Instruction Manual for the Marston Shark

Thank you for purchasing this Shark kit. This is not a beginner's kit, but it does not require expert building skills. The kit is fairly complete, and if you have built and covered a wood model before you should have no trouble here. Take your time, be careful and have fun with the build. You will need thin and medium CA and Epoxy to assemble the airframe.

This airframe requires some experience to fly, but if you have successfully flown a plane with ailerons, you should have no trouble at all launching, flying and landing this Shark. The wing loading is very reasonable, and if set up properly there should be no surprises.

This instruction manual is available as a PDF on line at http://www.pteroworks.com/shark.htm. The photos in this manual can be enlarged for greater clarity in the PDF.

Wingspan 29"
Length 33"
wing area 190 square inches (1.32 ft^2)
weight RTF 19 - 21 oz. (with a 3s 2000 mah li-poly battery)
wing loading 15 oz/square foot

Included in this kit: 10 sheets of laser cut wood (all wood required), 42" x 36" rolled plans, 0.210" carbon wing spars, 0.110 carbon wing trailing edges, carbon wing joiner tube, instructions.

Additional gear required: 25 mm - 29 mm diameter 200 Watt brushless motor with a kVa of around 2,200 rpm/v, 40 mm diameter spinner, 6 x 5.5 prop, a 30A ESCs, three mini servos (HS-45HB or equal) and a 2000 mah 3s Li-poly.

Requires one or two rolls of covering material (Ultracote or Oracover recommended).

Body

1. Assemble and glue ply doublers to the 3 balsa body joiners B, C, D.

2. Assemble and glue rear top and bottom body pieces with joiner (D). Ply doubler of joiner should face rearward. (note - tabs on joiners will stick out past body's surface and should be sanded flush during final sanding)

