AVANTI 3m Building Instructions
BUILT UP FUSELAGE

You must ensure you have MAAA (or similar for your country) model aviation insurance before flying this model.
Only fly in designated areas and in accordance with all council, government, airport, CASA and any governing body rules.
Ensure the model is built correctly and is checked thoroughly before flight. If you are an inexperienced pilot, ensure you have an instructor or experienced pilot with you at all times.
The manufacturer of this model kit takes no responsibility for your actions.

Building is fun but please remember you are responsible for your own health. Almost all adhesives contain solvents and other volatile substances and must be used with adequate ventilation. Ensure you follow all the instructions on the adhesives and equipment being used.
Be careful with CA (superglue) because it can glue your eyelids and fingers together very quickly.
Working with Balsa and Carbon can cause fine dust which must not be inhaled or swallowed.
Always cut and sand Carbon wet and do not blow carbon dust from the building board, remove it with a vacuum cleaner.
Using tools can cause injury.
Operating a model aircraft can cause accidents so you must have insurance before you fly this model aircraft.
Join a club (and the MAAA) and ensure you are properly trained and have an experienced person helping you.
Alan Mayhew, Marcus Stent and Performance Models take no responsibility for any damages and accidents that arise from the construction and operation of this model aircraft. It is the responsibility of the builder and flyer.

Now, on to the fun bit….

Before Starting

Place Food/Cling Wrap (or similar) over the plan before you start
Use a knife to separate parts form the sheet, do not use your hands.
Trim parts as necessary.

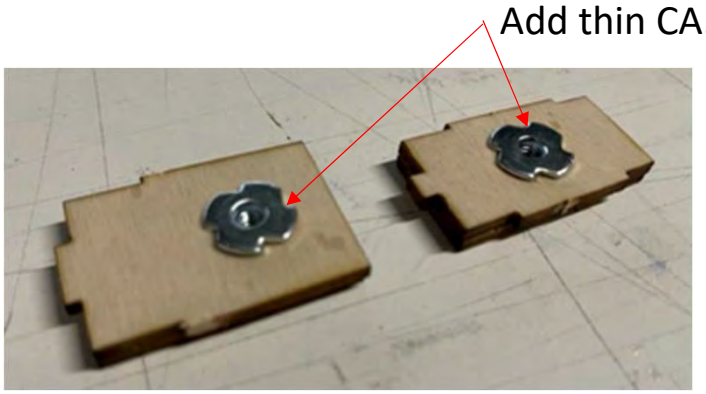
Abbreviations

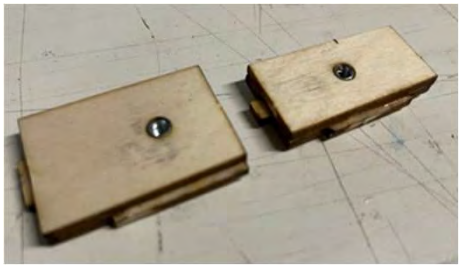
CA = Super glue
RHS = Right Hand Side
LHS = Left Hand Side
L.E. = Leading edge
T.E. = Trailing edge

BUILT UP FUSELAGE POD ASSEMBLY

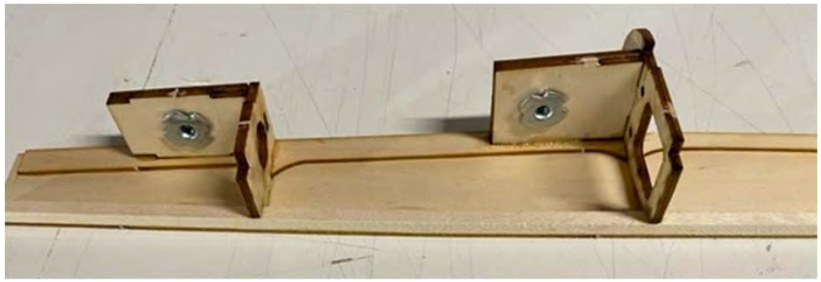
Glue the 1.5mm ply supports to the fuselage sides ensuring there is RH and LH side.
Cut the 5mm square stock (915mm) in half (457mm each) and glue in place, starting at the rear edge.
Cut and glue the 4 pieces of 8mm triangle stock in place at the nose.

Glue the magnet into F3.





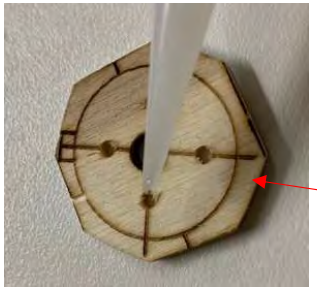
Assemble the 2 x front and 2 x rear hold down ply plates as shown and glue together with medium CA.
Ensure the T nuts are inserted from the correct side.
Apply some medium CA to the T nuts and gently hammer the T nuts in place.
Add a drop of thin CA to secure the T nut.



