SPEED FREAK

E-OUTLAW

High Speed Delta Wing ARF



EXTREME FLIGHT

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Thanks for your purchase of the Speed Freak Outlaw Delta wing ARF. Designed by 9 time NCFFA champion Jerry L. Smith of Paducah Kentucky, the Outlaw is a very unique high performance aircraft that possesses a very wide flight envelope and is capable of some very interesting maneuvers unique to this design. Jerry has been flying this aircraft on the air show circuit for several years now and it always gets the crowd fired up and asking "where can I get one?" Previously the Outlaw was available in a short kit and it required a bit of time and modeling skill to assemble properly. The Outlaw features a progressive airfoil that transitions between the root and tip rib and also has anhedral built in. Noted aerodynamicist Robert Vess assisted Jerry with the design and this unique airfoil and planform are part of what makes the Outlaw perform as it does. It also made the Outlaw difficult to build correctly for most modelers. Extreme Flight engineers spent many hours perfecting the construction and assembly of this aircraft and tested many prototypes to make sure the Outlaw ARF lived up to Jerry's expectations, while making it easy for the average modeler to assemble. For most modelers the Outlaw ARF can be assembled and ready for flight in a couple of evenings.

We are very excited to release the Outlaw in a dedicated electric version as the first model in the new Speed Freak lineup. The design has been modified to allow for easy installation of electric power systems and a spring loaded hatch allows instant access to your battery and the aircraft interior. The Outlaw requires 2 standard size metal geared servos with 100+ oz./in. of torque for the elevons and a metal geared mini servo for the rudder. The recommended Xpwr power system provides incredible performance on 6S Lipo power (2700-3800 mah suggested).

The Outlaw is a very unique aircraft and we are honored to have worked with Jerry to bring it to market. The only thing more fun than flying an Outlaw is flying several of them together with your buddies! Thanks again for your purchase, now let's get on with the assembly and get this thing in the air!



Tips for Success-Please read before beginning assembly!!!

1. Read the instruction manual thoroughly before starting assembly.
2. We are very pleased with the level of craftsmanship exhibited by the workers in our factory. However, these are mass produced models. As with any ARF, take a few minutes to go over the model and add CA to high stress areas such as the firewall, servo mounts or any joints that appear to need more glue.
3. Take a few minutes and go over the covering with a hot iron. Make sure all edges are sealed and pay special attention to thin stripes.
4. **Decals-** clean your airplane with glass cleaner and a paper towel before starting to apply the decals. Mist the area where the decal will be applied with glass cleaner or water mixed with a little bit of soap. Use scissors to remove the decal from the sheet. For best results cut as close to the edges of the decal as possible. Position the decal in place and use a credit card or rubber squeegee to push the excess liquid from under the decal and allow to dry. You may need to secure the edges of the decal with masking tape to prevent them from rolling up until the solution has dried and evaporated.

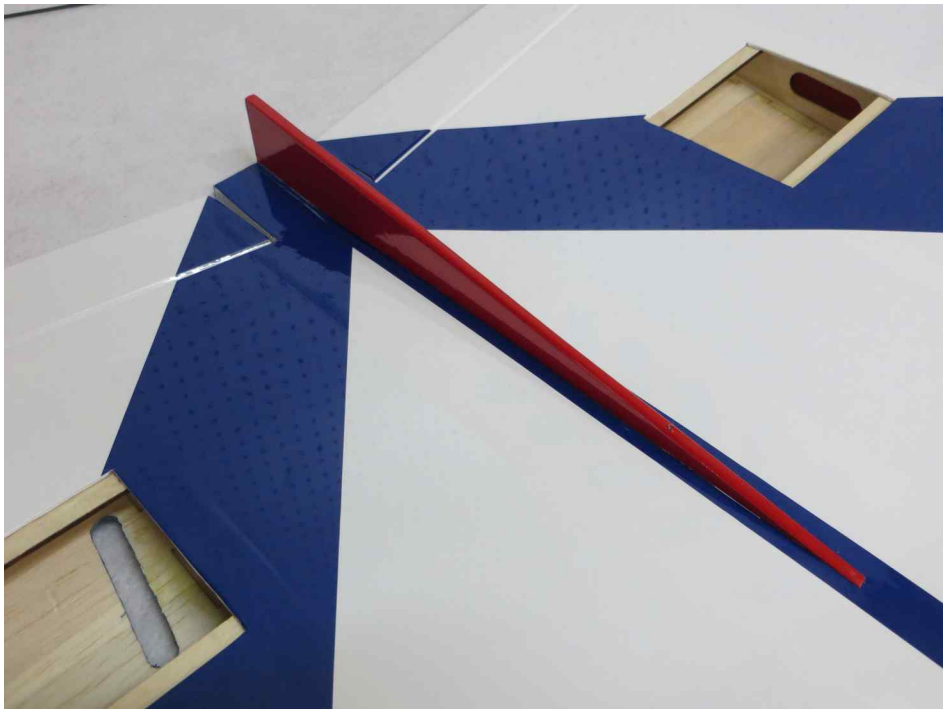
Items required for assembly and completion:

30 minute epoxy
Thin and medium CA
Assortment of screwdrivers and ball drivers
Electric drill with assortment of bits
Electric power system (Xpwr T3520 and Airboss ESC highly recommended)
2 High torque metal geared servos (100+ oz. in) for elevon actuation
1 Metal geared mini servo for rudder actuation (Hitec 5245, 7245, etc.)
Dubro Super Strength XL servo arms
12 inch servo extension for ESC lead to receiver.
Prop for your motor (For the T3520 we recommend APC 9x7)
52mm EF spinner
Adhesive backed Velcro
Velcro battery strap.

