

What happens when you take our incredibly popular Pug Micro DLG, Convert it to Wingeron controls, add a rudder and elevator into the mix?
 "A whole new world of light wind fun"
 Agile and fully aerobatic light wing slope soarer
 Balsa and carbon construction. Magnetic wing retainers
 Simple linkages. Large canopy hatch for easy radio install.
 Carbon Fibre wing leading edge.



We recommend building your Pug Twisty with "superphatic" adhesive or medium CA. For those of you sensitive to CA fumes we still suggest using it on the carbon to wood joints, so please use an extractor to remove any unwanted fumes, in a well ventilated room.

Lets start with the canopy hatch retainer.



The canopy is retained at the rear using a double magnet. If you have a 1mm and 1.5mm magnet supplied the 1mm magnet is glue to the hatch, the 1.5mm magnet into the plywood bracket we are assembling now.

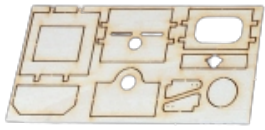
Please note the 5mmx1mm magnets are used for wing retainers.



Glue the plywood disc onto the back of the magnet holder.



Glue the 6mm x 1.5mm thick magnet into place using medium CA or epoxy resin.



These are the parts required to start the fuselage assembly.

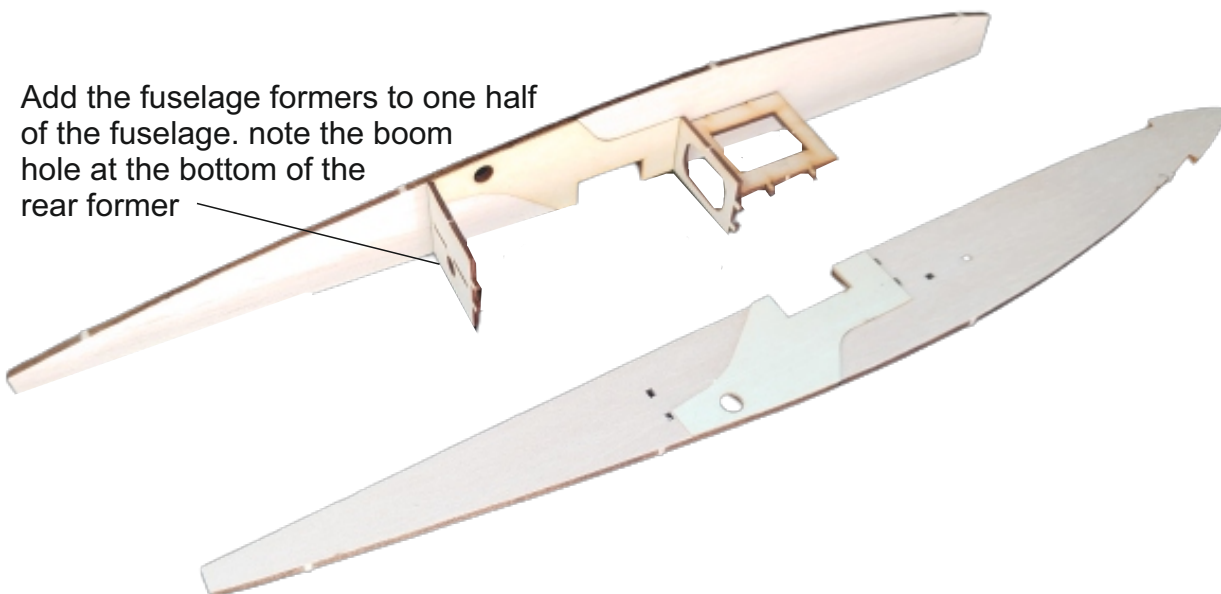


Remove the fuselage sides and doublers from the carrier sheets. Do not remove the canopy from the fuselage sides



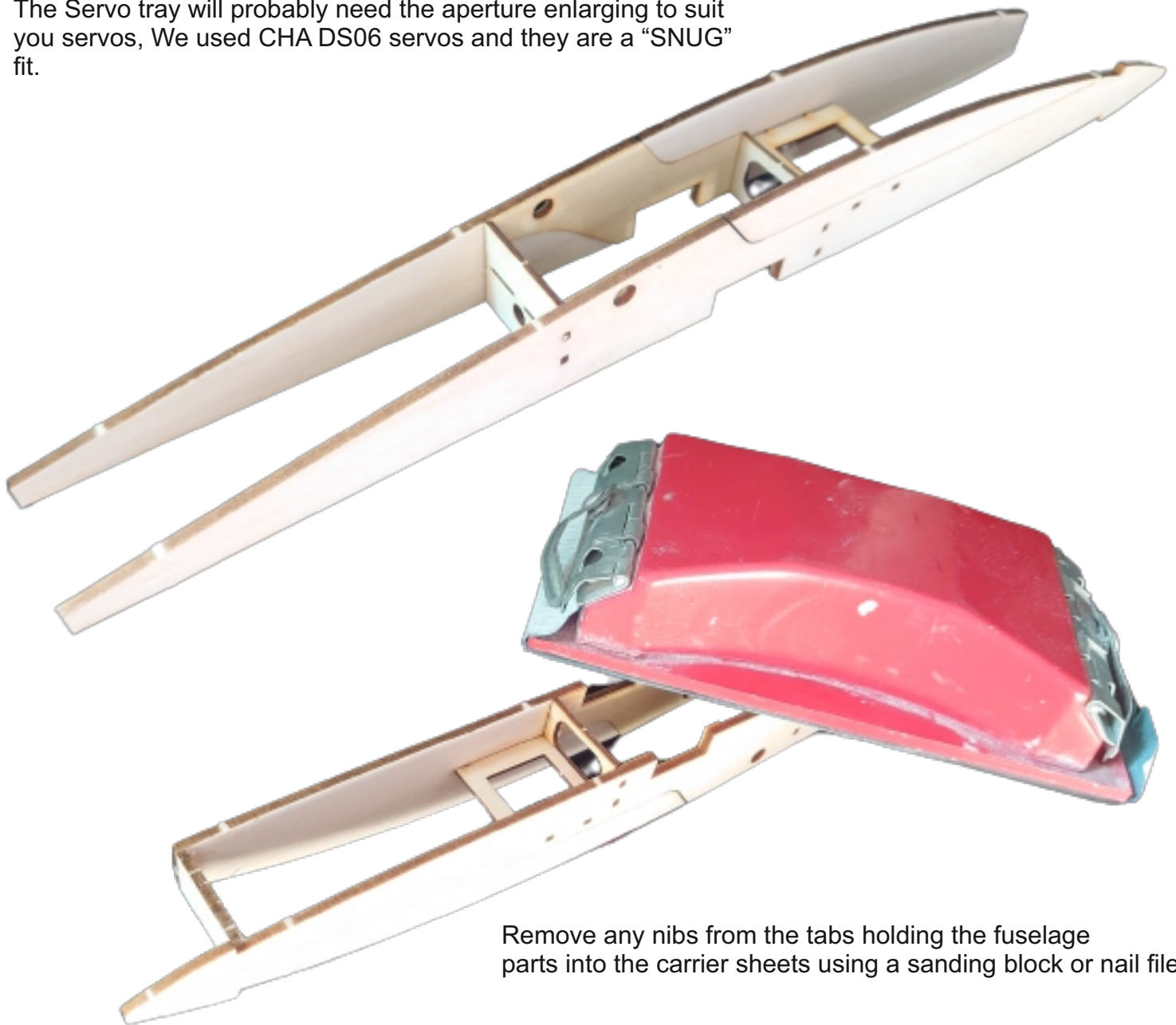
Glue the combined wing dowel and wingeron servo doublers onto the balsa fuselage sides. Make sure you make a correctly handed pair as shown above.

Add the fuselage formers to one half of the fuselage. note the boom hole at the bottom of the rear former

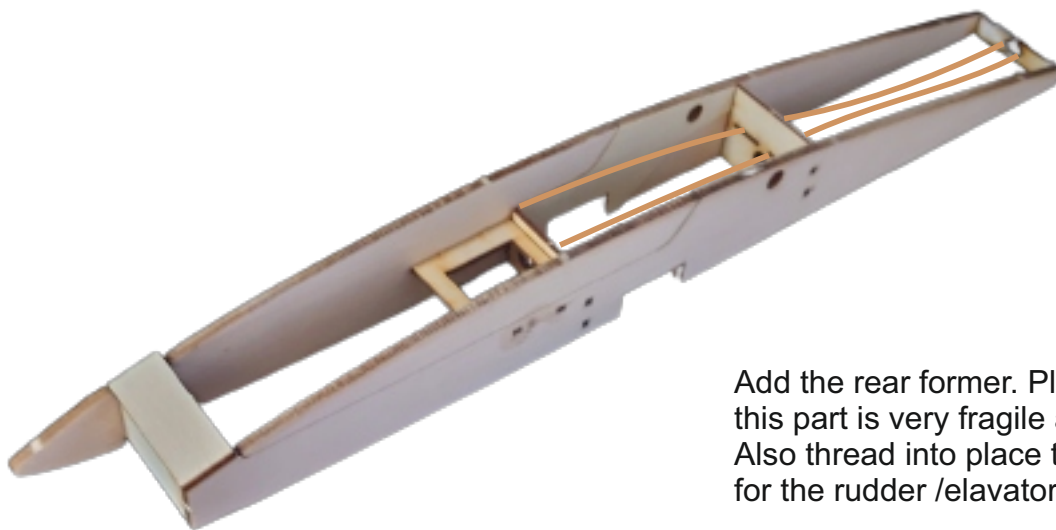


Add the opposite fuselage half, making sure that all the formers are at 90 degrees to the sides.