Glue the 2 x hold down plates, F3 and F4 to one side of the fuselage. They interlock together using the tabs.

Glue on the other side of the fuselage and hold with rubber bands until dry.

Glue in F5



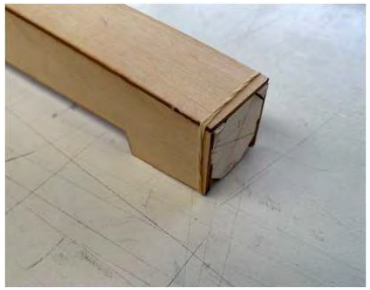
Drill holes in F1 to match your motor and seal the holes with CA.

Sand the beveled the edges to fit the triangular stock snugly.

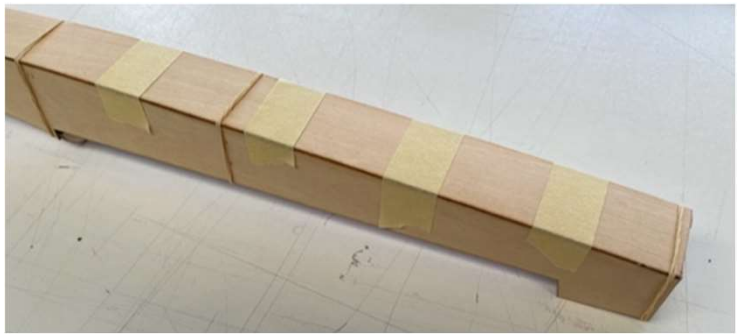
Trial fit F1 and adjust as necessary

Sand the bottom of the fuselage to eliminate any high spots

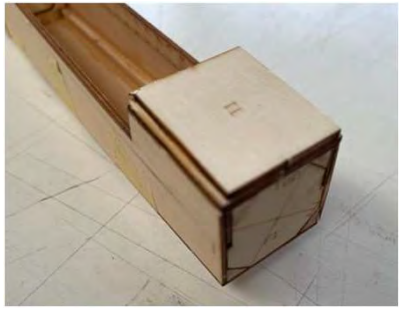
Install F2 to help alignment, but do NOT glue in place



Use the bottom of the fuselage to align the nose accurately.



Glue in F1 and the bottom fuselage at the same time. Hold in place with rubber bands and tape until dry.



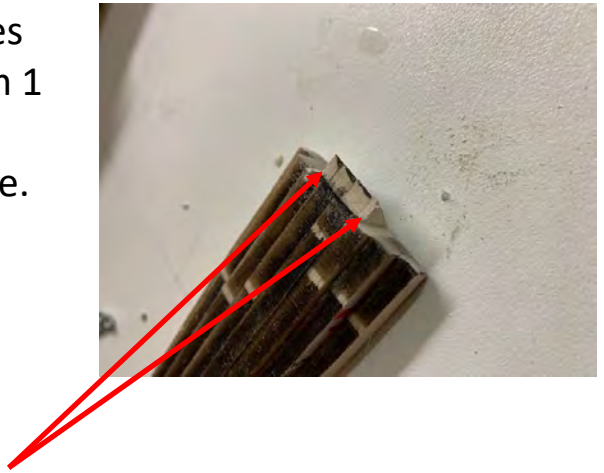
Add the 2 x ply nose pieces T2 and T1.

Add both thin CA and then medium CA inside the entire fuselage for extra strength

Glue the 4 x tailcone pieces together first, using the boom as a guide.
Temporarily fit the tailboom and slide on the tailcone pieces and glue to F5.
Be careful not to glue in the tailboom.
Once dry, remove the tailboom to allow the finishing of the fuselage pod.

Glue the canopy pieces together in order from 1 to 8.
Ensure they are square.