Assembly

1. First let's install the lower vertical fin. It's much easier if this is installed before gluing on the upper vertical fin and rudder. Test fit the fin in position. Glue the lower fin in place with 30 minute epoxy, making sure it is aligned properly.

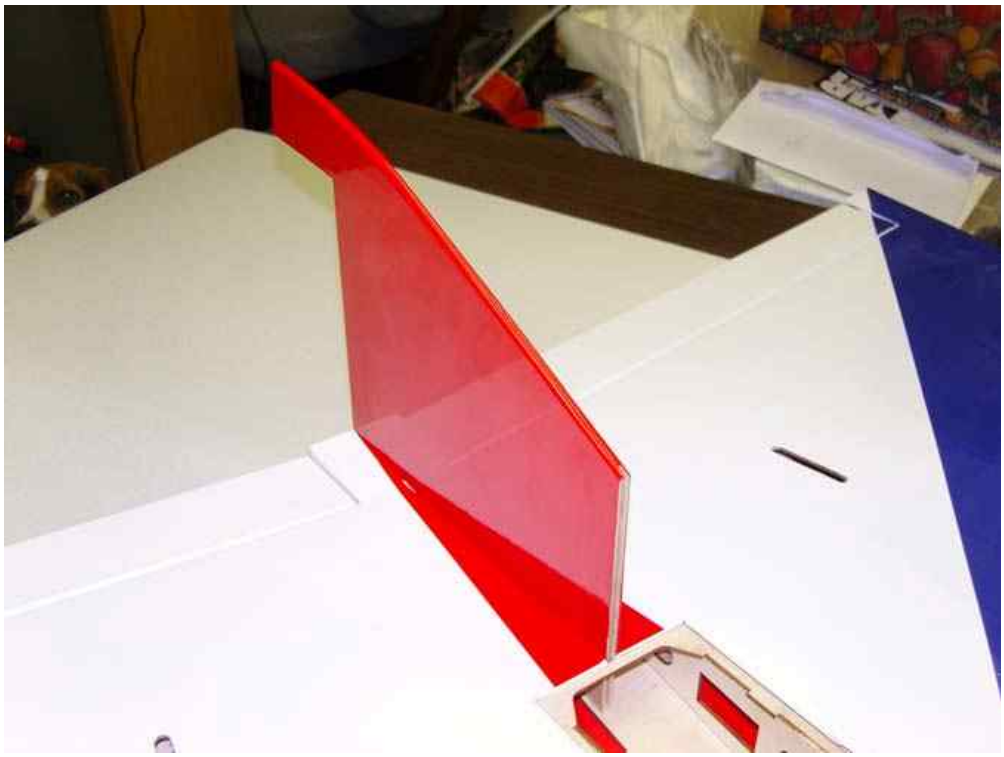




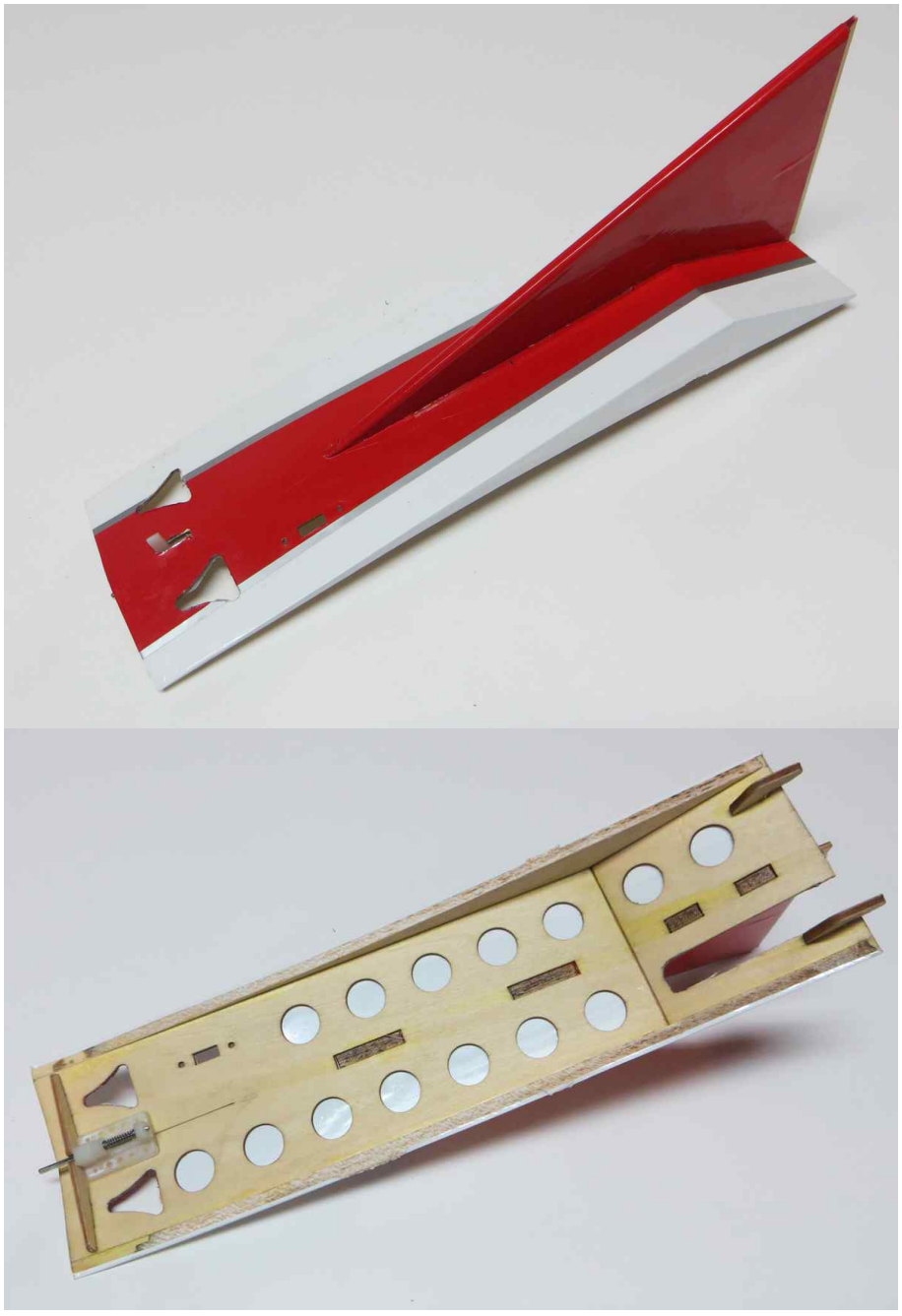
2. Once the lower stab is dry, flip the wing over and we'll install the top vertical fin.



3. The vertical fin has a series of tabs and notches to add rigidity and allow for easy alignment of the vertical fin. Trial fit the fin in place to insure proper alignment. Once satisfied glue the fin in place with 30 minute epoxy. Check from several angles to make sure the vertical fin is properly aligned and square to the wing.



4. Next let's assemble the forward portion of the vertical fin and top hatch. Use a sharp hobby knife and metal straight edge to remove the covering from the top of the hatch where the forward portion of the vertical fin will mount.
5. Glue the forward portion of the vertical fin to the hatch with 30 minute epoxy, making sure the fin is perpendicular to the top of the hatch. Trial fit before gluing and it is also a good idea to test fit the fin/hatch to the aircraft to be sure the tongue and groove portion is properly aligned with the fixed portion of the vertical fin. It is also a good time to remove the covering over the NACA air ducts in the forward section of the hatch. This will allow additional cooling air to enter the battery compartment.



