ANGELWING DESIGNS

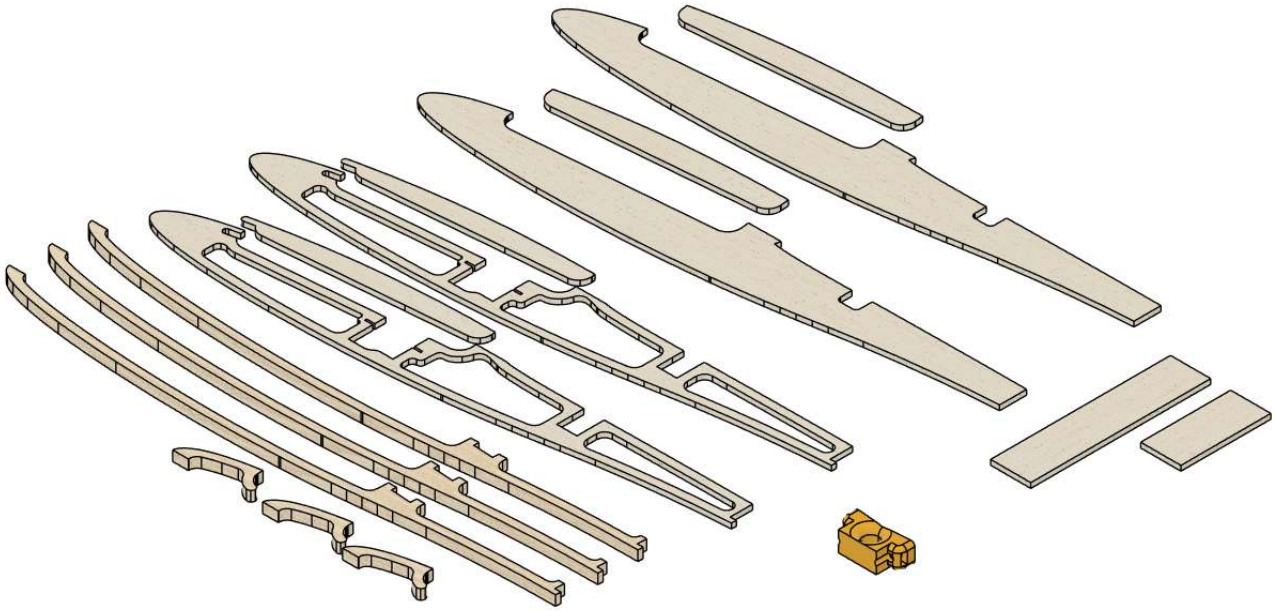
ALF



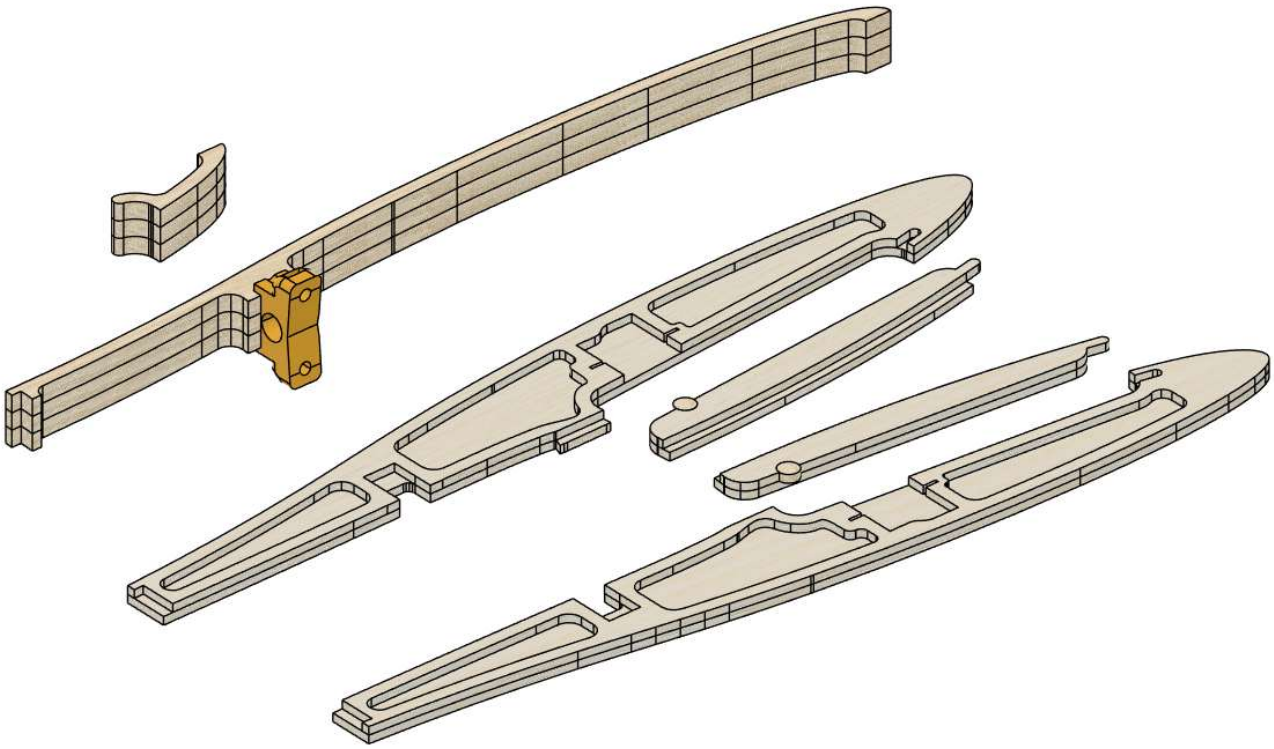
Our latest mini DLG following on form our best selling Pug. The all new ALF is a higher aspect ratio 1m Class DLG

Remember this is a model aircraft assembly kit and not a toy. You should follow all guidance and regional laws / guidance to enable you to fly the model safely. As this is an assembly kit, we at AngelWingDesigns can accept no liability for damage, loss, or personal injuries as a result of the building flying or ownership of this model aircraft kit.

Please follow the instructions carefully.

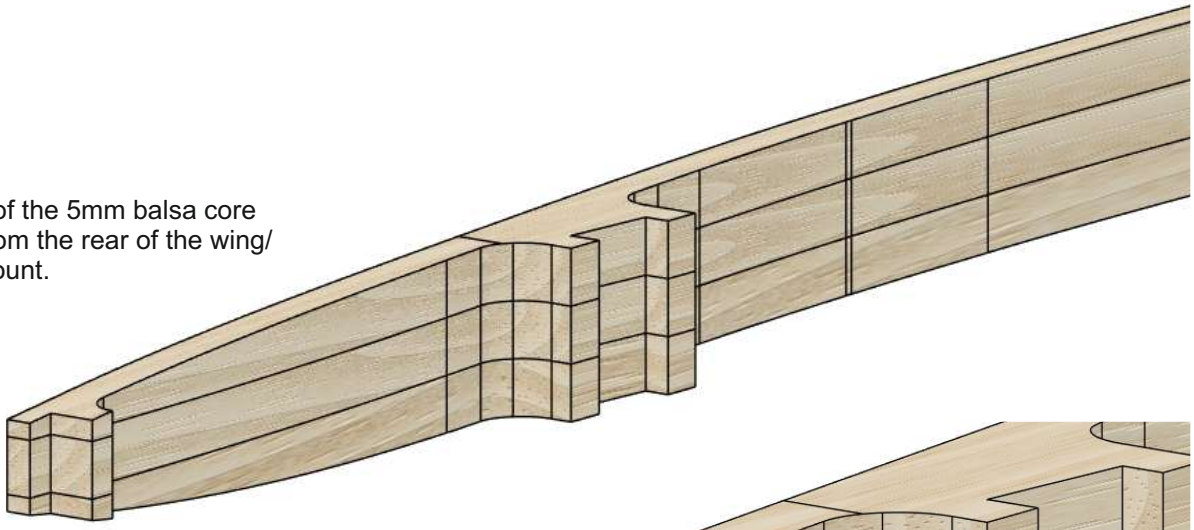


Remove all of the balsa components from the craarier sheets removing any burs left from the retaining tabs. Also note that there are 2 balsa circles not shown in the parts above. These are required but leave them in the carrier sheet until ready.
The instructions show the 3d plastic boom / wing mounts at various stages, but these **MUST NOT** be glued in until instructed. You may wish to lightly tack glue the rear boom mount however to add sanding and assembly.

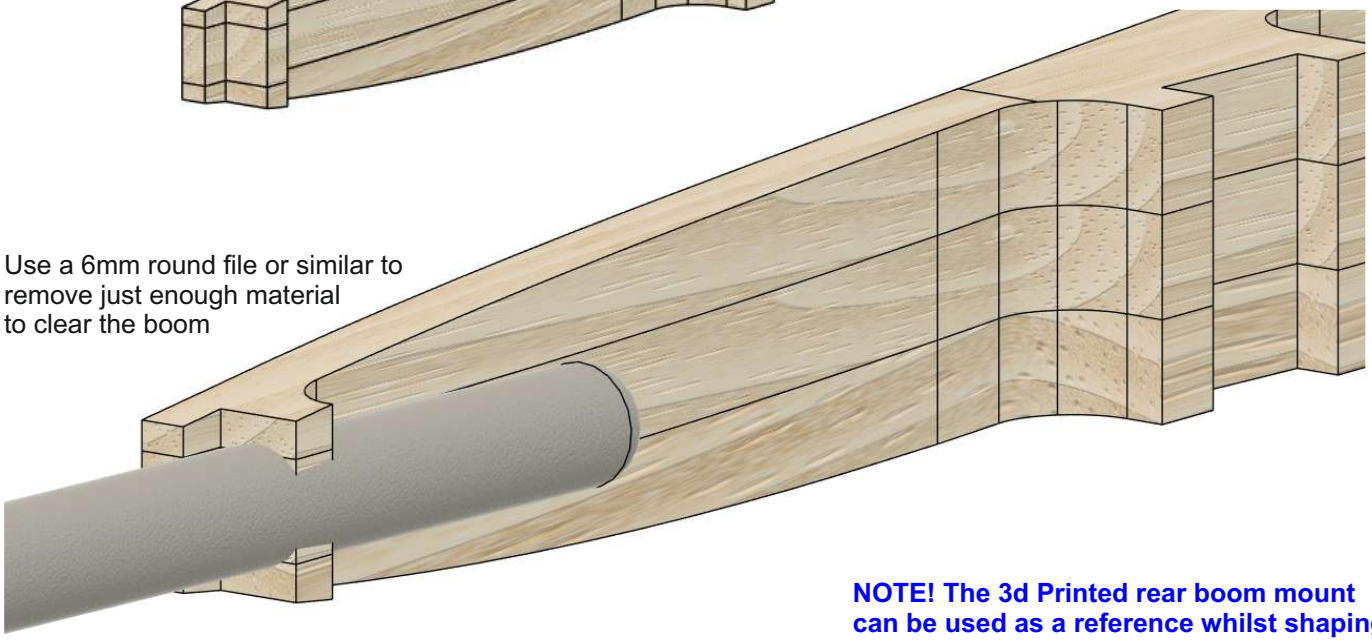


Laminate all the balsa fuselage parts as shown. We use wood glue such as our TB2 for this task.The Wing mount can be utilised to aid the exact alignment of the parts, but not glued into place.

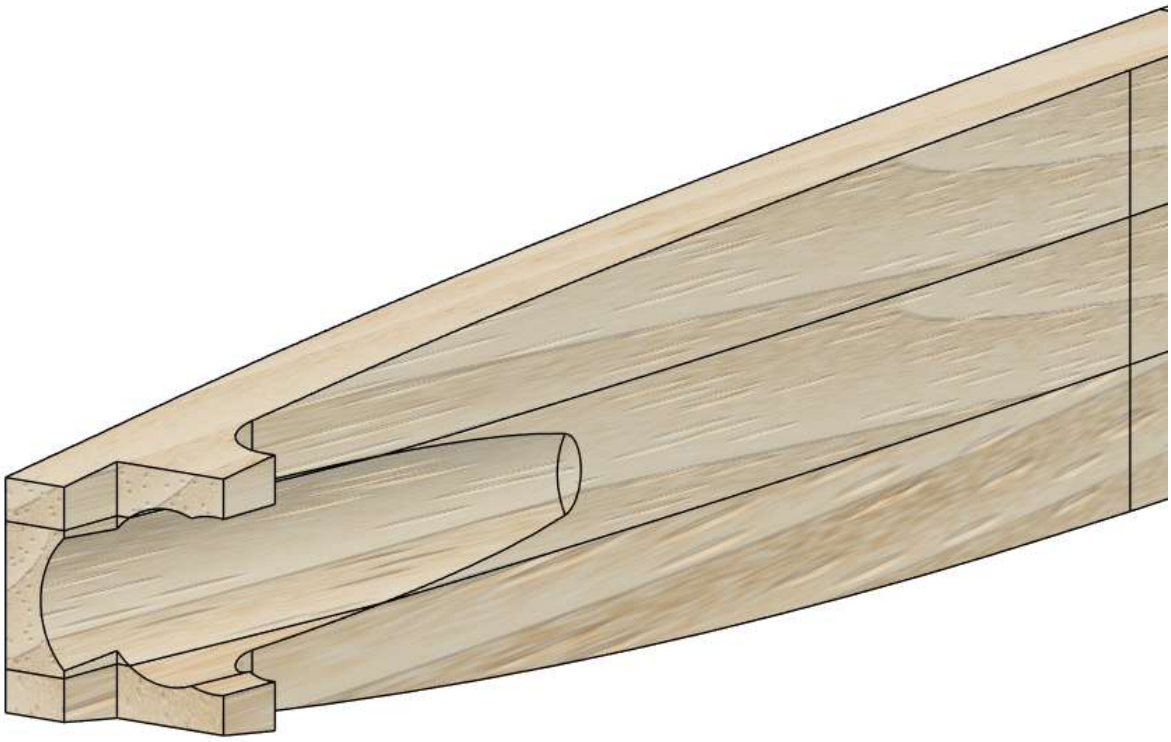
Thin the rear of the 5mm balsa core laminations from the rear of the wing/ boom front mount.