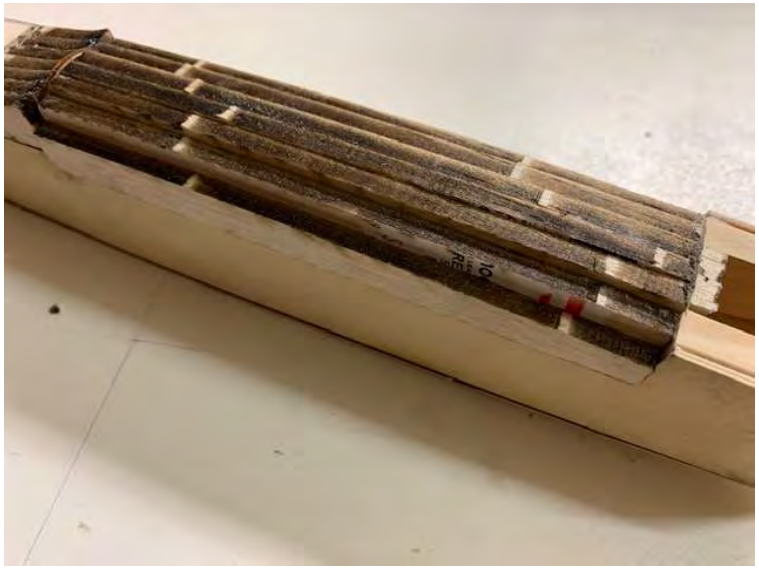
Trim to fit between the triangle stock

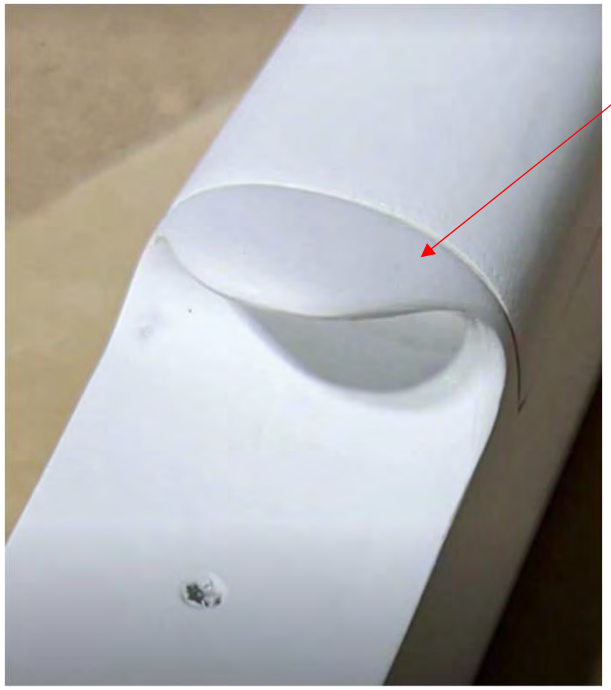


Sand the canopy and fuselage to shape using the spinner as a guide.

Add the magnets to the rear of the canopy.

Ensure the CORRECT orientation of the magnet to attract to the magnet in F3



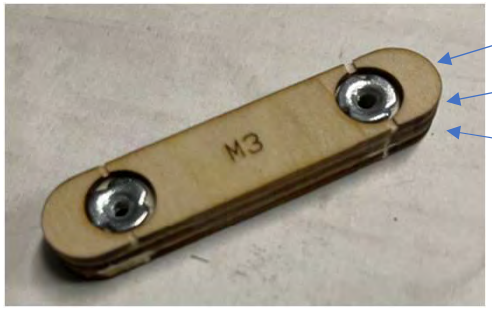


Trial fit the wing and add the 8 x balsa fairing pieces to the rear edge of F3 using the wing as a guide.

Sand the fuselage to shape

Tailplane Mount Assembly

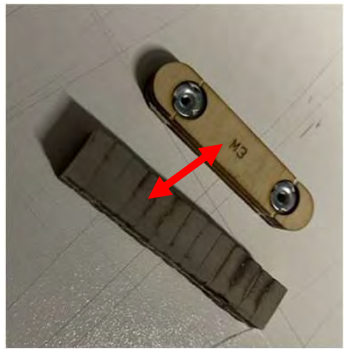
Make the elevator mount



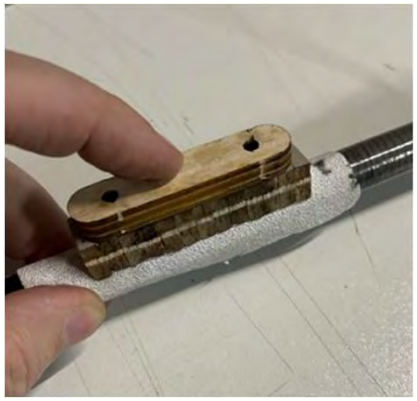
Bottom view

Glue together the curved pieces

Sand the bottom flush



Glue onto M3



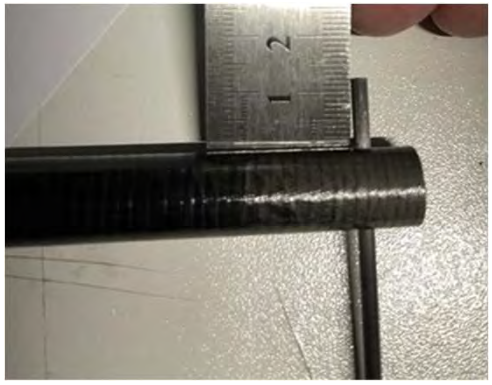
Once dry, lightly sand the mount with sandpaper on the boom

Lightly sand the boom

Built Up Fuselage Boom Assembly

For the built up fuselage, use the full length of the supplied **1m long boom** is used.