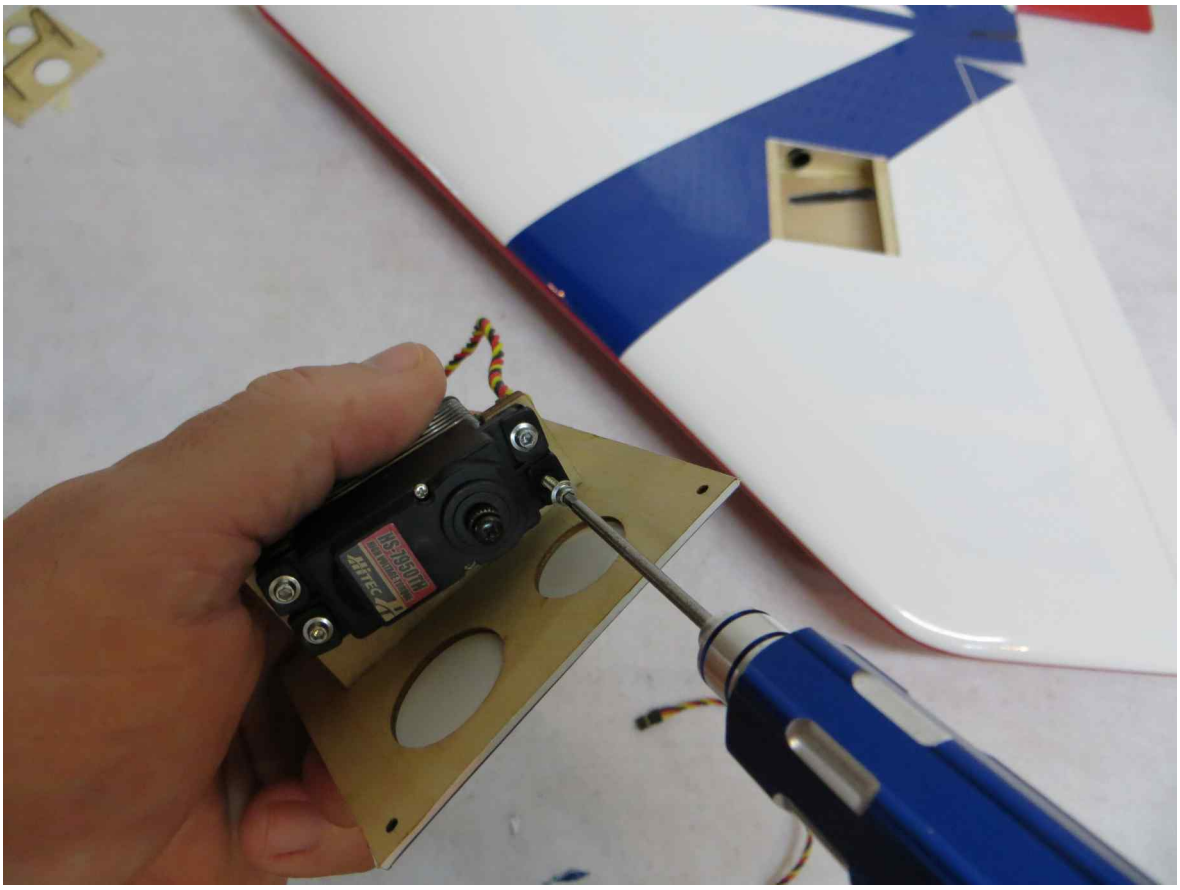
6. Slide the elevons into position and onto the hinges and secure with thin CA. Make sure to center the hinges in their slot before gluing, and leave enough of a gap to ensure maximum deflection. Once dry seal the hinge gap with a strip of covering or Blenderm tape.



