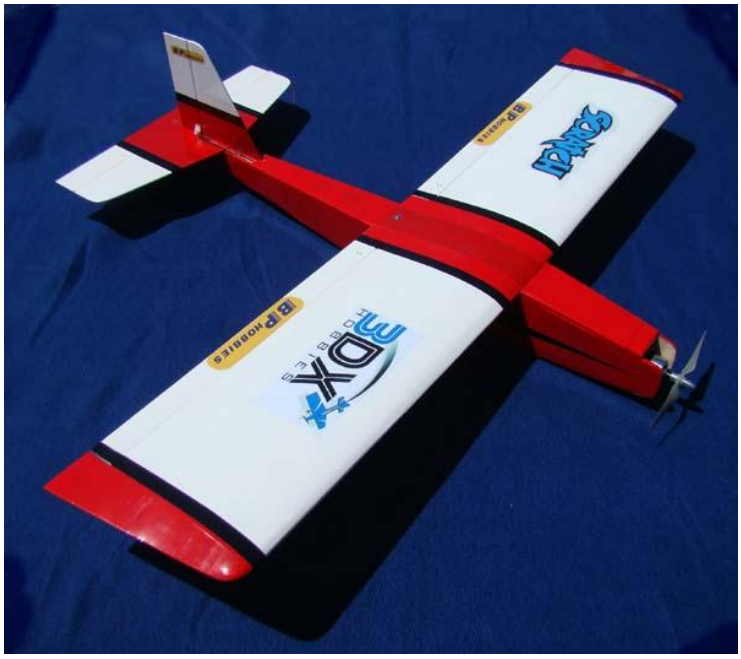
Assembly Manual



Designed by Jim Vigani

Version 1.1 - 6-18-10

Specifications:

- Wing Span: 40 in (1016 mm)
- Overall Length: 30.0 in (762 mm)
- Wing Area: 300 sq in (19.4 sq dm)
- Flying Weight: 20 oz (567 g)
- Motor Size: 175 to 275 watts
- Servos: 4 sub-micro servos
- Recommended Battery: 3-cell11.1V 1350 to 1800 mAh
- Type: Outdoor Aerobatic Sport Flyer
- Approx. Assembly Time: 3-4 hours

Produced by BP Hobbies and 3DX Hobbies

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Limited Warranty

The company warrants replacement of any materials found to be defective for their intended use prior to their use in the construction of the model, provided the purchaser requests such replacement within a one year period from the date of purchase, and the part is returned, if so requested by the Company. No other warranty, expressed or implied, is made by the company with respect to this kit. The purchaser assumes full responsibility for the risk and all liability for personal or property damage or injury resulting from the purchaser's use of the components of this kit whether assembled or not.

The Company reserves the right to provide a full refund to the purchaser if the model does not perform as advertised. Any refund is at the sole discretion of the Company.

Warning

This radio-controlled model is not a toy and, if operated inappropriately can cause serious bodily injury and property damage. *It is the buyer's responsibility to assemble the kit correctly and properly install the motor, radio and all other equipment. The model must always be flown in accordance with the safety standards of the Academy of Model Aeronautics (AMA).*

If you are an inexperienced modeler, we recommend that you get the assistance of an experienced modeler to help you with the assembly and initial flights. There are many local clubs that can offer help with assembly and flight instruction. Information on local clubs can be found through the Academy of Model Aeronautics. The AMA has over 2500 chartered clubs throughout the country. Information on the AMA can be found at www.modelaircraft.org.

Recommended Power System:

The Scratch has been designed to use a 150 to 275 watt power system with a motor KVA of approximately 1200. We also recommend the use of a 25-amp ESC, and a 1350 to 1800 mAh, 3S Li-poly battery. Performance will vary depending on the specific power system selected. For information on alternate power systems please BP Hobbies, 3DX Hobbies, or your local hobby shop.

Kit Contents:

The parts contained in the kit are shown on the left. Check the contents of your kit to make sure all components are included and have not been damaged during shipment. If you have any questions with the assembly or flying of this model, please contact us and we will be happy to assist you.