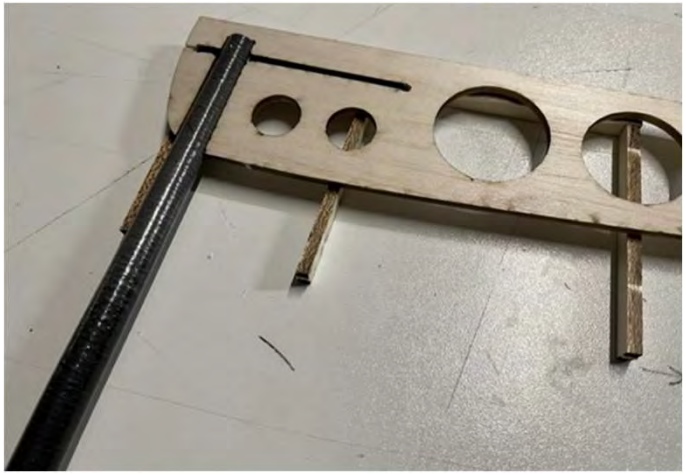
Drill a 3mm hole, 9mm from the end of the boom



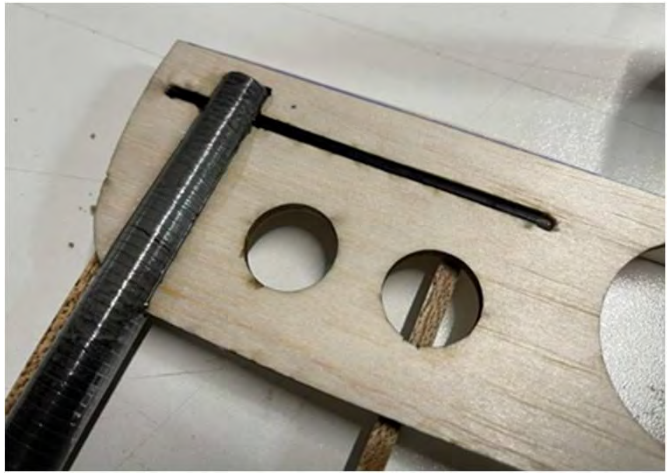
Glue in the 3mm carbon fin support

Lightly sand the top and bottom of boom where the fin sits.

Because of the boom is a constant diameter, pack the fin with scrap 5mm balsa to centralise it on the boom.



Fit the Fin on the boom. Use scrap 5mm balsa holds the fin accurately while the glue dries. I use medium CA.



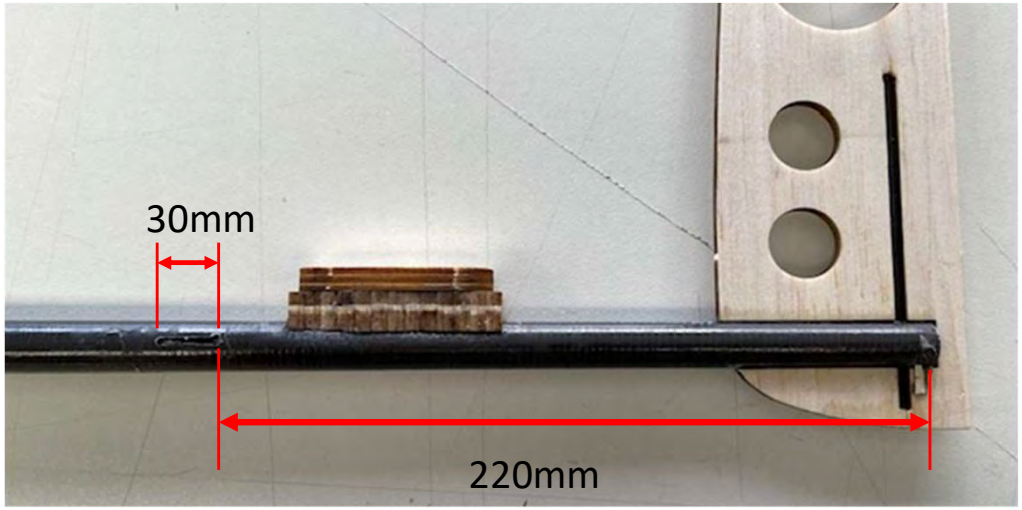
Tail Assembly

Sand the LE and TE of the elevator and stabilizer round, not sharp.