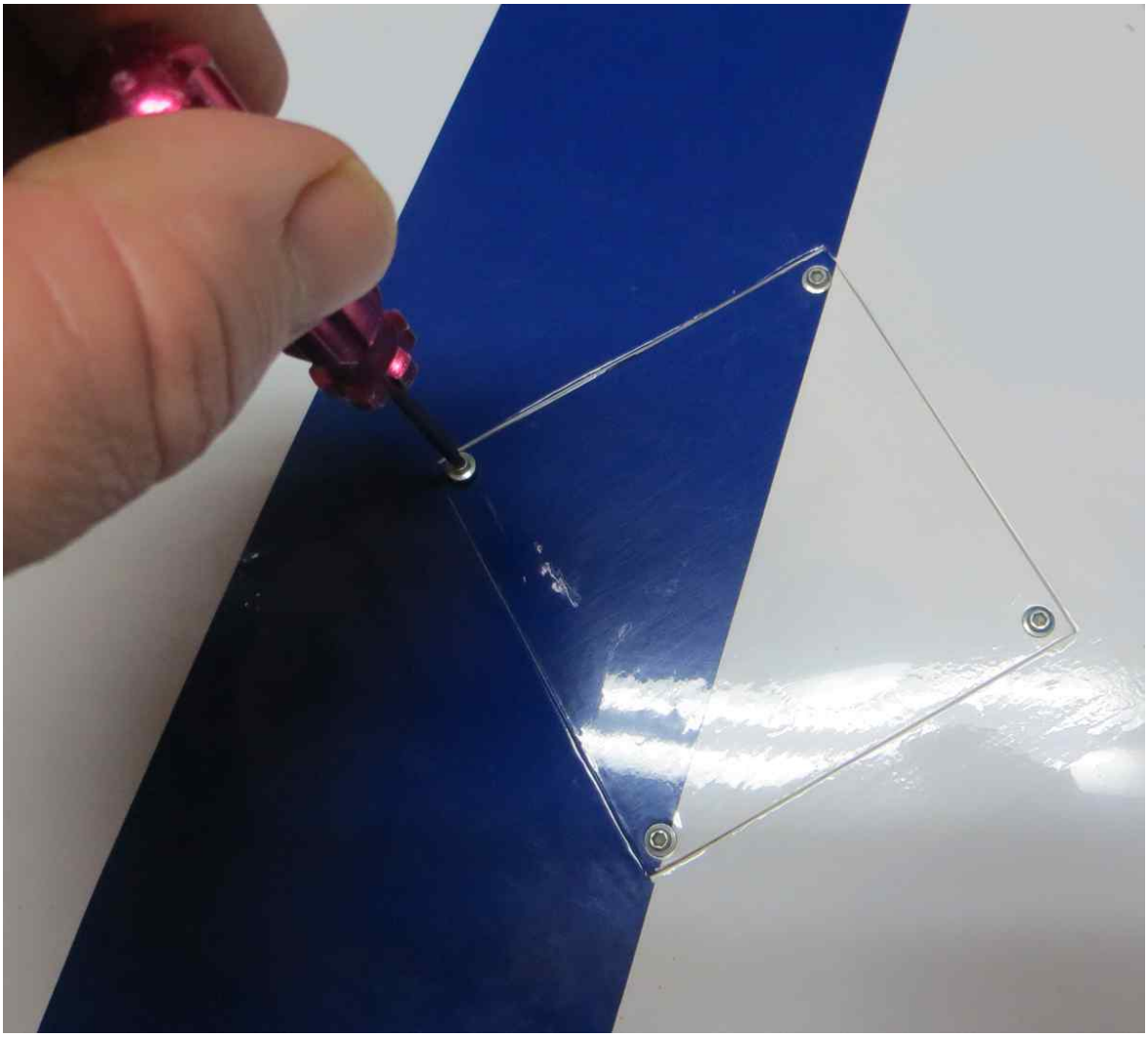
7. Slide the rudder into position on the hinges and secure with thin CA, again leaving enough gap to allow for maximum deflection. Make sure to install the bottom hinge that glues into the lower vertical fin. Seal this hinge line as you did for the elevons.