3. Glue bottom tray hatch piece in place (to bottom rear body piece)

4. Position and glue upper vertical fin into slot of upper rear body piece. Note position on plans before gluing.

5. Position and glue lower vertical fin into slot of lower rear body piece. Note position before gluing.

6. Join upper and lower vertical fins where they meet. Be sure there is a proper slot for the horizontal stabilizer.

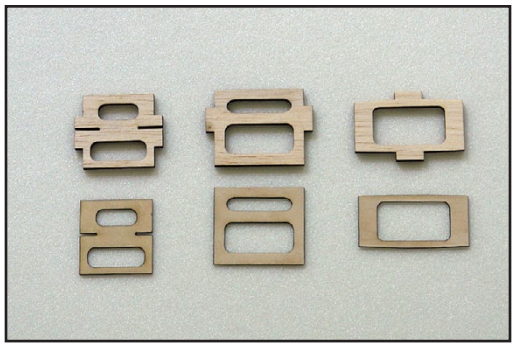
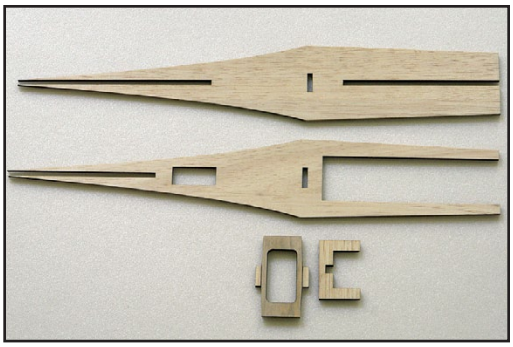
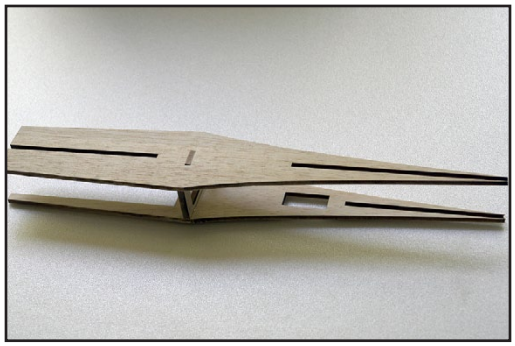
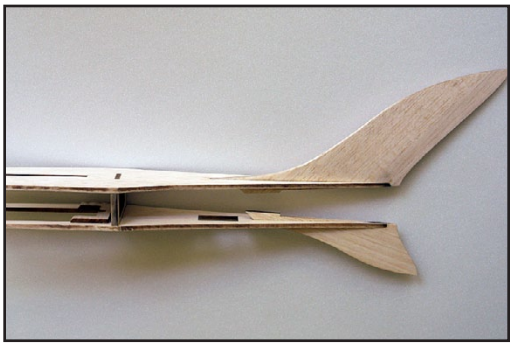
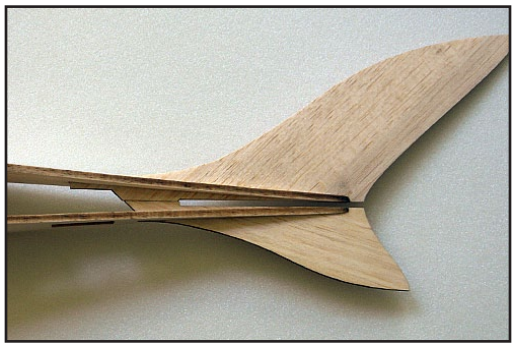
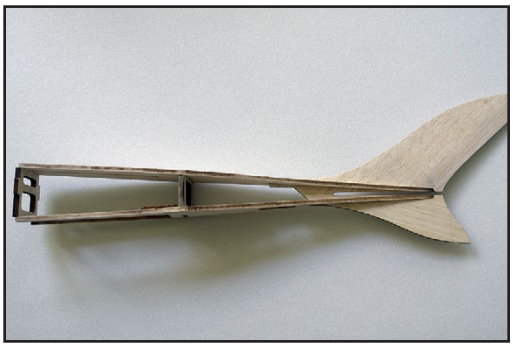
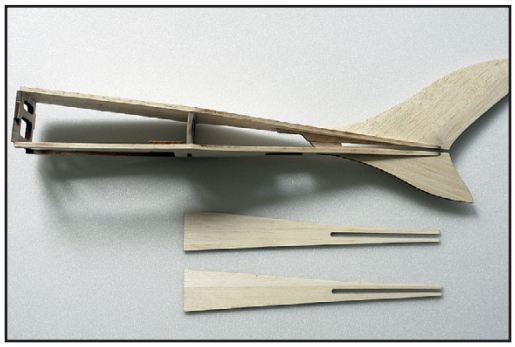
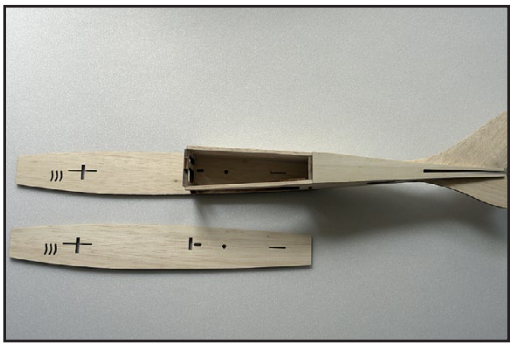
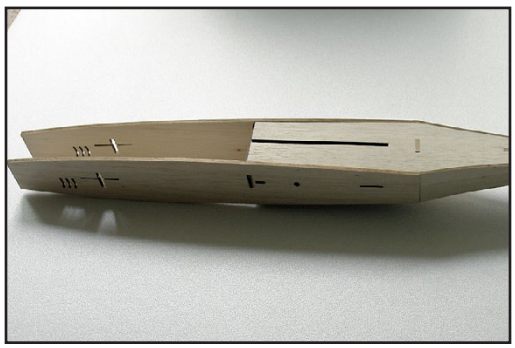
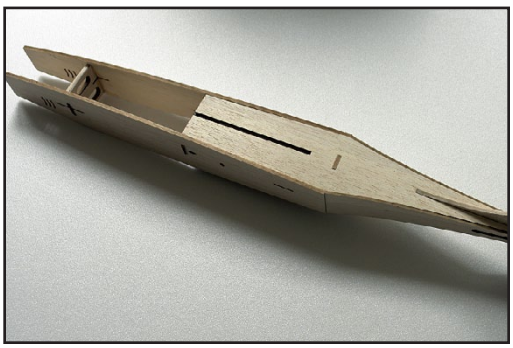
7. Position and glue middle body joiner (C) to body assembly. Ply doubler should face rearward.