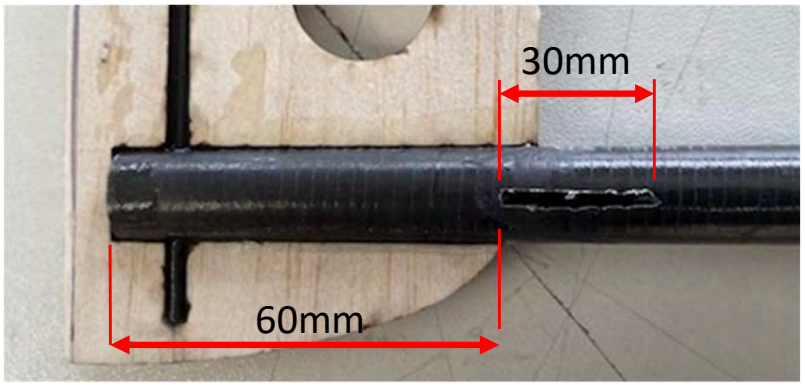
Bevel the hinge position of the fin and rudder.

Add the 1.5mm ply reinforcement plate.

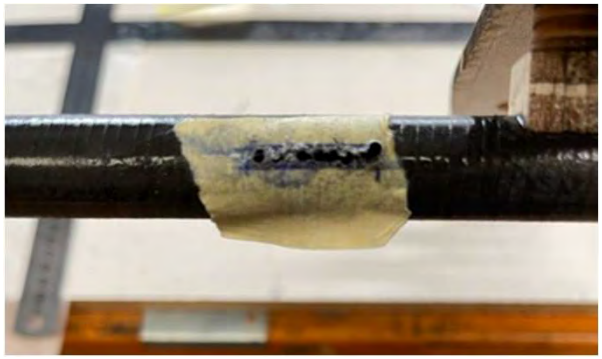
Left hand side of boom

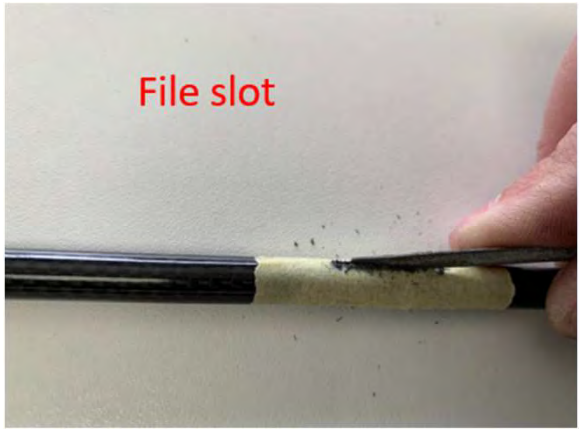


Right hand side of boom



Mark the pushrod openings.

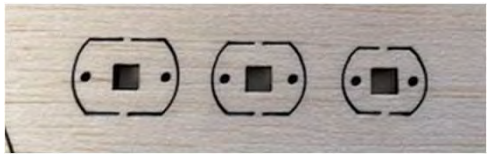




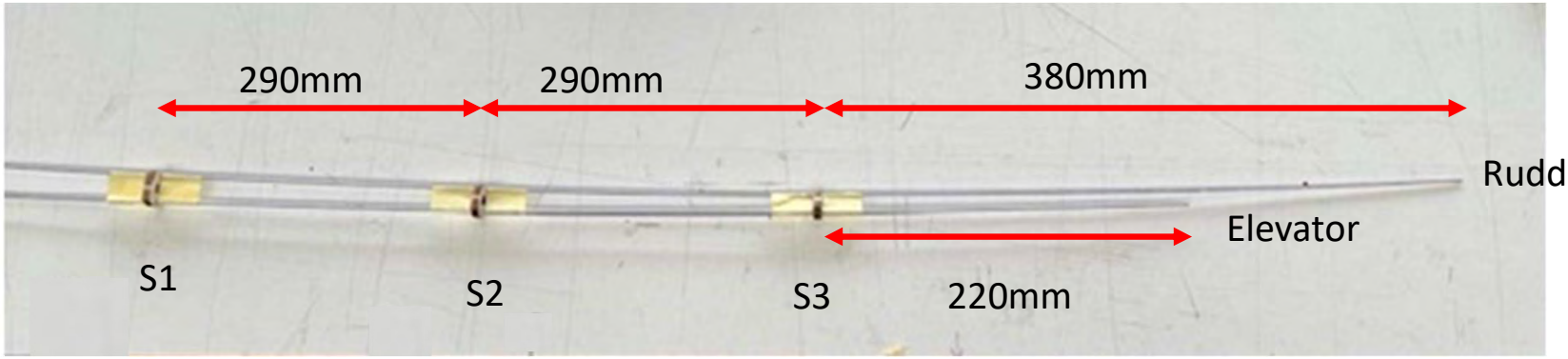
Drill with a 2.5mm drill bit and open with a file

