

Turbinator-2

Build Manual



Thank you for your purchase of the Turbinator-2 sport jet by Boomerang RC Jets. This RC Jet IS NOT A TOY and should only be flown and operated by experienced RC Turbine Pilots. Please seek assistance from an experienced builder and pilot if you are new to Remote Controlled Turbine Jets.

Turbine Waiver requirements for operation in the United States can be found by visiting the Academy of Model Aeronautics website. <https://www.modelaircraft.org/>

If you have any questions regarding this model you can reach us at boomerangrcjets@gmail.com

By building this model you assume FULL RESPONSIBILITY for the safe operation of this model.

It is assumed that you have built model planes prior to this build. This manual is to be used as more of a guide than a hard set of instructions.

Let's get started:

Take your time on each step and enjoy the building process as you progress. There is no better feeling than flying a model you've built. So, take your time, build it right and enjoy many years of successful flights.

If you have built a model airplane in the past you will find that the Turbinator-2 goes together just as any other model airplane would with common materials and practices being used throughout the build. The kit comes complete with the necessary hardware, linkages and the landing gear.

You may speed thing up a bit by working on different sections of the airplane at the same time. In other words, while waiting for the glue to dry on the aileron hinges you can work on the rudder hinges etc....

Step 1) Open the box and inspect for damages. Contact us right away if anything is damaged.

2) This is the best time to tighten up the covering. Using your heat gun or iron go over all surfaces and insure that the covering is properly adhered to the structure.

3) Find the top of vertical stabilizer and the 10mm aluminum rod. This top half will be glued to the fuselage using 30 minute epoxy or Hysol. You can use tie wraps for clamps while the glue sets.

Dry fit the 2 parts together and insure proper alignment.

Apply masking tape over the seam and very carefully slice along the seam to separate the 2 halves. This will help keep the surface clean from excess glue that may run. Do not overload the epoxy. Use only enough to provide adequate adhesion.

Separate the 2 parts and apply the epoxy. Use the tie wraps to clamp the parts together while the epoxy cures.





Clean off excess epoxy before it dries with denatured alcohol. Remove the masking tape before the epoxy sets and clean the area as needed.

3) Locate the control ailerons, rudder and elevators along with the pin hinges for them.

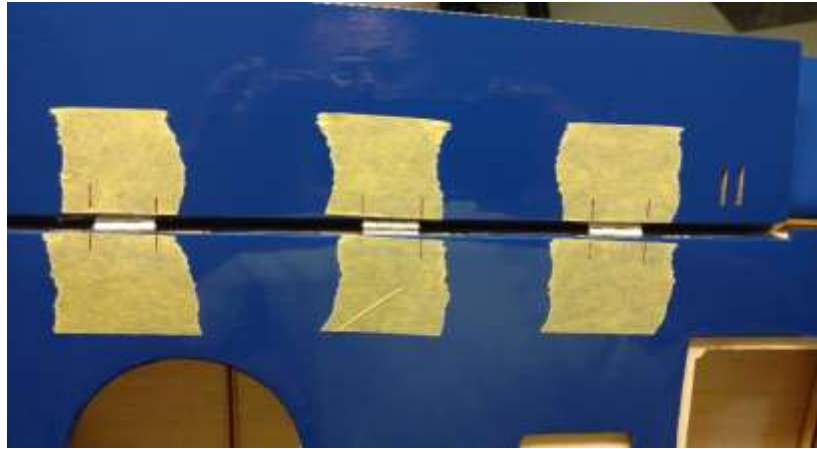
Check the fit of each hinge into the control surface. Also check the fit into the adjoining surface such as wings and stabs. Will need to remove a bit of the covering around holes as needed.

With slow set epoxy or Hysol, glue the hinges into the control surface first and let them dry completely before gluing to the corresponding wing or stab. Add a VERY SMALL drop of oil to the hinge pin prior to gluing to insure the glue doesn't bind the hinge. Do not get any oil on the shaft of the hinge. If you do clean it off with alcohol.



