

OZeRES Building Instructions

You must ensure you have MAAA (or similar) 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 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.

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 Glad Wrap (or similar) over the plan before you start

Use a knife to separate parts from the sheet, do not twist. Trim parts as necessary.

Abbreviations

CA = Super glue

RHS = Right Hand Side

LHS = Left Hand Side

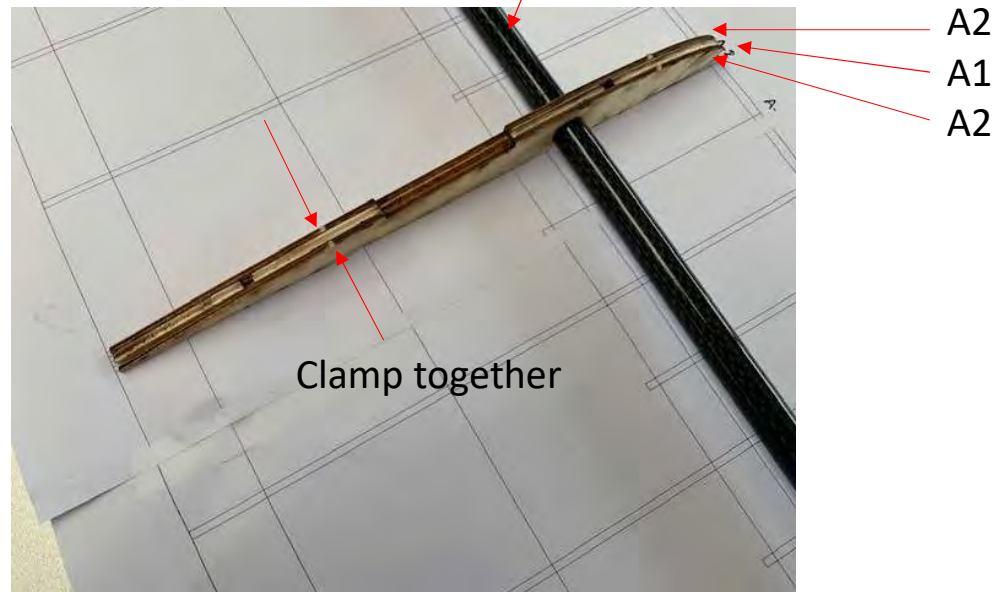
L.E. = Leading edge

T.E. = Trailing edge

Start with Wing Centre Panel A

Slide the central ribs A2, A1 A2 on to the 12mm diam. x 700mm Carbon spar and align over the plan. Separate the ribs, apply medium CA and slide together. This must be a secure bond so clamp with pegs or similar. Glue the rib assembly onto the spar.

Ensure you have the 12mm diam. X 700mm long spar





Sand a bevel into the trailing edge.
Use the witness line as a guide. Do not sand past the line.
The T.E thickness only needs to be 0.5 - 1mm thick.

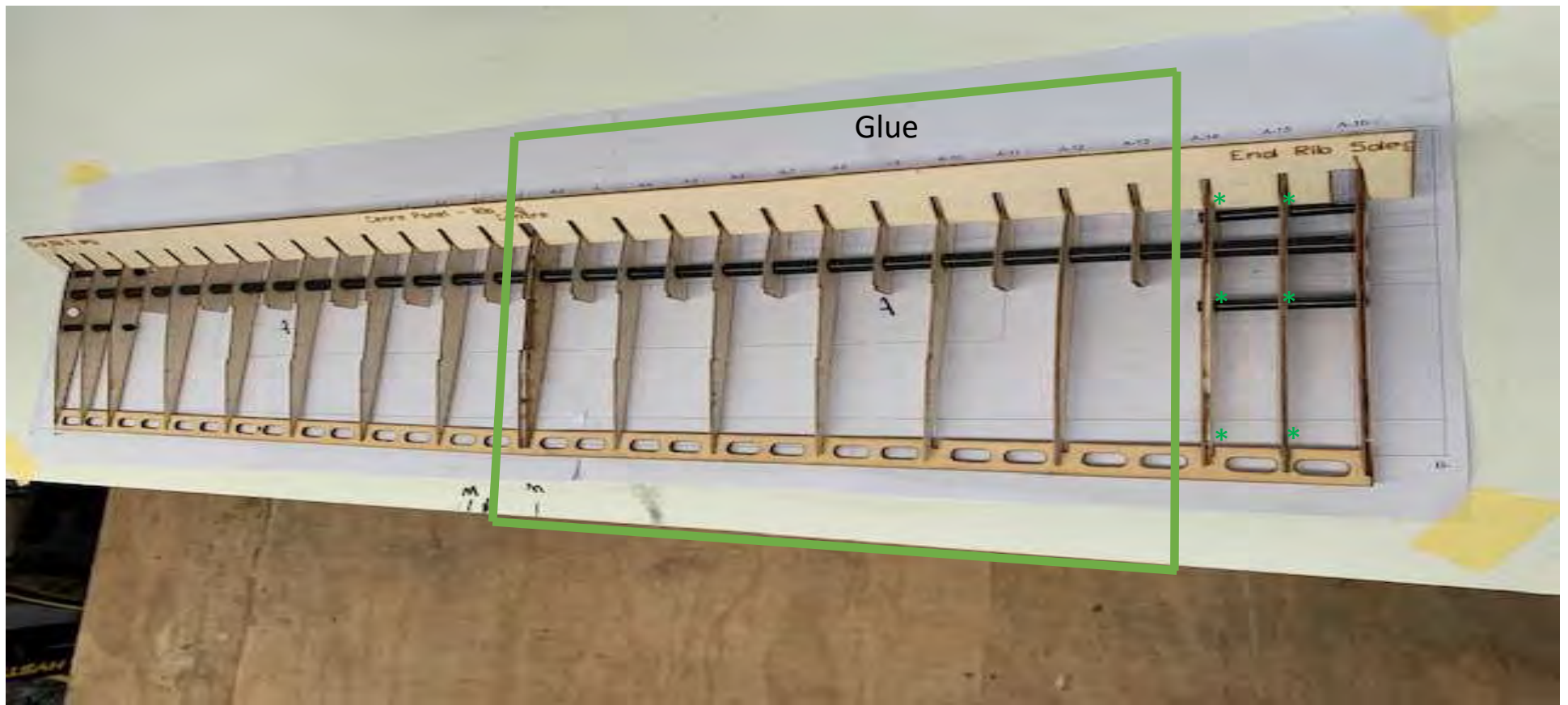
Slide the 6mm joiner onto the 7mm joiner tube to act as a guide/support to hold the plug square at the end. Insert the plug so it is recessed by about 1mm.

Remove the 6mm joiner tube and glue the plug in place with medium CA.