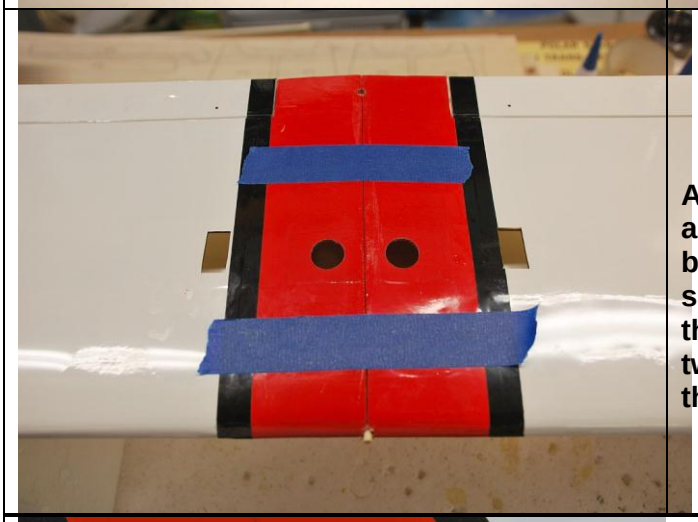
Wing Assembly and Installation:

Step 1

Cut out the small piece of wood at the front of the wing root rib on both wing halves to make room for the wing dowel.

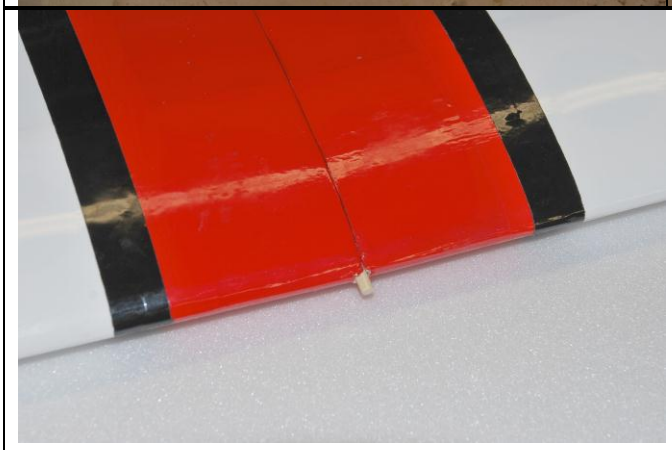
Step 2

Trial fit the plywood dihedral brace and the wing dowel into each wing half to make sure they fit properly.

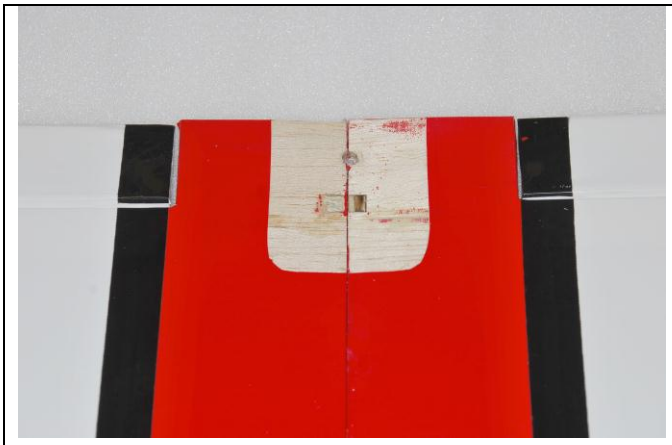


Step 3

Apply 15 minute epoxy to the dihedral brace and both wing root ribs. Insert the dihedral brace first into one wing panel and then slide the other wing panel in place. Insert the wing dowel and temporarily secure the two wing panels together with tape while the epoxy sets.