Periodically exercise the hinges while the glue is setting to insure they aren't sticking. Use SLOW SET epoxy during this operation.

You can install the Flap hinges at this time also using the flat hinges. Make sure the hinges are properly aligned with the slots before gluing.



Once the glue has set on the control surface you can then install the control surface onto their respective wing or stabilizer. Take great care and insure that you have proper alignment and that there is sufficient throws/travel on each control surface.

The Flaps should be set to allow for at least 70 degrees of deflection.

The Ailerons and Rudder should have $\frac{3}{4}$ inches of travel .

The elevator should have 1 inch of travel.

4) While the hinges are drying this is a good time to install servos on the servo covers. Find the covers for the flaps and ailerons. We recommend at least 150 in oz of torque for all servos. We are running Hitec 5645mg at 6 volts.

As an added security measure, I have added a layer of double sided tape to each hinge to help secure it to the cover. Although not necessary it certainly has saved me some headaches in various models over the years.

This is also a good time to install the servos in the fuselage for the Elevators and rudder.

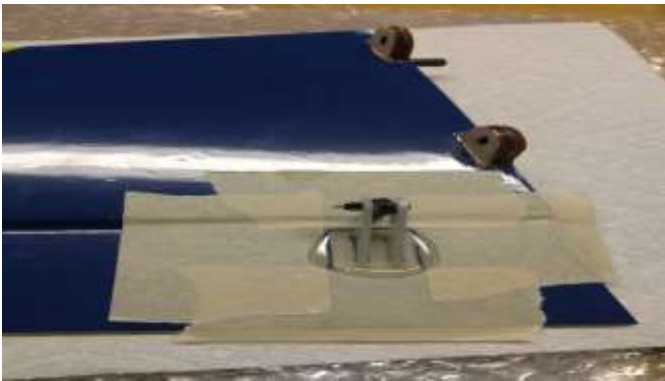


5) Control Horn installation:

The kit comes with composite control horns. You will need to trim the tabs on the horns to fit their respective control surface properly. Before gluing into the control surface lightly sand the horn to roughen it up a bit. This will help the epoxy to adhere to the horn.

When installing the horns be sure to install one of the provided ball links between the set of control horns while the glue is setting. This will insure proper alignment of the 2 horns during installation.

Prior to gluing the horns make sure you gently remove the covering under the backer plate. Do not cut into the wood. You can apply some thin CA to this area to stiffen it up a bit.



The Flap Control horns are installed facing the rear of the wing. Opposite of the aileron horns which face forward. This allow for proper clearance at full flap deflection.



6) Push Rod installation: Once all the control horns have been installed on all control surfaces you can begin installing the push rods. It is best power up your servos and make sure they are centered before installing the pushrods. This will save you from have to disconnect the rods later to insure the servos are centered. Make your mechanical adjustments as needed so that all surfaces are as close to center as possible.

The Flap servo should be centered, and the push rod set to the HALF FLAP position. Then you can adjust endpoints for the no flap and full flap position.

Half Flap 1 ½ inches from bottom of fuse



Zero Flap



Full Flap 2 ½ inches from bottom of fuse



Elevator and Rudder pushrods



7) While I have the wings on the bench I prefer to complete the installation of the gear and tip tanks at this time. I install the gear first and then the tip tanks. The gear is installed to the mounting blocks with 3mm blind nuts and screws. This will take some time but is better than wood screws which will come loose over time.

Install one blind nut at a time. If you try and install all 4 at once you run the risk of them not lining up properly. Again, this is where some patience will pay off.

I chose to modify the brake and retract leads to a standard servo connector. I used opposite ends of the connector to prevent confusion when hooking them up.

Main Gear installed with 3mm blind nuts.

Leads modified with servo connectors .



8) Tip Tank Installation:

The tip tanks are secured to the wing using 6mm aluminum pins. The pins are held in place by a 4mm screw on the bottom of the wing.