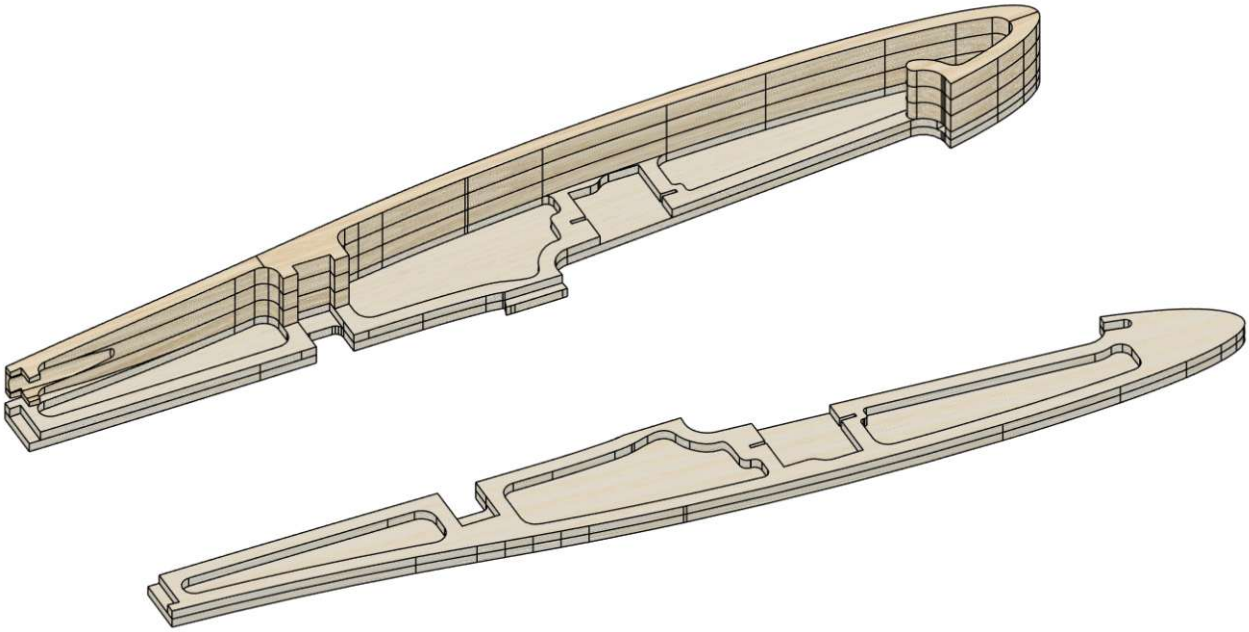


Use a 6mm round file or similar to remove just enough material to clear the boom

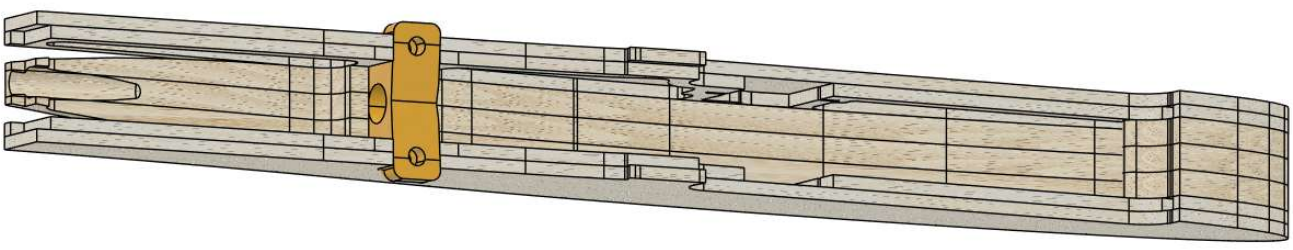


NOTE! The 3d Printed rear boom mount can be used as a reference whilst shaping the centre fuselage core

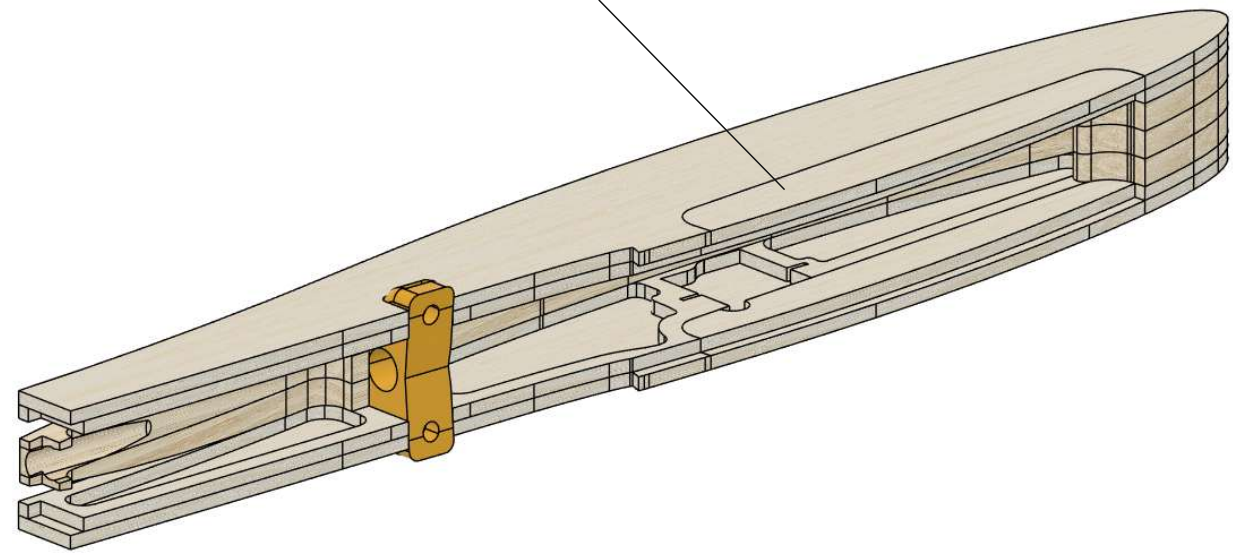


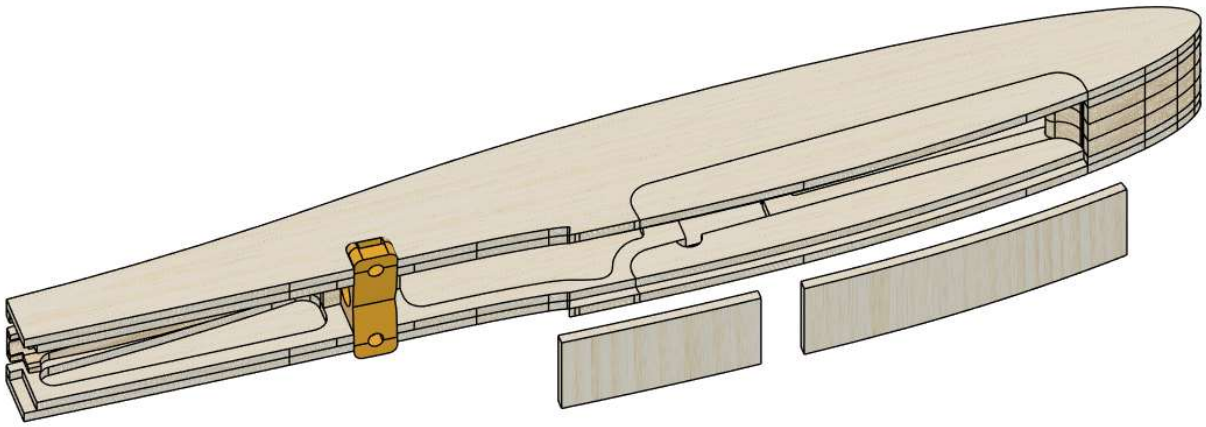


Add the outer laminated fuselage sides to the central 5mm core using wood glue. Use the wing mount as a guide. **DO NOT pull the rear fuselage together yet**

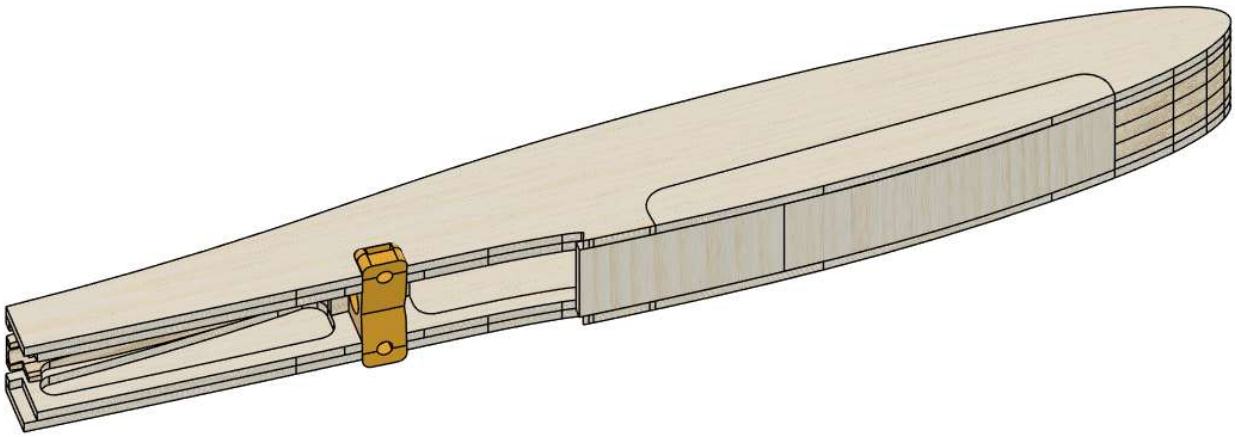


Use masking tape to temporarily hold the canopy sides into place





Glue the 2.5mm balsa canopy sheet into place. You will need to cut one of the sheets to the correct length

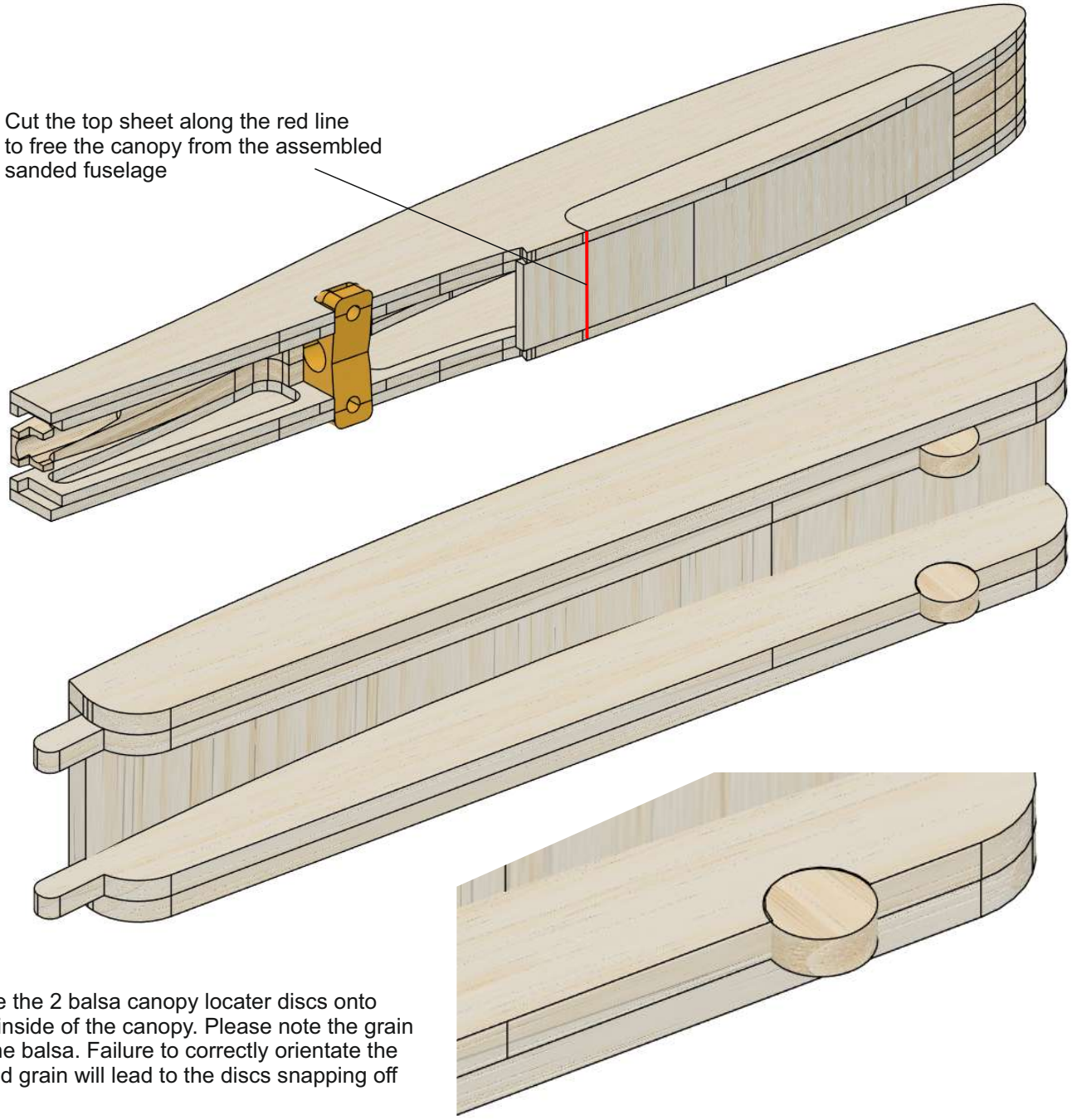


Do not be tempted to remove the canopy at this stage in fact we only remove the canopy once the fuselage has been sanded to shape

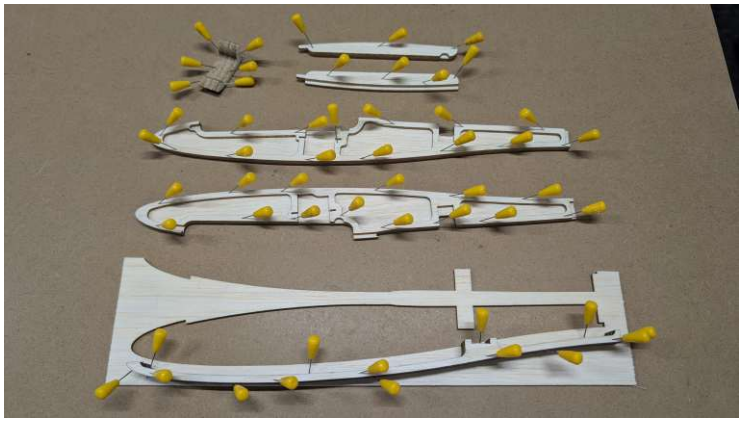


Pull the rear fuselage sides together and glue. We strongly recommend using both of the boom mounts to keep the fuselage accurate and true whilst you complete this task. The Rear mount can be tack glued into place.