8. Glue rear body side (L & R) sheeting in place to rear body assembly.

9. Glue forward body sides (L & R) to rear body assembly.

10. Position and glue forward body joiner (B) to body assembly. Ply doubler should face rearward.

11. Position and glue front nose ply piece A1 (the one with 4 slots in it) to body sides. Ensure proper orientation of slots and that nose piece is square and

there is good contact with body. Use thick CA or epoxy for a strong joint.

12. Position and glue upper and lower nose ply doublers. Mouth shaped cutout is on the lower doubler. Sand as required to ensure a good fit.

13. Position and glue top and bottom forward body pieces to body assembly. Sand as required to ensure a good fit.

14. Glue nose motor mount ply pieces A2, A3, A4 in place. A total of four pieces of 1/16” ply should be at the nose. Two sets are supplied - one with standard 16 mm and 19 mm hole spacing and one blank to accommodate other motor hole patterns.

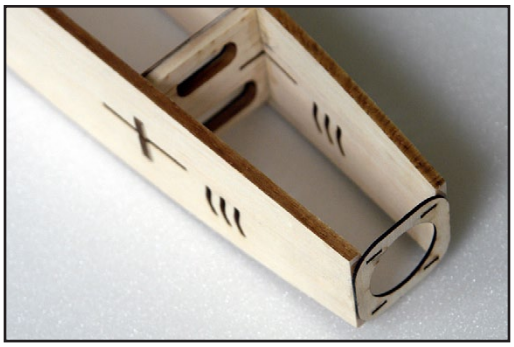
15. Sand body assembly square, then sand 45 degree bevels into all corners then sand bevels round.

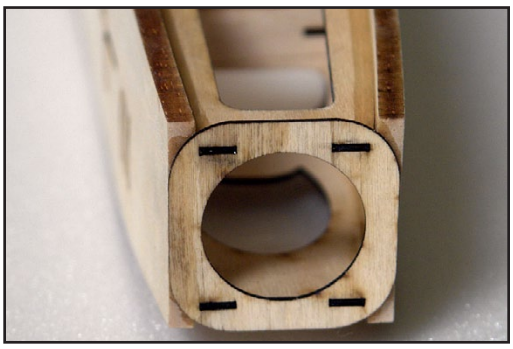
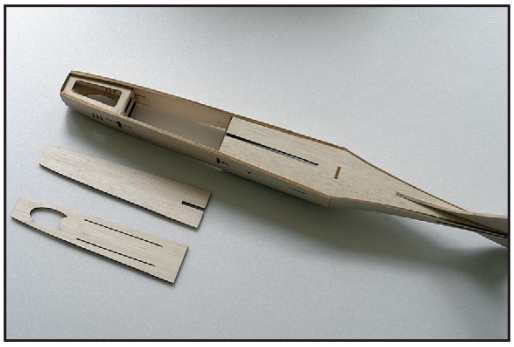
16. Sand and fit upper dorsal fin. Do not glue in place until after fin is covered to simplify covering process.

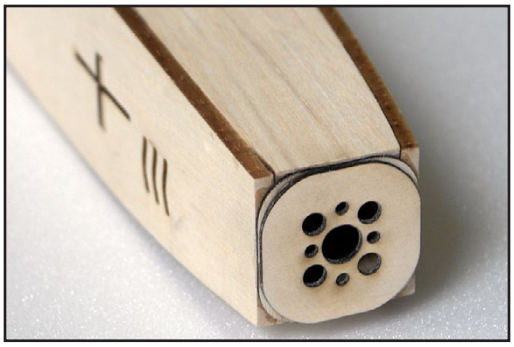
17. Sand and fit lower fin skids. Do not glue in place until after skids are covered to simplify covering process.