7mm diam. x 58mm joiner tubes x 4 off

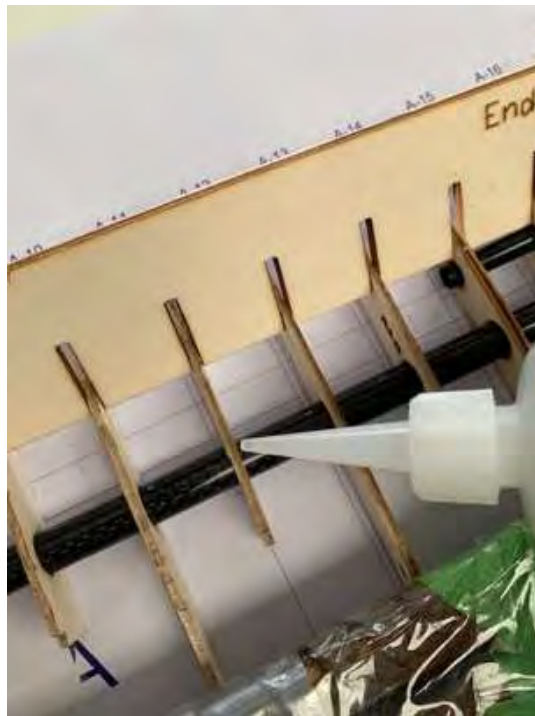


Slide the remaining ribs onto the spar and align over the plan. Add the LE, TE and joiner tubes. There is slight dihedral in the centre, so hold the RHS flat on the board with weights or pins. Use the rib template to align ribs. Apply thin CA to attach Ribs A1-A13, LE and TE. Tack glue the 6 locations shown with * and do not glue A16. Always hold parts flat on the board when gluing and ensure the glue is dry before removing.



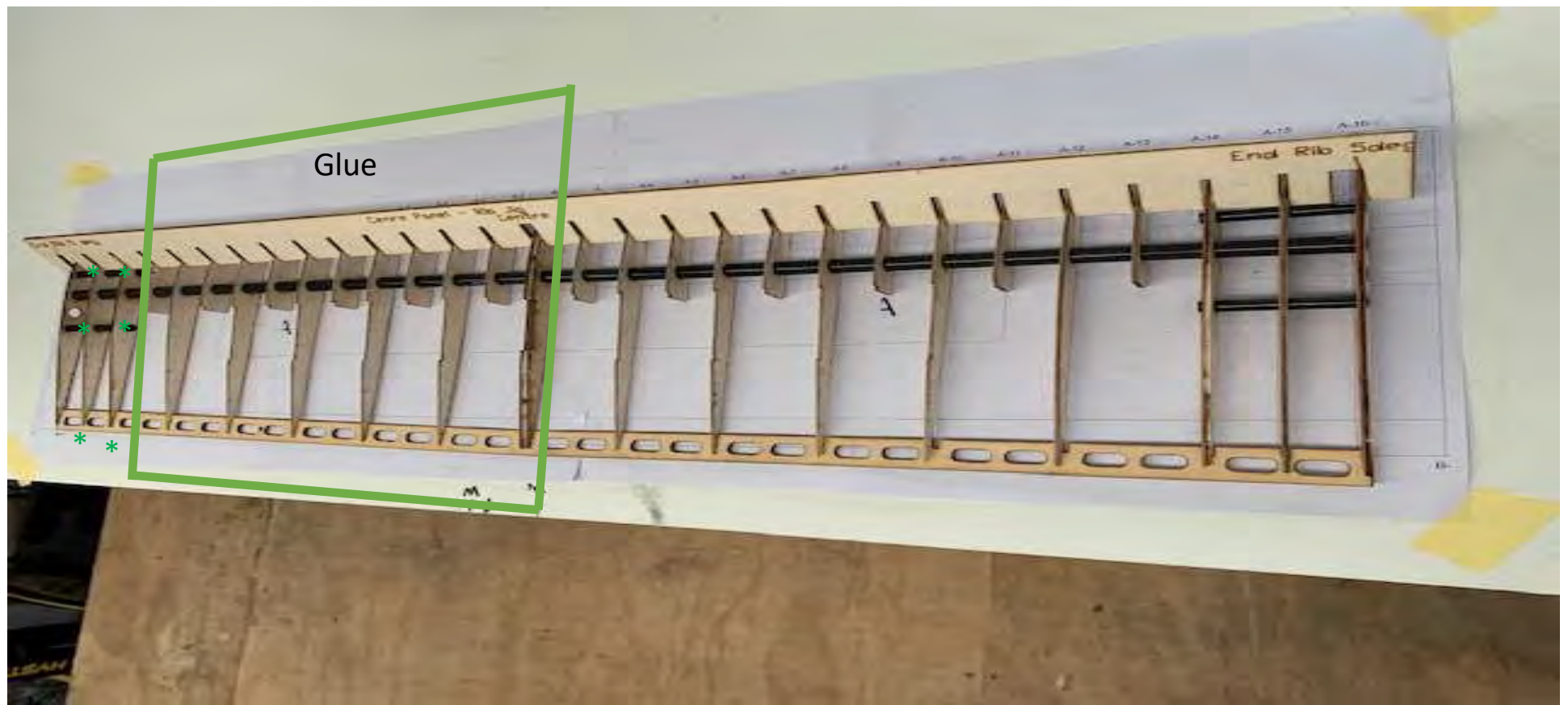


Plywood can be difficult to glue, so use thin CA and then medium CA for additional strength.



Glue the Spar. Use thin CA to wick into the balsa and then apply medium CA to form a filet.

Now hold the LHS flat on the board and repeat the process used for the RHS assembly.



Build Tip Panel B

Slide the ribs in place and align over the plan. Dry fit the joiner tubes at both ends. Hold with weights.