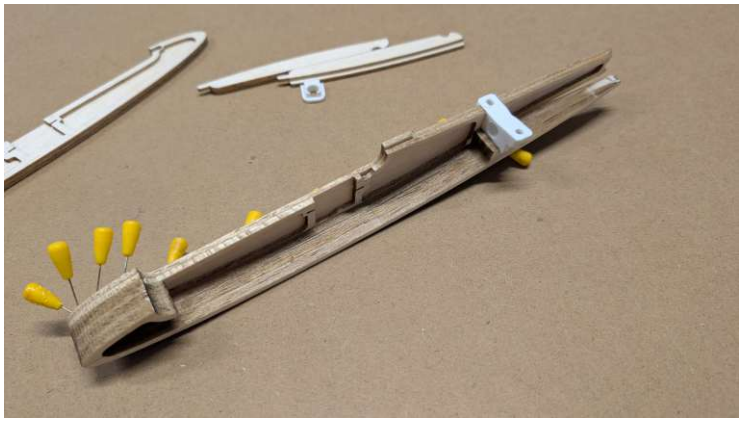
Sand the fuselage to shape rounding off all of the bottom edges, canopy area and nose using 320 grit glass paper.

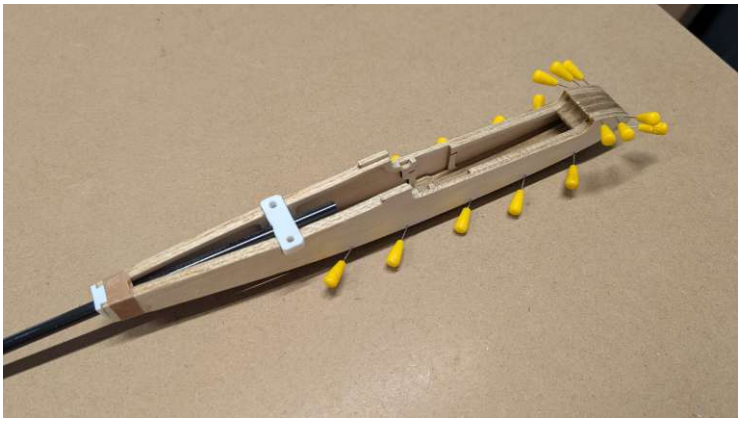


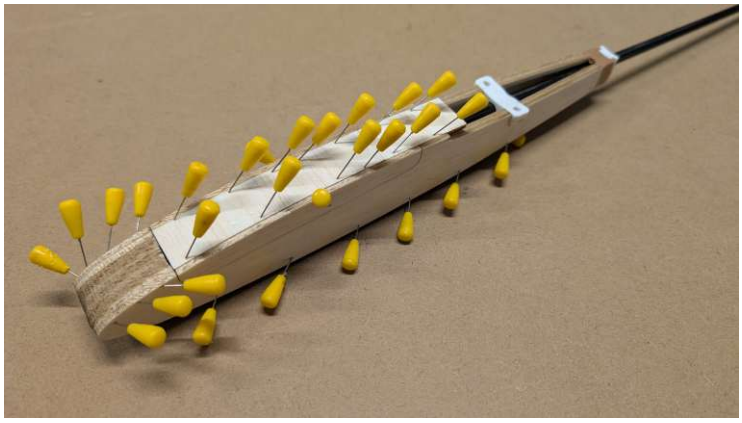
Glue the 2 balsa canopy locater discs onto the inside of the canopy. Please note the grain of the balsa. Failure to correctly orientate the wood grain will lead to the discs snapping off



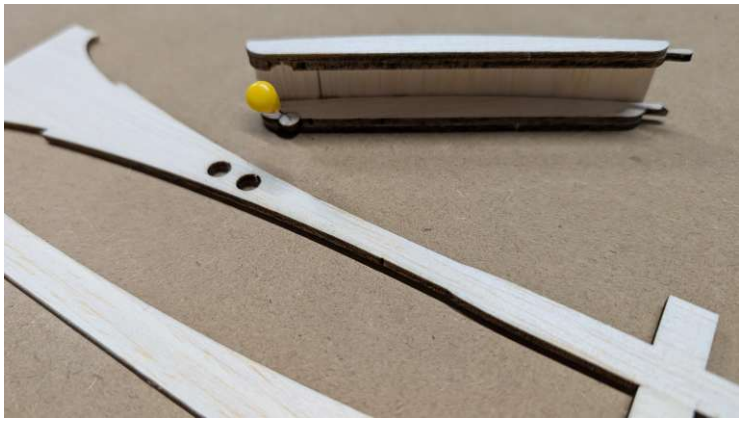






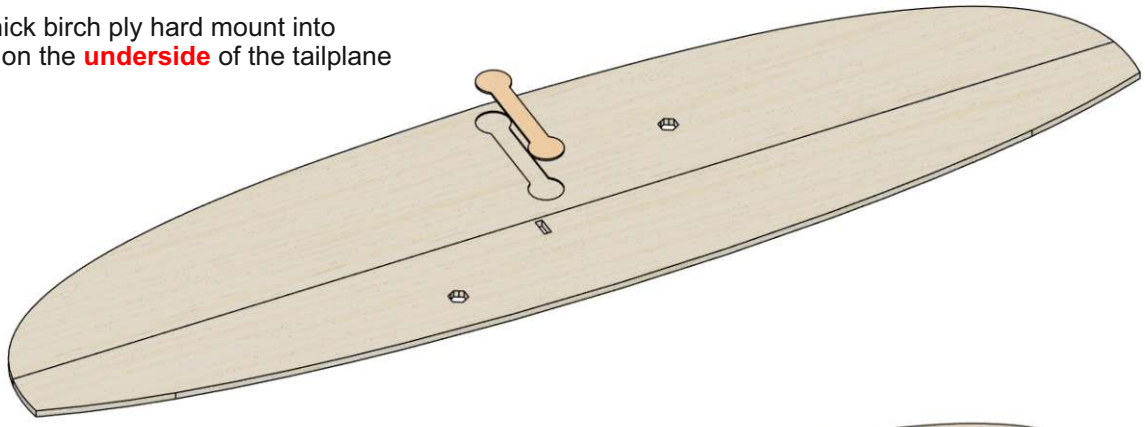


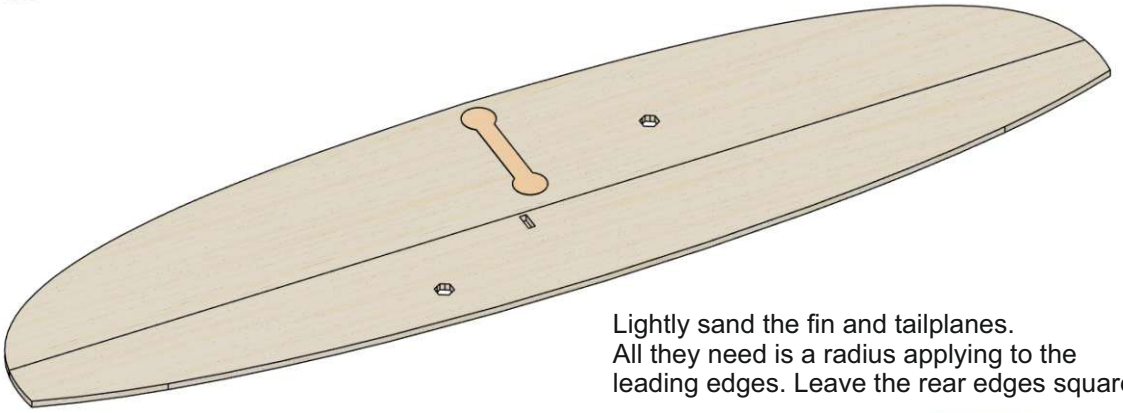




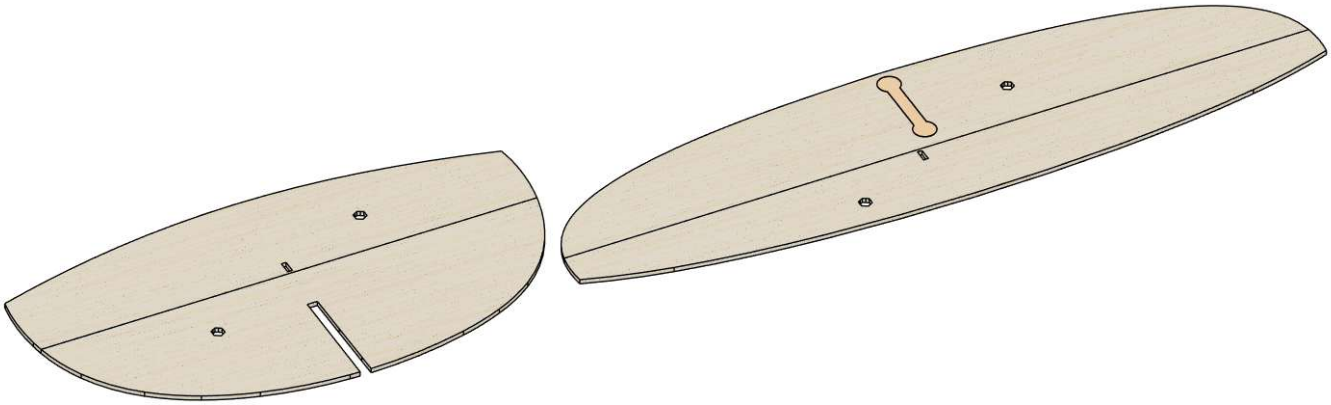
Pre Production Alf Fuselage construction photo library. This is how we built ours but the sequence mentioned in the CAD drawings already shown is our suggested sequence!

Glue the 0.4mm thick birch ply hard mount into
the etched pocket on the **underside** of the tailplane

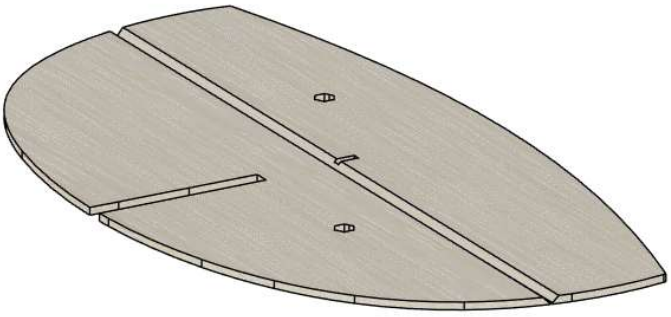


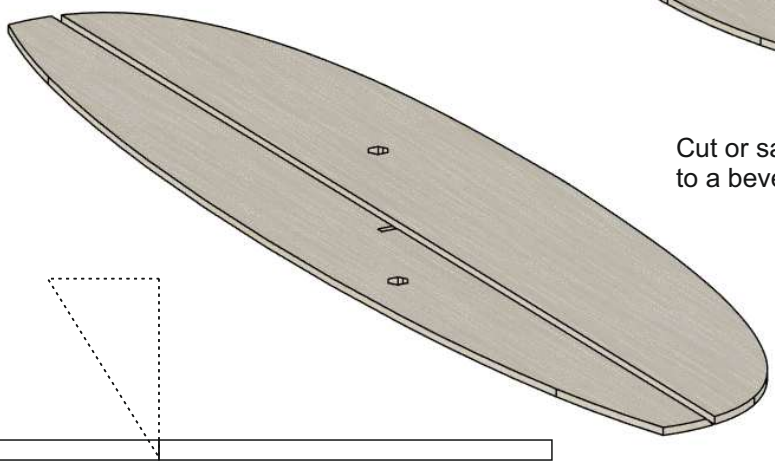


Lightly sand the fin and tailplanes.
All they need is a radius applying to the
leading edges. Leave the rear edges square.

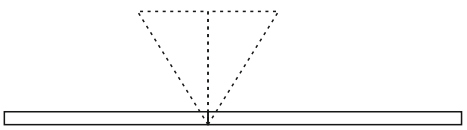


Cut or sand the leading edge of the elevator
to a bevel to allow the elevator to move up when hinged.
Only the elevator needs to be have a bevel added