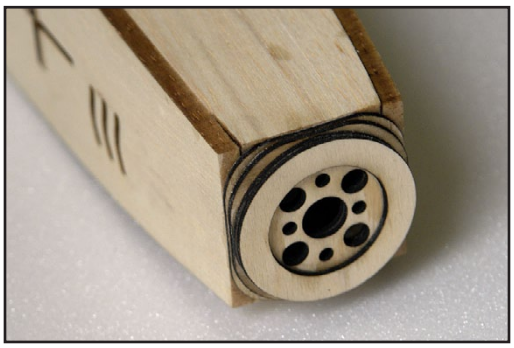
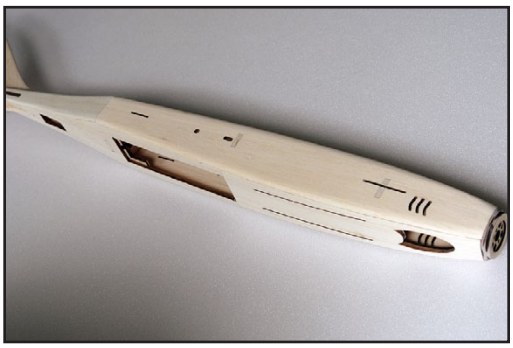
18. Glue horizontal stab halves together. Sand faces first to ensure a true fit and a flat stab. Sand assembly for aerodynamic efficiency (round leading edges and taper thickness at trailing edge). Check fit with slot in body and sand as necessary. Do not glue in place until after stab is covered to simplify covering process.

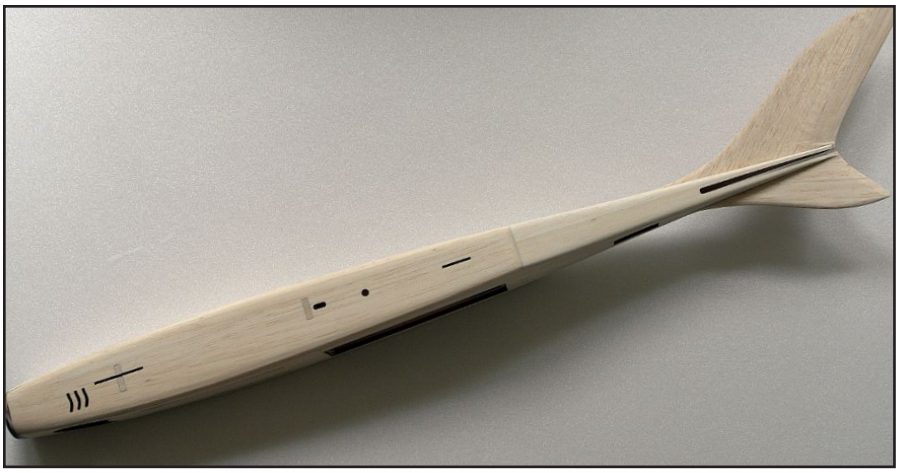
19. Sand elevator to match trailing edge of horizontal stab.







Wing

20. Layout all wing internal pieces - ribs, leading edges, trailing edges, and carbon tubes to familiarize yourself with the wing's composition.

21. Cut two main carbon wing rods (0.210" diameter) to 10 5/8" (10.625") length.

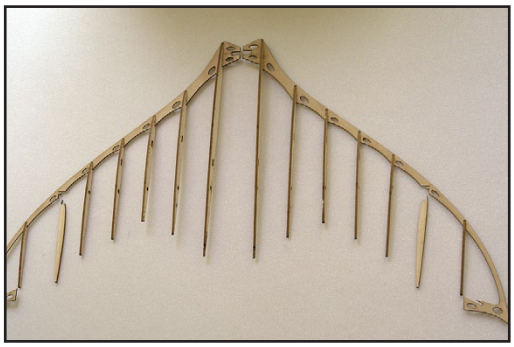
22. Cut two carbon trailing edge pieces (0.110" diameter) to 13 5/16" (13.3125") length.

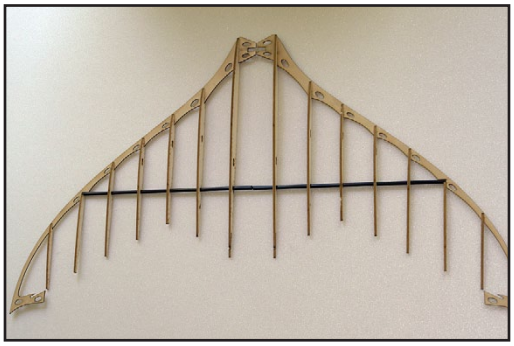
23. Assemble ribs onto the leading edge piece for both wing halves. Ensure ribs fully seat into slots of leading edge. Do not glue yet.