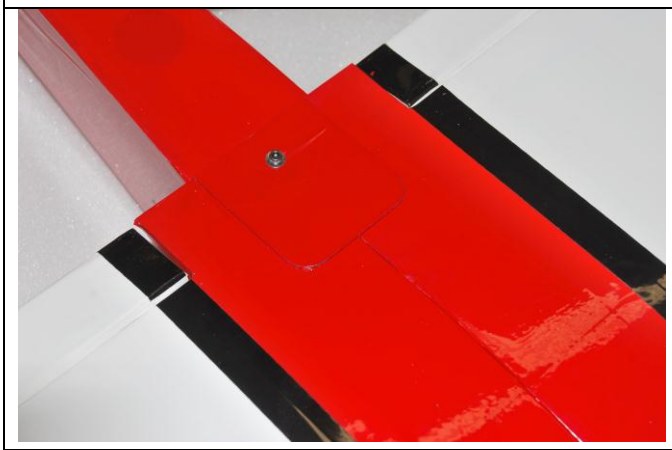


The joined wing panels



Step 4

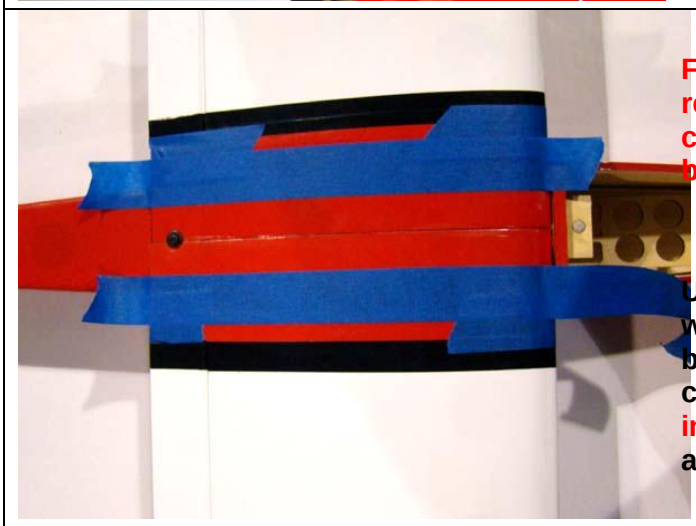
Mark the location of the wing hold down bolt reinforcement, and with a sharp hobby knife, cut and remove the covering where the reinforcement gets glued to the wing. DO NOT cut into the wood as this will weaken the wing.



Step 5

Glue the wing hold down bolt reinforcement in place with medium CA. Test fit the wing on the fuselage using the provided wing hold down bolt. Remove the wing.

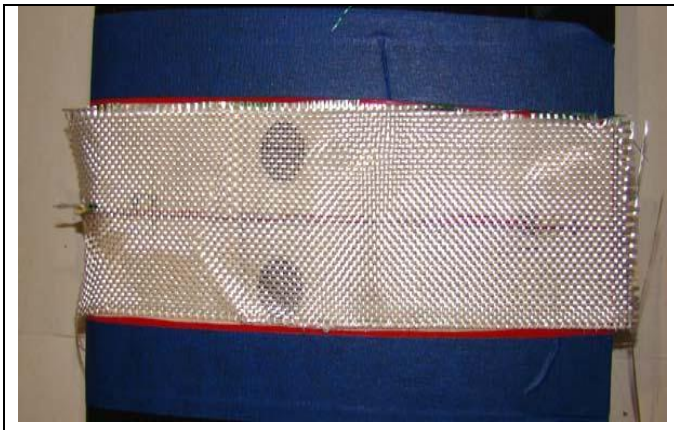
Note: For normal sport flying it is sufficient to reinforce the center joint with clear, 2 inch wide packing tape (not provided).



For aggressive flying we recommend reinforcing both the top and bottom wing center joint with fiberglass cloth as shown below.

Alternate Step 6a

Using masking tape mark a line 1-1/2 inches wide on the center of the wing top and bottom. \With a sharp hobby knife cut the covering along the tape line, DO NOT cut into the wood. Remove the covering in this area to expose the balsa.



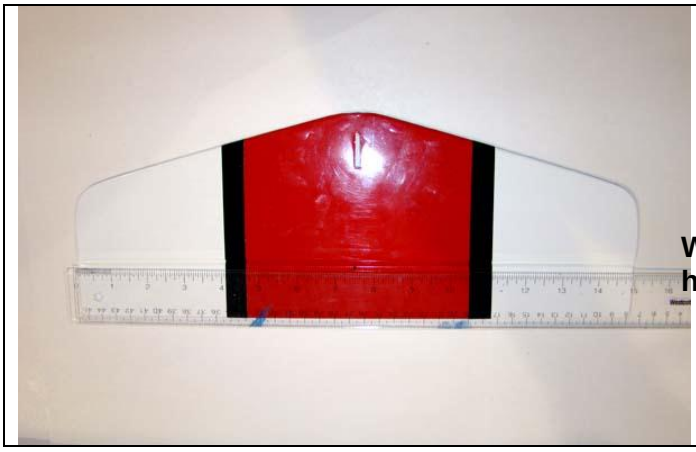
Step 6b

Apply a piece of 1-1/2 inch wide fiberglass cloth to the bottom of the wing.