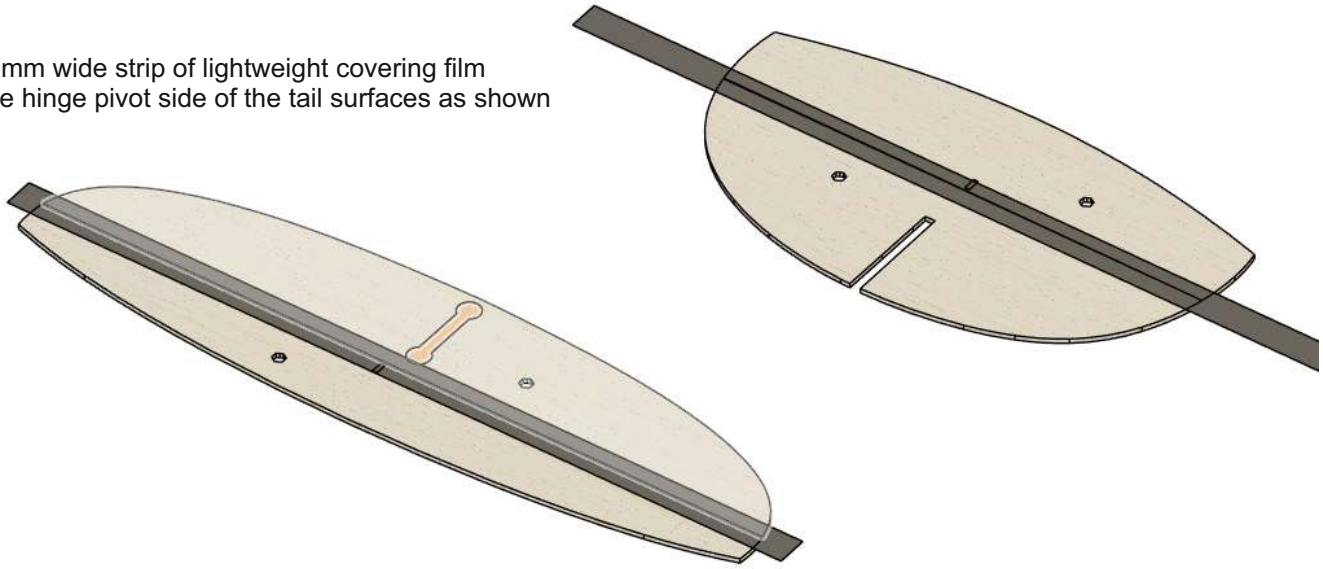


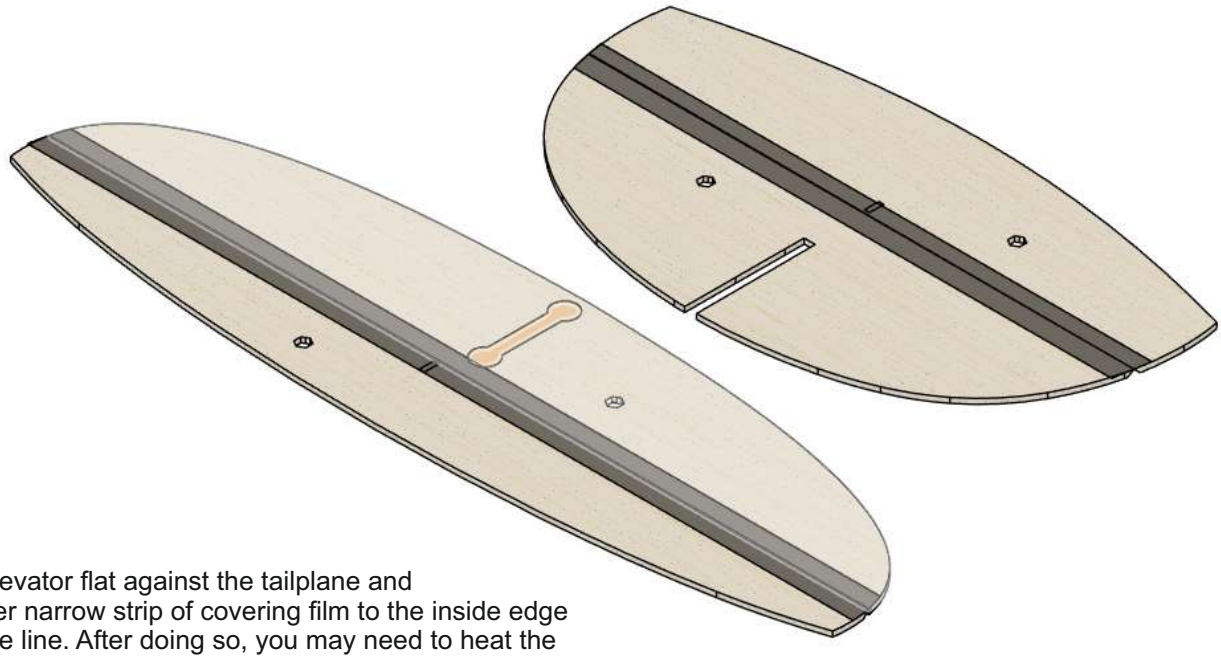


Cut or sand the leading edge of both the fin and rudder
to a bevel to allow the rudder to move up freely.

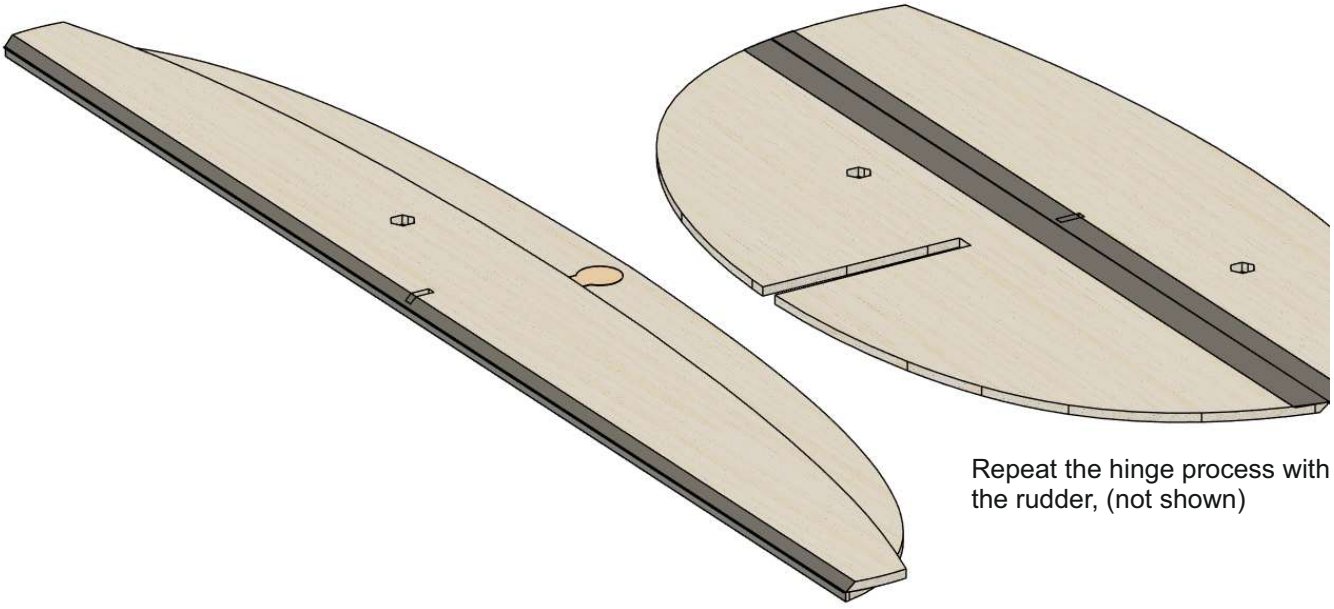


Iron a 10mm wide strip of lightweight covering film
to one the hinge pivot side of the tail surfaces as shown

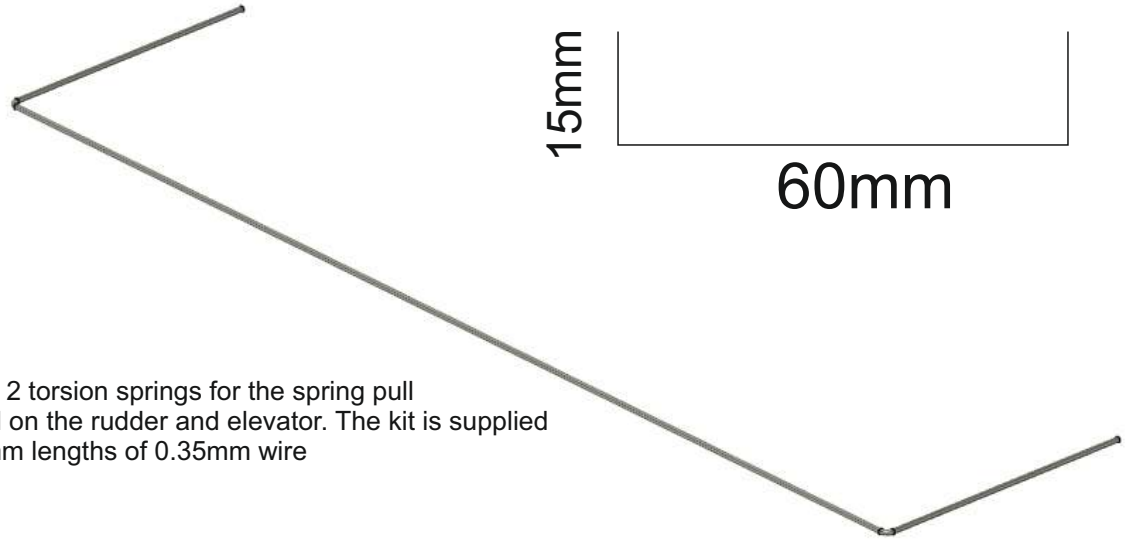




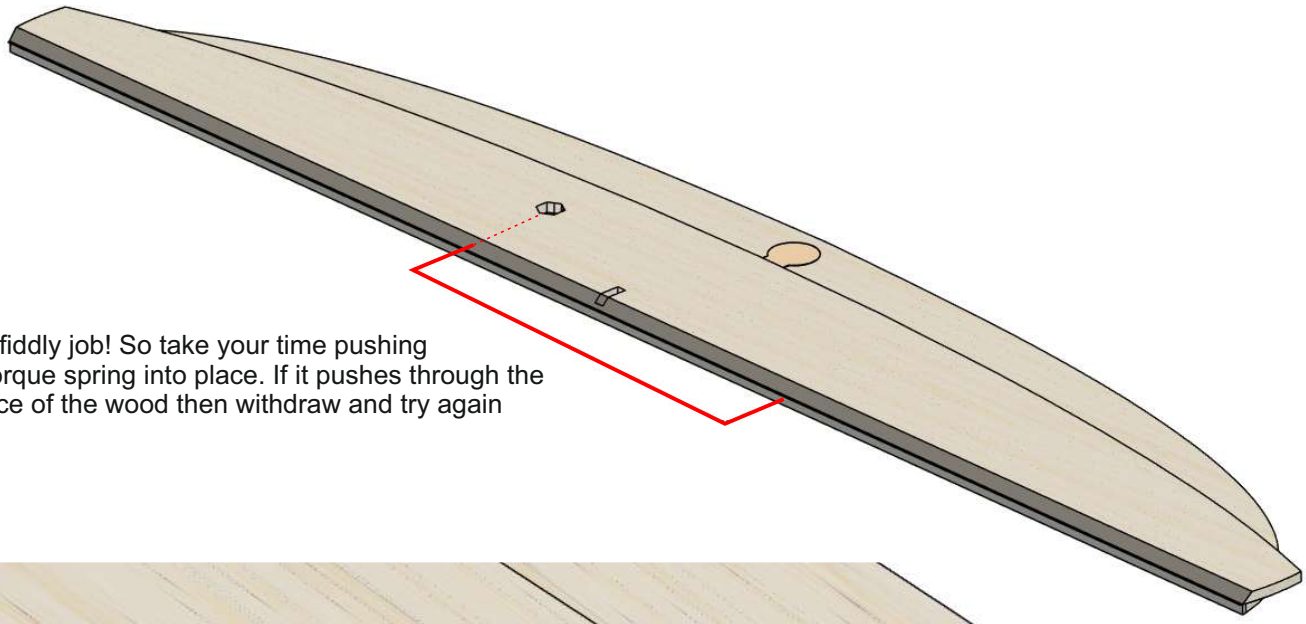
Fold the elevator flat against the tailplane and
add another narrow strip of covering film to the inside edge
of the hinge line. After doing so, you may need to heat the
first strip of covering again to allow full travel both ways



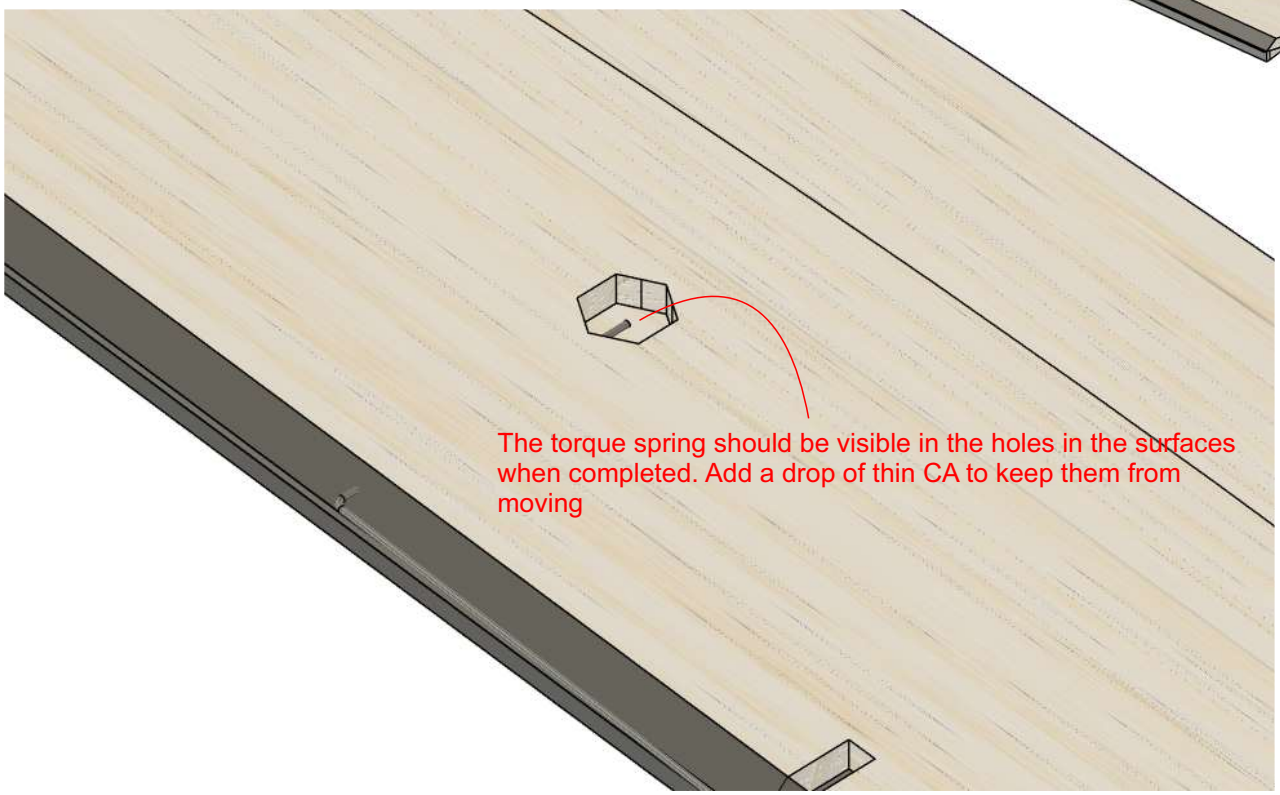
Repeat the hinge process with
the rudder, (not shown)



Make up the 2 torsion springs for the spring pull system used on the rudder and elevator. The kit is supplied with 2 x 90mm lengths of 0.35mm wire



It's a fiddly job! So take your time pushing the torque spring into place. If it pushes through the surface of the wood then withdraw and try again