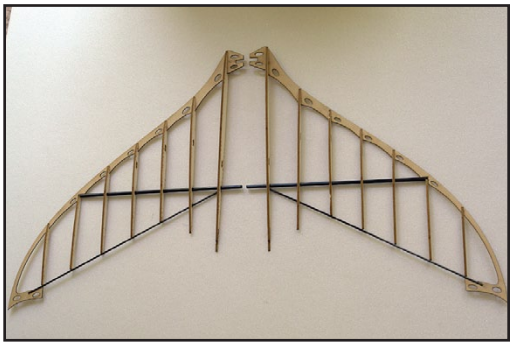
24. Carefully run main carbon wing rod through holes in ribs and into notch on leading edge pieces. Do not glue yet.

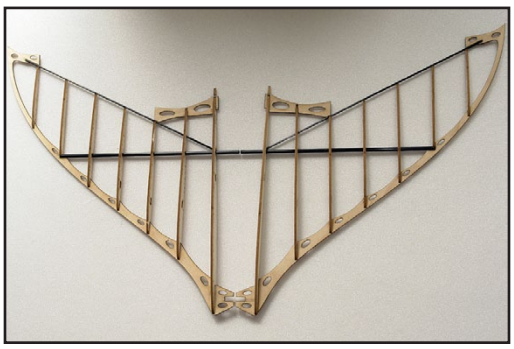
25. Carefully run carbon trailing edge through holes in ribs and into slot at wing tip on leading edge pieces. Do not glue yet.

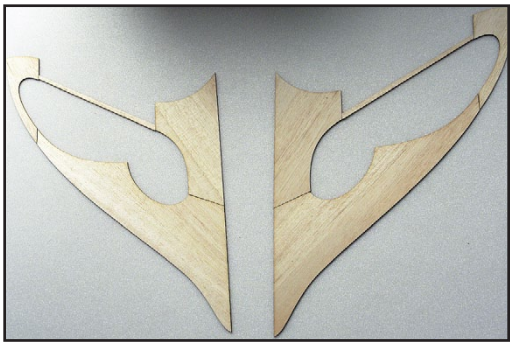
26. Place wing assemblies on a flat surface and ensure there is no twist or warp in wing and glue all joints with thin CA. Notes- Largest rib (innermost rib) is not parallel to the other ribs. Wing design will favor a slight upward curve of the wing tips and a slight amount of wash-out at the wing tips to increase stability of wing.











27. Sheet the bottom of both wing halves. Start with the inner trailing edge piece first, and check position with the plans. Sheeting pieces are supplied slightly oversized to allow for sanding to a perfect fit. Allow sheeting to extend beyond the root rib. Next do the main leading edge sheeting. Wet the piece and let it sit for a few minutes to increase the flexibility of the wood. Carefully check position before gluing in place. Lastly glue the wing tip sheeting in place, again checking with the plans to ensure proper positioning.

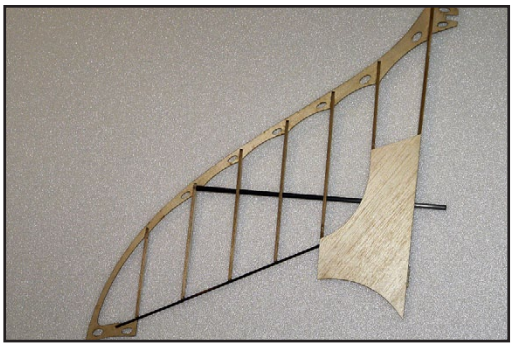
28. Install aileron servos. The wing can accommodate servos with a maximum width of 10 mm. Glue servos to wing sheeting (cover servos with tape first if desired).

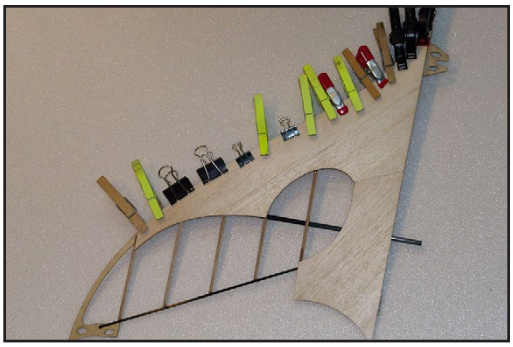
29. Sheet top of wing. Use same process as was used for bottom sheeting.