Step 6c

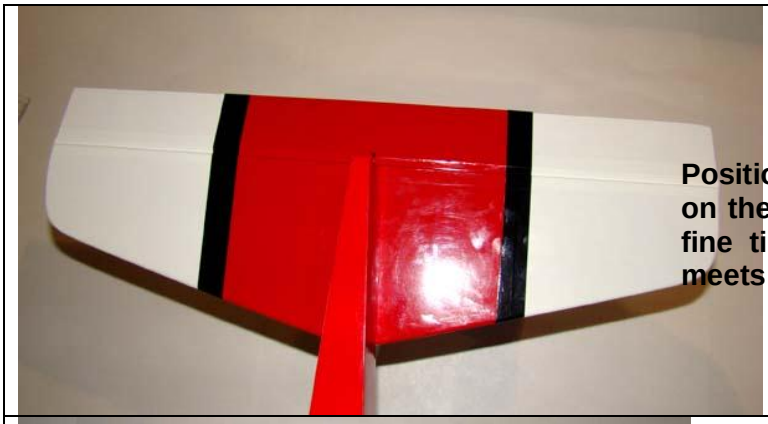
Saturate the cloth with thin CA or thinned down epoxy. Follow the same procedure for the top of the wing.

Horizontal Stab and Vertical Fin Installation:



Step 7

With a marking pen, mark the center of the horizontal stab.

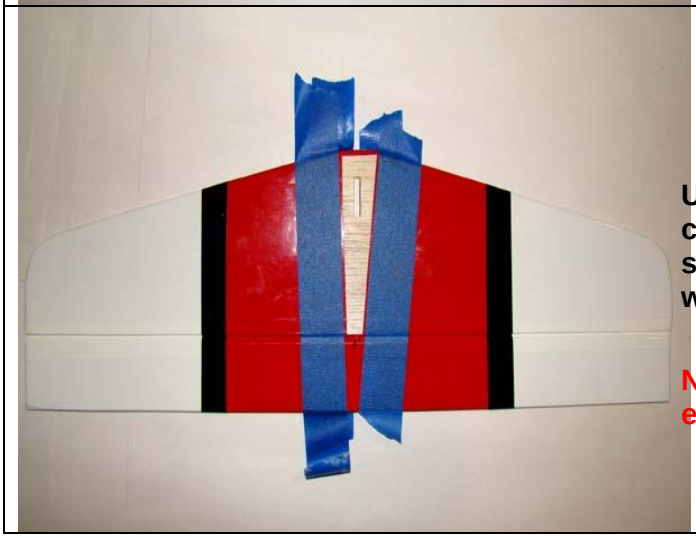


Step 8

Position the horizontal stab and vertical fin on the fuselage and with masking tape or a fine tip Sharpie, mark where the fuselage meets the bottom of the horizontal stab.

Step 9

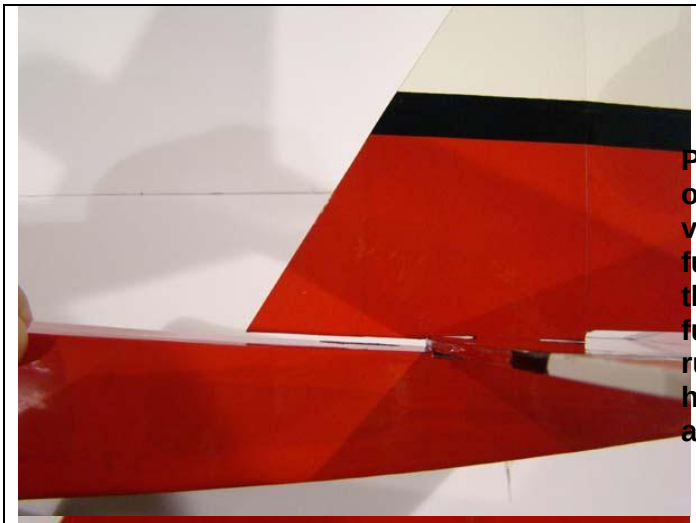
Mark another line 1/8 inch inside the first line.



