

Pelican Fuselage Building Instructions

Pelican by Crashtesthobby.com



SPECIFICATIONS

- Fuselage length 26" Polyhedral and Aileron wings are 34"
- The fuselage can be built with either a nose mounted motor or the recommended pod mounted motor.
- The Pelican is cut from 100% EPP foam so it is incredibly durable
- The fuselage is laminated but the wings are designed to not be laminated.
- Center of Gravity: 2.75" (7 cm) back from the front of the wing.
- Pod mount motor does not change the center of gravity
- Elevator, Rudder and Aileron Throws: 3/8" up/down/left/right (1 cm)
- Wing tip angle is up 3.5" to top of the wingtip on each side of the polyhedral wing.
- Dowels back 5" and 13" from the nose of the fuselage
- Motor pod is back 5" from the nose of the plane behind the front dowel
- Motor has two 3/16" washers under bottom screw to get a positive motor angle
- Use four to six #64 rubber bands to secure wing
- 2812 motor, 7x6 APC prop, 20A ESC, 2 mg90 servos,
- 1300 -1500 mah 3S lipo battery
- Target All-Up Weight: 15-22 oz
- Lighter always flies better!!!!
- Try to keep the weight forward so you don't have a tail heavy airplane.



A Goop hinge is flexible and works well on EPP foam. Pin the tail surfaces onto a piece of cardboard with the beveled edges up and barely touching. You don't want glue to flow down between the hinge line. Make your Goop hinge by spreading a thin layer of goop along the hinge line and immediately spreading thin with a razor blade. If you get too much Goop the hinge will be stiff and not work.



Trim the back corner of the bottom of the rudder off up 1.25" and extending past the hinge line so the elevator has room to move. Trim the top of the back of the fuselage off 3" to make a place to install the horizontal stab with elevator. Make sure all of the pieces fit and the elevator and rudder can move freely.



Glue two layers of laminate on the nose. The laminate makes a firewall for a nose mount motor but also strengthens the fuselage and is a bumper that protects the battery if you are building with a pod mounted motor. I prefer the pod mounted motor for motor protection and reduction of broken propellers.



Cut slits for wing dowels 3/4" deep back 5" and 13". Roll the dowels and roll them into the slit. Enlarge the holes with iron.



The pod will be behind the front dowel to give it extra strength in a head on impact. Mark the location with the wing in place. Make a hole for the pod with a soldering iron and a screw driver. the pod needs to be at 90 degrees to the top of the fuselage and turned slightly to the left so the motor will point at the left front corner of the fuselage to compensate for prop torque. If you have installed LED lights do not damage the lights or put the pod so deep you cannot put lights underneath. The plane in this demonstration has LED lights installed.



Wrap the nose of the plane in bidirectional reinforced tape back 8" on the fuselage. Extreme Tape by Scotch is one of our favorites. This tape will stick to EPP foam. Open the dowel holes and pod hole with a soldering iron or hobby knife.



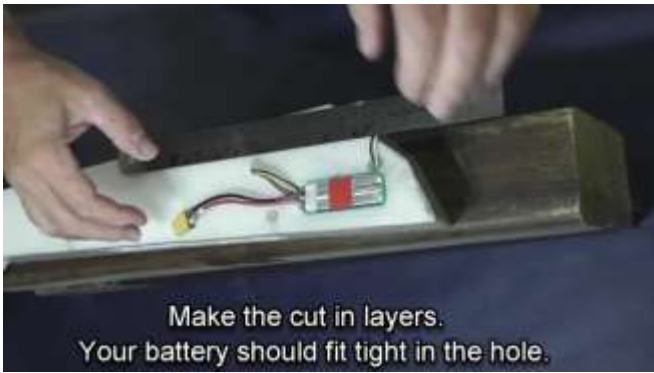


Put a strip of tape around the fuselage over the rear dowel location to prevent the back dowel from ripping out in an accident. Laminate the fuselage with an iron about 190-210 degrees or just hot enough water will boil on the surface. It is easiest if you start on the top and wrap the laminate around the fuselage from each side. I like to double layer the bottom of the fuselage.



Cut out your radio compartment and battery hole. I like to make a radio compartment that starts at the back of the pod and is 3/4" wide, 6" long and 1.5" deep. I cut with a box knife or a soldering iron. It is easiest if you cut the laminate and the E-Tape with a razor blade before trying to cut with a soldering iron. Keep the battery as far forward as possible to help with center of gravity. Make a slit for a piece of 3/4" Velcro to keep the battery in place.





Make the cut in layers.
Your battery should fit tight in the hole.



Glue horizontal tail in place. Make sure it is square with fuselage and level with the table.

Glue on the tail surfaces with a low temperature hot glue gun making sure that the tail is square with the fuselage and level with the table and the wing. Punch a few holes with the soldering iron to allow glue into the foam when gluing the vertical stabilizer and rudder into place. The tail is not laminated to help keep the weight forward.