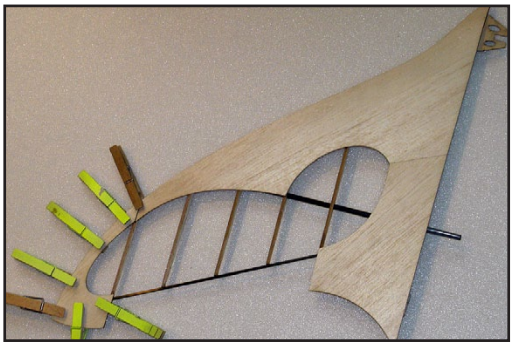
30. Trim excess sheeting. Use a straight edge and a sharp X-acto knife to trim at the root rib. Check fit with body before trimming.

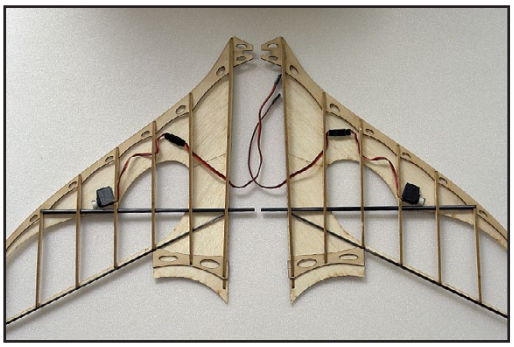
31. Sand wing assemblies to create a smooth airfoil. Sand trailing edges down to create a sharp edge.

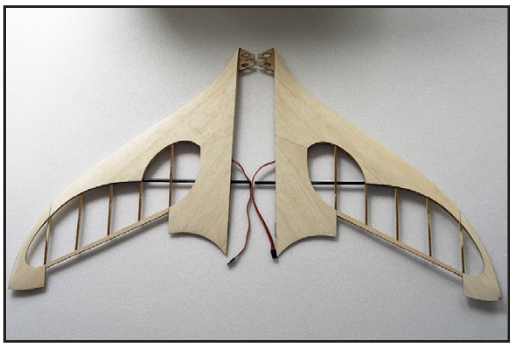
32. Sand ailerons for a good fit and to match wing airfoil.