Step 10

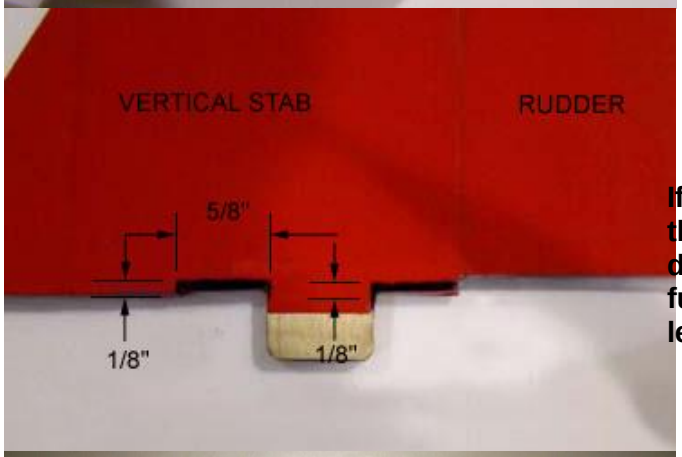
Using a sharp hobby knife, score the covering and remove the covering on the stab between the lines. Do not cut into the wood as this will weaken the stab.

Note: Do not remove any covering from the elevator.



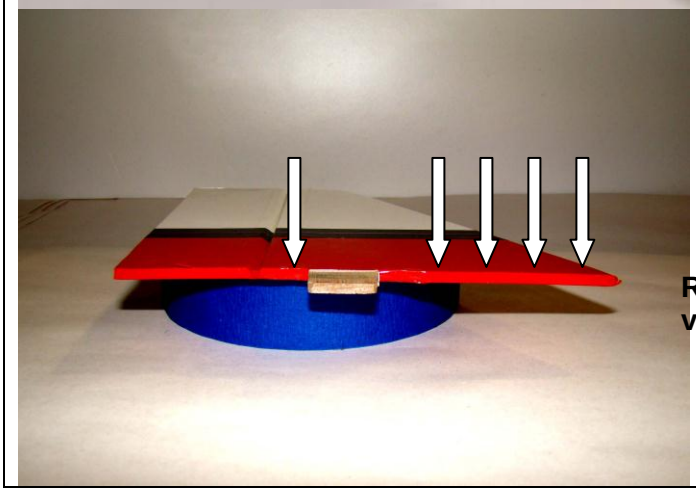
Step 11

Position the horizontal stab and vertical fin on the fuselage making sure the tab on the vertical fin is set into the slot in the fuselage. Check if there is a gap between the bottom of the vertical fin and the fuselage. Also check that the back of the rudder is located in front of the elevator hinge line and that the elevator hinge line is at or behind the rear of the fuselage.



Step 12

If a gap exists, trim the cutouts on bottom of the vertical fin so that the vertical fin rests directly on the top of the stab and the fuselage. Typical dimensions are shown at left.

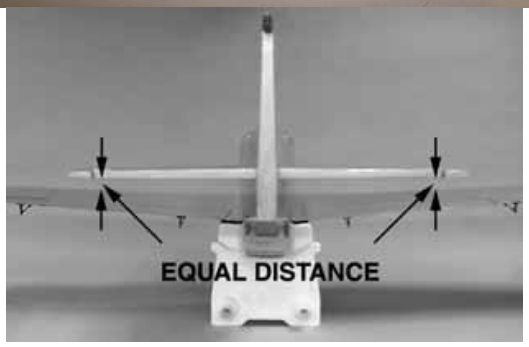


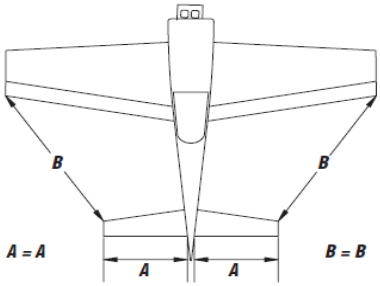
Step 13

Remove the covering from the bottom of the vertical fin to insure a good glue joint.

Step 14

Position the vertical fin on the fuselage and mark where it meets the fuselage. Cut the covering away with a sharp hobby knife. Do the same where the fin meets the horizontal stab. The fin and stab are now ready to be permanently glued to the fuselage.