Built Up Fuselage Pushrods

Make up the pushrods using the housing supports S1, S2 and S3

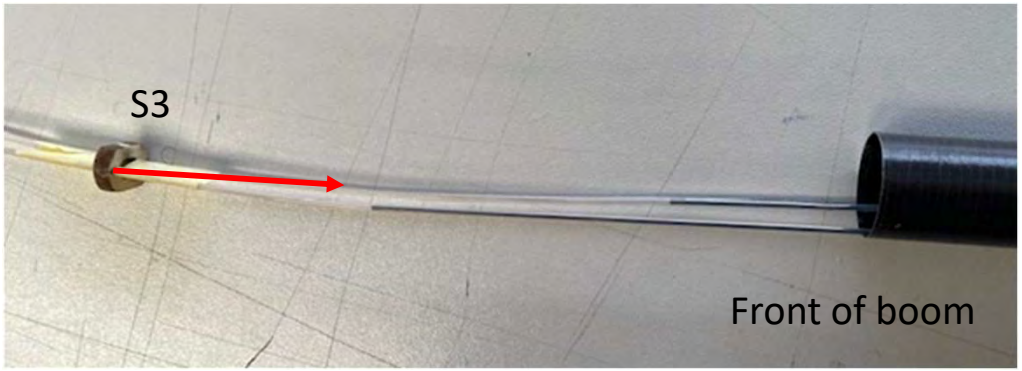


S1 S2 S3



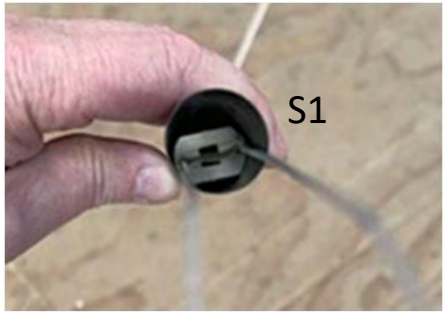
With the 1.5mm carbon rod inside the pushrod housing, make up the assembly as show.
Use tape to hold S1, S2 and S3 in place and then glue onto the pushrod housings.

Remove the 1.5mm carbon rods from their housings and slide the carbon rods into the fuselage from the rear, through the elevator and rudder slots in the boom.
Feed the pushrod housing assembly in from the front end of the boom, ensuring you are matching the correct rudder and elevator 1.5mm carbon pushrods .
Slide the assembly down the carbon rods.
Glue S1 in the boom, 50mm from the front of the boom.
There must be no slop in the pushrods.



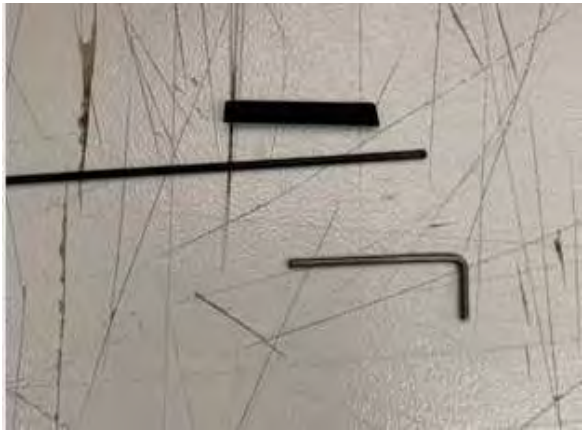
Step 1 - slide the 1.5mm carbon rods in **from the rear** end, through the elevator and rudder slots.

Step 2, slide the pushrod housings onto the 1.5mm carbon rods **from the front** end. Slide down the boom into place.



Glue S1 50mm from the front of the boom. S2 and S3 do not need to be glued.

Assemble the pushrod wire at one end of the pushrod. Do this for both pushrods.



Bend the 1mm wire into a L shape 20mm long x 6mm long.
Sleeve the carbon tube and wire with heatshrink tubing and heat until the grip on the wire is just enough to hold it in place.
Check the fitment on the control horn and add a drop of thin CA at each end of the tubing. Then shrink the tubing fully until tight.