8. Electronically center your servos and place the servo arms on the output shaft and secure with the supplied screws. We highly recommend the use of the Dubro XL Super Strength servo arms for best alignment with the opening in the top of the wing. Use the manufacturer supplied hardware to mount your servos to the servo hatches. Pay close attention here to the pictures to make sure you mount the servo properly or it will not fit into the wing. The output shaft is oriented toward the rear of the plane.



9. Place the servo hatch into position, being sure to route the servo wire into the radio compartment through the fiberglass tube that is pre-installed in the wing. Secure the hatch with the provided screws, one at each corner. I highly recommend installing the screws then removing them and the hatch and putting a single drop of thin CA into each hole to harden the threads. You may find that you need to enlarge the width of the servo arm slot in the top of the wing slightly to accommodate different makes of servo. This is easily done with a rotary tool and ¼" sanding drum attachment. Again the Dubro Super Strength servo arms work best here.



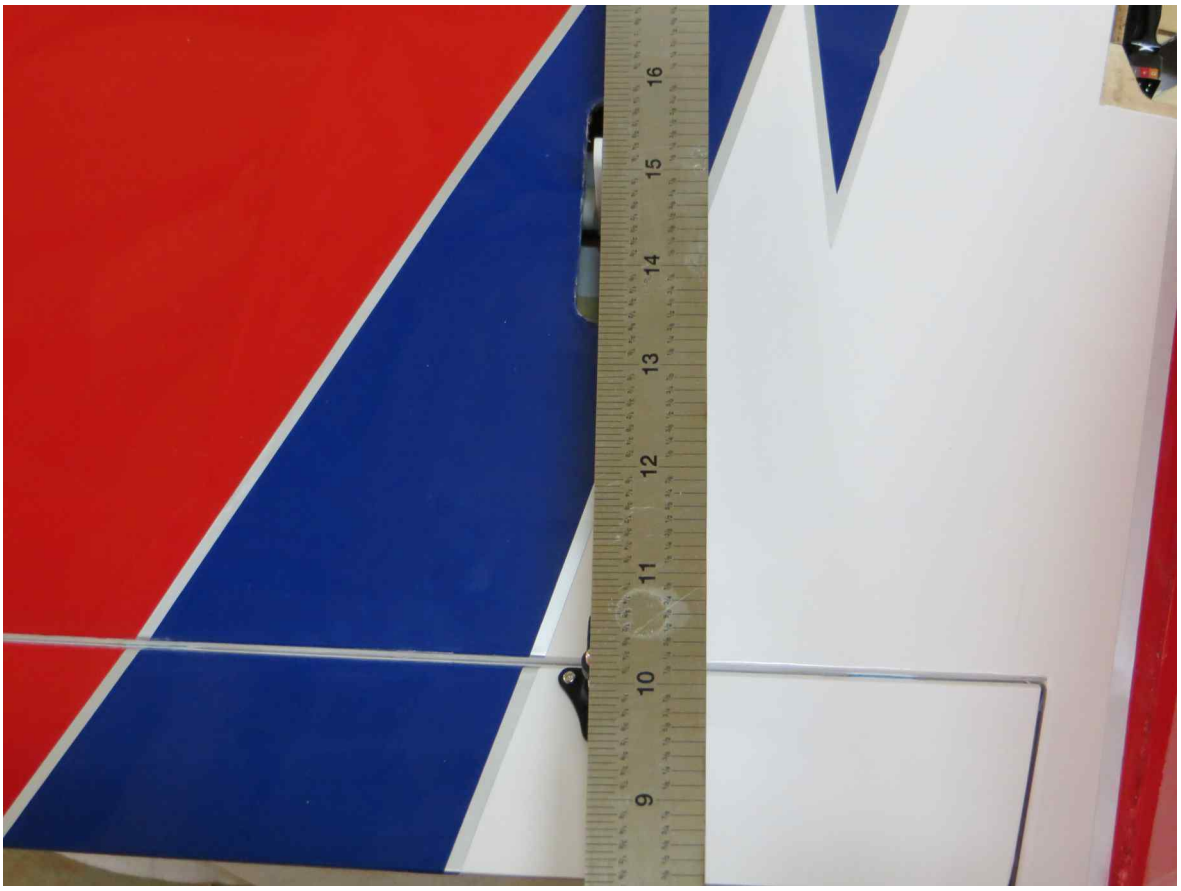
10. Use the manufacturer supplied hardware to mount the rudder servo in the interior wing rib as shown with the output shaft toward the front of the plane.