Step 15

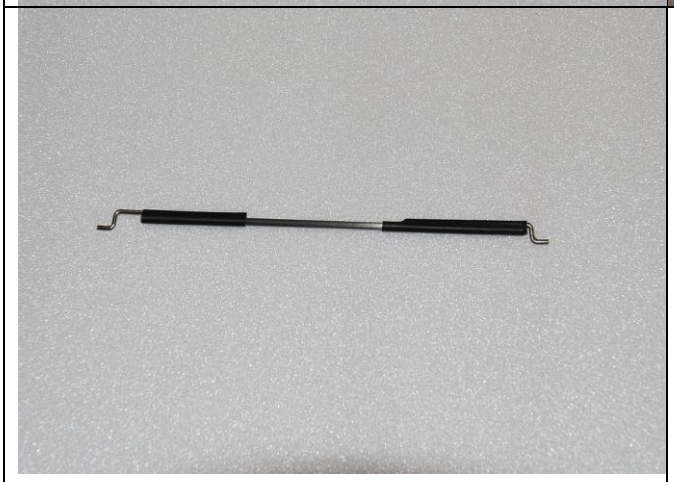
Attach the wing to the fuselage.

Mix up an adequate amount of 5 minute epoxy and glue the fin and stab to the fuselage at the same time. Make sure that the fin is properly keyed into the slot in the stab and into the slot in the fuselage. Check that that the horizontal stab is parallel and equal distance from the main wing. Check that the vertical fin is square with the horizontal stab.

Electronic Equipment and Control Linkage Installation:

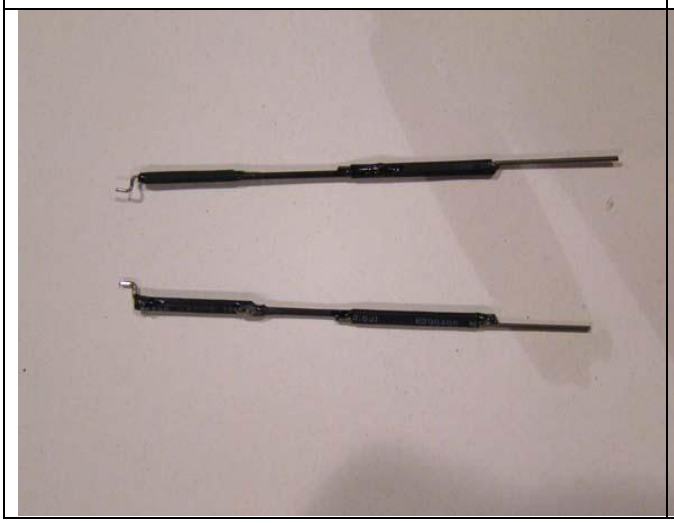
Step 16

Install the two aileron servos in the wing as shown. Bring the two servo leads through the holes in the wing sheeting.