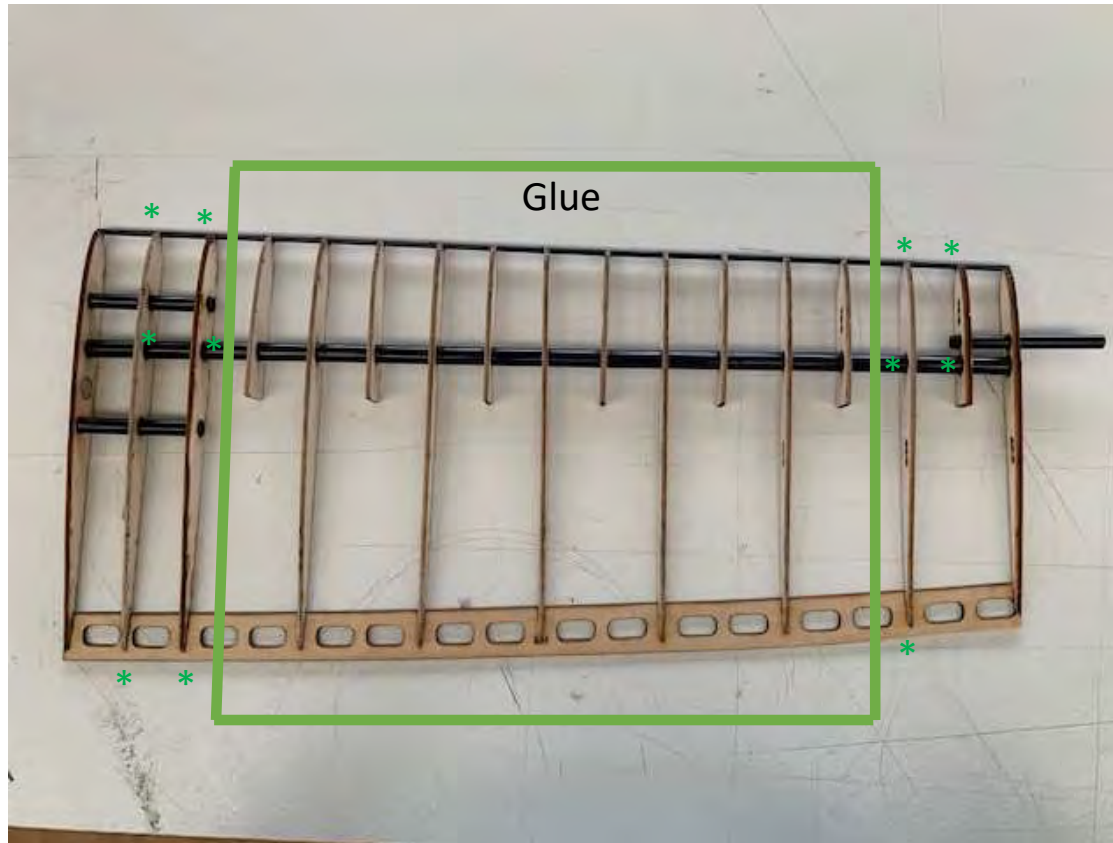
Use the rib alignment template (as used for the centre panel). Glue ribs B4-B15 in place on the spar, L.E. and T.E.

Glue the 11 locations shown with * but do NOT glue the ribs B1 and B17, just dry fit.

L.E. Diam. 3mm

Spar Diam. 8mm

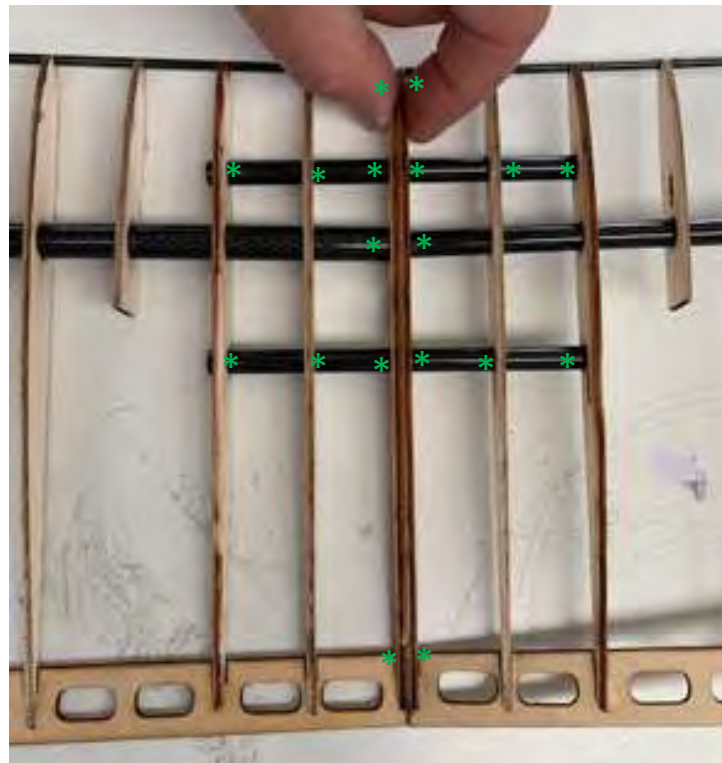
Joiner tubes
2 x 7mm x 58mm



Joiner tube
6mm x 64mm

Repeat for the LH Panel B

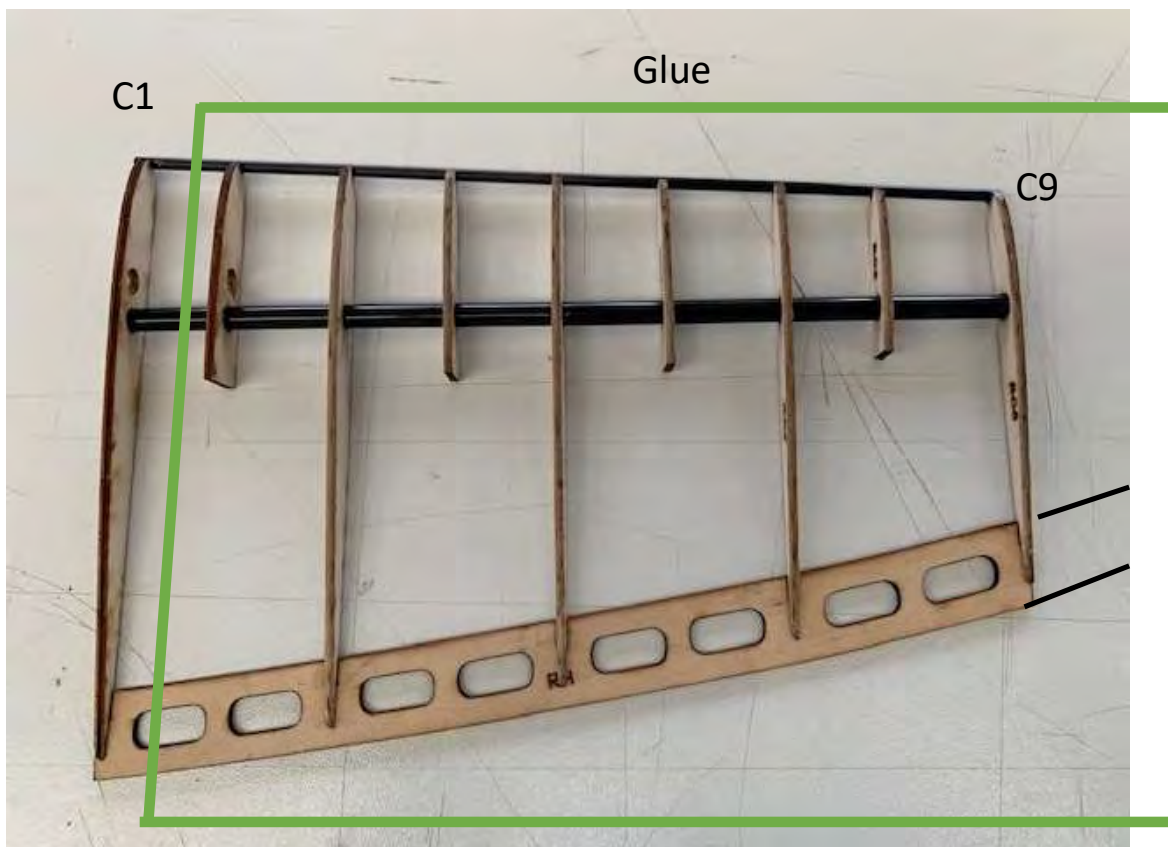
1. Slide Centre Panel A and the Tip Panel B together using the 2 x 6mm diam. x 104mm joiners.
2. The entire assembly should self align as shown.
3. Use the dihedral spacers to hold the dihedral correctly.
4. Slide the panels apart again and check the tubes are fully engaged in the ribs. Adjust if necessary.
5. Slide the panels back together again. Repeat until happy.
6. Squeeze the 2 end ribs A16 and B1 together as shown until they are flush with each other. A small gap in the L.E or T.E. is OK.
7. Use MEDIUM CA, **not thin CA**, to tack the system in place, only glue in the locations shown *. This avoids glue getting into the joiners.