Install the pins in the wing and leave about half the pin extending from the wing.

Next you will epoxy the tip tank onto the pins. You may have to adjust the hole in the tip tank to insure a perfect alignment. This can be done with a drill bit and drill and auguring the block in the tip tank as needed.

Once you are satisfied with the alignment of the tip tank go ahead and apply epoxy to both the pin and the tip tank. Use masking tape or plastic wrap to insure you don't glue the tank to the wing. I used Hysol for this operation and let it set overnight.



Masking tape between tip tank and wing



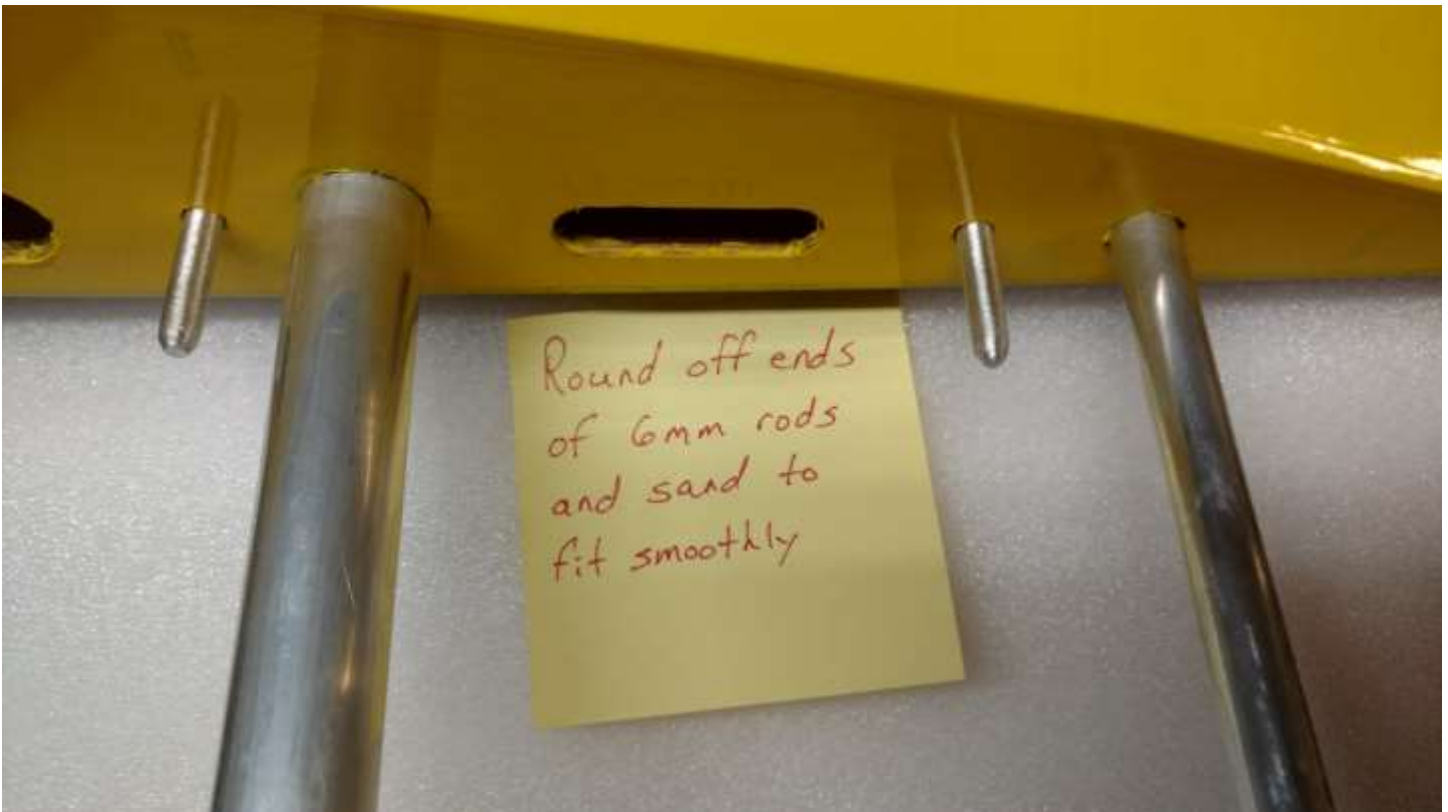
Masking tape clamps while the glue sets



9) Installing the wings onto the fuselage:

The wings slide over 2 aluminum rods and butt against the fuselage. They are held in place by two 6mm aluminum rods that protrude from the fuselage and are secured with 4mm screws from the bottom of the wing.

To allow for a smooth fit over the 6mm pins it is best to round off the ends of the 6mm pins and sand them as needed to make for a smooth fit.



Sanding the pins with 80 grit paper to allow for a smooth fit.



Once you are satisfied with the fit, grind a flat spot onto the 6mm rods where the screw contacts it.

This is an important step. **DO NOT SKIP THIS STEP.** This will help maintain the security of the wing in flight.

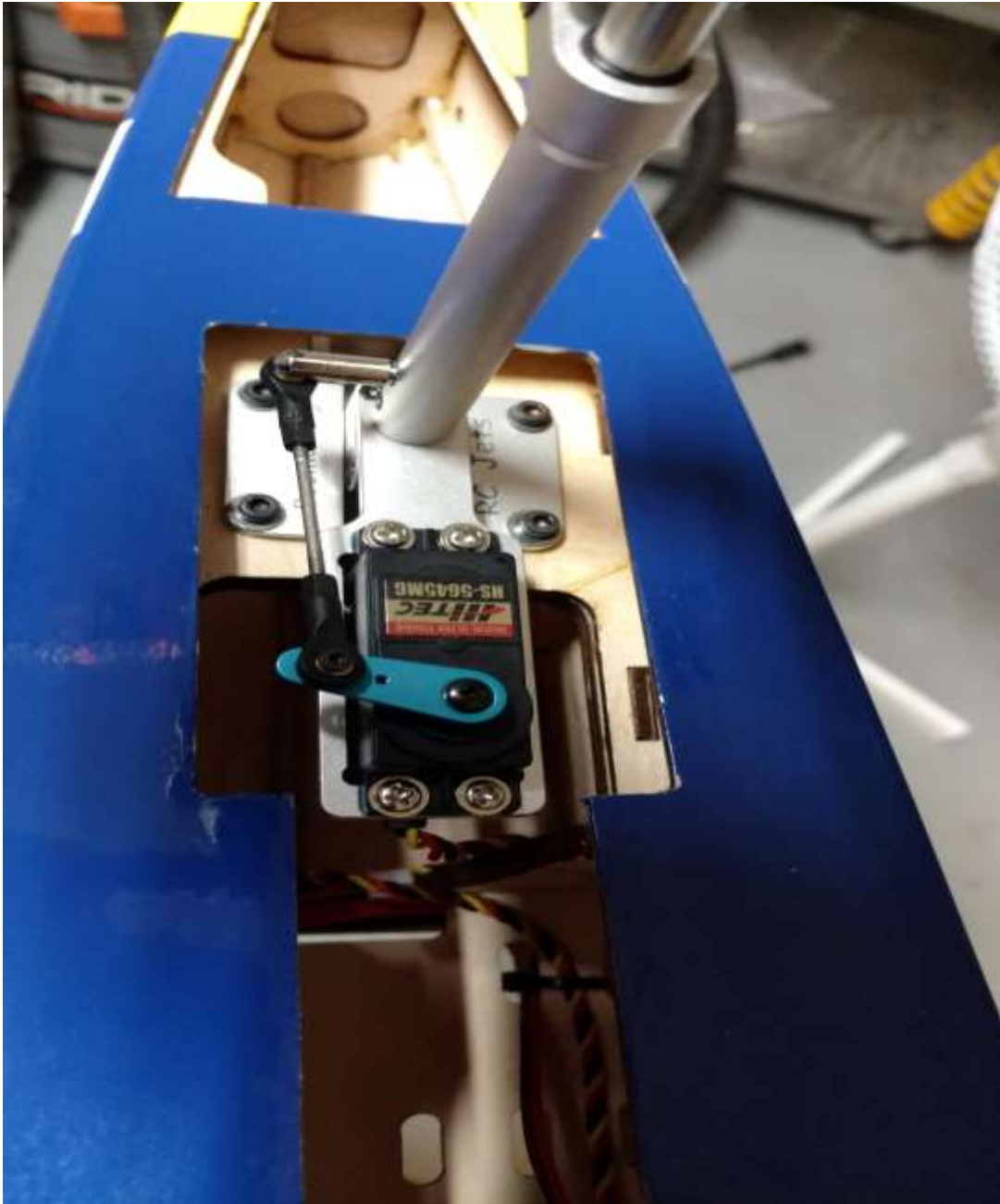
You do not have to crank down hard on the screws when assembling the wing for flight. Just snug pressure is enough to hold it.

