

UAV Flying Wing Building Instructions [Draft 01]

Preliminary

The wing and the fuselage base are made of three layers which are illustrated on the bottom left of the PDF plan. At the bottom right are the dimensions for the wing layers. All the parts that are more complicated to cut out are on the upper right of the plan. They will be referred as templates. Print out the templates for the fuselage layers, the middle wing layer (servo recess), the plywood fuselage frame, the winglets and the canopy.

Fuselage

Cut out the three layers of the fuselage and the fuselage plywood frame by using the templates.

Cut out the grooves of the firewalls and check if the according tongues fit into the grooves. Check if the top fuselage layer (the narrow one) fits into the plywood frame.

Epoxy the two plywood stringers onto the top fuselage layer. After the stringers are fastened, epoxy the two plywood firewall plates onto the stringers.

Glue the foam parts for the nose onto the plywood frame (depending on whether you would like to use the camera mount or not).

Wing

Cut out the three layers that are used for the right and the left wing half. Use the PDF plan for the dimensions.

Bevel the top and the bottom wing layers with a 30° angle (be sure to bevel the right side).

Cut out the elevons by using the dimensions in the PDF plan.

Cut out the servo recesses from the middle wing layers by using the wing layer template.

Winglets

Cut out the winglets by using the templates.

Chamfer the leading edge of the winglets with sandpaper.

Assembling

Put the bottom wing layers for the right and the left wing half on a table and use the bottom fuselage layer template to mark the fuselage/wing intersection. Cut off the intersection. Do the same with the middle and the top wing layers by using the same template. This ensures that you'll have a 7mm gap for the canopy on the top layer.

Put the bottom fuselage layer and the bottom wing layers on a table and tape them together.

Glue the middle fuselage and wing layers onto the bottom layer. Use tape to reinforce the intersection of the wing and the fuselage layers.

Connect the servo extension cables to the servos and put the servos into the servo recesses using the double sided tape.

Glue the spars onto the bottom layer (at the wing roots the servo extension cables are routed under the spars).

Now glue the previously assembled top fuselage layer including the plywood frame onto the middle layer (the servo extension cables are routed through the top fuselage layer).

Tape the front of the top wing layers to the front of the bottom wing layers.

The top layers will be folded and glued onto the middle layers, so apply contact glue to all the tangent layer areas and the spars.

Carefully fold the top wing layers onto the middle wing layers and press to the glue joints together.

Glue the winglets onto the wings tips.

Canopy

Cut out all the parts for the canopy by using the templates.

Glue two 7x7mm stripes onto the inner side of the canopy side panels so that they build a joint between the side panels and the canopy top.

Glue the canopy top onto the canopy side panels.

Finish

Chamfer all the edges of the fuselage and the canopy.

Glue the Velcro onto the fuselage.

Put some tape at the fuselage bottom for protection.