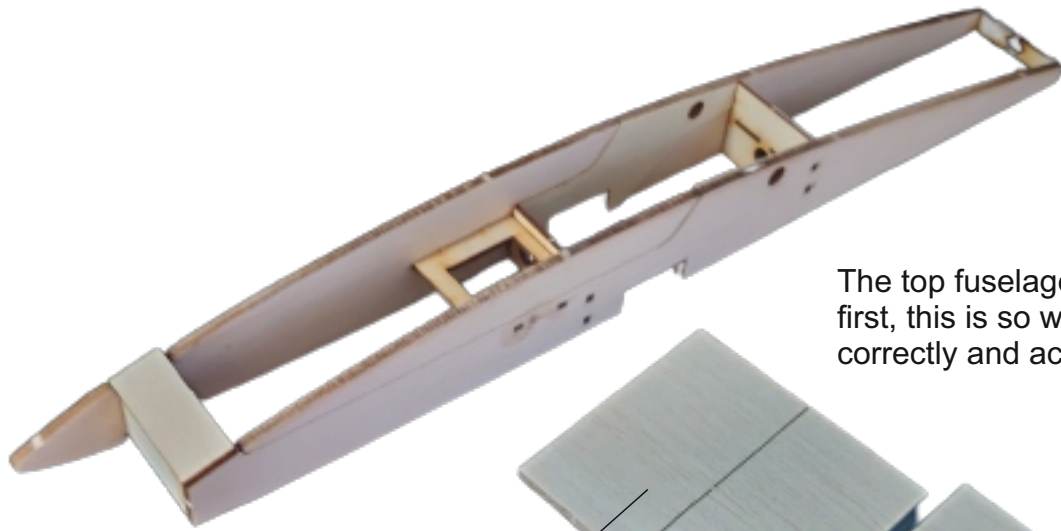
The Servo tray will probably need the aperture enlarging to suit your servos, We used CHA DS06 servos and they are a "SNUG" fit.



Remove any nibs from the tabs holding the fuselage parts into the carrier sheets using a sanding block or nail file

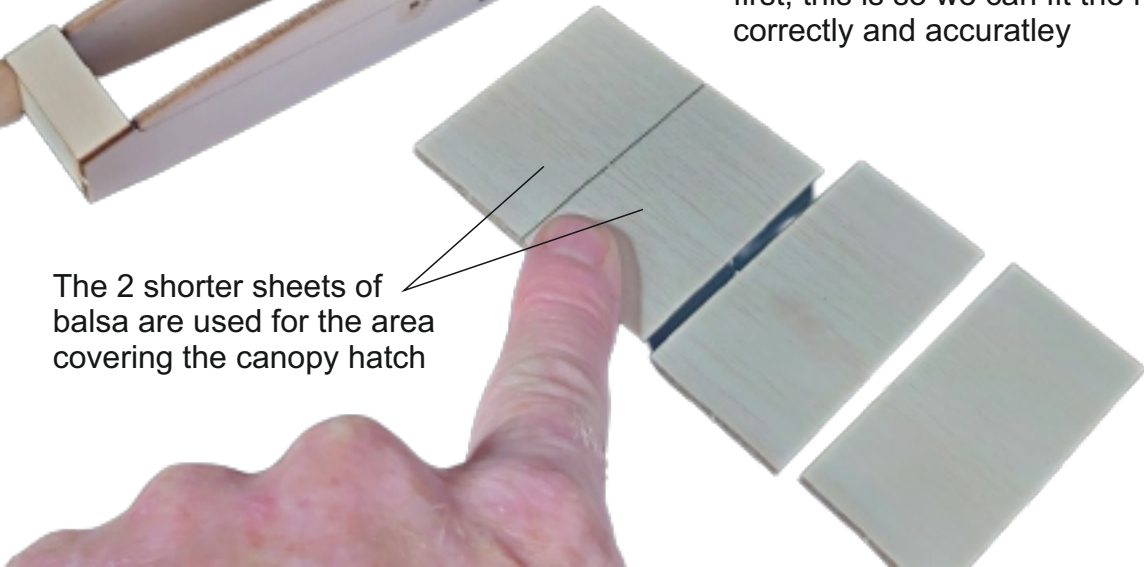


Add the rear former. Please be careful as this part is very fragile at this stage.
Also thread into place the PTFE guide tubes for the rudder /elavator pushrods.

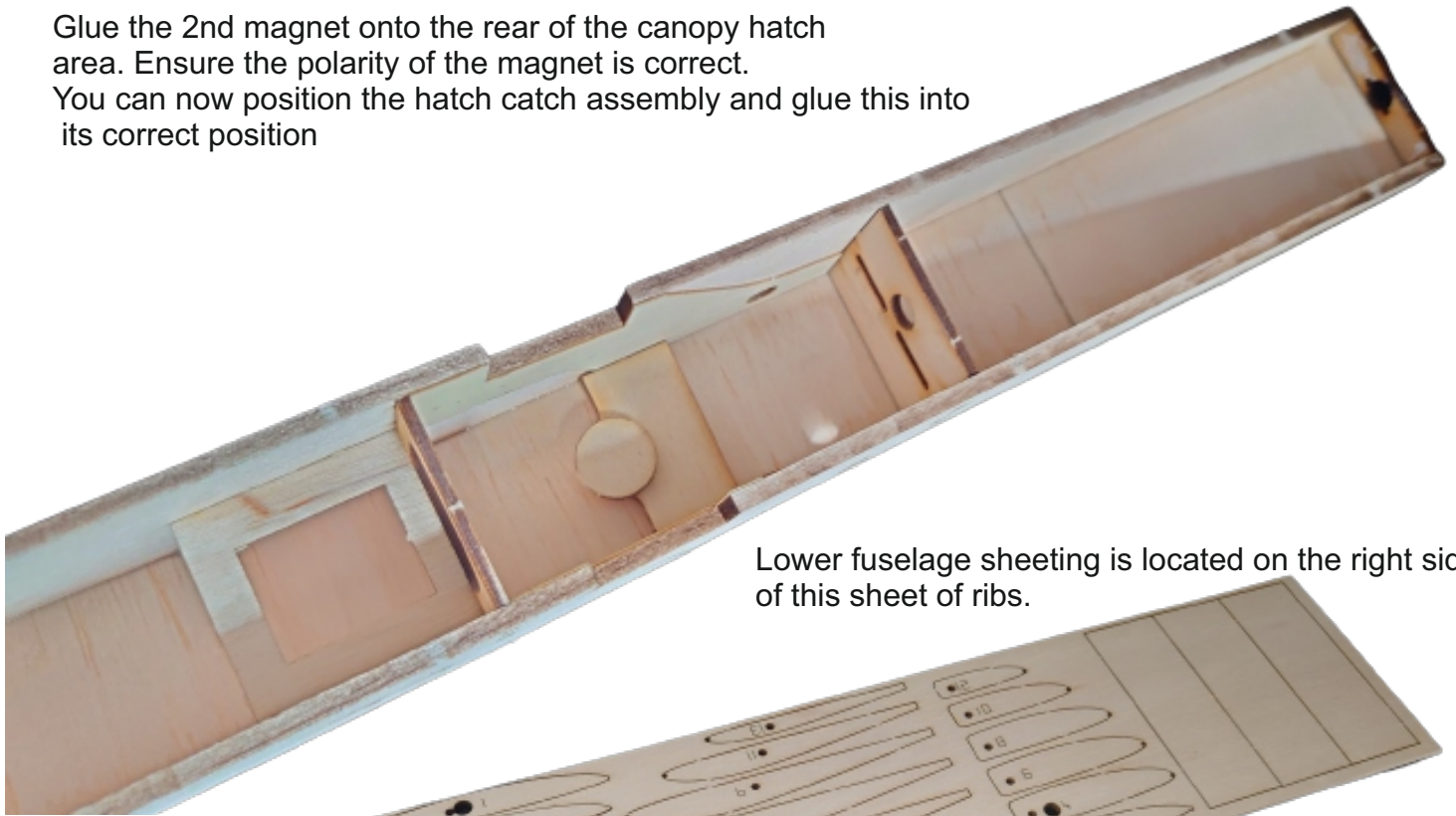


The top fuselage sheeting should be added first, this is so we can fit the hatch retainer correctly and accurately