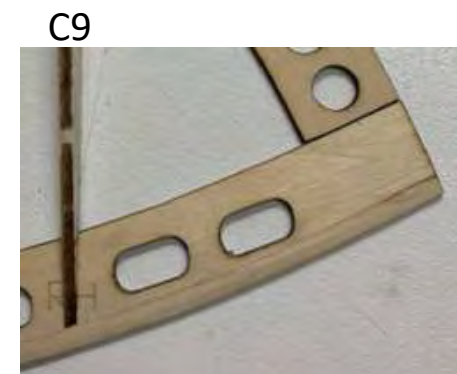
7. Allow to dry
8. Separate the panels and remove the joiners. Add more medium CA if required to the tubes and ribs for a good bond.

Build Tip Panel C

Slide the ribs in place and align over the plan. Use the rib alignment template (as shown on the centre panel) and hold with weights or pins. Glue ribs C2-C9 in place on the spar, L.E and T.E.
Do NOT glue the spar to C1, just dry fit.

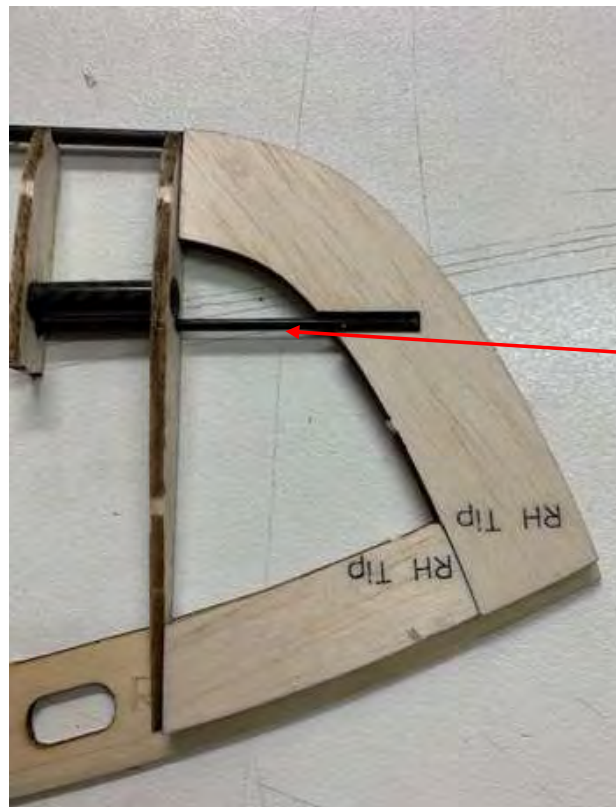


Update - on later kits the T.E. extends past C9 as shown below.



Tip construction

First add the ply tip and glue in place. It sits flush on the building board.

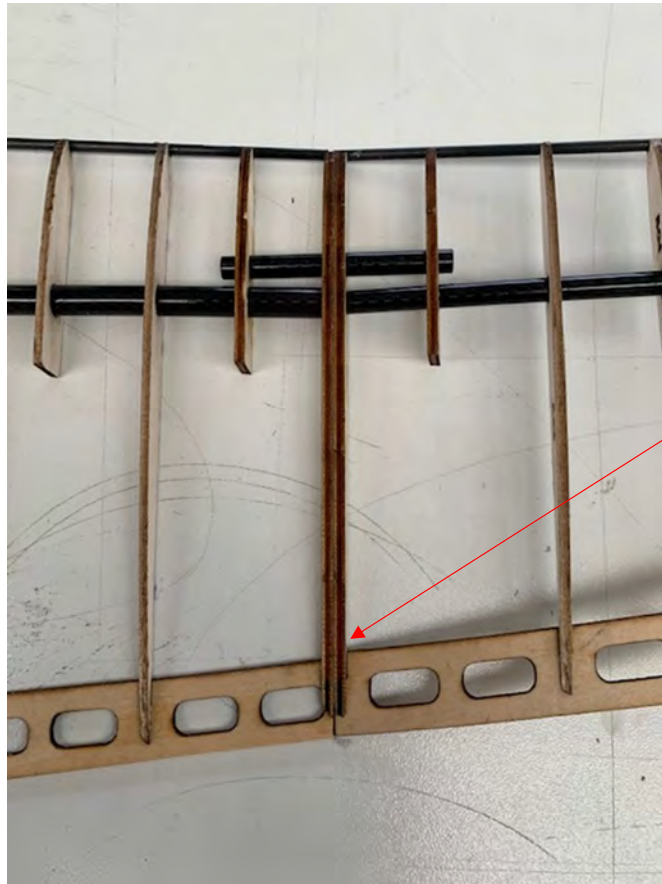


Add the supplied carbon rod

Add the 3mm balsa pieces as shown.

Sand the tip to shape.

1. Slide Tip Panel B and Tip Panel C together using the 6mm diam. X 104mm carbon tube.
2. The entire assembly should self align as shown. Use the dihedral template at the very tip of the wing to ensure the dihedral is correct.
3. Squeeze the 2 end ribs B17 and C1 together until they are flush with each other.
4. Slide the panels apart again and check the tubes are fully engaged in the ribs. Adjust if necessary.
5. Apply medium CA between B17 and C1 and slide the panels back together again. Hold until dry.
6. Glue all locations



Glue all the triangle support pieces in place as shown on the plan. These add significant stiffness and strength to the wing.

Repeat for the left hand wing panels.



Glue in S RH and S LH in the wing. These will need to be trimmed to size for a good fit. These stop the wing rocking on the fuselage.



Shave the height of S RH and S LH to be flush with the bottom of the wing.