11. Now let's install the control surface linkages. Locate the 3 sets of triangle shaped control horns and bases, pushrods, ball links, clevises and screws.

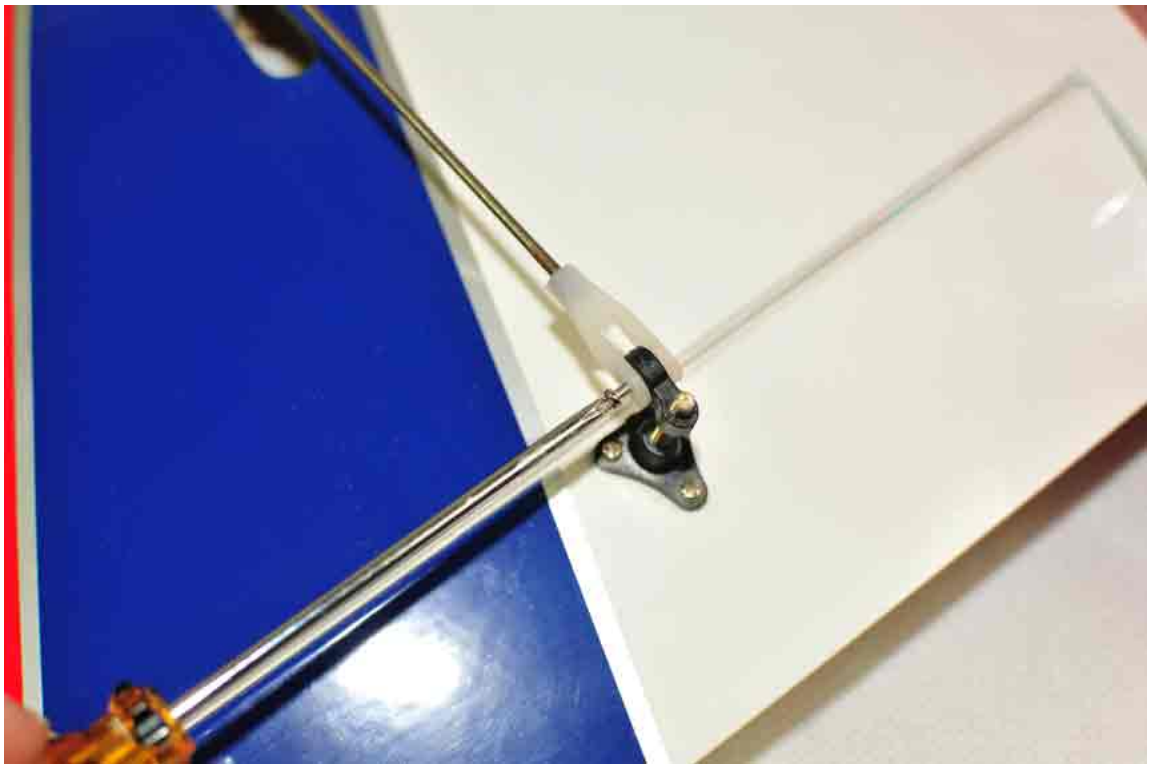


12. Use a straight edge aligned with the protruding servo arm to determine location for the elevon control horns to be mounted. Place the triangle shaped horn in place and drill through the control surface at the location of the 3 holes. Use the provided screws to secure the control horn to the surface and thread them into the base plate on the bottom of the surface. Make sure to position the horn so that the pivot point of the linkage is directly over the hinge line.





13. Thread a clevis onto one end of the pushrod and a ball link onto the other end. Secure the clevis to the control horn with the provided screw and secure the ball link to the servo arm with the 2mm bolt and nut. The distance from the hinge line to the pivot point should be the same as the distance from the servo output shaft to the location of the ball link on the servo arm for best mechanical set-up. Screw the connector down on the threaded horn to the proper position.