10) Nose gear installation: We used 3mm blind nuts and screws to attach the nose gear. Once you've completed this step you can install the steering servo and linkage. You do not need full throw for the steering, In fact you'll only need about 40 percent of your travel at the maximum.

3mm blind nut



Nose Steering linkage



11) Turbine installation: The Turbinator-2 was designed around the Swiwin 60 but will accommodate other turbine brands in the 60 to 80 class of turbines. We have also flown it on a wren 44.

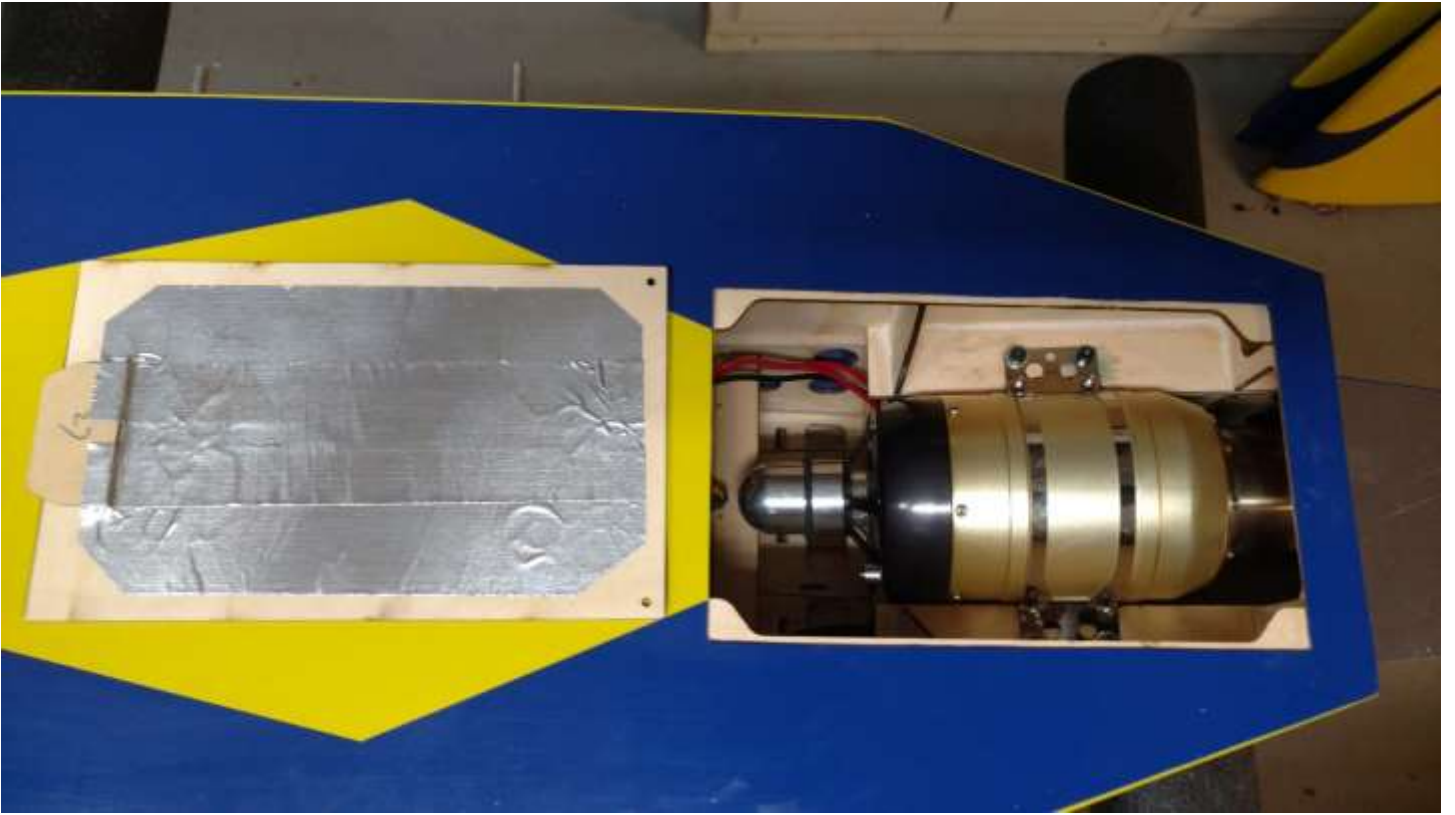
When installing your turbine make sure the tail cone is protruding out the back of the fuselage a few millimeters. Install the turbine of your choice according to the manufacturer's instructions.