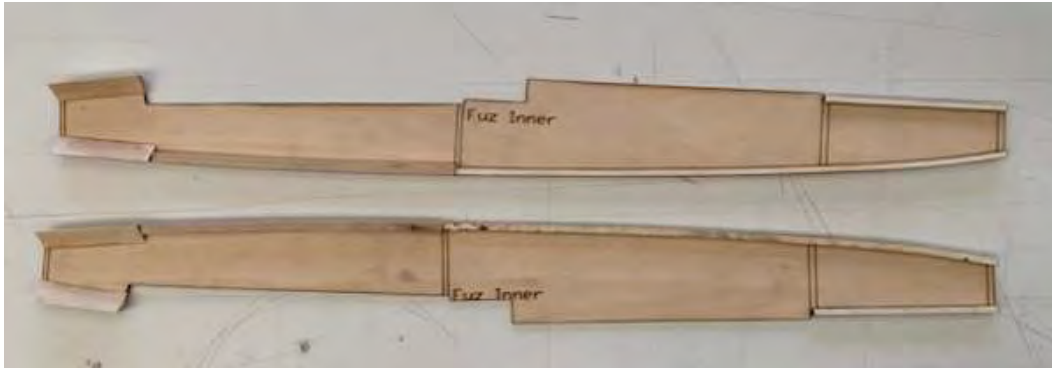


Turn the wing over and drill the hold down bolts at the front and rear

Add magnets to the end of the centre panel and tip panels ensuring the magnets are in the correct orientation for attraction.



Fuselage Assembly



Glue the 8mm triangle stock, 5mm square stock and the 3mm laser cut pieces to the fuz sides as shown on the plan.



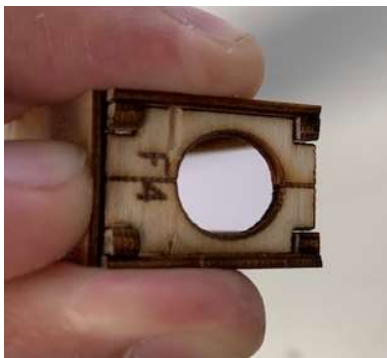
Glue the magnet into F2.



Glue F2 and F3 in place.



Align the fuselage sides over the Fuz Floor and glue in place between F2 and F3.



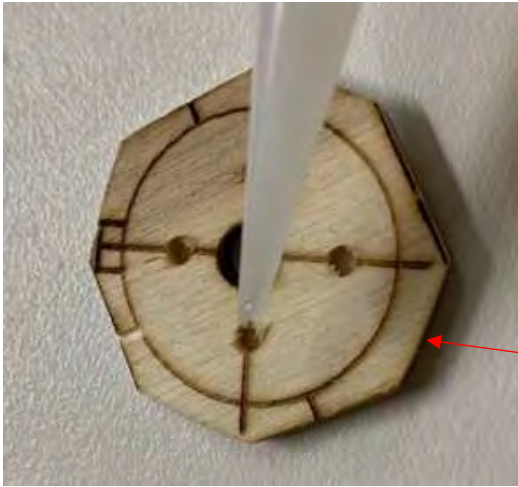
Glue F4 to the Fuz Sides while holding the Fuz floor in place. The Fuz Floor aligns the fuselage.
Use a clamp or rubber band to hold while drying



Once dry, glue the Fuz Floor in place

Hold in place with tape





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

Drill the same holes in the 0.6mm ply end plate F0.

Upgrade – some kits now have a birch ply F1 which is stronger and a F0 is not necessary.

Sand the beveled edges to fit the triangular stock snugly.



Trial fit and glue in F1 using Epoxy

Glue and secure the Fuz Floor in place at the same time. This ensures the correct alignment of the fuselage





Sand the front of the fuselage for a good fit of the top front fuselage pieces



Glue on the 2 x top front fuselage pieces

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





Glue the Front and Rear Hold Down Plates together (double thickness)

Hammer in place the T nuts and then glue with thin CA



Glue the Front Fuselage supports together and then glue in place





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.

Add the magnets to
the rear of the canopy.

Ensure the **CORRECT**
orientation of the
magnet to attract to
the magnet in F2



Hold Down Bolt Alignment



Dry fit the Hold Down Plates. Trim as necessary

Place the wing bolts in the wing and add a sheet of Glad Wrap over the bottom of the wing, punching holes in the Glad Wrap for the bolts. This protects the wing from glue





Screw on the Hold Down Plates as shown

Place the wing on the fuselage

Note the size of the Hold Down Plates may need to be trimmed to fit the fuselage

The LE should be pushed up against F2

Align L.E. here
against F2

Trim as required Gaps are OK



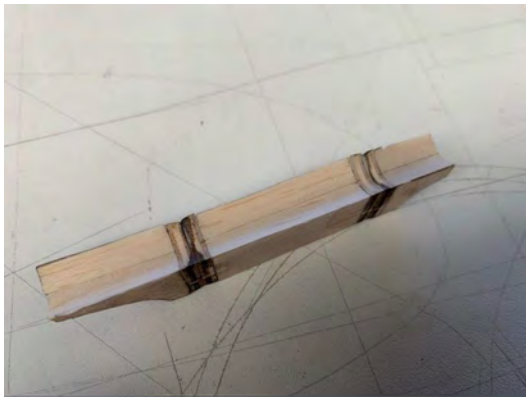


Pull the wing from the fuselage, apply epoxy and re assemble

Ensure the wing is sitting down flat on the fuselage and square to the fuselage.

Allow to dry.

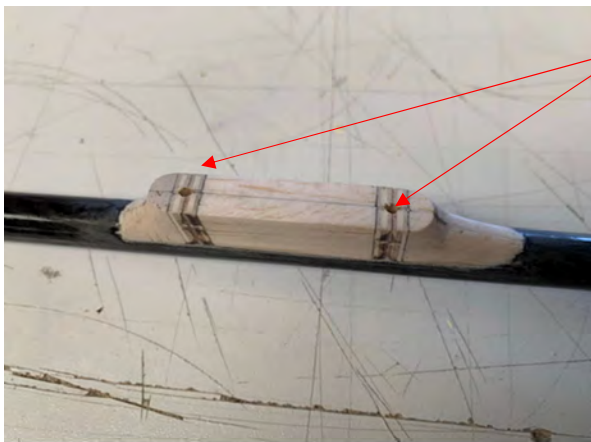
Once dry, unscrew the wing and trim away any excess epoxy.



Assemble the elevator mount as shown and sand a concave radius using sand paper wrapped around the boom.



The elevator mount MUST be parallel to the boom for good flying performance. This cannot be underestimated. Check with a long straight edge and adjust elevator mount as necessary.
Glue with medium CA or Epoxy.



Once the elevator mount is attached, check the fitment of the elevator and drill the 2 x screw holes using a 2 mm drill bit. Ensure the holes are located in the ply reinforcements.

Screw the supplied screws into the holes to form a thread., being careful not to split the plywood.