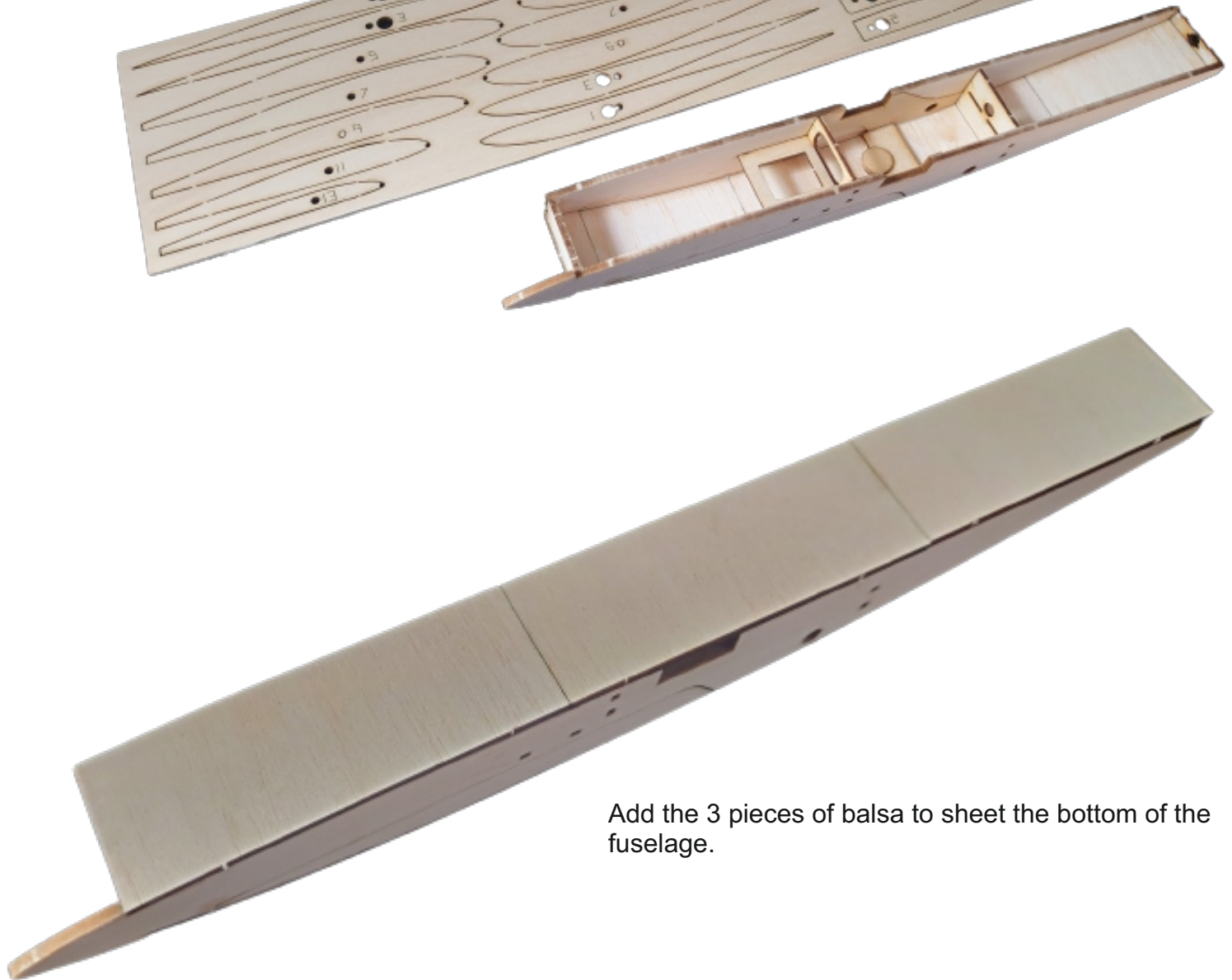
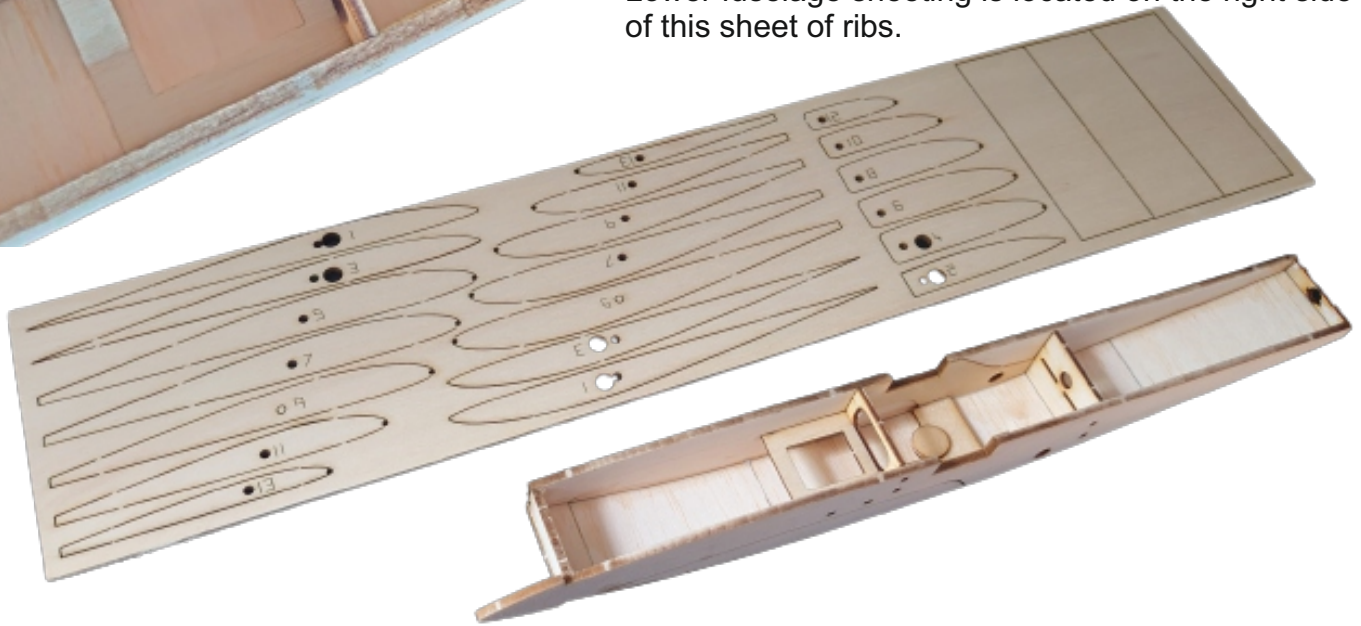
The 2 shorter sheets of balsa are used for the area covering the canopy hatch



Glue the 2nd magnet onto the rear of the canopy hatch area. Ensure the polarity of the magnet is correct. You can now position the hatch catch assembly and glue this into its correct position



Lower fuselage sheeting is located on the right side of this sheet of ribs.



Add the 3 pieces of balsa to sheet the bottom of the fuselage.

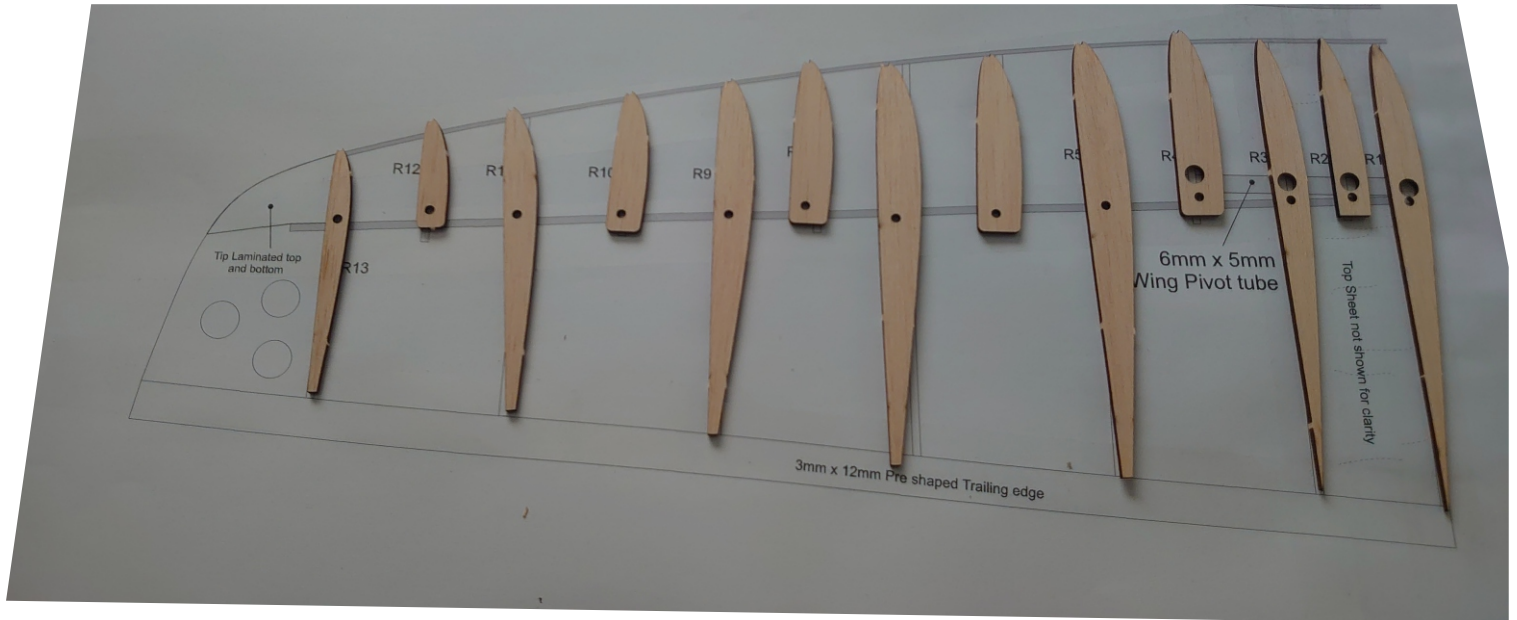


Use a knife and steel ruler to remove the canopy hatch.

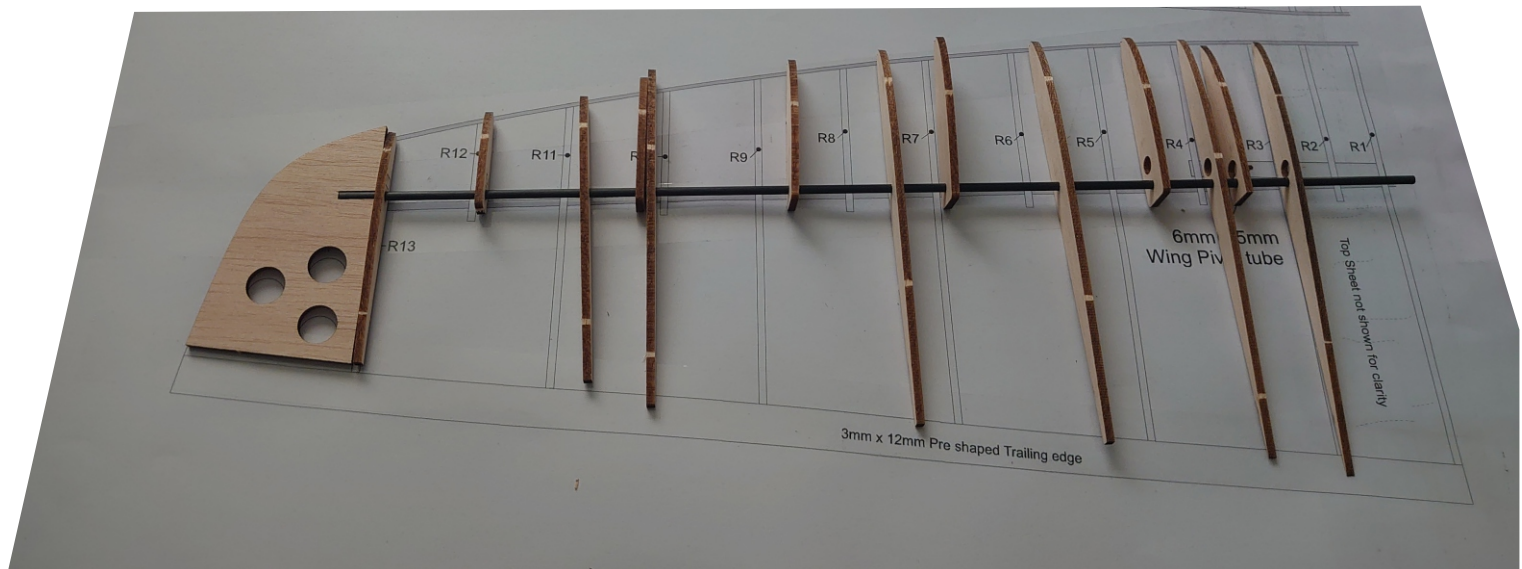


Add all of the balsa nose block layers.
We strongly recommend NOT using CA for this
as it can make sanding difficult