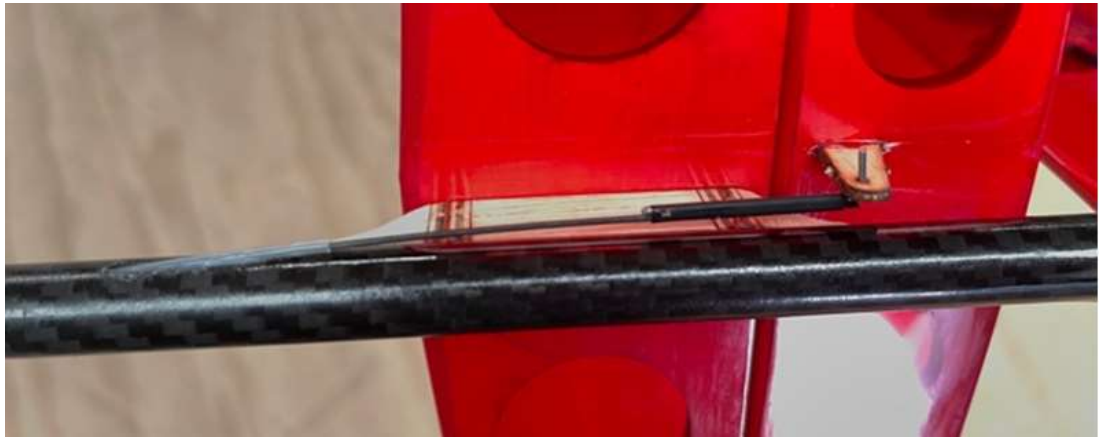
Apply the same principle to get the correct pushrod length at the servo end.

Assembled pushrod wire

Pushrod installation

Ensure gradual flexing of the carbon pushrods as they exit the boom to ensure free movement.

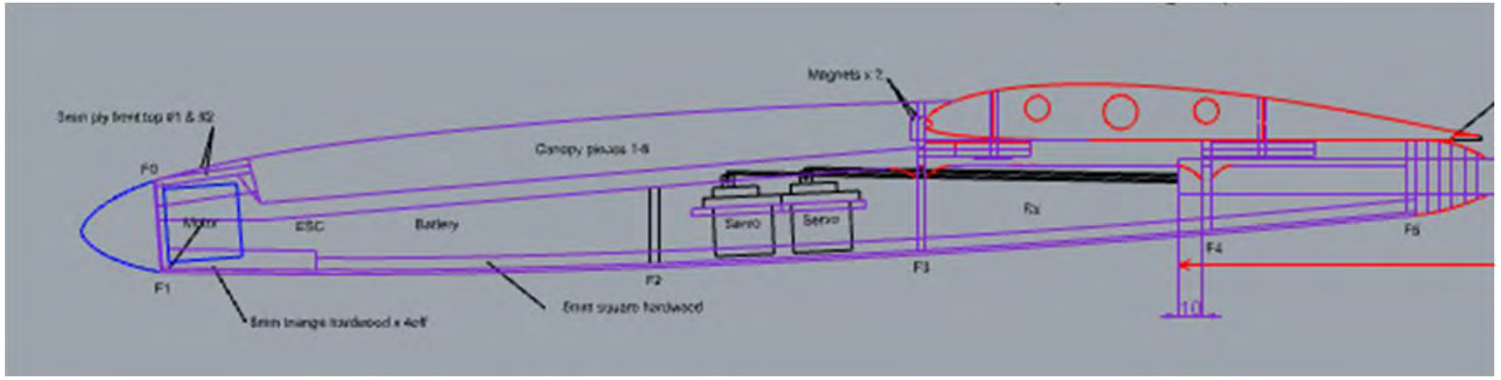
Extend the slots if required for free movement.
No keepers are required on the control horns if a slight flex is used to hold the pushrod in place. Use medium CA only, NOT thin CA to glue the pushrod housing to the boom.



Place a keeper over the control horns if the flex is not sufficient.

Finish The Fuselage

Once the tailplane and boom have been completed, lightly sand the boom and glue the boom to the pod ensuring everything is square to the wing. The boom extends 10mm forward of F4.
Install the servos and repeat the pushrod connection for the front end of the fuselage. Ensure the pushrod housings are glued to the sides of the fuselage, both at F3 and in the opening under the wing. Glue scrap pieces of balsa to the pushrods for extra support.
There must be no slop in the pushrods.

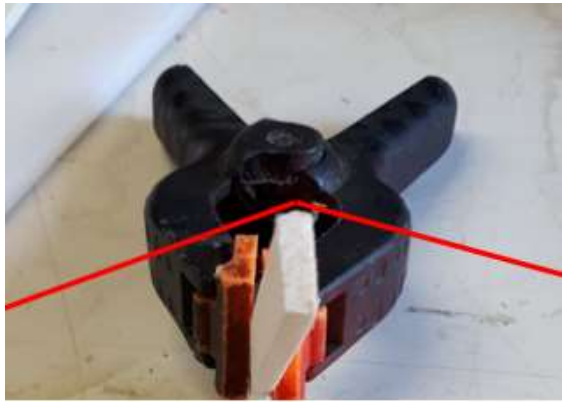


This shows a typical layout of the gear. Dry fit all components and adjust their position to get the correct C.G. if necessary.