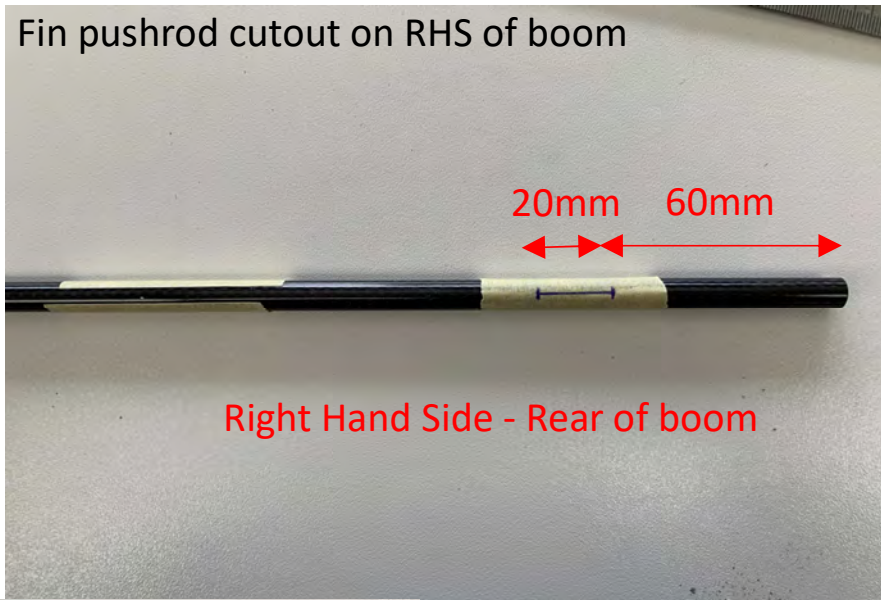
Apply thin CA to the holes to harden the thread.

Boom Preparation

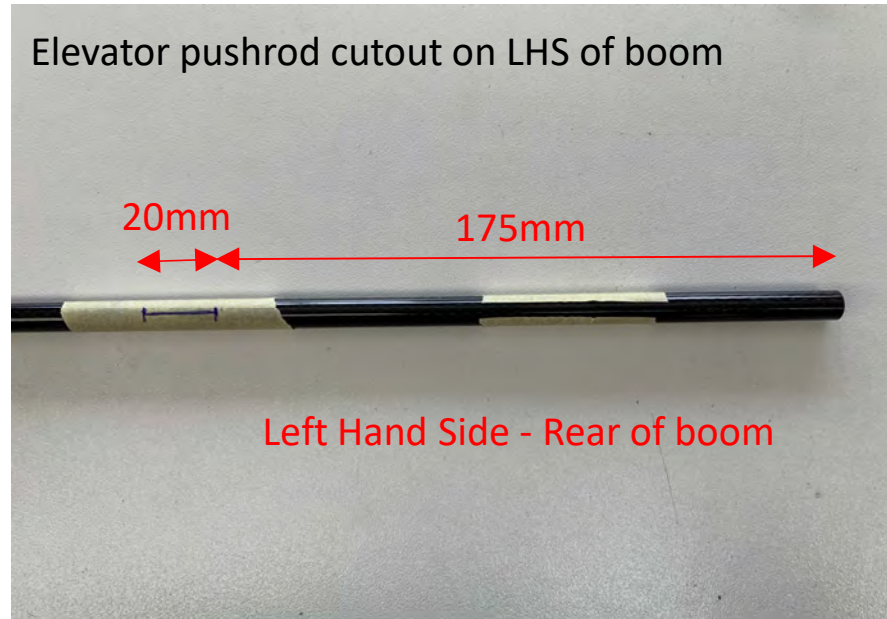
Ensure you have the 12mm diam. X **648mm** long carbon tube.

Add tape to the rear end of the boom and make cutouts so they are on **opposite sides**.

Fin pushrod cutout on RHS of boom



Elevator pushrod cutout on LHS of boom



Drill with 1mm holes



File or cut slot



Round file on ends



Finished slot



Tail Construction



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



Add the 0.6mm ply reinforcement.
Countersink the holes slightly and very carefully by hand.



Sand the fin to shape



Drill a 3mm hole for the 3mm carbon tube fin support 10mm from the end of the tail boom.

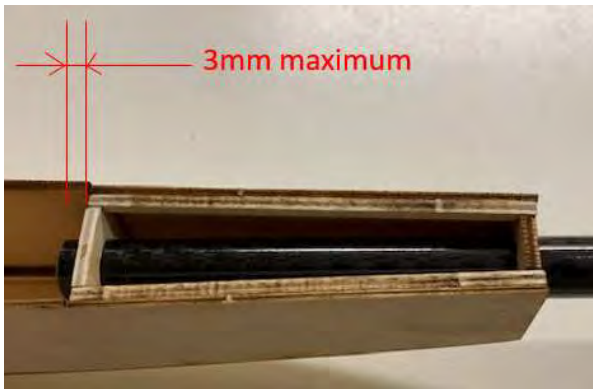
Ensure it is square to the elevator mount. File the hole slightly if needed.

Glue the fin in place using the 3mm x 104mm carbon tube. Aligning it square to the elevator.





Assemble the boom into the fuselage.
Ensure the fin and elevator are square to the wing.



Glue the boom in place with both thin CA and then medium CA.



Apply the top fuselage ply and the tail cone pieces and sand to shape.

Spoiler Servo Installation

Thin spoiler servos can be mounted on the supplied spoiler plate. However, if a MKS113MG or similar 12mm thick servo is used then the spoiler plate is discarded and balsa supports are made using scrap balsa as shown. Remove the mounting tabs from the servo and wrap the servo in 2 layers of masking tape and CA in place. Ensure the servo arm is in the correct position for closed and open positions.

A1



Balsa supports

Open position

Closed position



Spoiler installation

Tie 2 x supplied rubber bands into approx. 2/3 and 1/3 loops. Cut and discard the 1/3 portion.

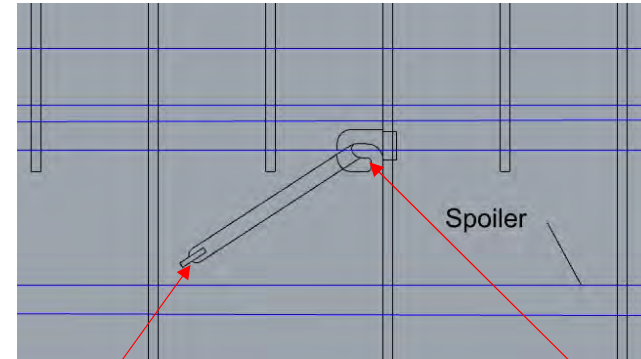


Discard

This shows the rubber band position with the spoiler open. Only light tension is required when closed.