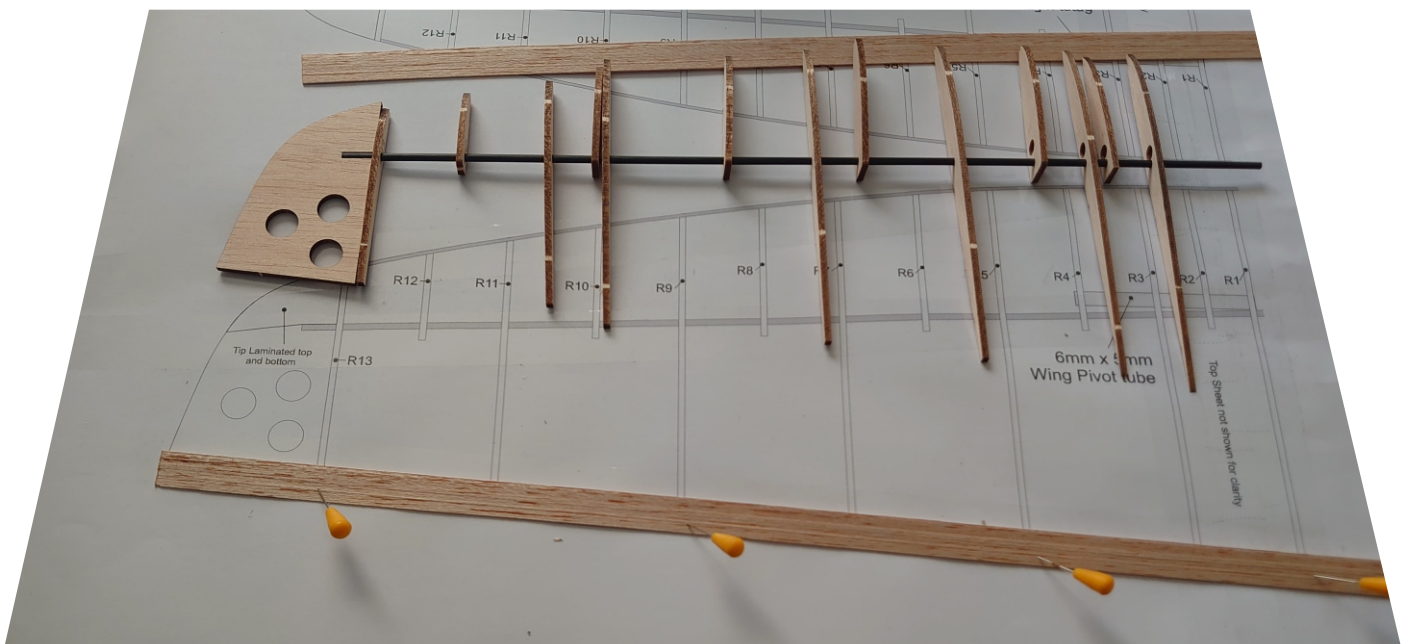
Wing Construction is very simple. We start by laying out the ribs.

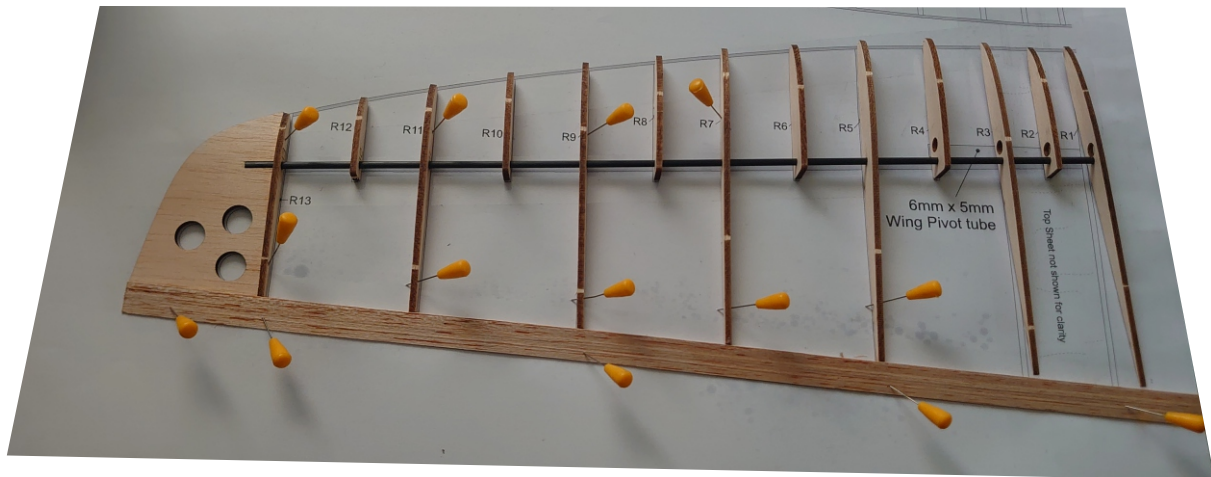


Slide each rib and the wing tip onto the carbon tube spar.



Pin the balsa trailing edge to the plan. The plan must be protected from the glue. You can use a polythene sheet, Clear tape or rub with wax to stop the glue sticking

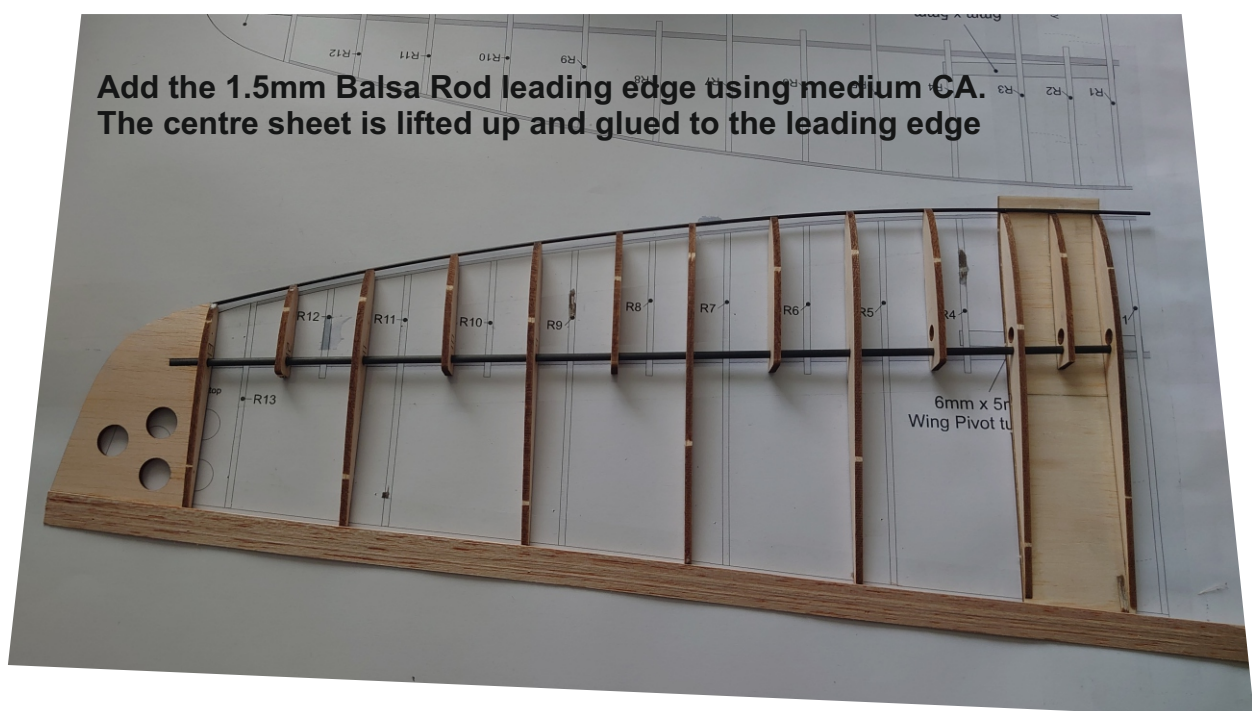




Pin the ribs into place before glueing.
Please note the Root Ribs R1 and R3 appear to be short. Do not glue yet! They are the correct length and sit on top of the 1.5mm balsa centre sheet.