Mounting rails are installed using Hysol adhesive

Swiwin 60 installed with 3mm blind nuts

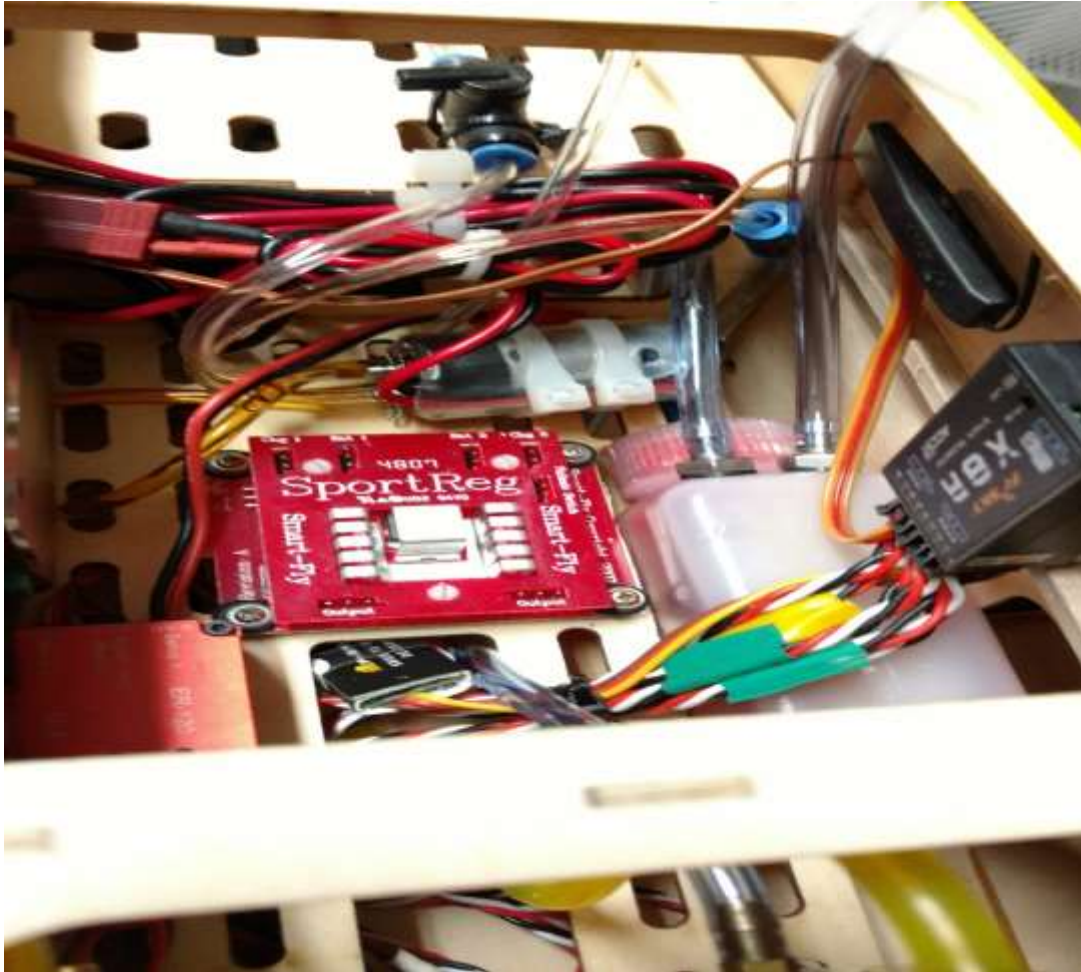


Aluminum Heat Tape installed on engine bay cover.