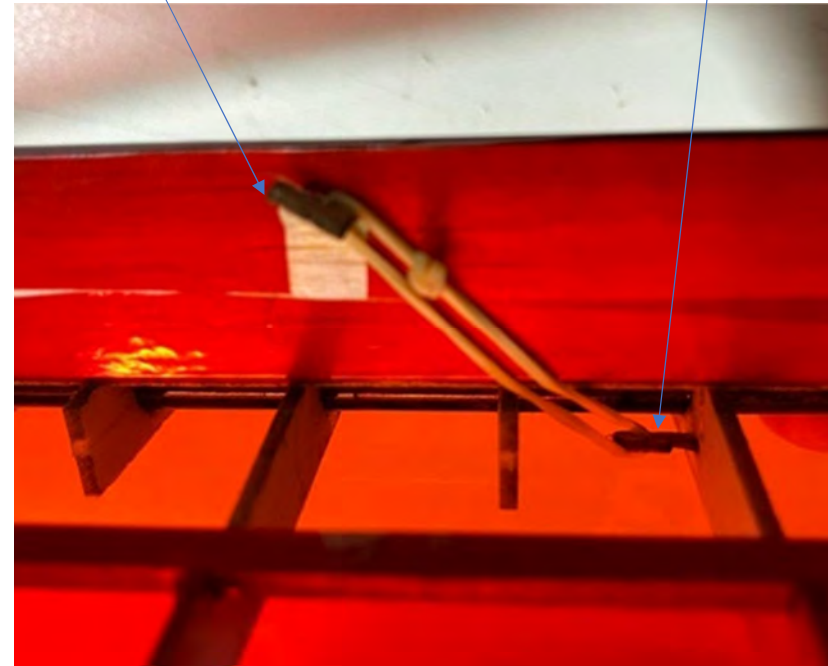
Repeat for RHS Spoiler

Plan view, spoiler closed. LHS shown.



Spoiler Hook 1

Spoiler Hook 2



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.



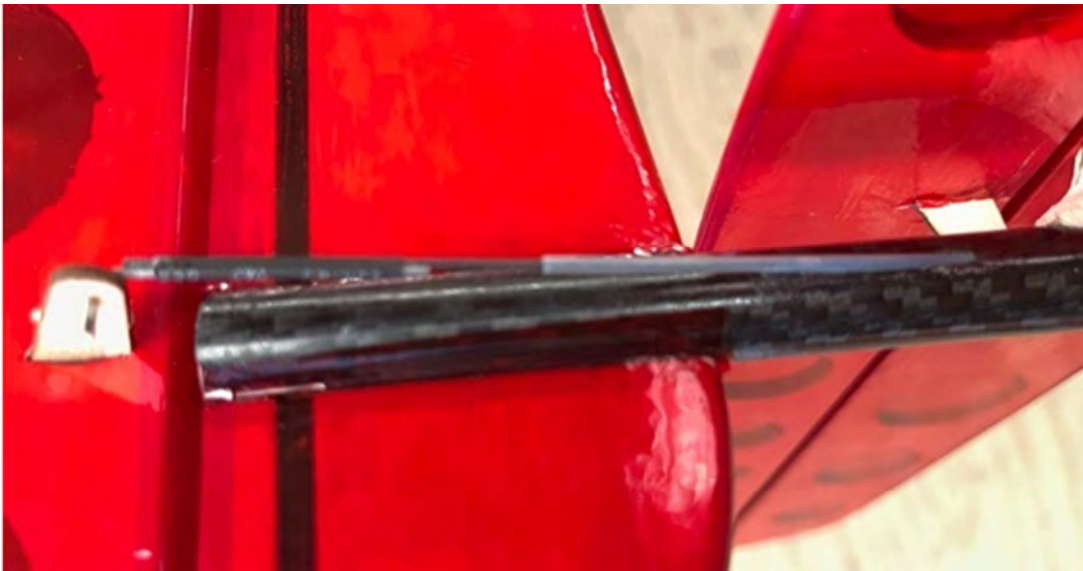
Assembled pushrod wire

Pushrod installation

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

The boom is very strong, so 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.



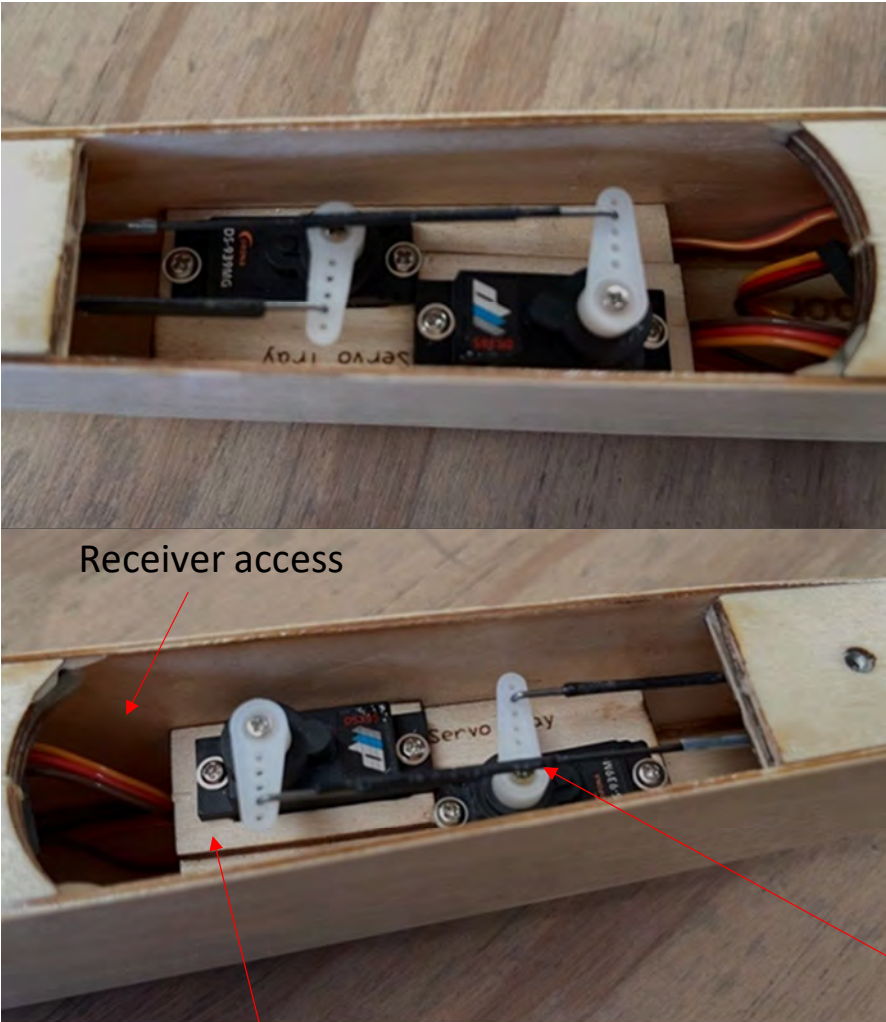
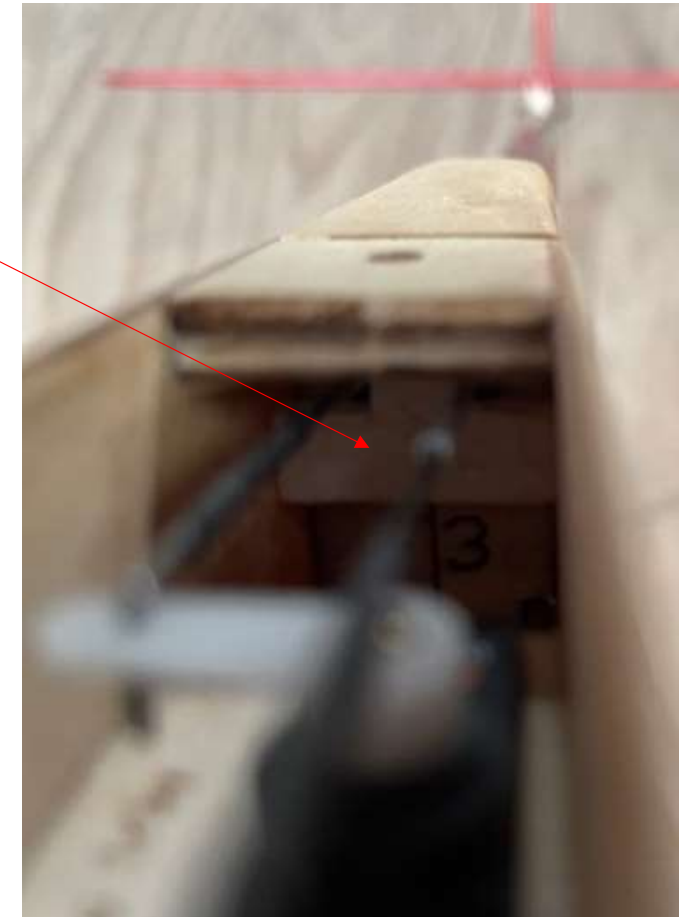
Servo Installation