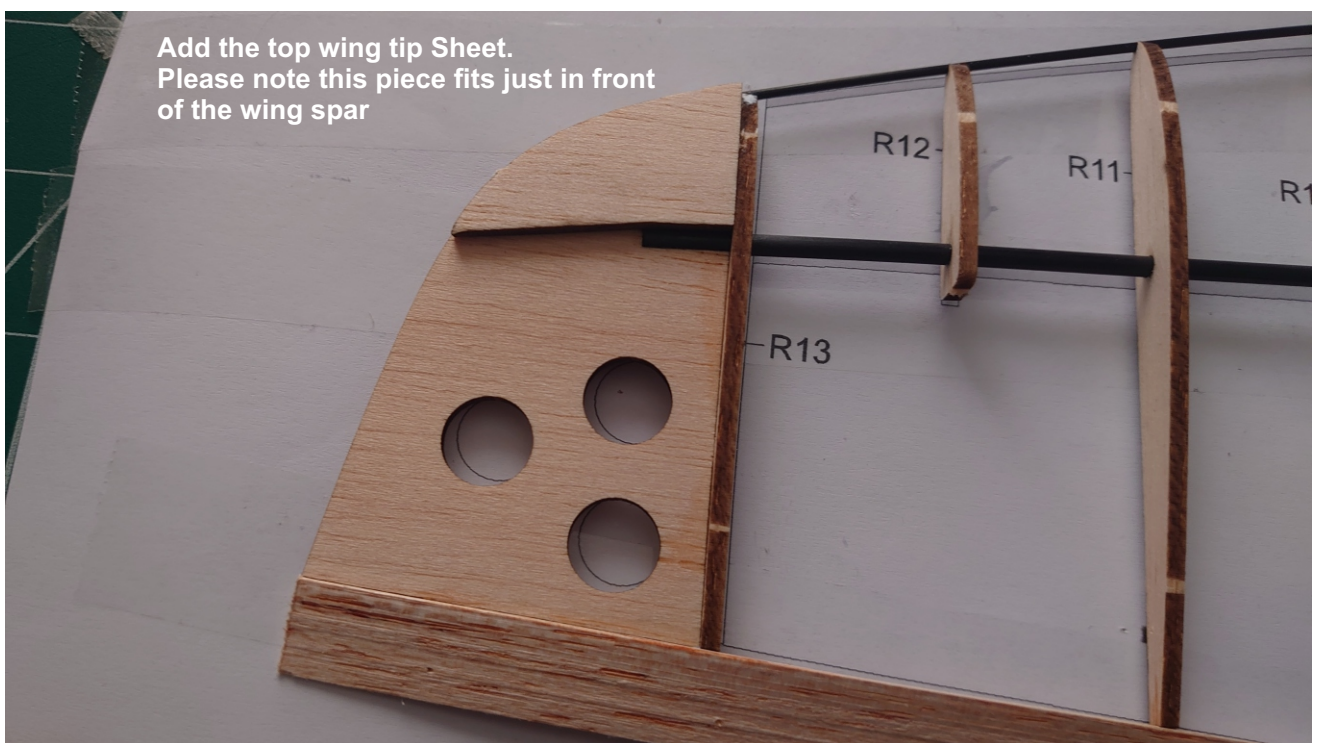


Centre sheet is made up of 2 pieces
of 1.5mm thick balsa.
This needs to be cut to fit

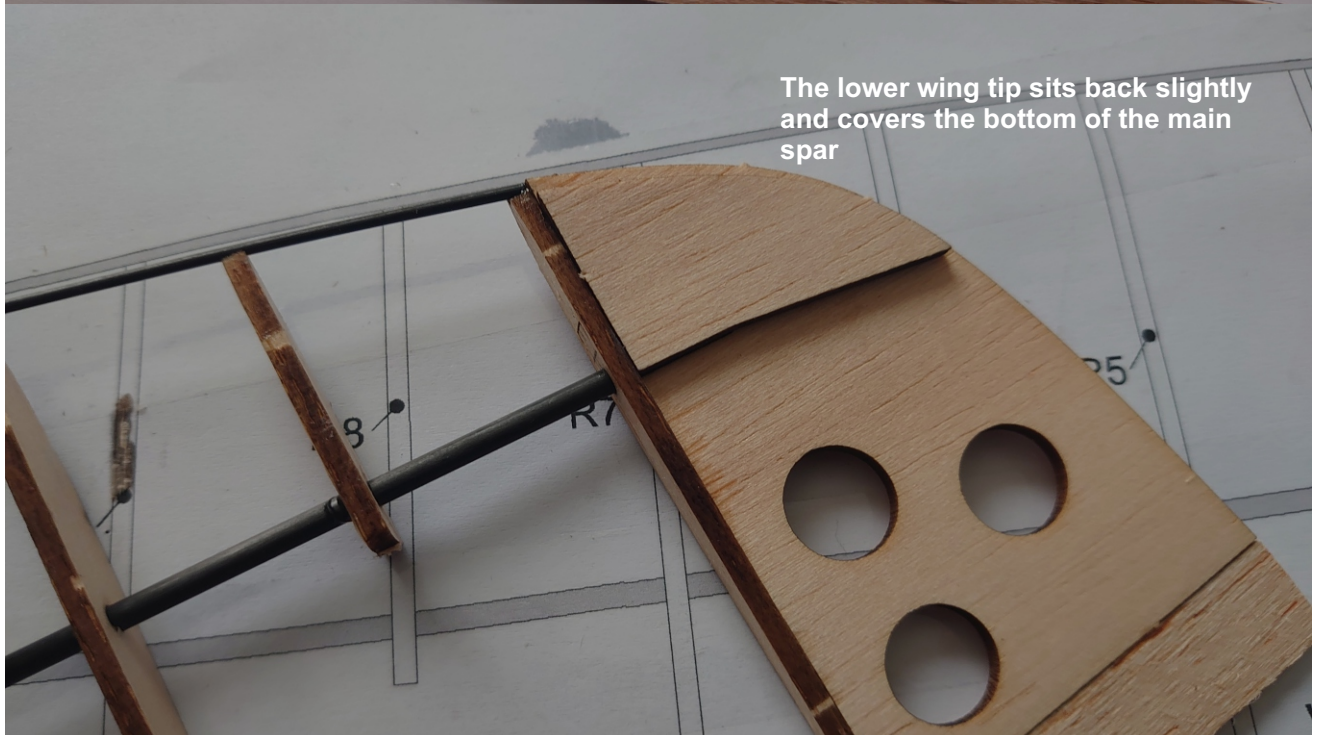


Add the 1.5mm Balsa Rod leading edge using medium CA.
The centre sheet is lifted up and glued to the leading edge

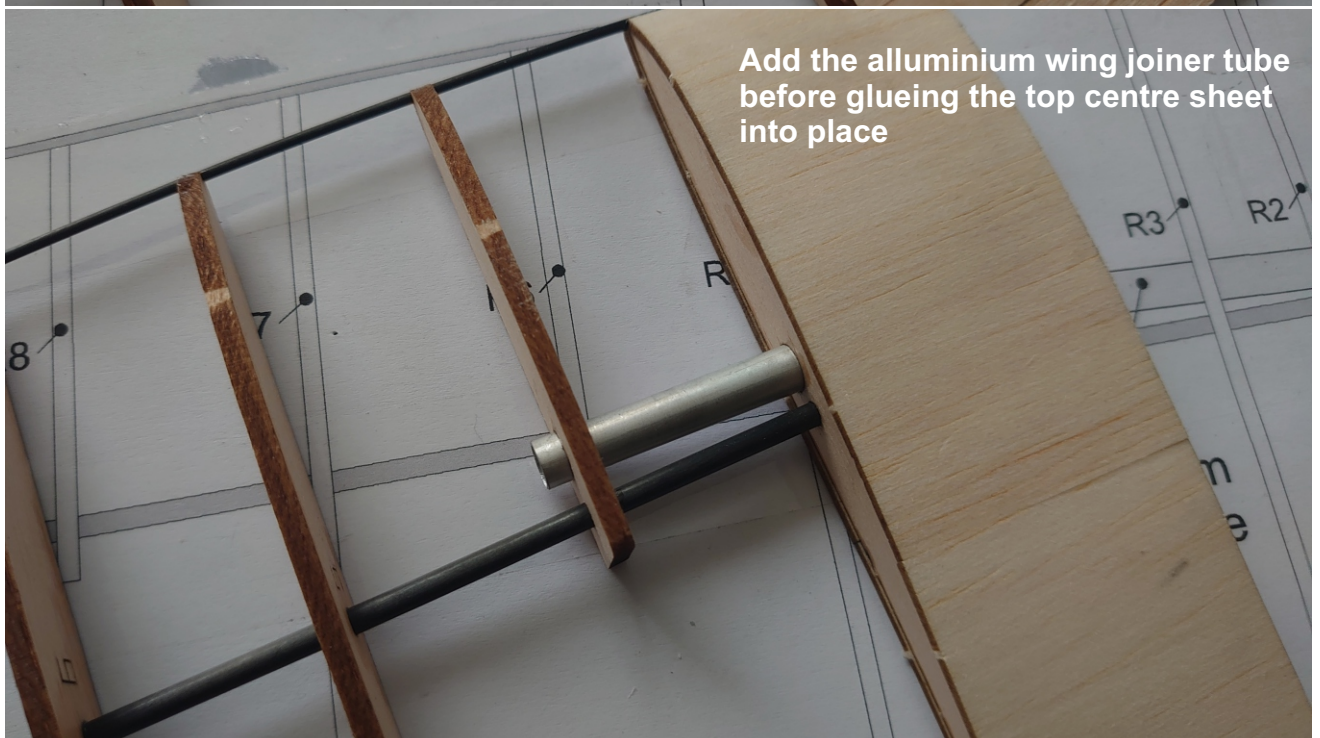
Add the top wing tip Sheet.
Please note this piece fits just in front
of the wing spar



The lower wing tip sits back slightly
and covers the bottom of the main
spar



Add the alluminium wing joiner tube
before glueing the top centre sheet
into place