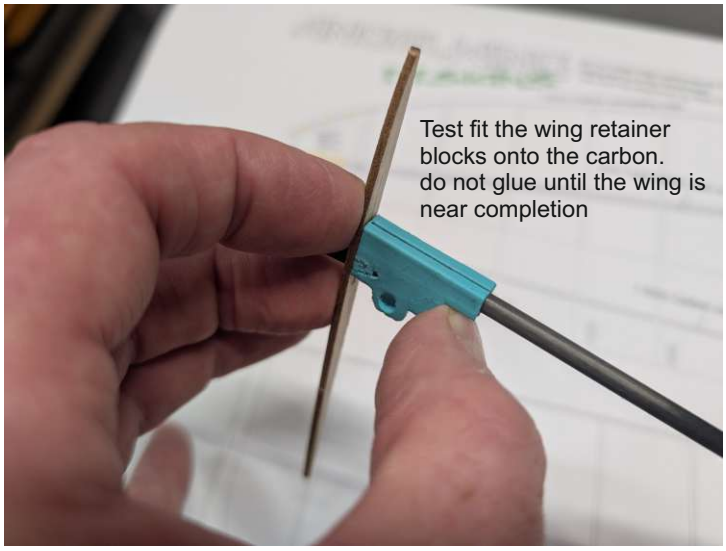


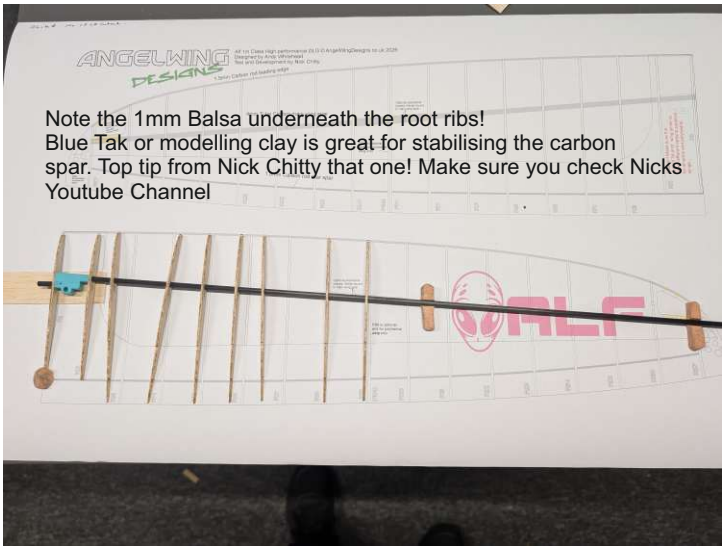
IMPORTANT!

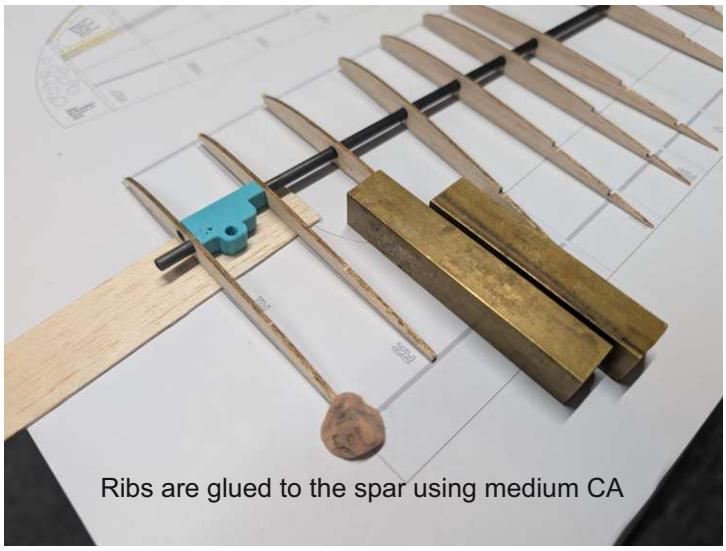
The Wing, You need to decide now if your going to build either the standard dihedral verison of the polyhedral version of the wing. The majority of the build is the same and as such the build images relect this. However you need to chose the correct wing mounting block for the centre of the wing to set the correct angles. Polyhedral parts are supplied in the main hardware set. the Dihedral option parts are supplied in a separate small zip lock bag.

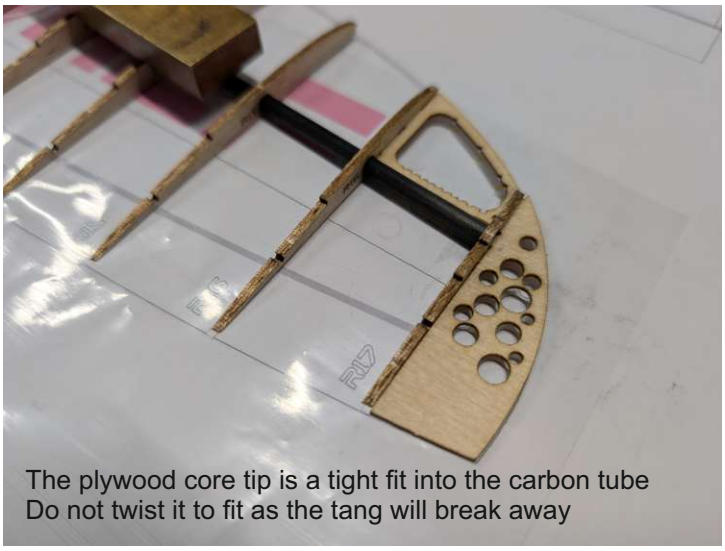
Subtle changes to the build images will be experienced to the kit parts, but the sequence remains the same

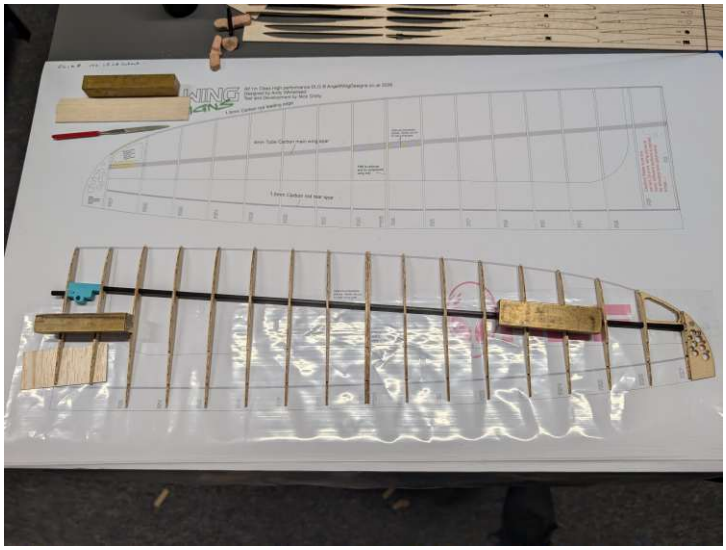
If you are building a straight dihedral version of the ALF then skip pages 13 and 14 of the instructions.

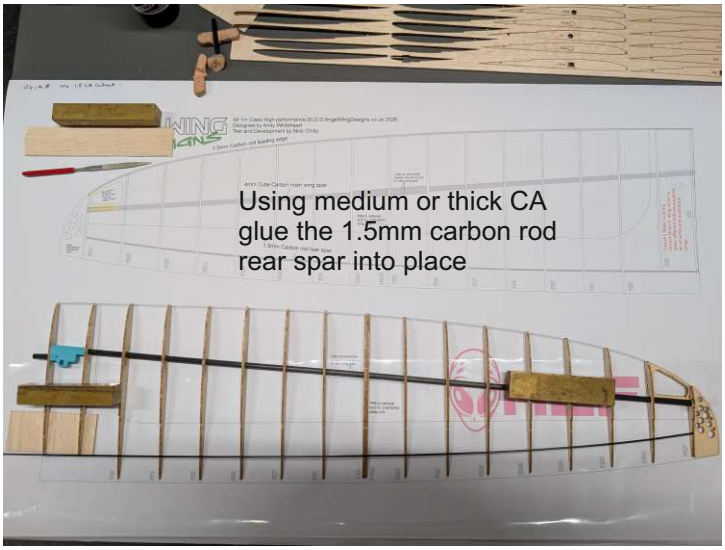




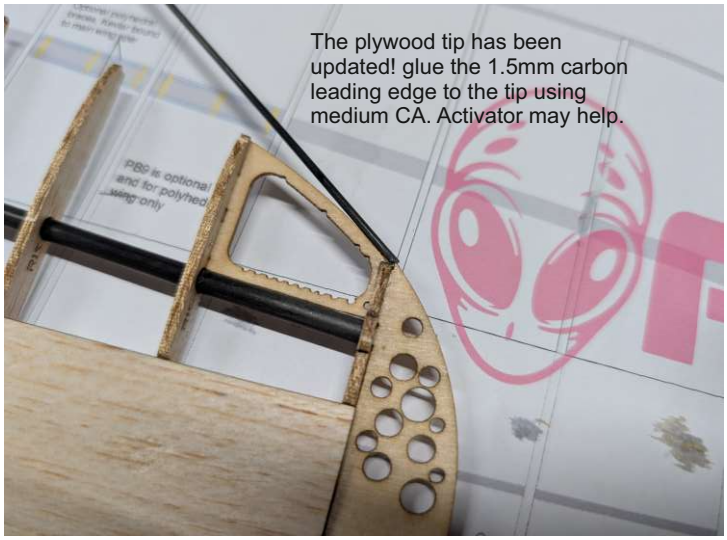


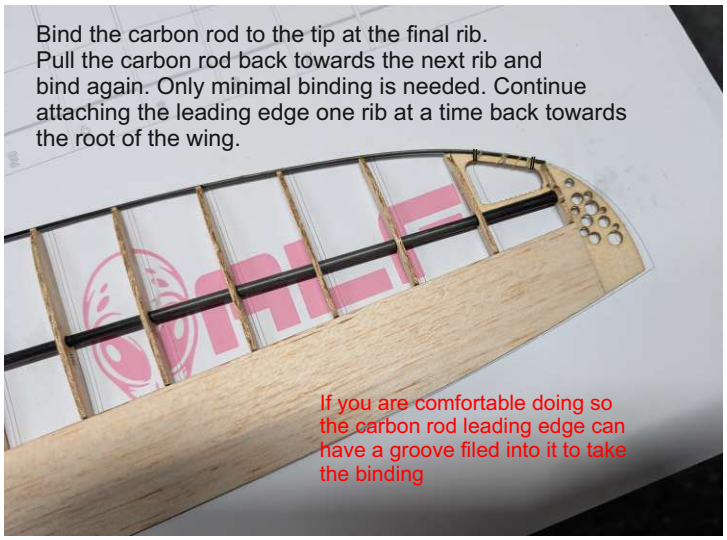


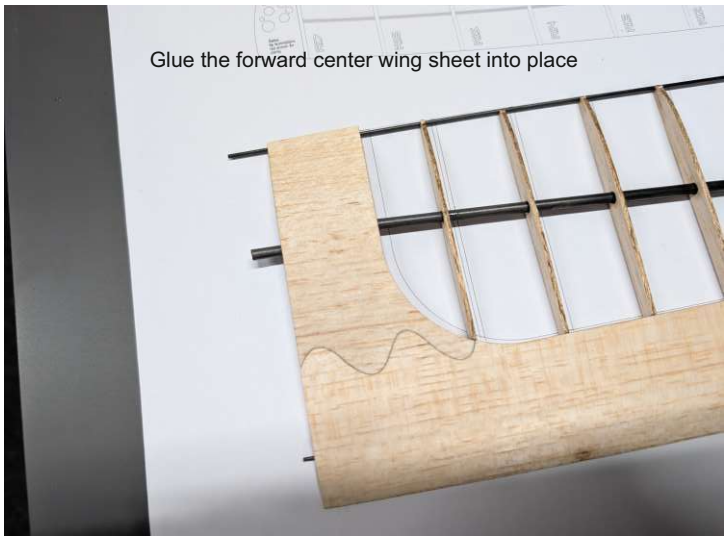




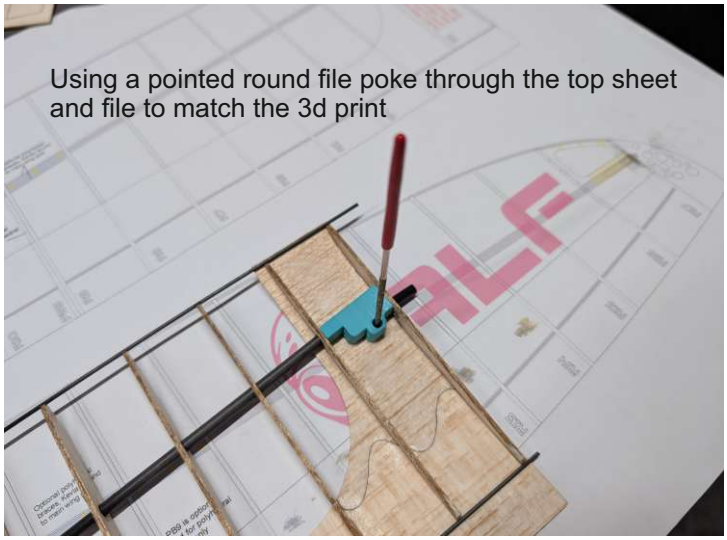

Use wood glue to attach the 1mm Balsa trailing edge sheet. Once dry you can flip the wing over and run medium CA along the joint of the carbon rear spar and the sheet


The plywood tip has been updated! glue the 1.5mm carbon leading edge to the tip using medium CA. Activator may help.