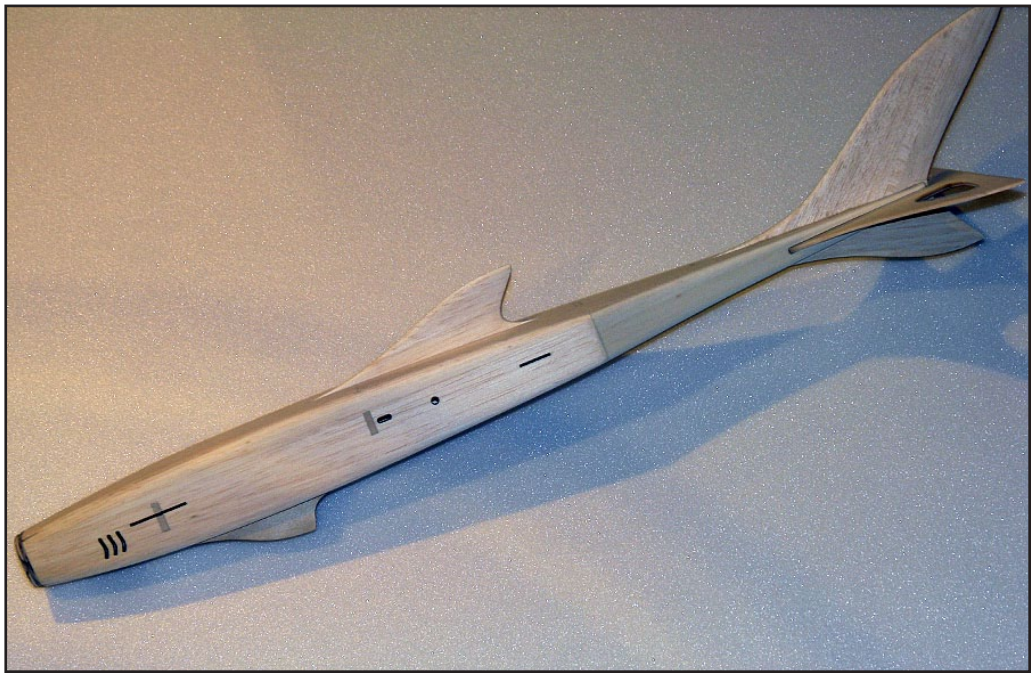












Assembly

33. Instal the motor through the “mouth” opening. Motor should be 25 mm - 29mm diameter, 200 Watts and have a KVa of between 2,000 - 2,600 to spin a prop between 4.75” x 4.75” and 6” x 5.5”. Ply spacers are supplied to fit inside the recess of the motor mount to accommodate longer shafts or outrunner wires. Spinner should be 40 mm diameter.

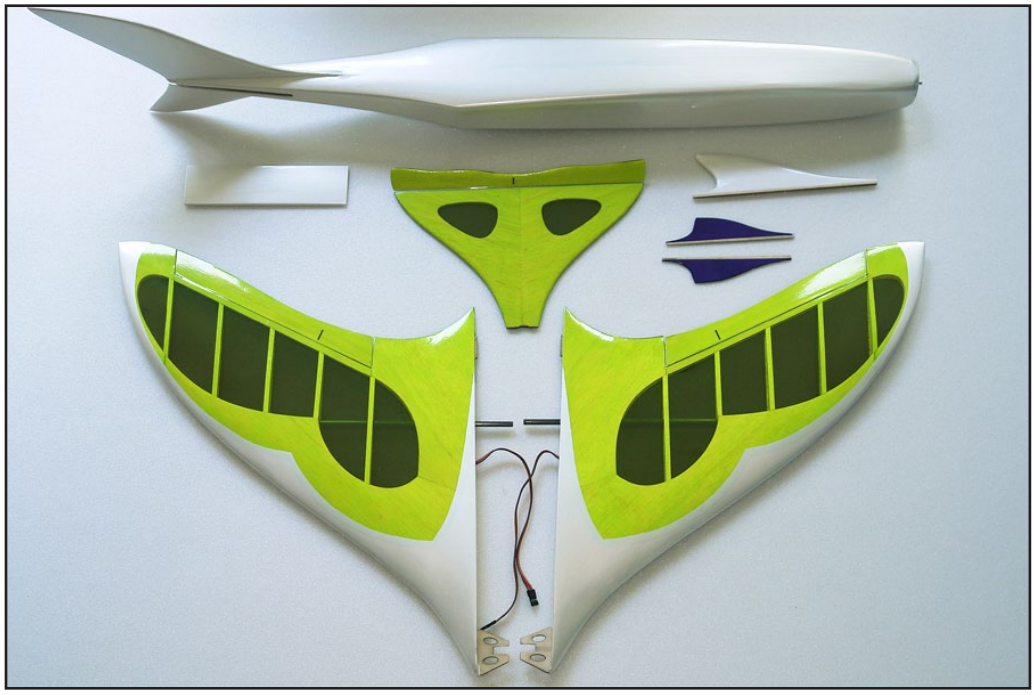
34. Cover the parts of the Shark before assembling. Ultracote/Oracover is recommended. When covering the wing halves ensure there is no twist or warp. Use a heat gun or covering iron to remove any twist or warp after covering.

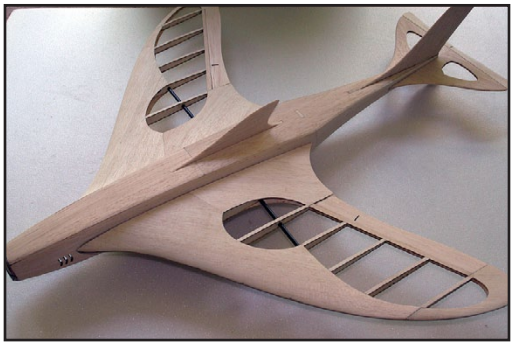
35. Tape the control surfaces (ailerons and elevator) to the wing halves and horizontal stab.