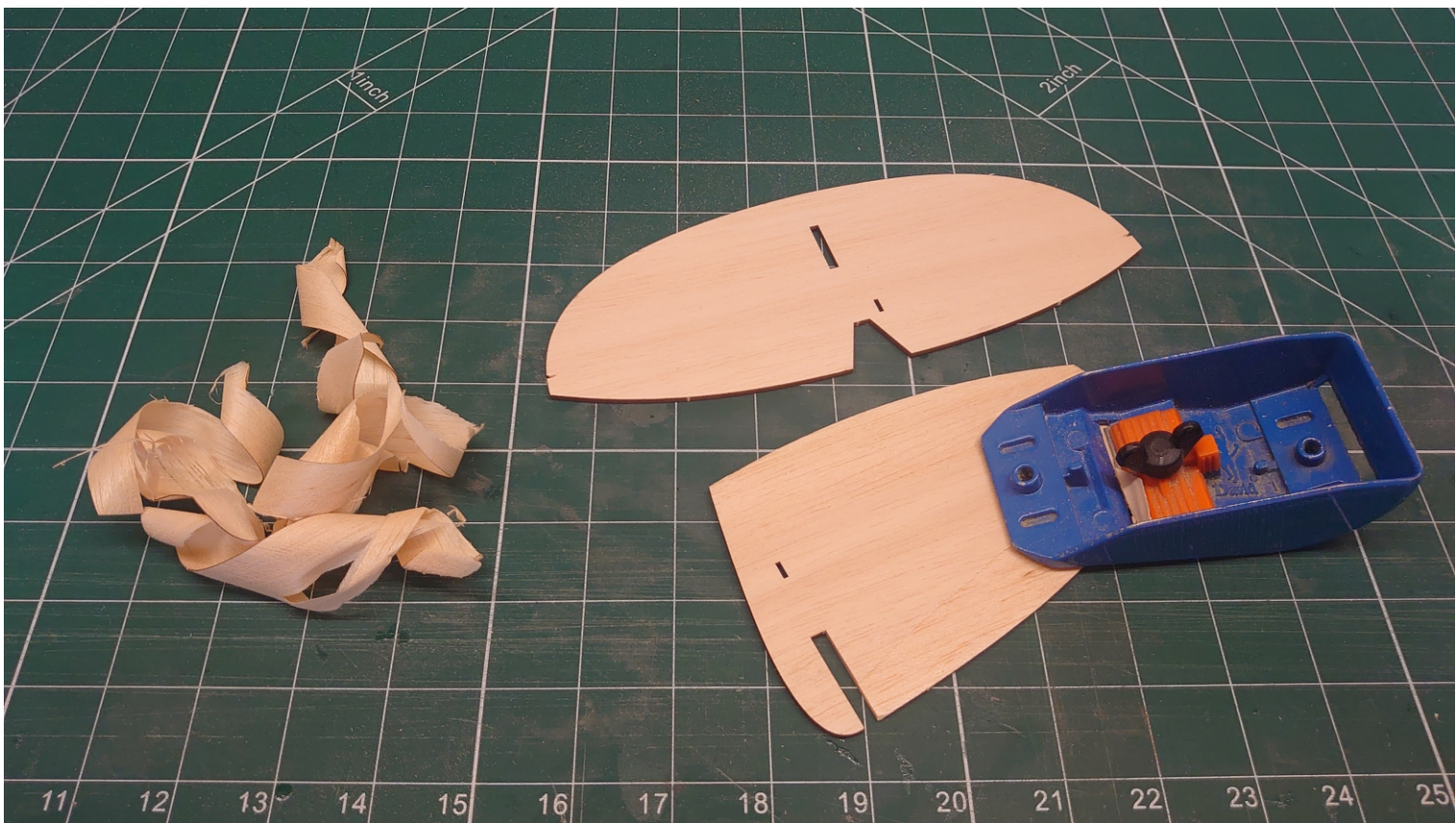


You can now make the **other** wing half. Make sure you make a left and right hand wing panel !

Please note the reminder about making a left and right hand wing is on behalf of a good friend and infamous Youtuber! who enjoys making 2 right hand wing panels!

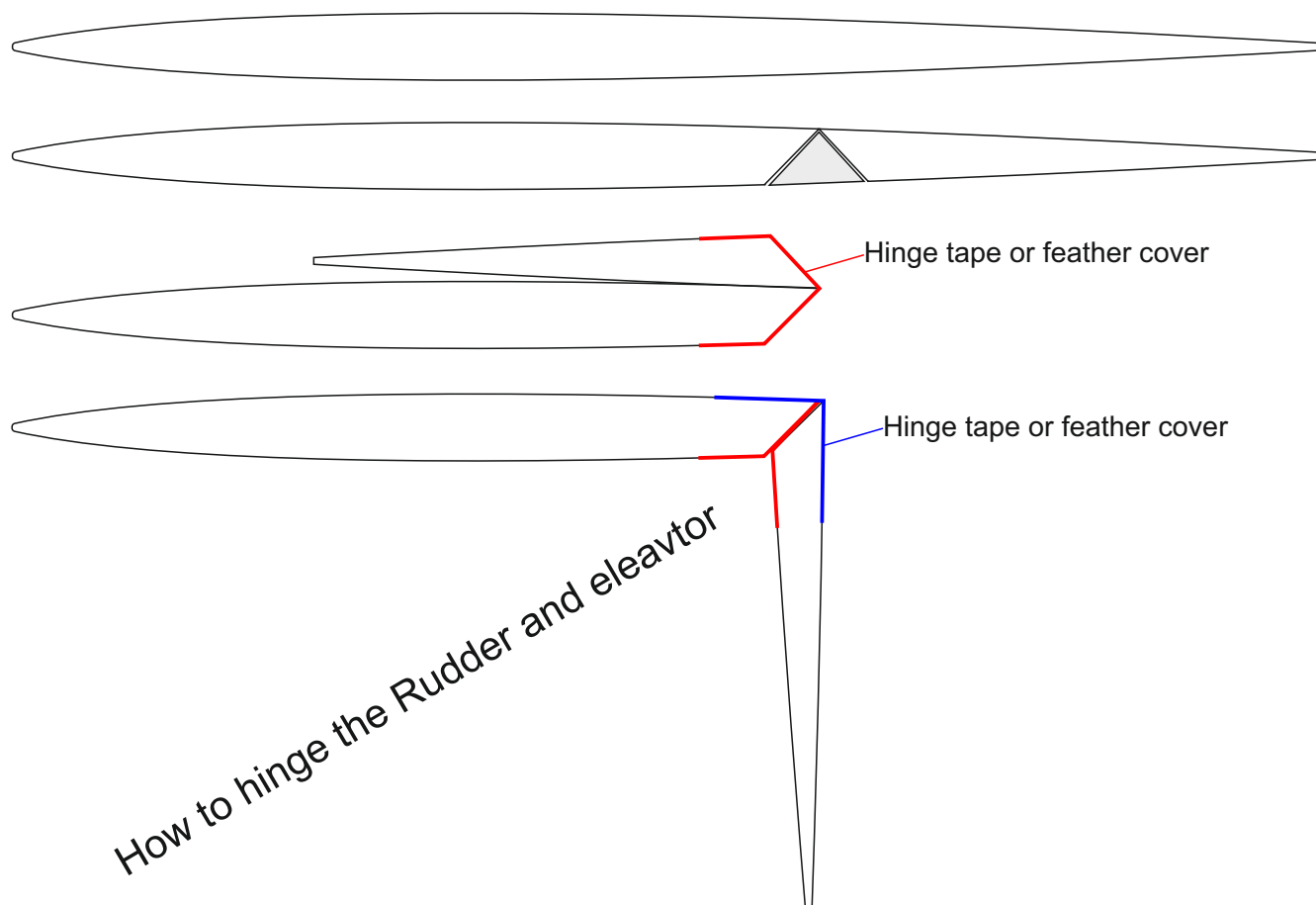


The wing should be sanded using a flat block. We sanded till the slight scorch marks are removed from the ribs.