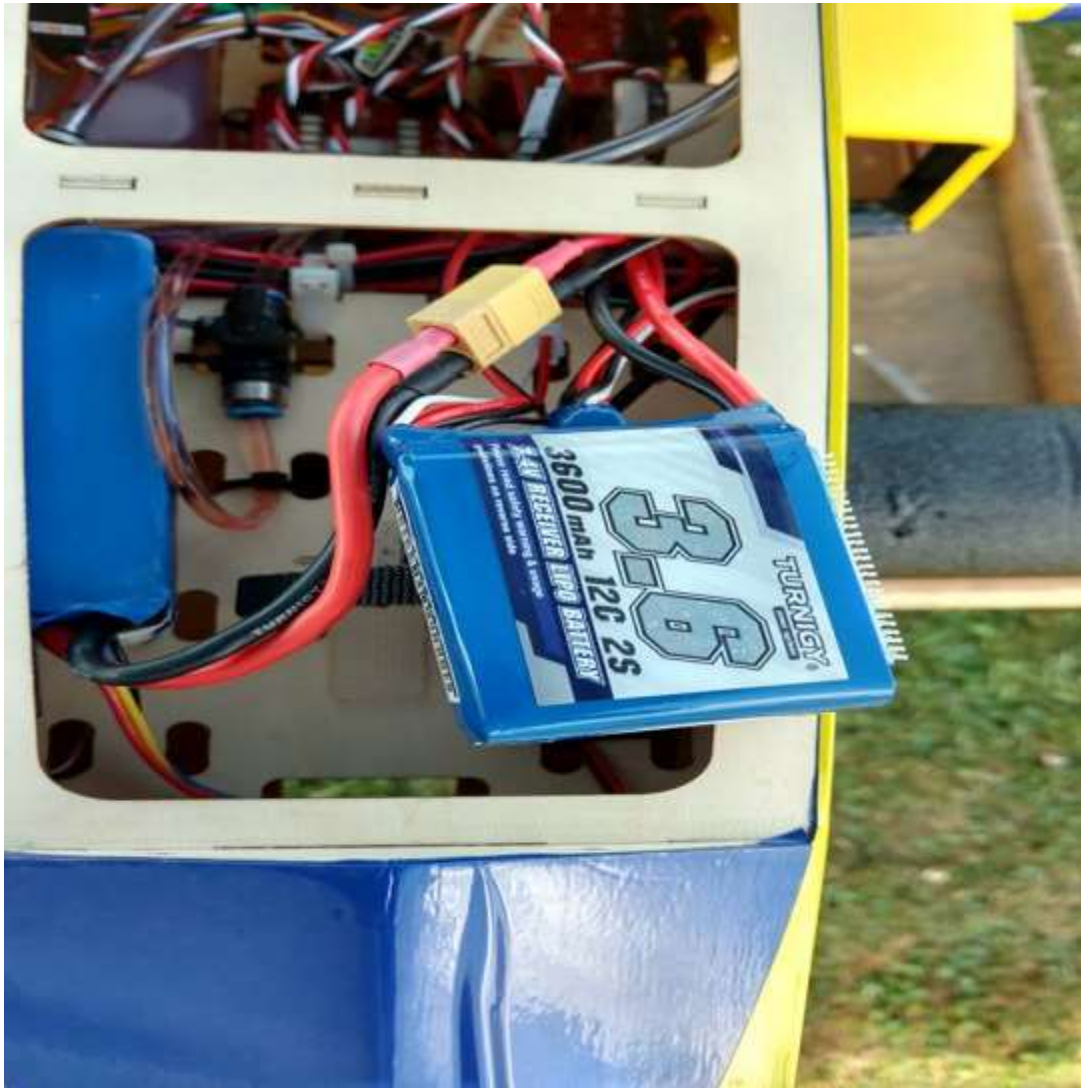


12) Component installation: Each builder has their own preference of how they like to install the various components. Here are a few pictures of how I chose to install my equipment.

I am using a Hanson 4 ounce UAT, a Smart Fly Voltage regulator, Swiwin ECU and the landing gear controller. I have 3 batteries on board. The ECU battery is a Turnigy 3s LiPo and the Receiver batteries are Turnigy 2s LiPo. I use the receiver batteries to power the landing gear controller at 6v by running a simple Y connector from the regulator.







Fuel Tank: The Turbinator-2 will accept a wide range of fuel tanks. Pictured here is the partitioned composite fuel tank with 70 ounces of fuel and 30 ounces of smoke oil capacity. The fuel tank is not included with the kit and can be purchased separately through Boomerang RC Jets.

With 70 ounces of fuel we experience 8 minute flights with plenty left in reserve.

A Dubro 60-ounce tank will also work great and it is the tank we flew the prototype on. It's a great inexpensive tank that will still allow for 7-minute flights with reserve.

Be sure to set the tank on the CG location when installing it. The CG is 5.75 inches from the leading edge of the wing.

For tank venting we used a piece of 1/8 inch brass tubing out the bottom of the fuselage. We installed a balsa block to help secure it. The Smoke tank is vented the same way but is cut almost flush to the fuse to prevent confusion when connecting your taxi tank.

