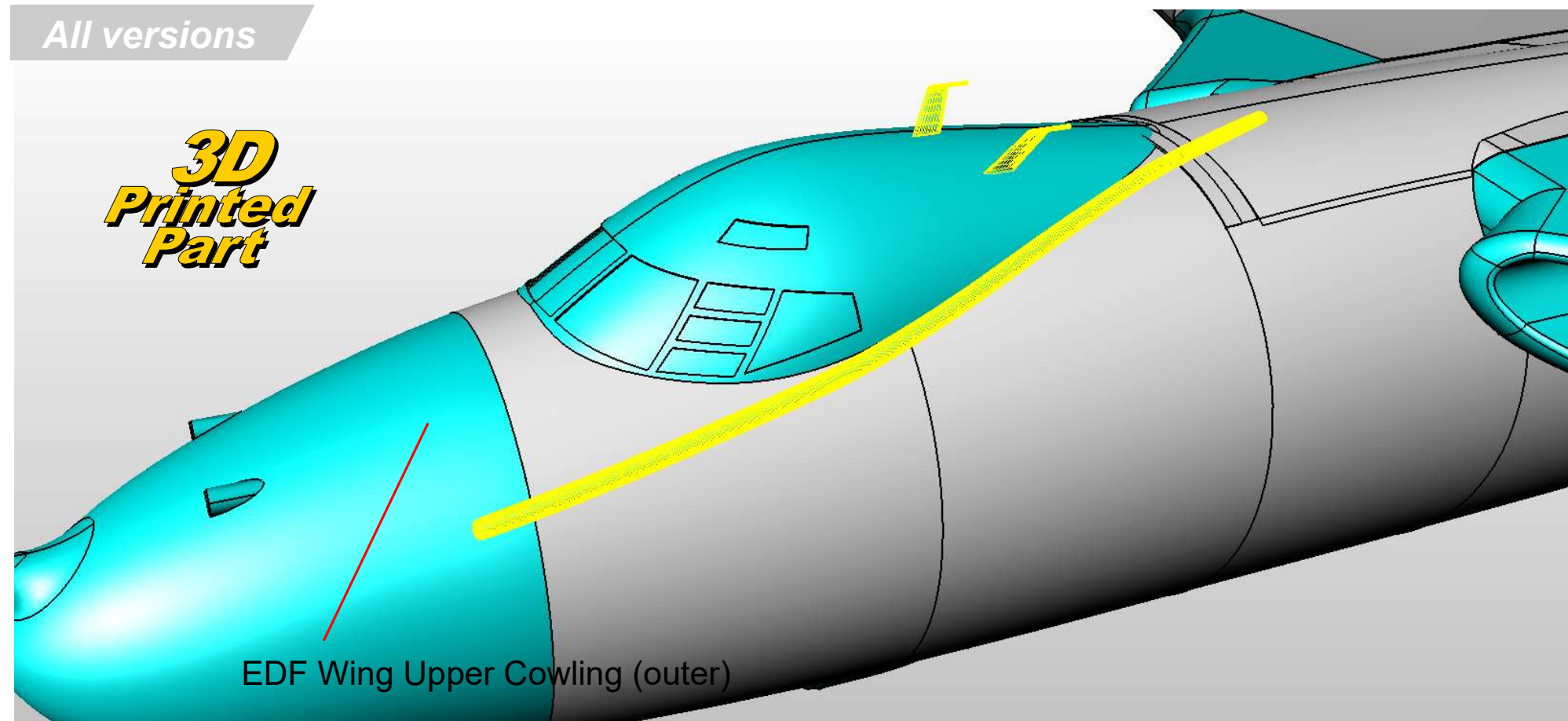


Glue the **Wing Upper Cowling** pieces around the thrust tubes/ Pusher Exhausts onto the wing as shown,