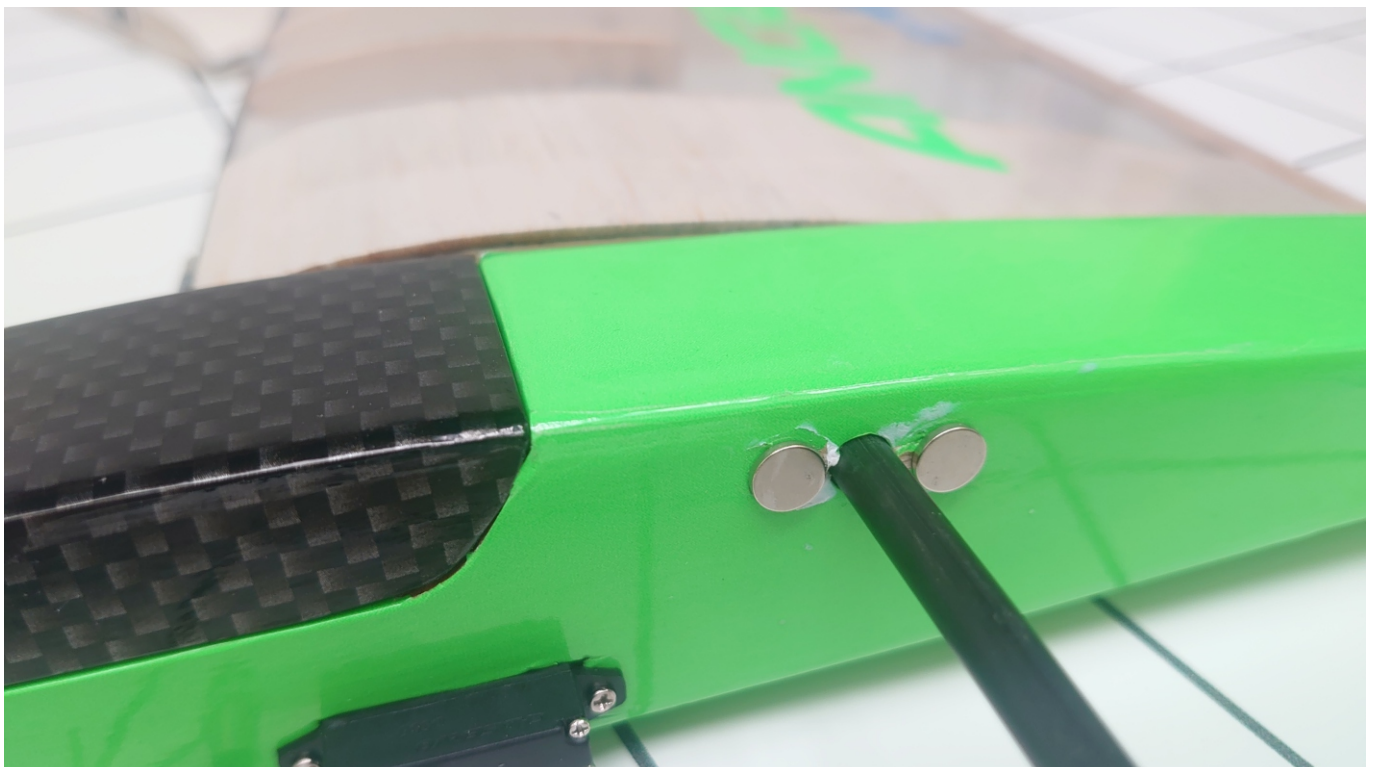
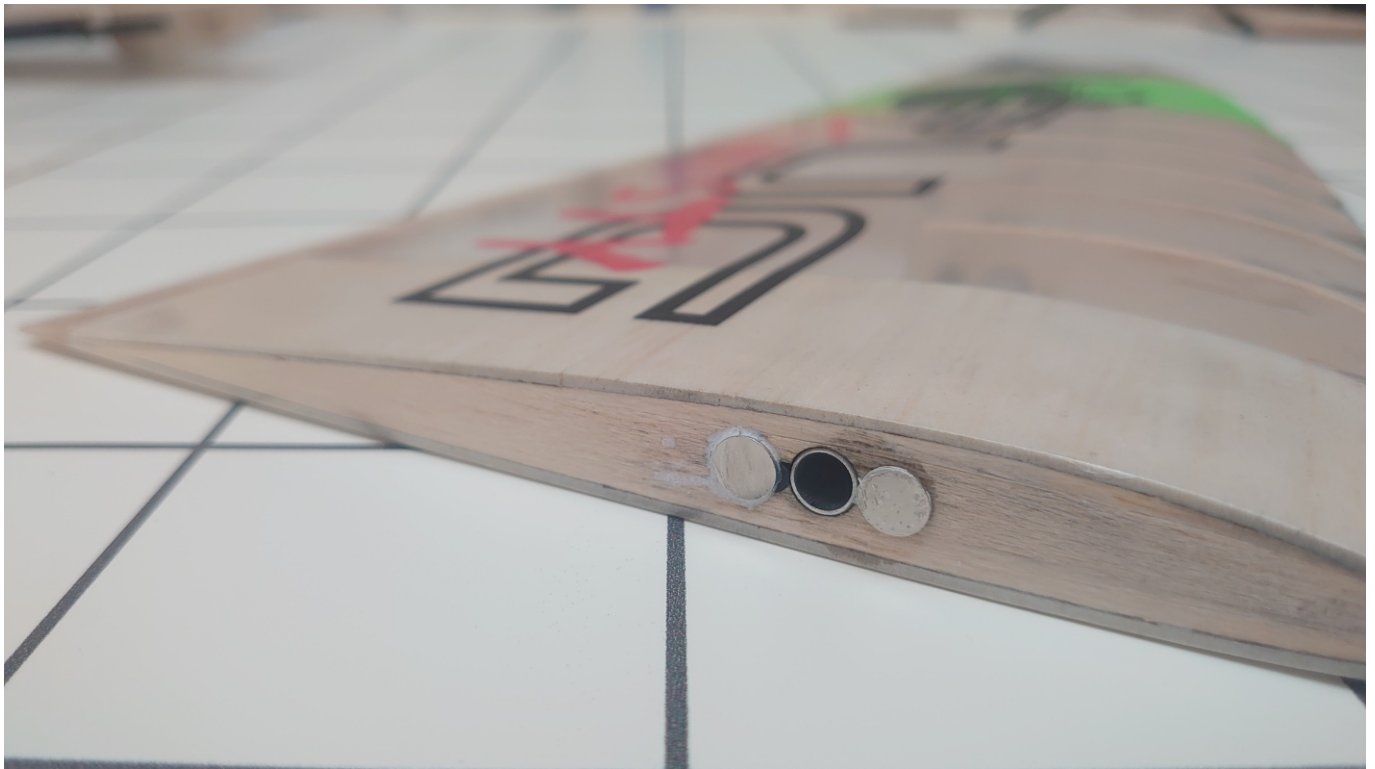
Despite the tail and fin only being 2.5mm thick we still like to try and carve / sand these to a nice symmetrical section. We always aim for a trailing edge thickness of approximately 0.5mm. This is not critical! If you aren't confident with carving / sanding and covering thin balsa then just a slight taper of the rudder and elevator is sufficient.

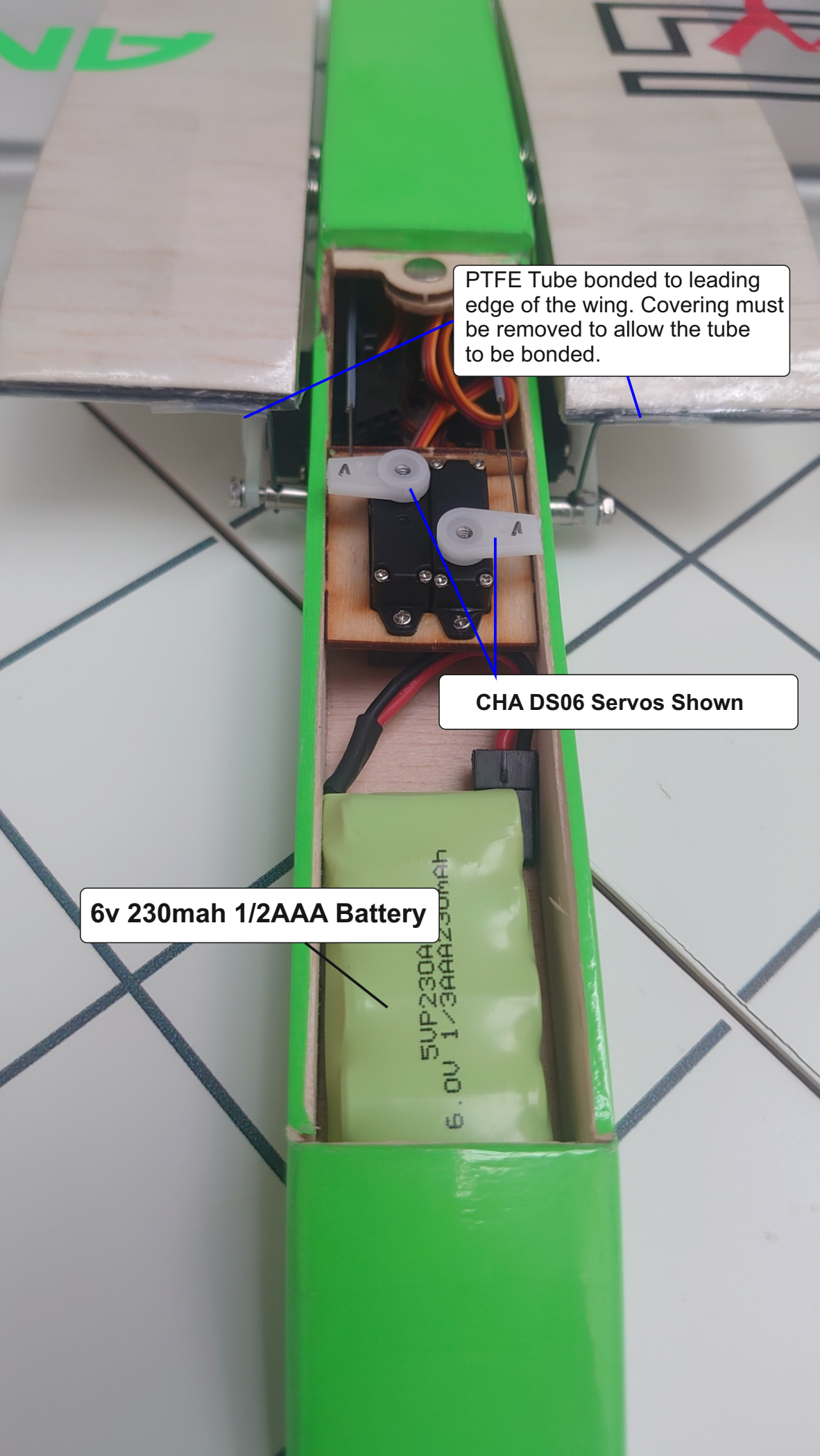
The Pug Twisty can be built with or without rudder and elevator control. If you're going to use these features the rudder and elevator is simply cut away using a sharp knife and ruler. There are indications on fin and tail assemblies indicating where to cut.



Before covering make sure all dust has been removed from the airframe. Pretty much any method of covering can be used for the fuselage. Vinyl, traditional heat shrink films, tissue and dope or glass cloth and resin. Ours is covered in a regular heat shrink film. The wings and tail surfaces are light weight and as such can easily be distorted with film coverings if incorrectly applied. Our preferred film covering for the Pug Twisty is our feather cover gloss. This does not shrink as much as most covering films making twists and warps less likely. You can also use Oraltight or Solarfilm Solite.

The images below depict the magnets that are used on the V2 to hold the wings into place. Two pairs of magnets are used to hold each wing panel in place.