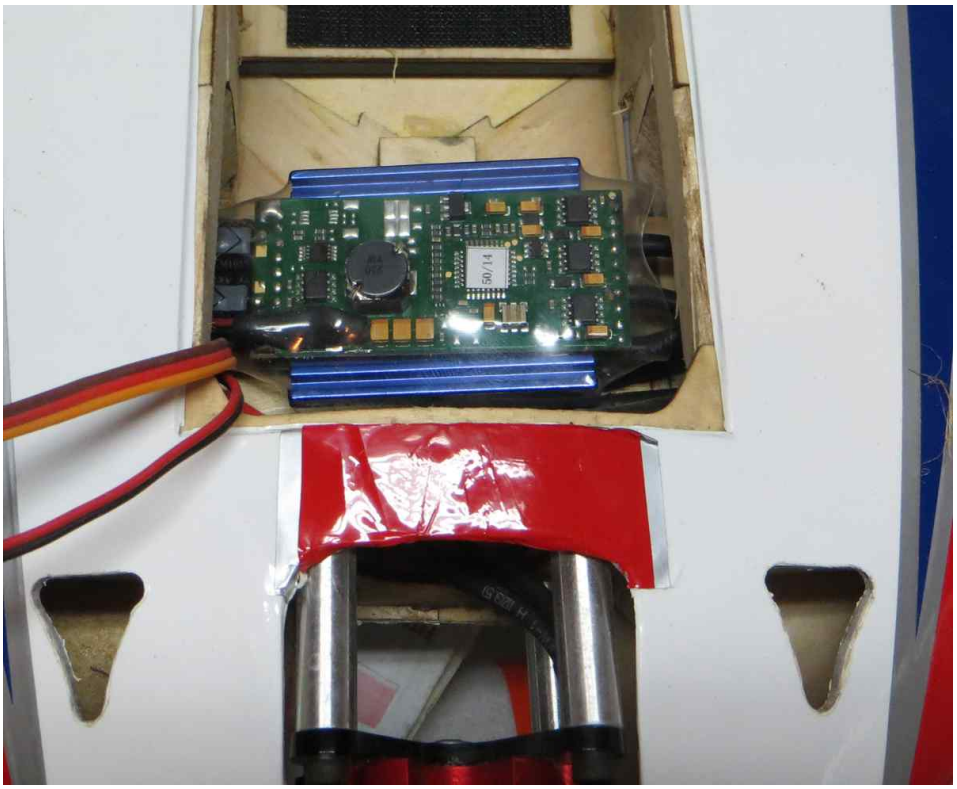
14. The rudder linkage assembles and is installed the same way. Screw in the control horn connector so that the linkage does not interfere with the movement of the elevons and cut off the excess portion of the bolt.



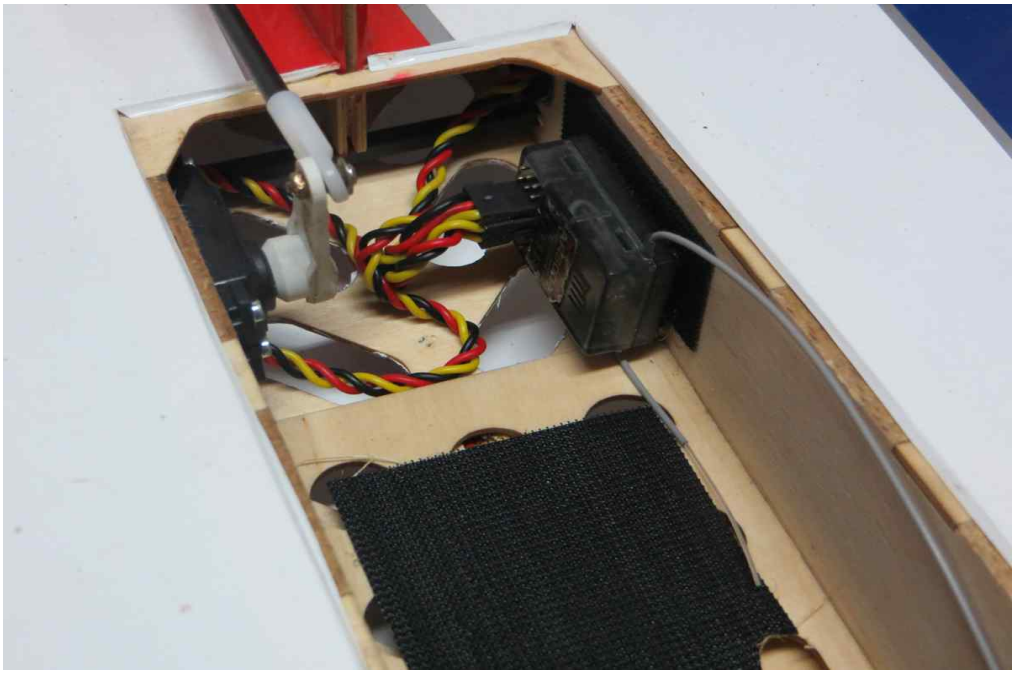
15. Now let's mount the motor. If using the recommended Xpwr T3520 the supplied aluminum standoffs will make installation a breeze. Other makes of motor may require different length standoffs. Locate the motor mount package within the hardware kit which will include 4 long black 3mm socket head cap bolts, 4 nylon insert locknuts, 4 aluminum standoffs and 4 washers. After mounting the prop adapter and X mount to the motor (blue Loctite on ALL bolts!) insert the 4 3mm bolts through the holes in the X mount, through the aluminum standoffs and through the holes in the firewall. Secure on the back side of the firewall with the washers and locknuts. It is also a good time to remove the covering from over the laser cut NACA ducts on each side of the motor compartment.