Bind the carbon rod to the tip at the final rib.
Pull the carbon rod back towards the next rib and bind again. Only minimal binding is needed. Continue attaching the leading edge one rib at a time back towards the root of the wing.
If you are comfortable doing so the carbon rod leading edge can have a groove filed into it to take the binding


Glue the forward center wing sheet into place

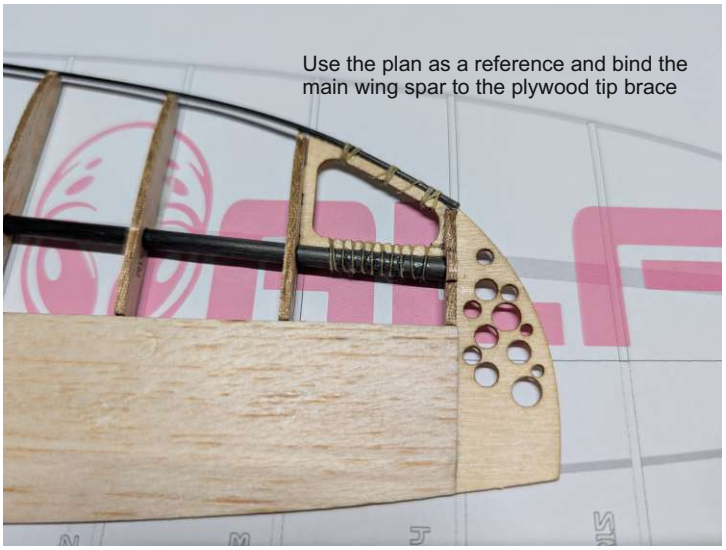


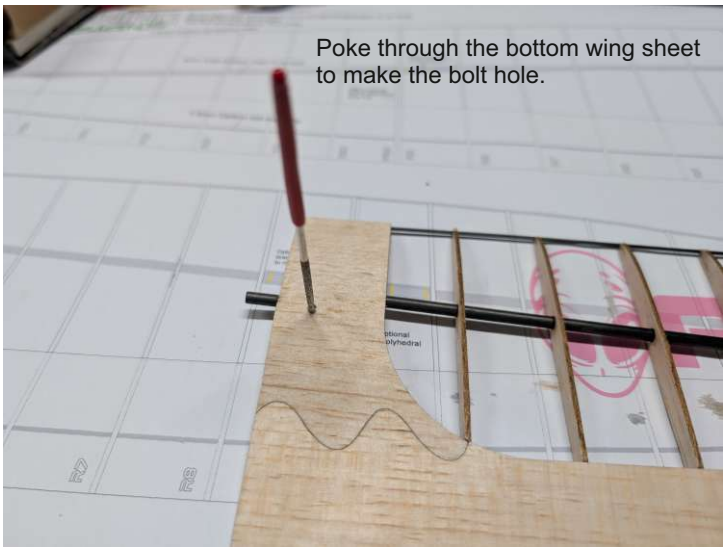

Using a pointed round file poke through the top sheet and file to match the 3d print

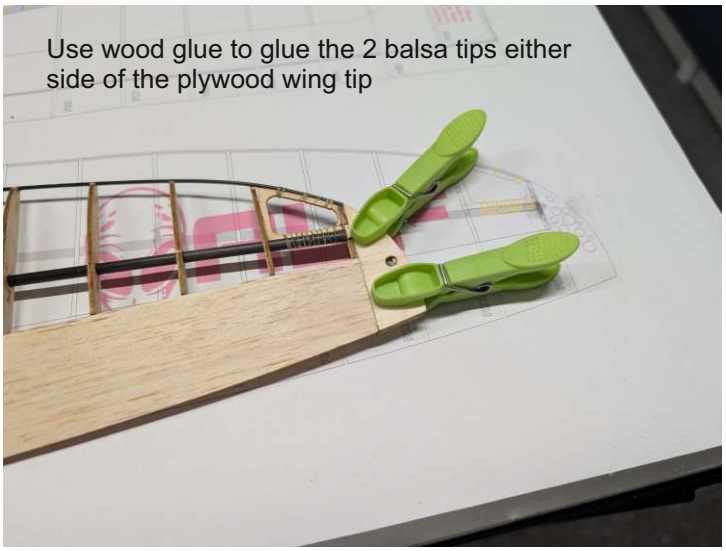

Run thin CA around the edges of the bolt hole to harden the balsa sheet


Glue the bottom center sheet into place









Trim off any excess carbon from the 4mm tube wing spar, Leading edge, and trailing edge.

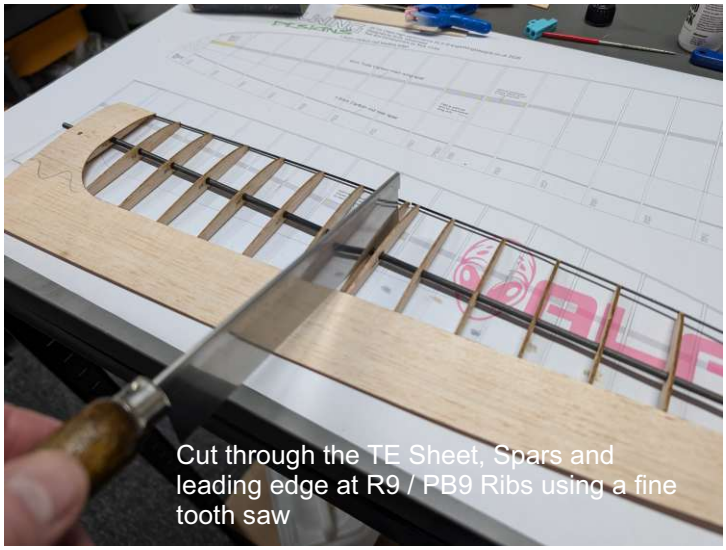
Carefully sand the wing sheet at the root rib joint using a flat sanding block.

Sand the Wing tip to match the wing section using a flat sanding block.

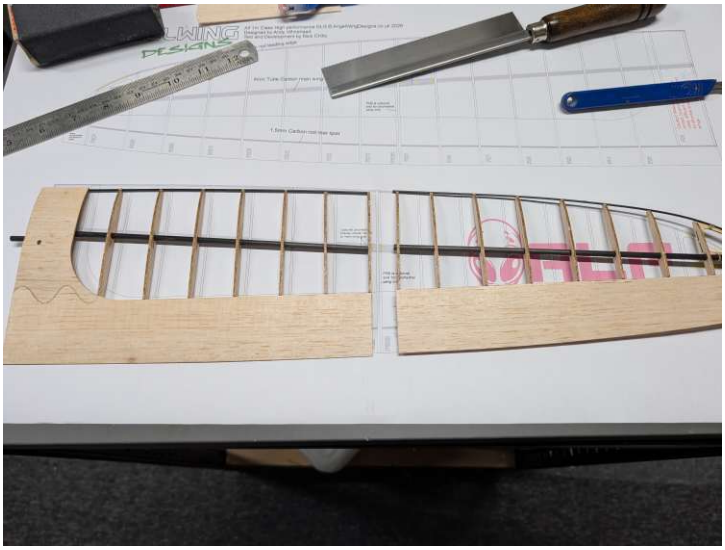
Build the second wing, making sure you build the opposite wing panel.

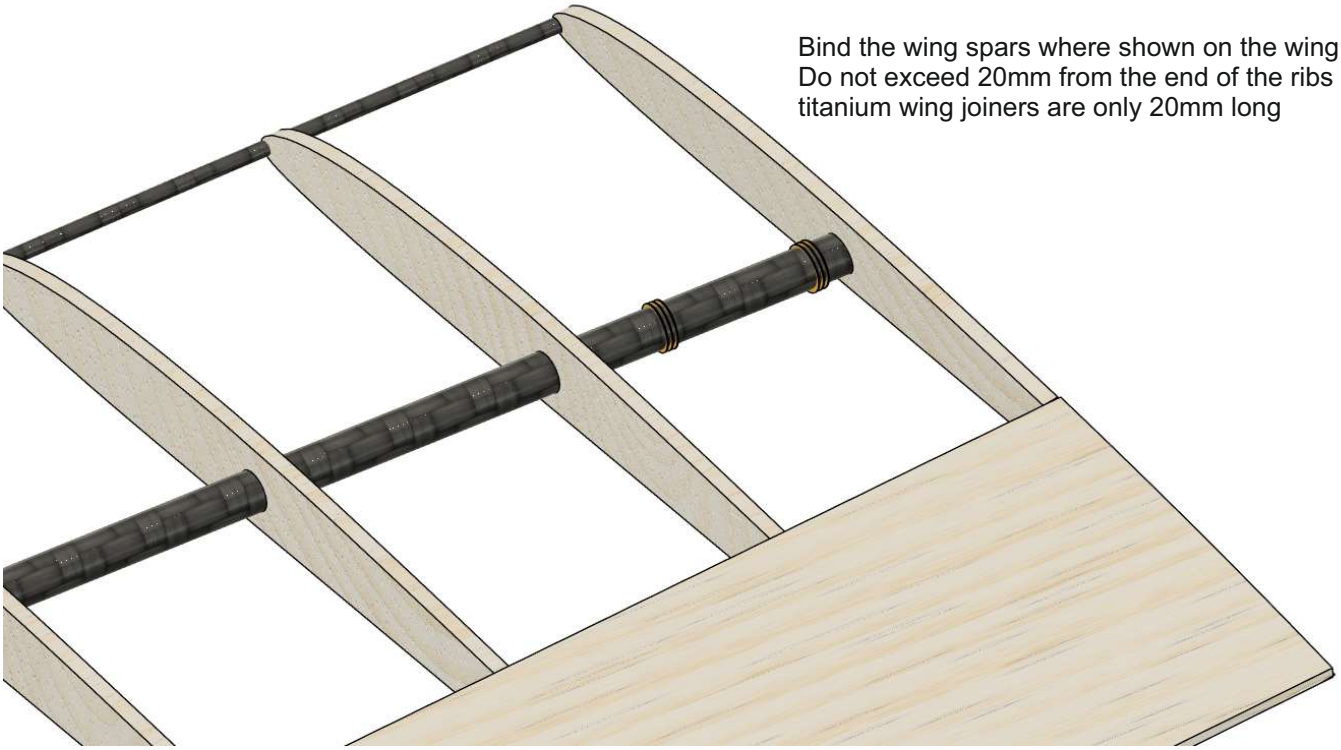
We suggest that the prebuilt wing is use along with the wing joiner to perfectly align the root ribs. Just be careful not to glue them together. If your using thin CA this will almost certainly happen!

Polyhedral wing option only

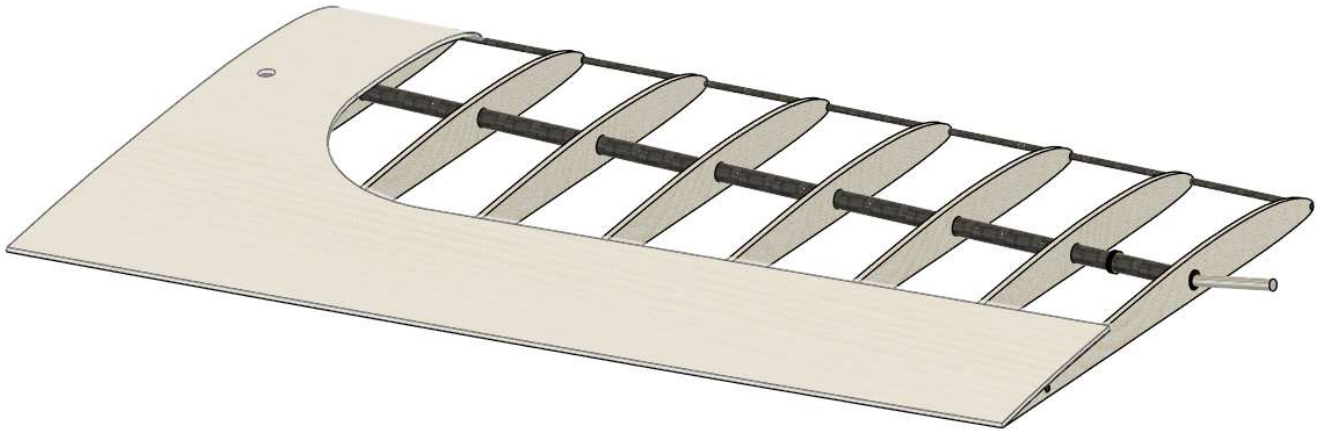


Cut through the TE Sheet, Spars and leading edge at R9 / PB9 Ribs using a fine tooth saw



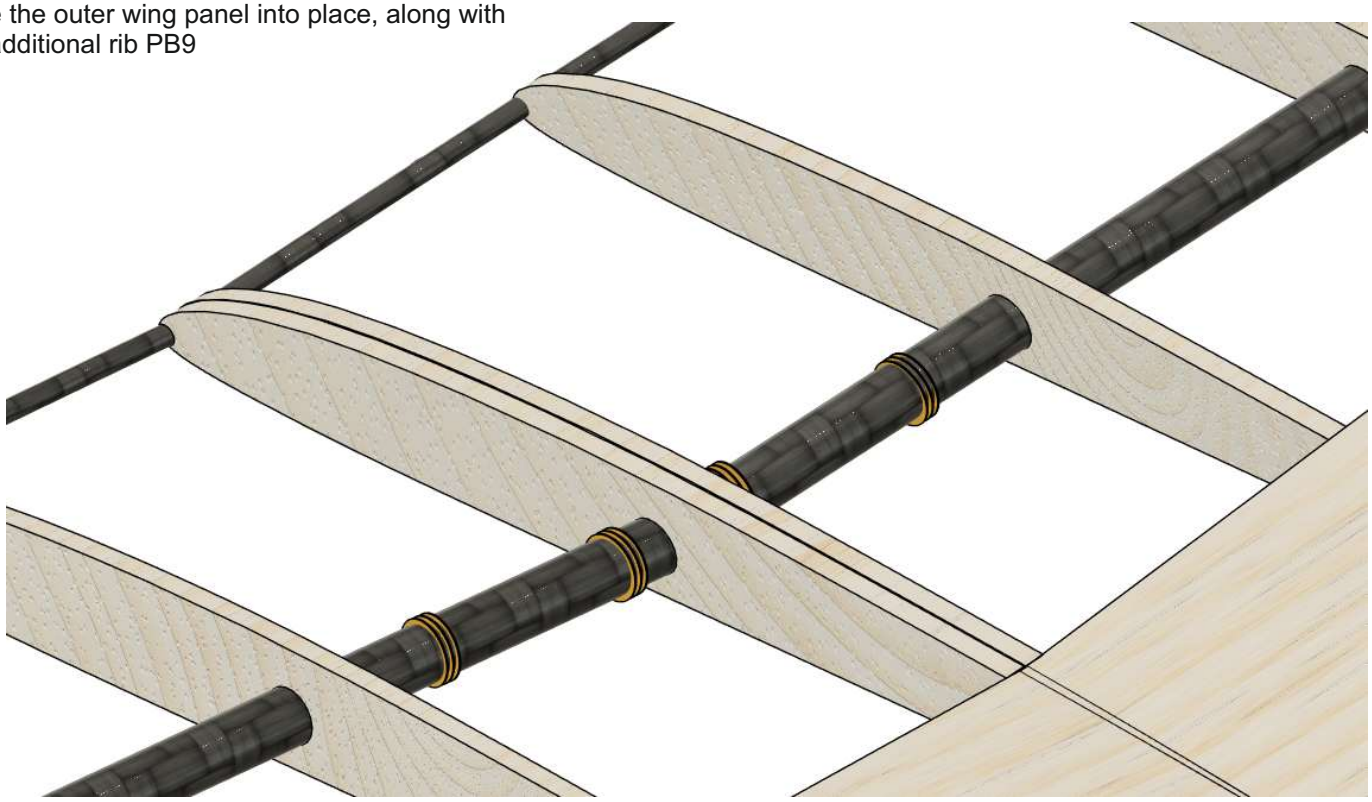


Bind the wing spars where shown on the wing plan. Do not exceed 20mm from the end of the ribs as the titanium wing joiners are only 20mm long