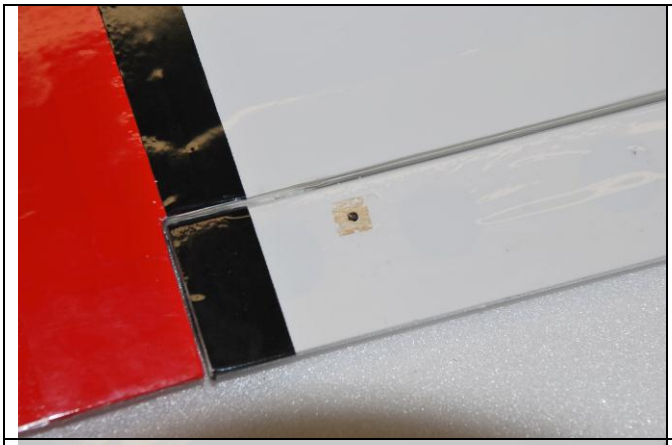
Step 17

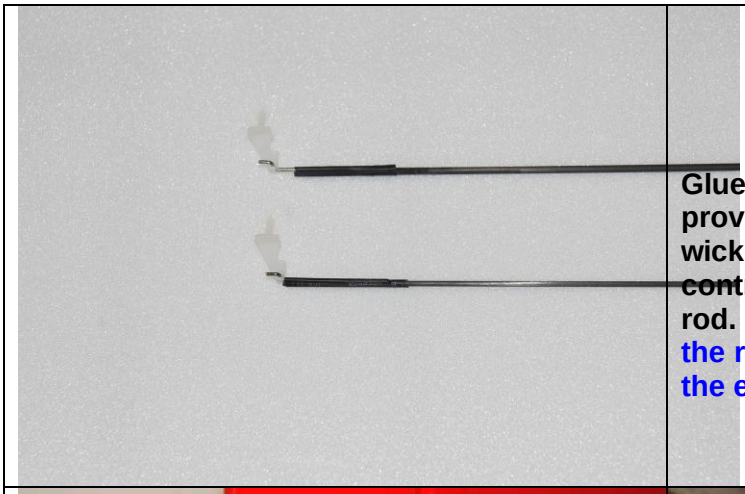
Make up two aileron pushrods as shown using the two short carbon rods in the small parts bag, the Z bend wires, and heat shrink tubing. Heat shrink the tubing to hold the Z bend wires in place, but do not glue until the control linkage is centered.



Step 17a

As an alternate, you can use a straight wire on one end for connection to a Dubro EZ Connector.

	**Step 18** **Temporarily insert a control horn in the hole provided in the aileron. Trace around the control horn and remove the covering where the control horn gets glued to the aileron surface.**
	**Step 19** **Secure the aileron control horns in place with medium CA. Install the aileron pushrods, and with the servo arms and ailerons centered, secure the Z bend wires with thin CA wicked into the heat shrink tubing.**
	**Step 20** **Install the elevator and rudder servos in the servo mounting holes in the center compartment of the fuselage.**



Step 21

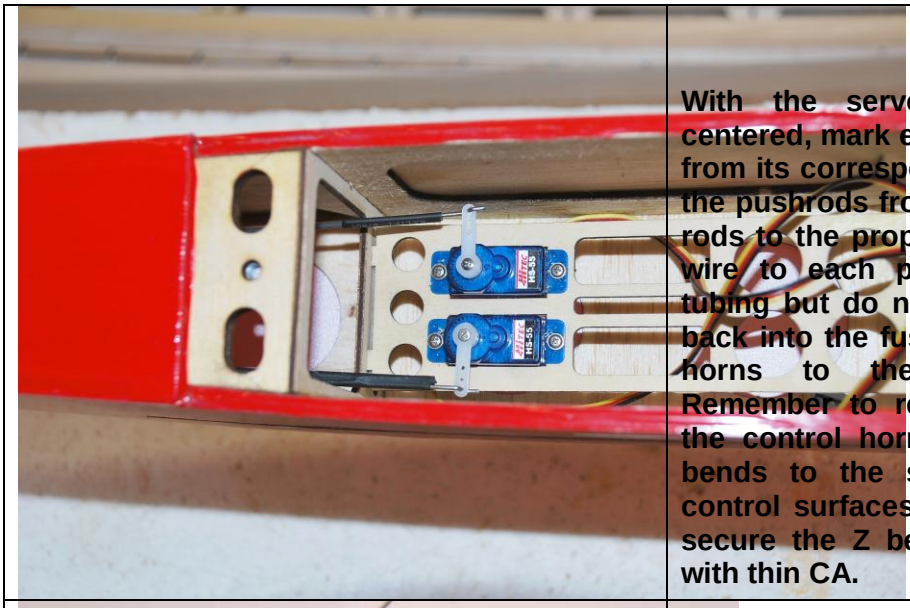
Glue the preinstalled Z bend ends of the provided long pushrods with thin CA wicked into the heat shrink tubing. Install a control horn onto the Z bend end of each rod. Note: The shorter, thinner rod is for the rudder, and the longer, thicker rod is for the elevator.

Step 22

Thread the elevator pushrod through the center of the fuselage as shown. Drill a 1/16" dia. hole in the center of the elevator 3/16" from the elevator hinge line. Push the control horn pin into the elevator. DO NOT GLUE IT in at this time.