Punch some holes through the laminate and glue the vertical stabilizer in place.



Make sure it is straight and at 90 degrees to the horizontal tail.



Make sure it is straight and at 90 degrees to the horizontal tail.



Install the servos back behind the rear dowel. They can be installed side by side.

Install the servos behind the rear dowel so the top of the servo body is below the surface of the foam. Cut or melt a slit for the servo wires to enter the radio compartment.



I am using MG90 servos. Cut through the laminate after drawing a pattern.



You want only the servo arm to be above the surface of the foam.



Cut a slot for the servo wires to get to the radio compartment.



Bind your radio and center the servos.

Bind your radio and center your servo arms with the trims adjusted to center. Drill out the third hole from center on each servo and install the pushrods from the bottom up to keep the pushrods close to the body of the fuselage. I have the elevator servo on the left and rudder servo on the right when standing behind the plane.



Use a 1/16" bit and drill the servo arm. I ended up using the third hole from center.



Bring the pushrods up from underneath the servo arm.



Put hot glue from both sides of the foam to secure the horns in place.



Drill the top hole in the control horns with a 1/16" bit.

Install your elevator control horn in a place it won't interfere with the rudder. Cut a slit with a hobby knife and melt a hole for the glue to flow up around the control horn. Glue the control horn in place from both the top and the bottom with the holes in the control horn at the hinge line for the best leverage.



Install the snap rings upside down and put the set screw in place.



Install the snap rings upside down and put the set screw in place.

Glue your servos in place from the top only so you can get them out if you have servo problems. Drill the top hole in the control horn with a 1/16" bit and install the EZ connectors. After you have turned on your radio and centered the servos tighten the EZ connectors and cut the pushrod to length.

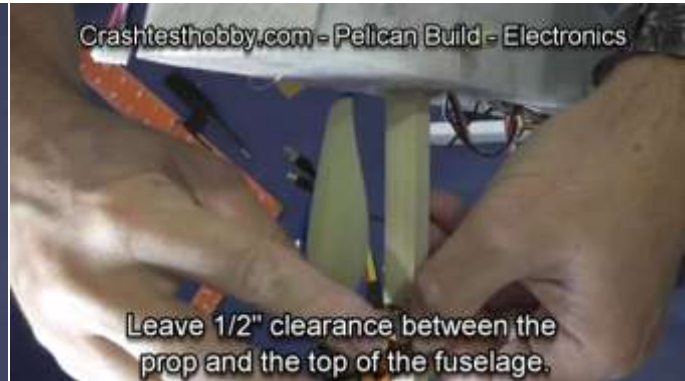


Pull the servo wires out of the way and glue in the dowels with a low temperature glue gun. Roll the dowels as you apply the glue to spread the glue around. The motor pod will be against the front dowel. Glue the pod in place making sure the pod is square with the TOP of the fuselage and aimed and the left front corner of the fuselage.



Install the prop connector on your motor. Cut the pod to length and install the motor on the pod.

I like to put 3mm screws in the motor base but the set screws that come with the motor will work. Install the prop and mark the location of the motor on the pod so you have 1/2" clearance with the top of the fuselage. I use the top and bottom holes of the motor base only with #6 wood screws. You will have to drill the motor base to get the #6 screws to fit. Aim the motor up with installation by putting two 3/16" washers under the bottom screw on the base of the motor as shown. We have found that the bigger motors need more up thrust to keep the plane from pulling down on launch.



I colored the pod black for looks with a permanent marker. I made an extension for the ESC to motor connection due to the short wires on the ESC. This plane has programmable LEDs and the LED controller is in the radio compartment with the receiver and ESC. I cut an access hole in the left side of the fuselage for the battery connection wire and the lead that goes to the LEDs in the fuselage. Tie your motor wires to the pod with wire ties or zip locks to keep the wires out of the propeller.

Because of the LEDs I added one ounce of lead to the nose of the plane to get the plane to balance on the spar.



Trimming the Slow Flyers are a little different (Pelican, Albatross, Storm Chaser)

The slow flyers are designed to be launched with a harder toss at half throttle and then throttled up. This is to help them be amazing at self stabilization at any throttle setting. Self stabilizing occurs when the plane speed and the trim on the rudder and the angles of the wing and elevator pull the plane to a flat and level flight from any position if they have enough altitude. For example: The Pelican polyhedral wing trainer will pull down until it is up to speed if you launch at full throttle or throttle up from a slow glide too rapidly. This design will then stabilize itself in flight as it comes up to speed and can be trimmed with the elevator to keep their nose on the horizon at any throttle setting.

You can decrease the amount of downward pull if you give a faster toss on the launch to help the plane get up to speed more quickly. You can permanently decrease the amount of pulling by tipping the motor up 3 to 5 degrees by putting two or three 3/16" washers under the bottom motor mount screw which makes it easier to launch, but then the plane is a little slower to self stabilize. This may help you launch on your initial flights. The plane will still fly well once it is trimmed with the modified motor angle.