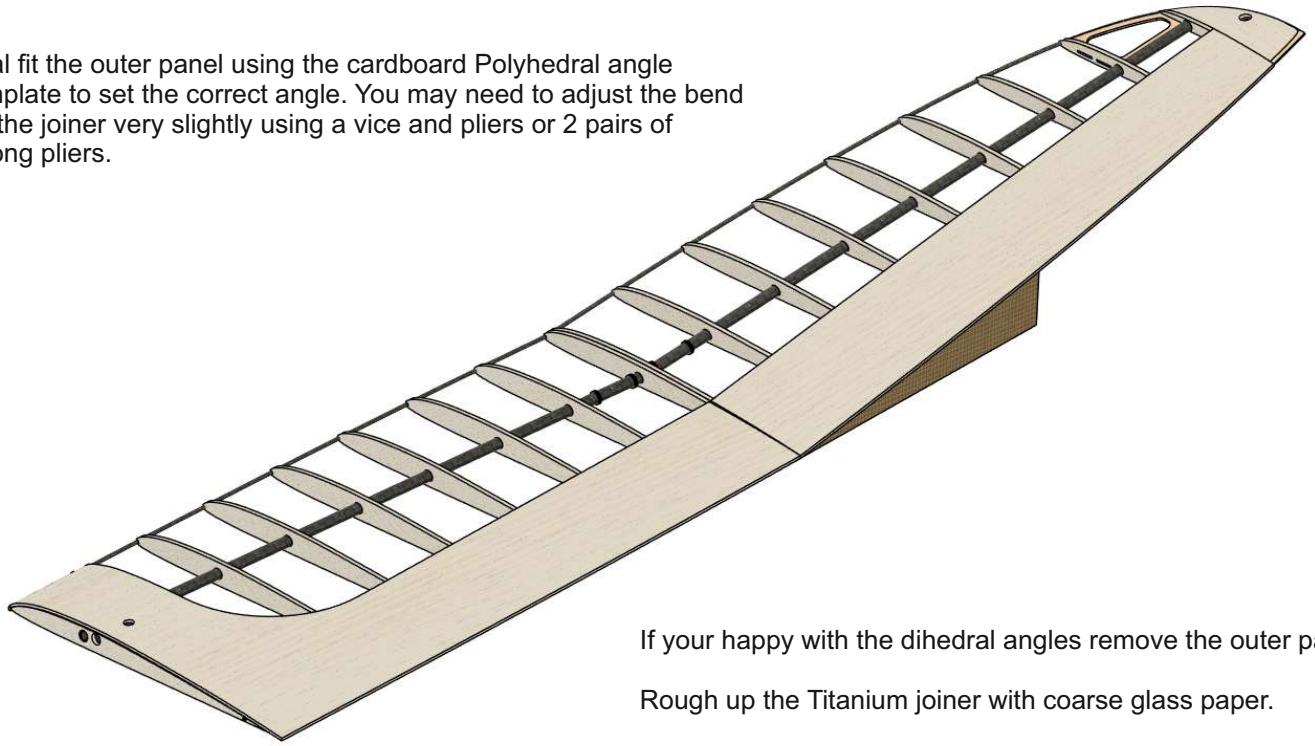


Slide the titanium wing joiner into place...DO NOT GLUE YET. This will be a sloppy fit in the tubes.

Slide the outer wing panel into place, along with the additional rib PB9



Trial fit the outer panel using the cardboard Polyhedral angle template to set the correct angle. You may need to adjust the bend on the joiner very slightly using a vice and pliers or 2 pairs of strong pliers.



If your happy with the dihedral angles remove the outer panel.

Rough up the Titanium joiner with coarse glass paper.

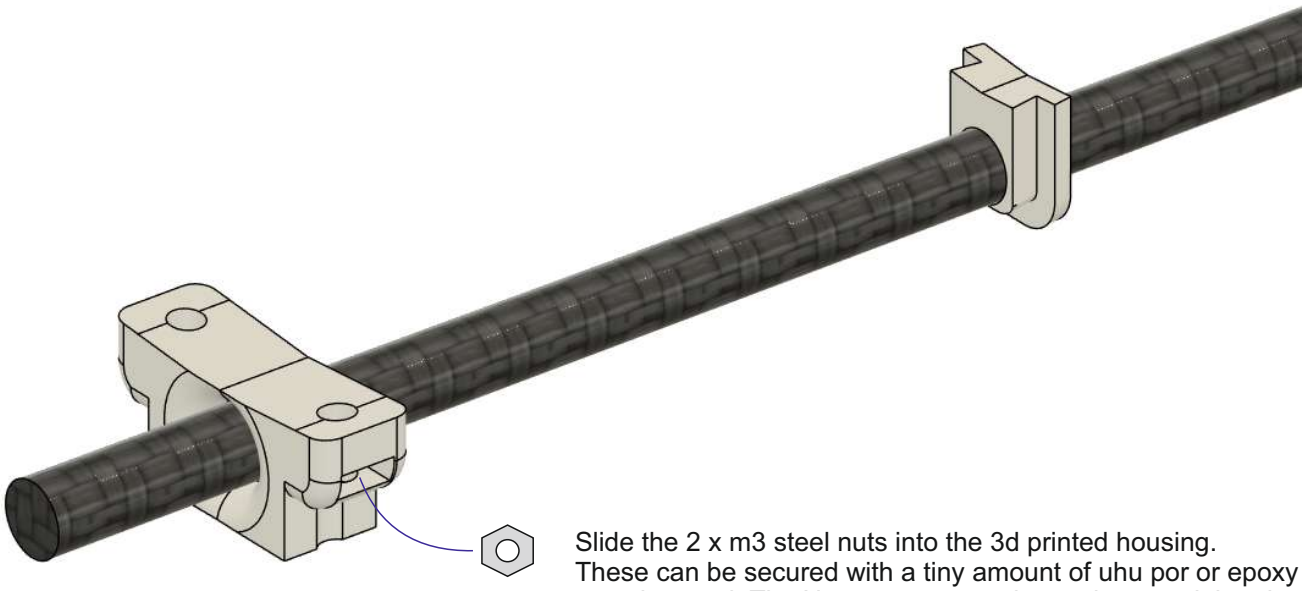
Force 2 part epoxy adhesive into the ends of the carbon spars.

Liberally coat the joiner with epoxy and the faces of the exposed ribs with wood glue.

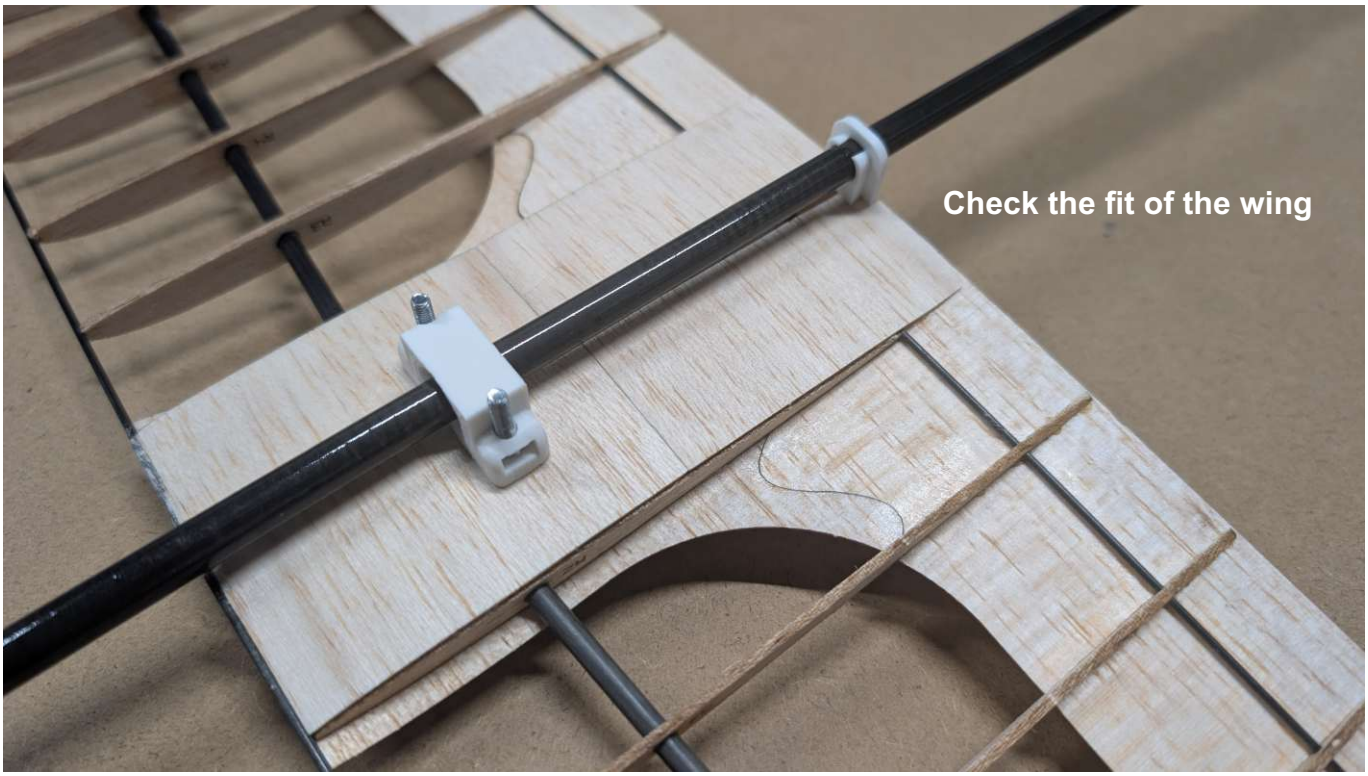
Bring both wing halves together using the angle template again. Weight down and either tape or pin the joint while the adhesive sets.

Slide the 3d printed boom supports bracket onto the boom from the narrow end
Some of the boom will protrude through the main wing mount. This can be left or cut off with a cutting disc if prefered. **Do not glue anything yet**

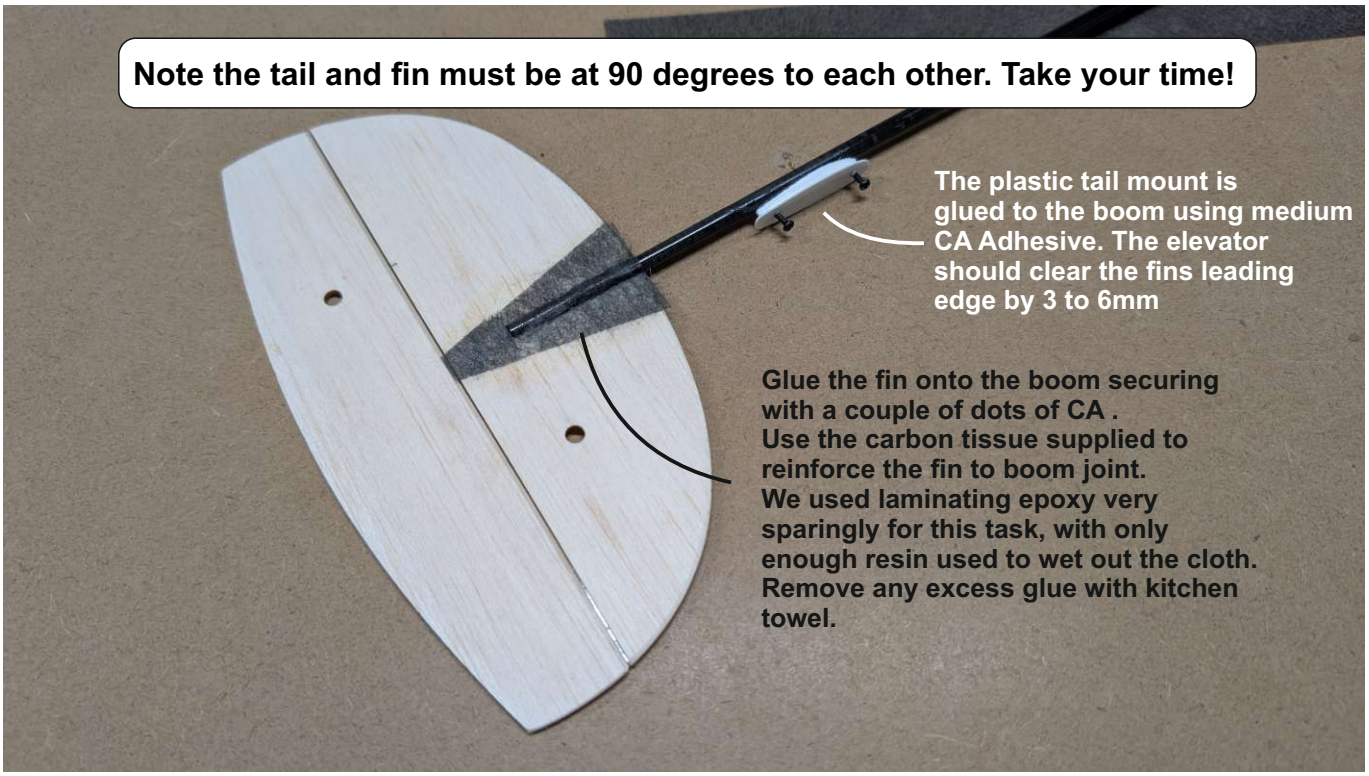




Slide the 2 x m3 steel nuts into the 3d printed housing.
These can be secured with a tiny amount of uhu por or epoxy once inserted. The Nuts cannot turn themselves, and the glue is only to prevent loss when stored / transported with the wings off.