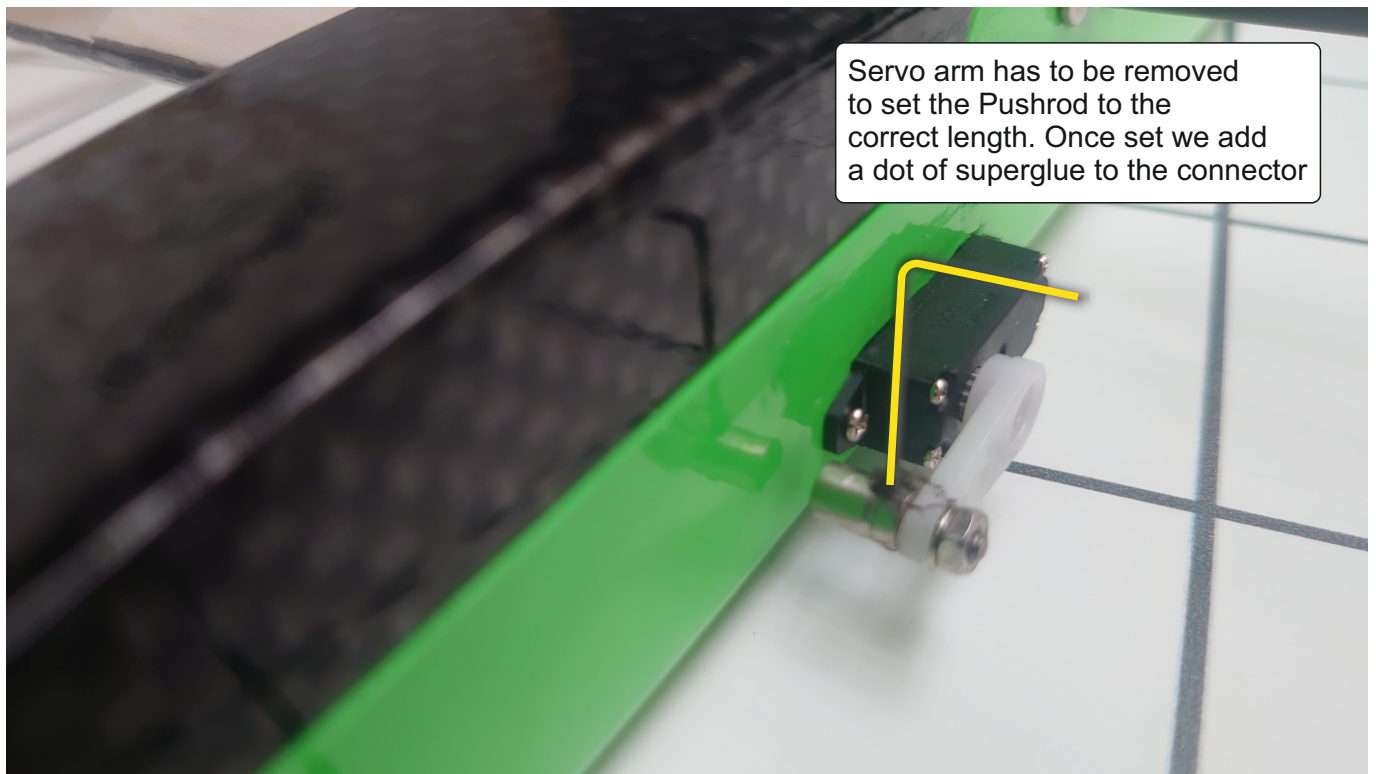




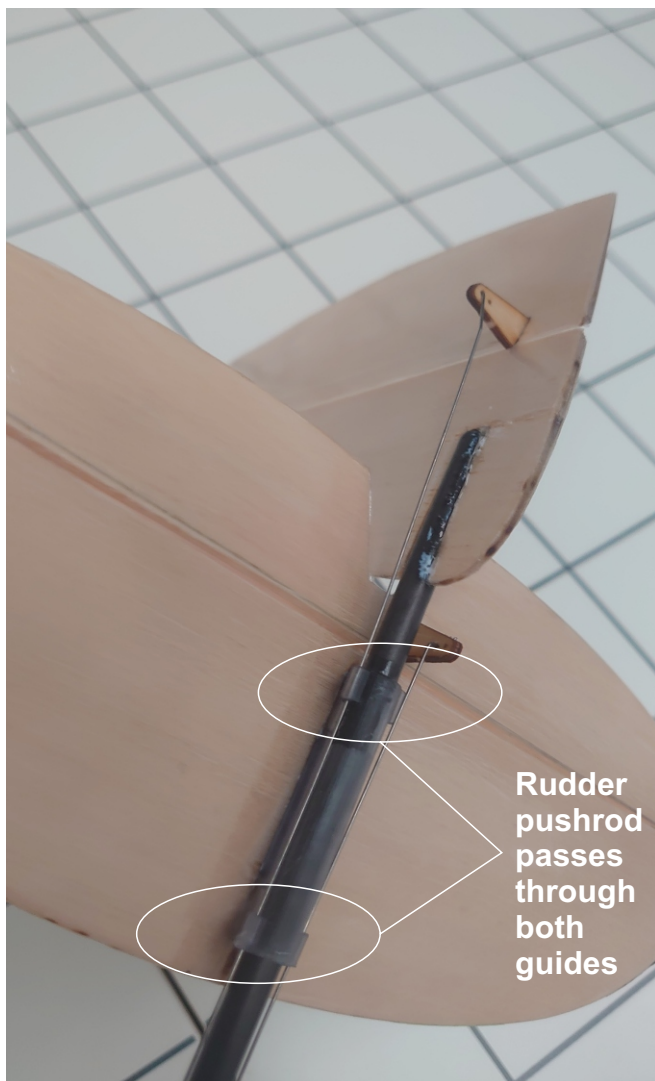
PTFE Tube bonded to leading edge of the wing. Covering must be removed to allow the tube to be bonded.

CHA DS06 Servos Shown

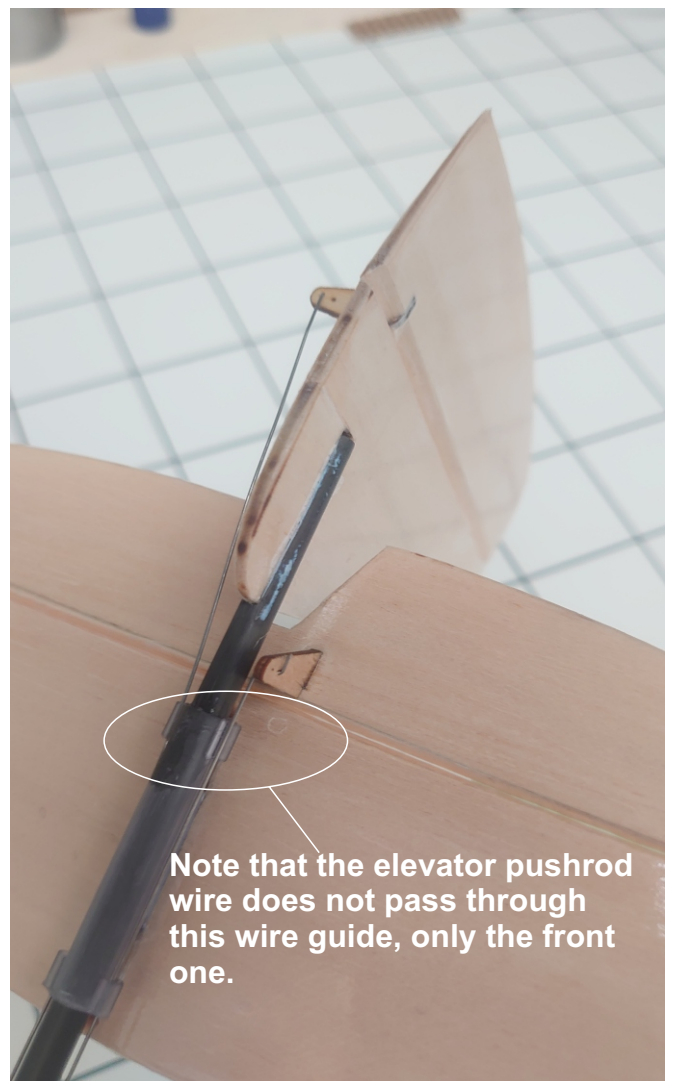
6v 230mah 1/2AAA Battery



Servo arm has to be removed to set the Pushrod to the correct length. Once set we add a dot of superglue to the connector



Rudder pushrod passes through both guides



Note that the elevator pushrod wire does not pass through this wire guide, only the front one.

Approximate Neutral trim of the wings...

The Trailing edge should be flush with the top surface of the fuselage.

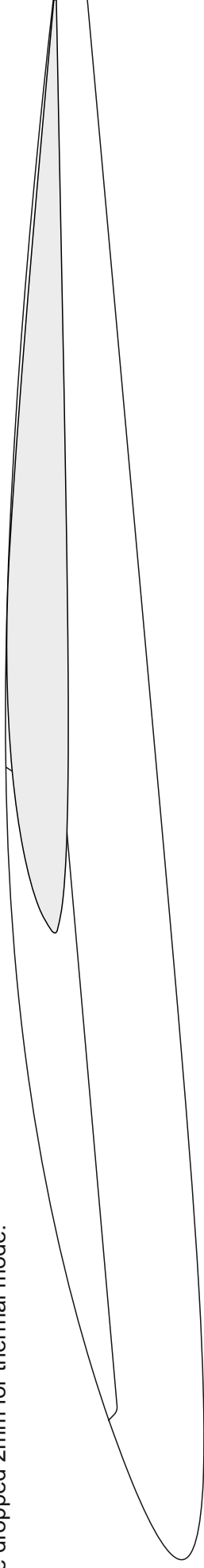
This is the Light wing trim point and should be used for test

flights. This can be fine tuned rather than using elevator

trim to give straight and level flight The trailing edge can be raised

2mm for windy day to give better penetration and speed. It can equally

be dropped 2mm for thermal mode.



C of G The Pug Twisty should be balanced on the main wing pivot tube, not the main spar.

We will update information of control throws and mixing options with a Youtube video once the weather here in the UK improves

Control throws :

Elevator Low Rates 8mm up and down 15% Expo , High Rates 15mm up and down 30% Expo

Rudder Low Rates 15mm left and right. 10% Expo High rates MAX 20% Expo

Wing travel :

The Pug Twisty is supposed to be fun, so this is a simple one MAX achievable.

We set our models with Dual rates at 60% and 15% Expo and Full rates with 30% expo

Possible Mixing Options

Elevator to flap Mix We use 3 flight modes, No elevator to flap mix, 25% elevator flap mix, 60% Elevator flap mix