All versions

**3D
Printed
Part**

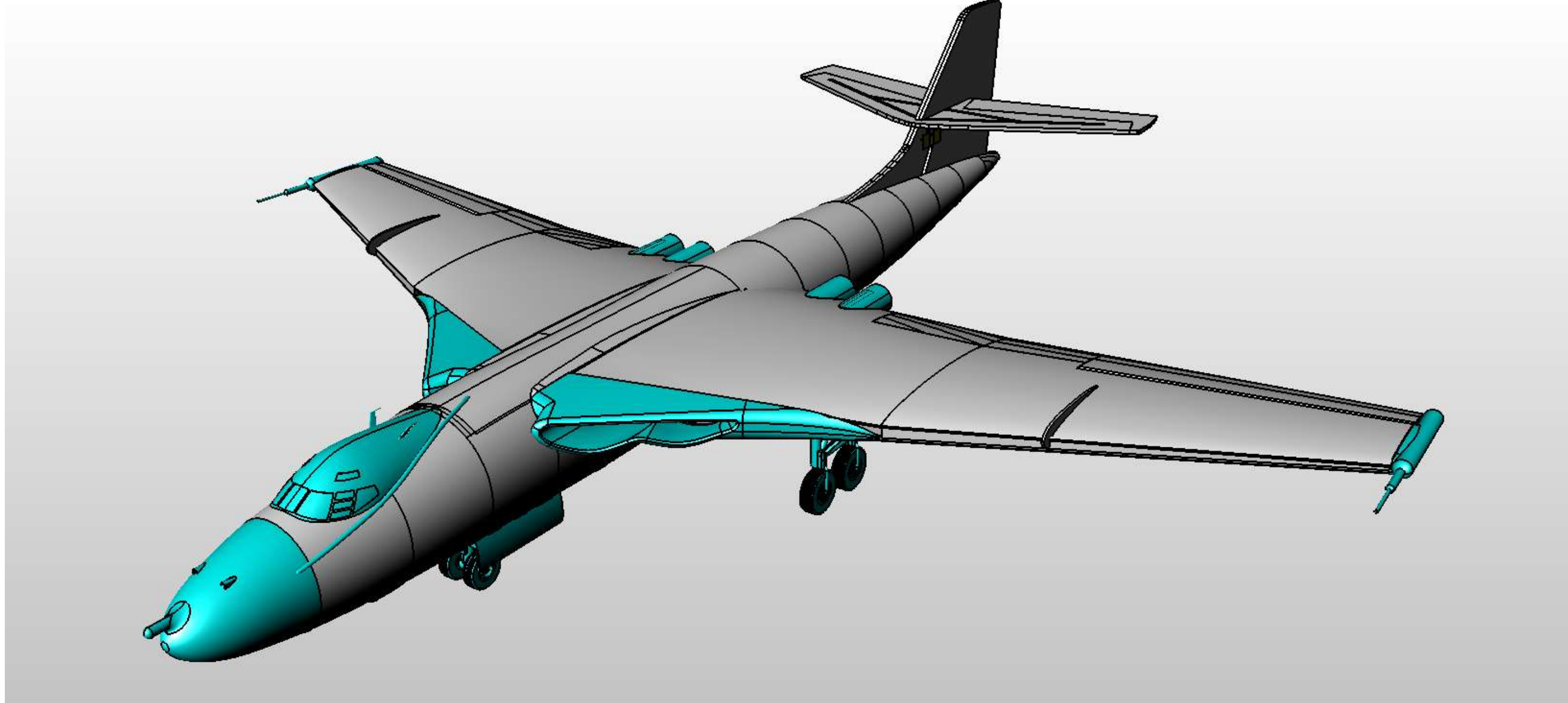


Glue the smaller detailed pieces to the Fuselage as shown,



Valiant





Congratulations! Your model is now complete.

I recommend you apply thin strips of 0.6oz fibreglass over the 3mm foam skin joints on the fuselage and in the middle of the upper wing. Use Water Based Polyurethane varnish as 'resin'

Either fly it as it is, or finish it further - look at www.jetworks.online for finishing guides.





The internet is full of images of the Valiant. Use them to help finish and detail your model.

Valiant