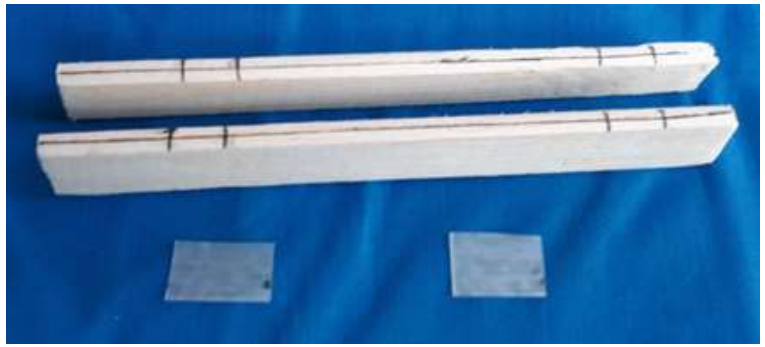
The starting C.G. is 90mm from the root at the leading edge.

Optional method for hinging the tails

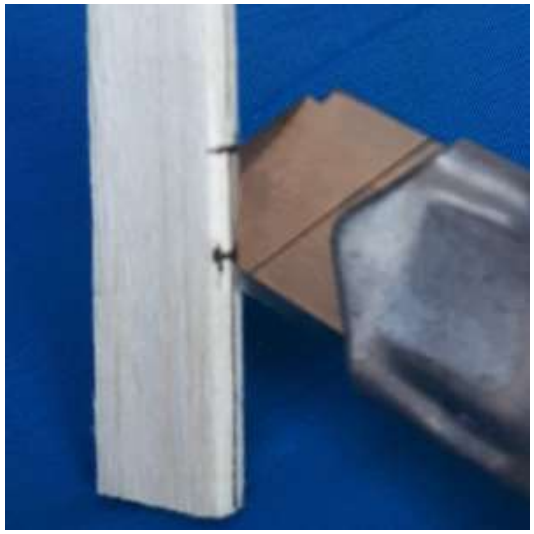
Use 4 hinges on each of the ruddervators.



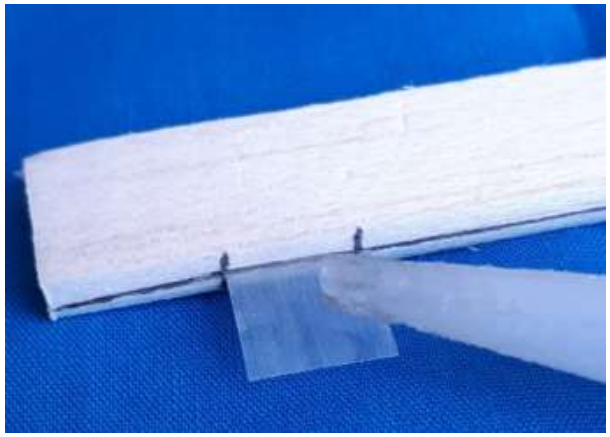
Bevel edges of balsa to allow for hinge movement



Mark the centreline and hinge positions.
Cut supplied mylar hinges 10mm wide x 15mm long.
Sand lightly with 400 grit.



Cut slots 5mm deep (half the width of the mylar) with an 18mm snap off blade style knife



Glue the mylar into one side of the job using 1 drop of thin CA on the top and 1 drop of CA on the bottom.

Once dry, trial fit the other side of the surface.

Flex the hinge to allow for movement. This will create a 1-1.5mm gap.

Glue the hinge in the other side of surface with 1 drop of CA. Remove excess CA with the edge of paper towel.

Turn job over and complete the same process for the other side.

Now you have a nice strong, flexible hinge

Starting Setup

Elevator throw is +/- 12mm.
Aileron throw is 10mm up and 7mm down.
Aileron to rudder mix of +/- 5mm.
Rudder throw is +/- 30mm.
Brakes at 90 degrees with some up elevator mix of approx. 6mm. Tune in flight.
Tune all these settings to your own personal liking.

I like to run 30% exponential on rudder, elevator and ailerons to give a slightly smoother response in the middle of the stick.
Check all your control movements are in the correct direction before flying.

Balance the model at 90mm from the L.E. of the wing at the root. This is a good all-round C.G. for float and penetration.
For very windy conditions I like to move the C.G. forward 5mm, but please experiment and find your own ideal settings.
Some minor amount of elevator retrimming is required as the C.G. moves forward.
The further forward the c.g. the better the natural penetration of the glider, but the worse the float performance.

Ballast can be added in the centre spar for windier conditions. Remove a tip panel, add/remove ballast and re assemble.
Use a combination of 10mm diam. Galvanized Steel and Aluminum rods. Locate the steel rods over the middle of the wing.
The Aluminum rods are just spacers so other materials like balsa can be used.

I hope you enjoy flying your Avanti. For any feedback or questions please email Marcus at performance@mailzone.com