Install servos as shown using the supplied servo trays.

Install a support made from scrap balsa to attach the pushrod housing prevent the pushrods flexing.

Both pushrod housings must be secured at both ends to prevent flexing.

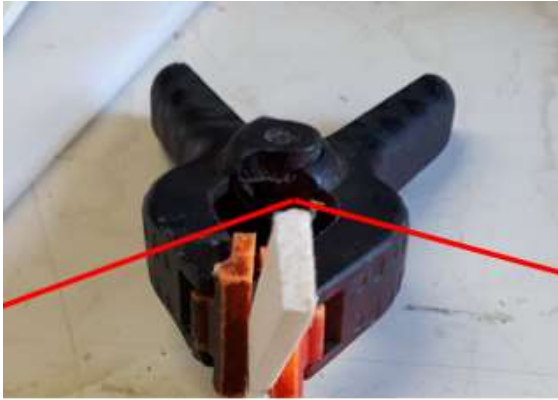
Clearance.



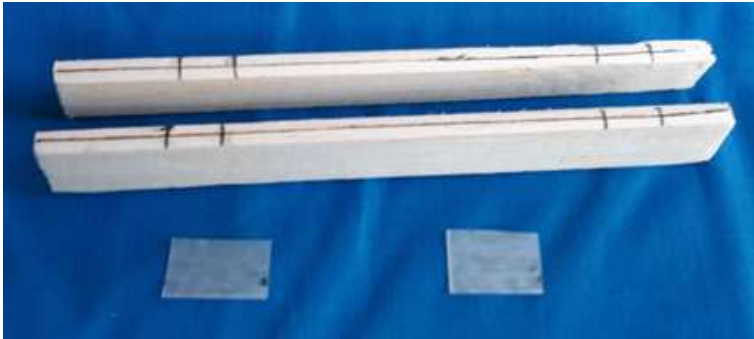
Receiver access

Additional supplied servo tray for extra height of the front servo.

Hinging of the Rudder and Elevator.



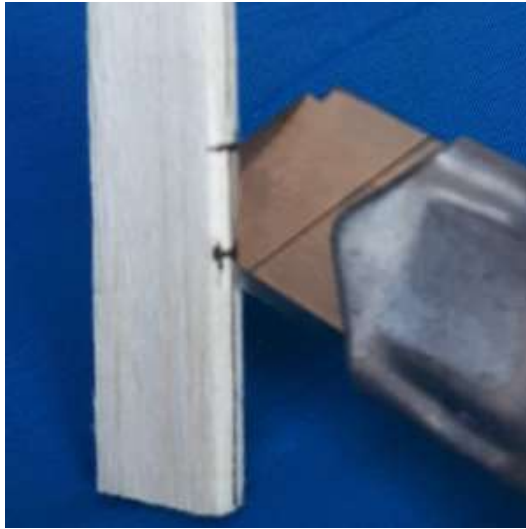
Bevel edges of balsa to allow for hinge movement



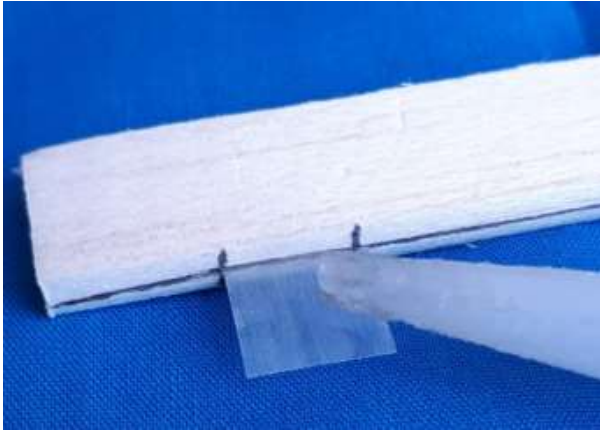
Mark centre line and hinge positions

Cut mylar hinges 10mm wide x 15mm long.
Sand lightly with 400 grit.

Use a minimum of 4 hinges on the elevator and 3 hinges on the rudder.



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

Covering

If you are using a transparent or clear covering film then you can wipe about 50% of the burn mark from the ribs using a microfibre cloth. You can also give the entire wing a light sand with a 300 or 400 grit long sanding block to remove the remaining burn marks.

When covering, wrap the film from the T.E. around the Leading edge and back to the T.E.

Do not apply the iron to the carbon leading edge or the film may not shrink properly around the L.E. edge afterwards.

Tack seal all edges on medium heat first.

Then seal all the edges with high heat.

Then carefully shrink with the base of an iron or a heat gun set on low. Move carefully and apply minimum heat.

Starting Setup

Balance the model at 75mm from the L.E. of the wing.

Rudder throw +/- 25mm

Elevator +/- 10mm

Check all throws are in the correct direction before flying.

Adjust C.G. and throws for personal preference, I have had good success with the C.G. between 72mm and 78mm.

For light conditions I like the c.g. at 78mm.

For windy conditions I like the c.g. at 72mm.

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 rods cut to 100mm lengths and 10mm diam. Aluminum tubes cut to 100mm lengths. Locate the steel in the middle of the wing.

For 60g ballast use 3xAl, 1xSteel and 3xAl for a total of 7 rods.

For 120g ballast use 2xAl, 1xSteel, 1xAl, 1xSteel and 2xAl for a total of 7 rods.

For 180g ballast 2xAl, 3xSteel and 2xAl for a total of 7 rods.

This moves the c.g. forward to 72mm and some minor elevator trimming is required for this c.g. and ballast combination, but the result gives excellent penetration and performance in the wind.

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