Turbinator-2
Control Throws
Weight & Balance

Center of Gravity is located 5 ¾ inches aft of the wing leading edge at the fuse. Approximately 1 pound of nose weight will be required to achieve this balance.

The CG balancing is performed with the gear up and the UAT full.

Empty Weight = 17.5 lbs.

Full Fuel (70 ozs) = 21 lbs

Full Smoke oil (30 ozs) approx. 23lbs

All weights are approximate.

Control Throws:

Ailerons = 5/8 inches up and down with 40 percent expo

Elevator = 7/8 inches up and down with 40 percent expo

Rudder = 5/8 inches left and right with 40 percent expo

Flaps: ½ flap = 1 ½ inches down at trailing edge from the bottom of fuse.

Full Flap = 2 ½ inches down from the bottom of fuse.

You can adjust these settings to your personal taste as you gain familiarity with the airplane and it's flight characteristics.

Flight tips: On Takeoff use half flaps and insure a positive rate of climb before retracting the flaps and gear. The aircraft will accelerate briskly.

Landing: The Flaps are very effective and will slow the airplane down very quickly. Carry power throughout your approach until you are sure of making the runway. I maintain about 1/3 rd power until final and then adjust power according to wind conditions.

Maintain a nose down attitude during approach. Keep in mind the flaps will slow the airplane and a nose high attitude during landing could result in the airplane becoming too slow.

Enjoy Your flight!