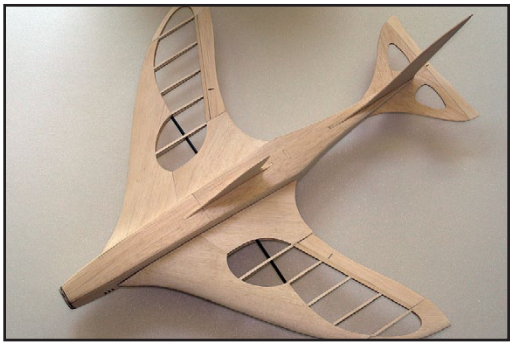
36. Glue the horizontal stab to the body, ensuring it is square to the vertical fins. Sand as necessary to ensure a good fit.

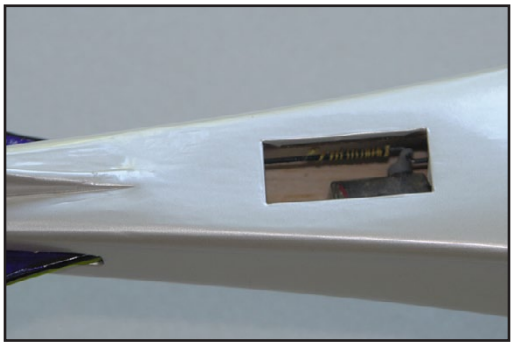
37. Instal the elevator servo into the rear of the body, through the servo access cut out. Drill a hole through the body to accommodate the elevator control linkage. Glue the rectangle shaped hatch in place after ensuring the servo is working properly. Cover the hatch.

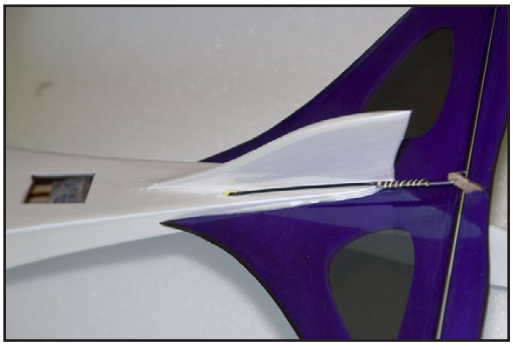
38. Glue the top dorsal fin in place, and the lower fin skids into their grooves in the body. The lower fins aid in the landing of the Shark and protect the body and help protect the propeller.





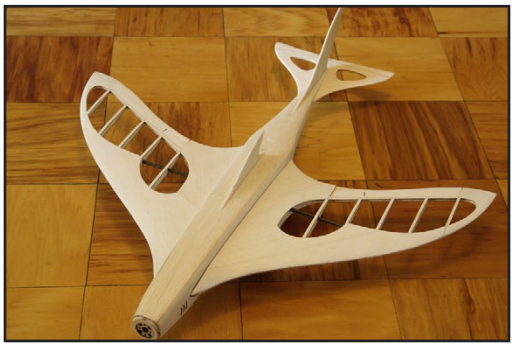






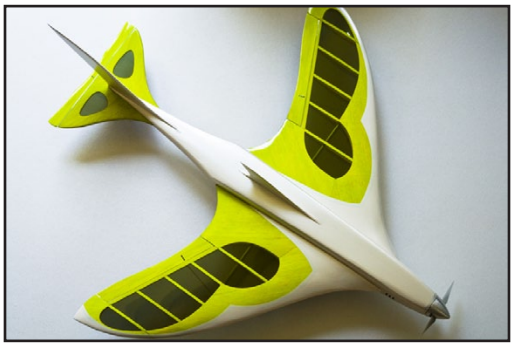
39. The wing can be left unglued if you wish it to remain removable, however, for increased strength the wings should be glued to the body. Use the supplied carbon tube to join the main carbon wing spars inside the body. Use rubber bands to hold wing in place while glue dries.

40. Instal receiver in main hatch area and test fit the battery, which should be a 3S LiPoly 1,600 - 2200 mah.



41. Check Center of Gravity against the plans and ensure you are within 1/8". Position the battery to adjust the C/G, and mark the battery's position. Use velcro to hold the battery in place.

42. Adjust control surface throws. Elevator should be about 1/4" up and down; ailerons should be 3/8" up and 1/4" down.



43. Always perform a radio check before flying. The shark should fly fast and have a great roll rate, and should also be very stable. Spoilerons (raised ailerons) can be programmed for shorter landings. Down elevator will need to be mixed into the raising of the ailerons. Experiment at a safe height!

44. **Have fun!**