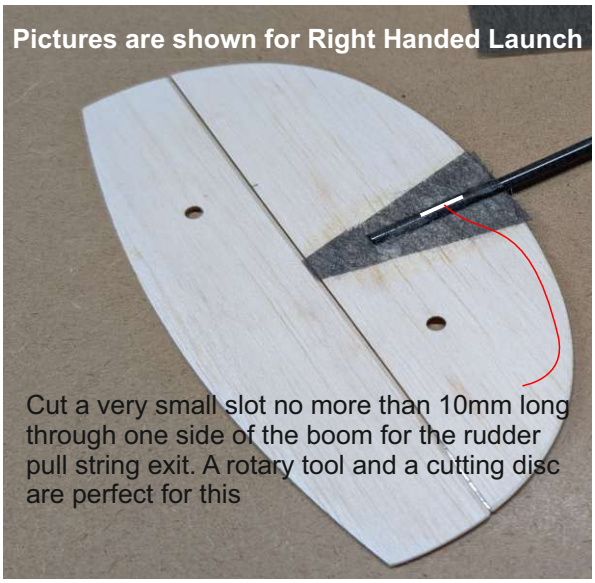
Note the tail and fin must be at 90 degrees to each other. Take your time!



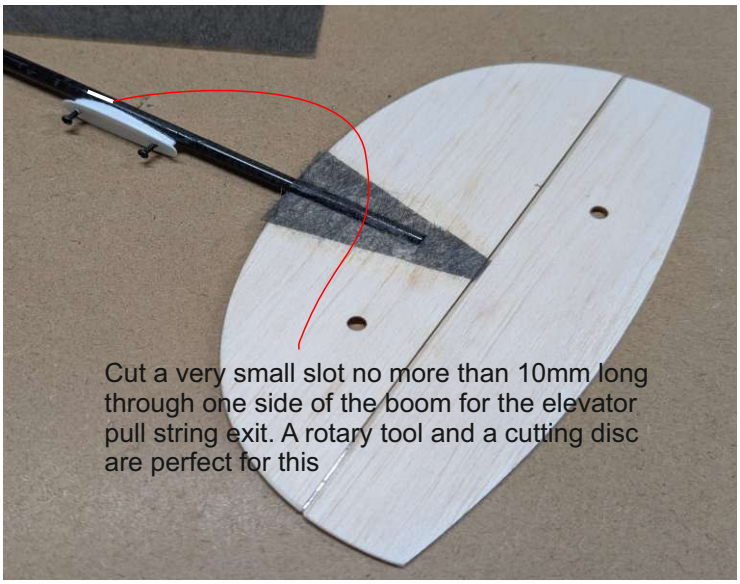
The plastic tail mount is glued to the boom using medium CA Adhesive. The elevator should clear the fins leading edge by 3 to 6mm

Glue the fin onto the boom securing with a couple of dots of CA .
Use the carbon tissue supplied to reinforce the fin to boom joint.
We used laminating epoxy very sparingly for this task, with only enough resin used to wet out the cloth.
Remove any excess glue with kitchen towel.

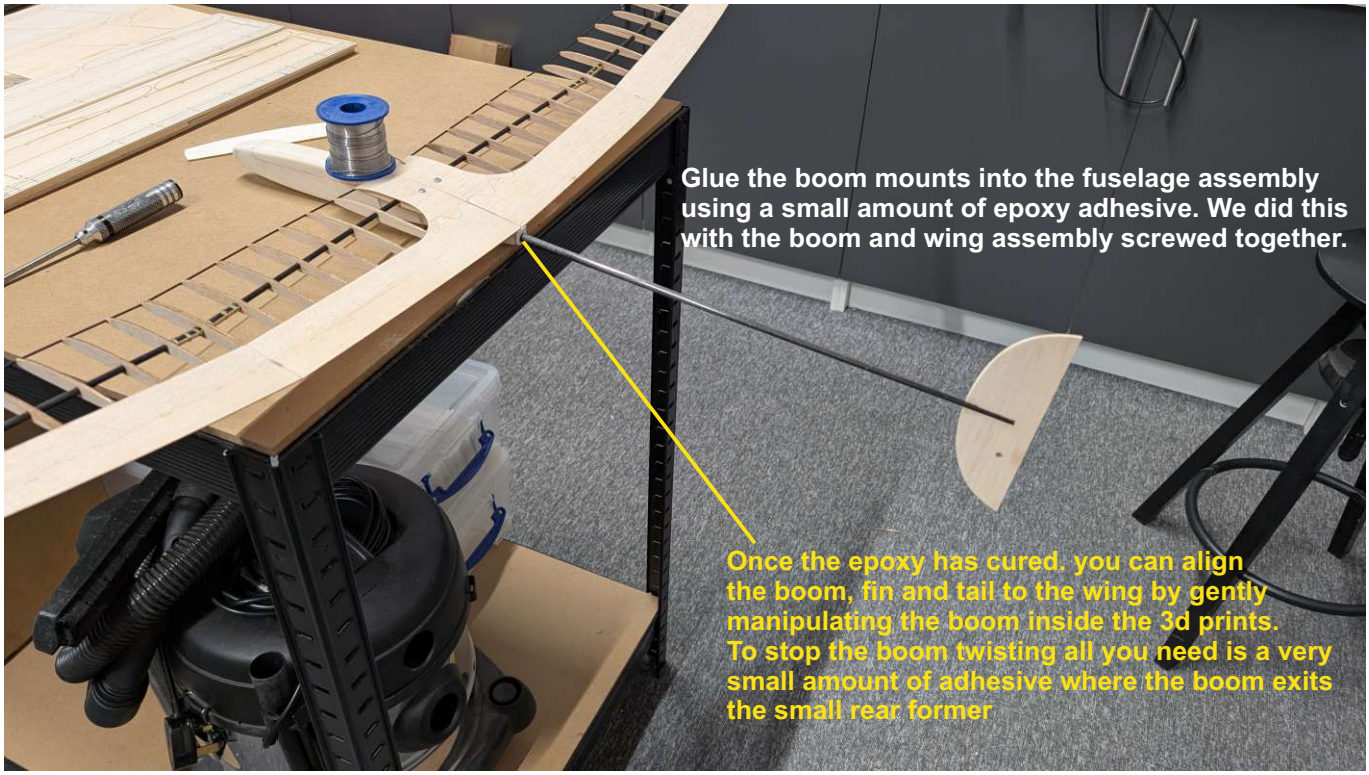
Pictures are shown for Right Handed Launch



Cut a very small slot no more than 10mm long through one side of the boom for the rudder pull string exit. A rotary tool and a cutting disc are perfect for this



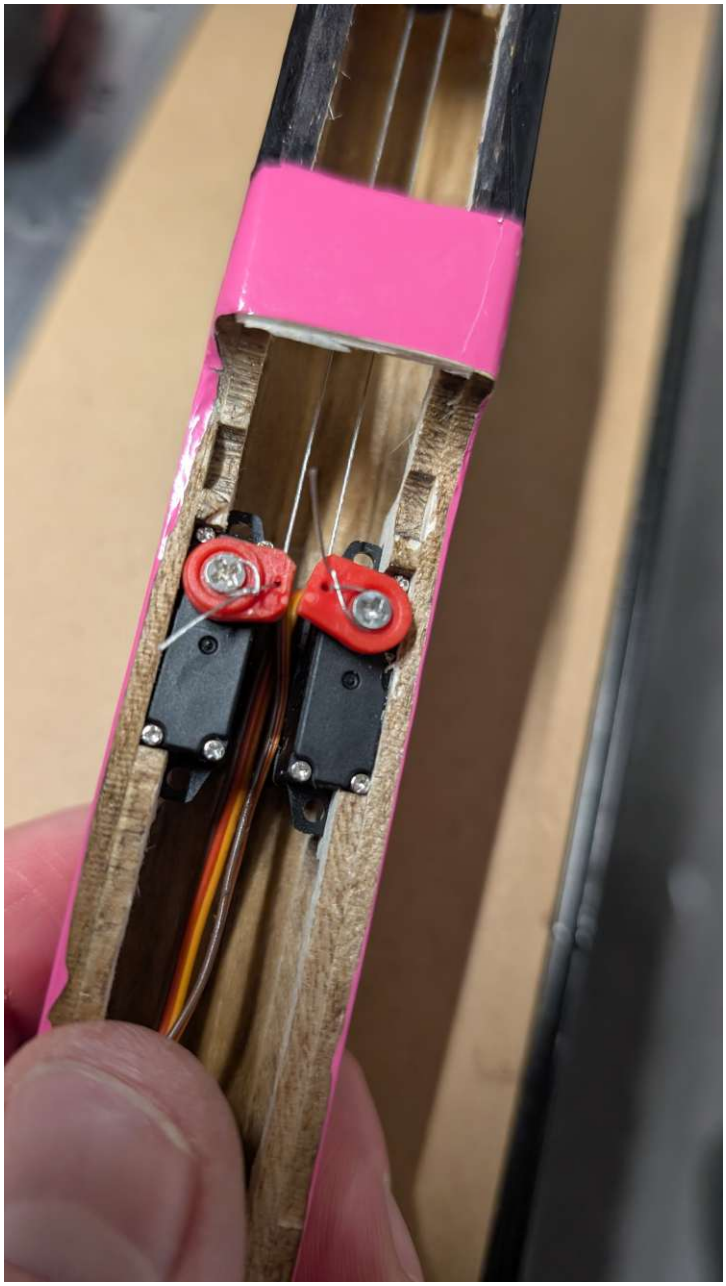
Cut a very small slot no more than 10mm long through one side of the boom for the elevator pull string exit. A rotary tool and a cutting disc are perfect for this



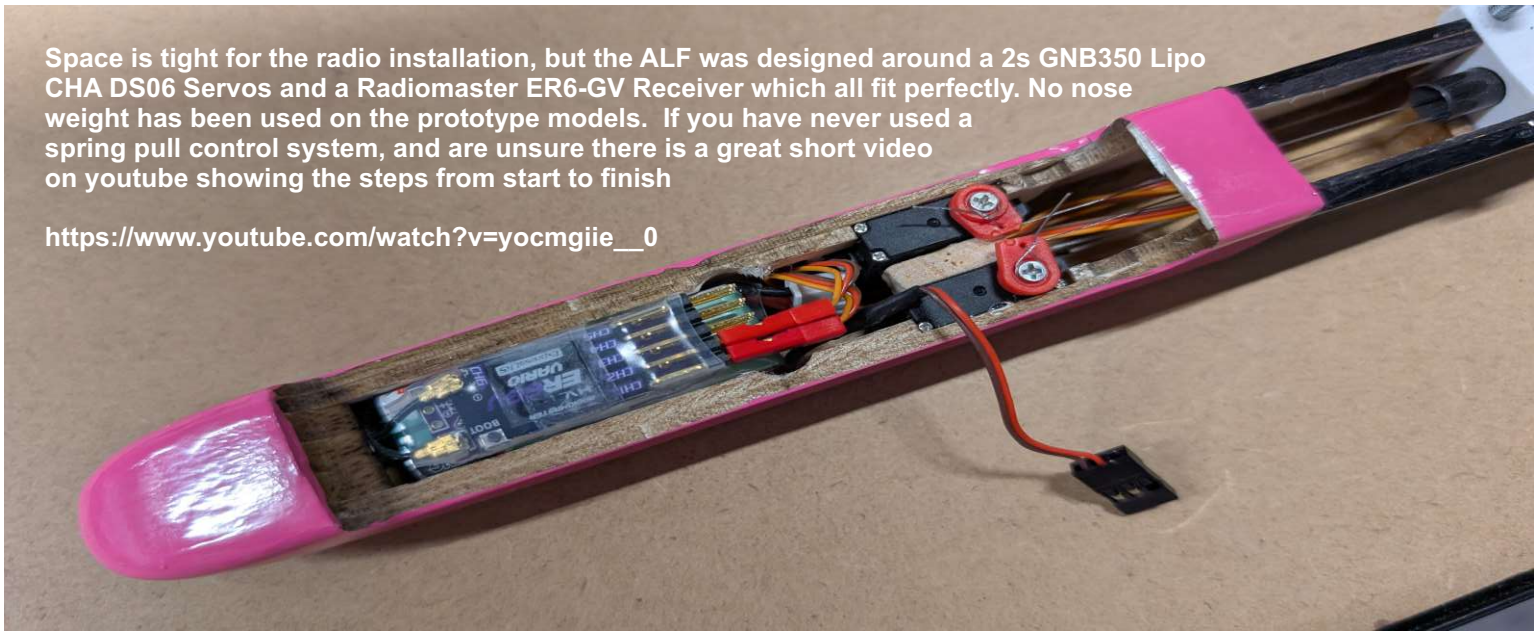
Glue the boom mounts into the fuselage assembly using a small amount of epoxy adhesive. We did this with the boom and wing assembly screwed together.

Once the epoxy has cured. you can align the boom, fin and tail to the wing by gently manipulating the boom inside the 3d prints.
To stop the boom twisting all you need is a very small amount of adhesive where the boom exits the small rear former

You can now final sand and cover the completed airframe. The flying surfaces can easily be warped and twisted from the covering film. It is essential that a lightweight covering film is used to reduced the risks of inducing a warp, as well as weight saving. Our own feather cover is the most cost effective lightweight option if you want a transparent finish. Our prototype model is covered in Oracover Oralight.







Space is tight for the radio installation, but the ALF was designed around a 2s GNB350 Lipo CHA DS06 Servos and a Radiomaster ER6-GV Receiver which all fit perfectly. No nose weight has been used on the prototype models. If you have never used a spring pull control system, and are unsure there is a great short video on youtube showing the steps from start to finish

https://www.youtube.com/watch?v=yocmgiie__0

Apart from glueing the launch peg into place your ready for final setup.

CG 55 to 57mm from the leading edge

Elevator max up throw until it just touches the underside of the boom and this can be matched equally for down.

Rudder we have ours maxed out at 45 degrees either way.

20% expo on both Rudder and Elevator give prefectly harmonised controls.

We get asked about launch modes and this is down to the individual and can be tailored to suit your own requirement. I have 5% up elevator and 7% right rudder mixed in for my launch mode on a momentary switch. That is my launches though and not the models natural tendency. Just find what you feel is right for you.

Thank you for purchasing the Alf and we hope you enjoy building and flying the model. Please feel free to forward any feedback to

awdbalsakits@gmail.com