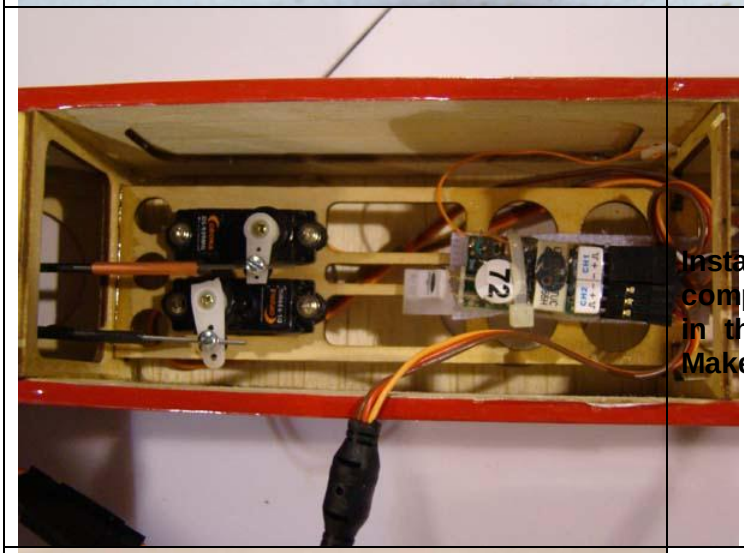
Step 23

Follow the same procedure for the rudder.



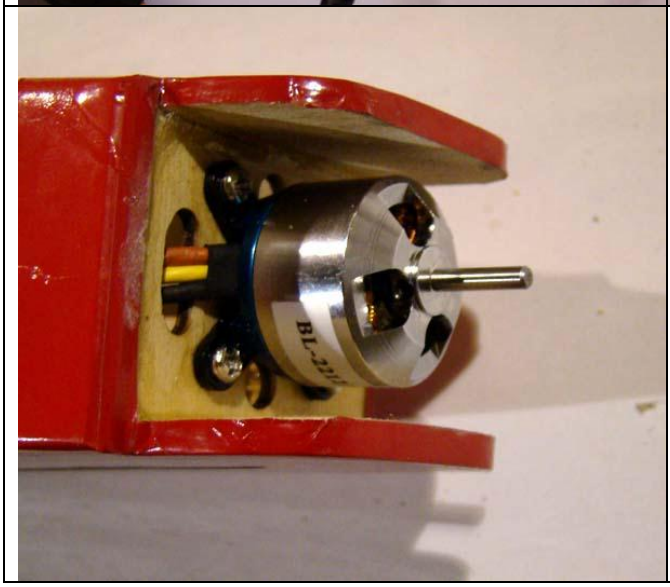
Step 24

With the servos and control surfaces centered, mark each pushrod 3/8" inch back from its corresponding servo arm. Remove the pushrods from the fuselage and cut the rods to the proper length. Add the Z bend wire to each pushrod using heat shrink tubing but do not glue. Put the pushrods back into the fuselage and glue the control horns to the elevator and rudder. Remember to remove the covering under the control horn. Attach the servo end Z bends to the servo arms and with the control surfaces and servo arms centered, secure the Z bend wires to the pushrods with thin CA.



Step 25

Install the receiver in the center compartment of the fuselage and secure it in the fuse with hook and loop fastener. Make all of the proper servo connections.



Step 26

Route the motor leads through one of the firewall cooling holes, and secure the motor to the firewall with four wood screws (not provided).

Step 27

Mount the speed controller to the side of the battery compartment using hook and loop fastener. Add a piece of hook and loop fastener to the battery tray to hold the battery in place during flight.

Final Assembly and Pre-flight checklist:

Tighten up any loose or wrinkled covering with a covering iron set to low/medium temperature taking care to secure any loose seams. Apply the decals.

Balancing:

We recommend that you perform initial flights with the CG 2 to 2 3/8 inches behind the wing leading edge. Adjust the CG to get the flight characteristics that suit your taste.

Electrical Components:

Check that all electrical components are securely attached and all plugs are fully seated. Secure any extra length on servo leads neatly within the fuselage or the wing. Avoid loose or dangling wires.

Controls:

Check that all the control surfaces move in the correct direction. Adjust the control throw as outlined below.

Control Throws	Low Rate	High Rate
Elevator	3/8 inch	3/4 inch
Aileron	5/16 inch	1/2 inch
Rudder	3/4 inch	1 1/4

Prior to each day's flying, always perform range check of your equipment in accordance with the manufactures instructions.