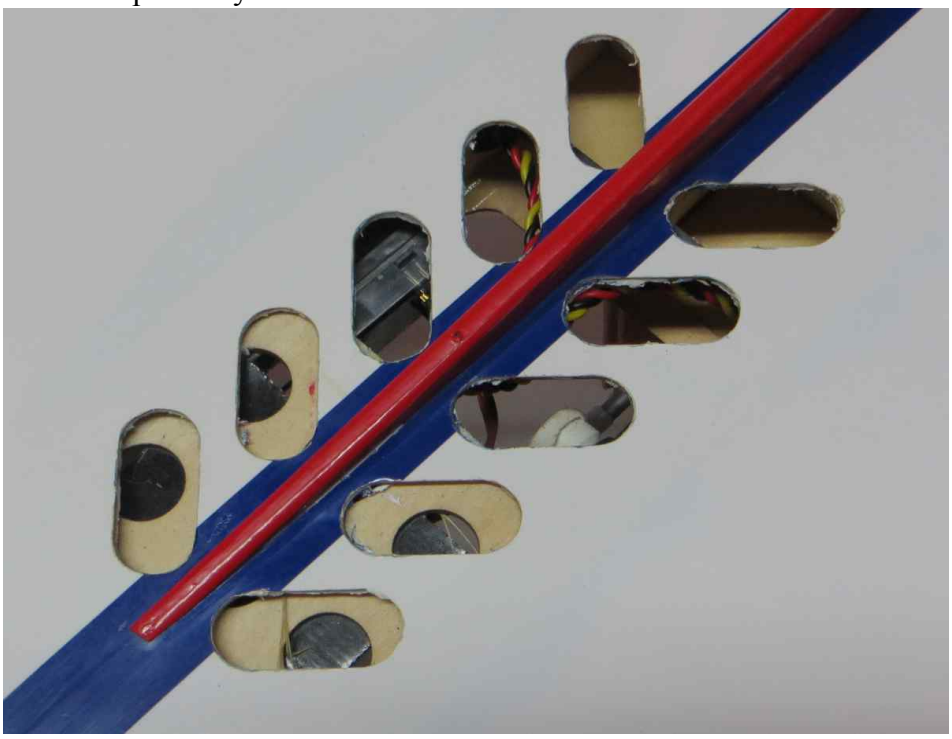
16. Install the ESC on the tray behind the motor with double sided tape or Velcro as shown.



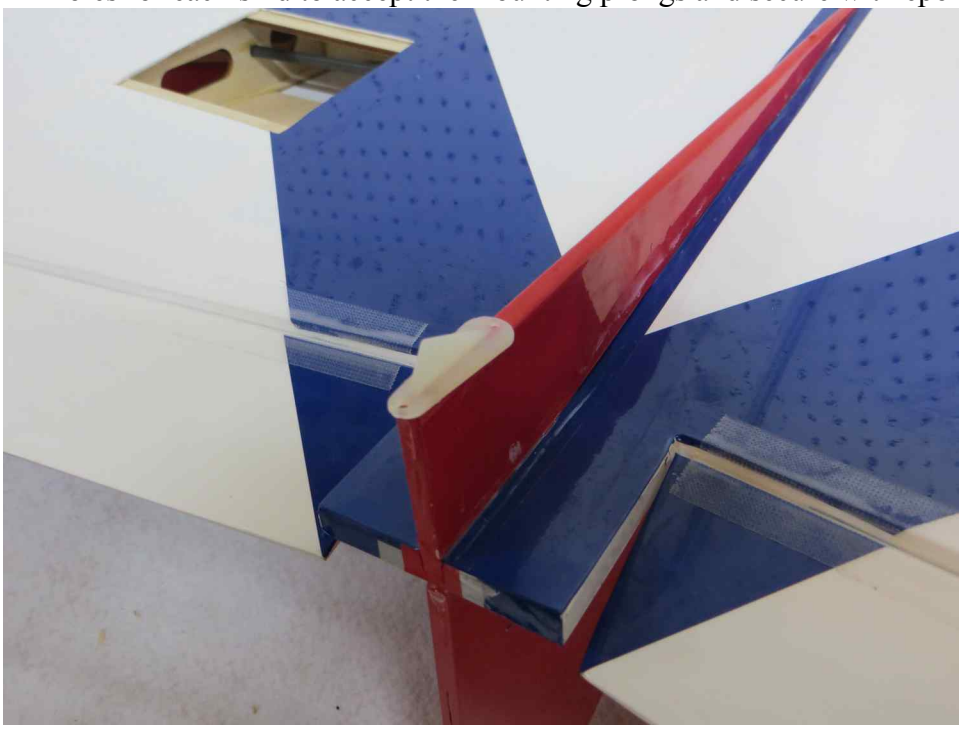
17. Here is a picture showing where we installed our receiver. There is plenty of room in the rear of the interior to install your receiver as you see fit.



18. Use a sharp hobby knife or soldering iron to remove the covering over the air exit holes on the bottom of the wing. This is very important to insure proper cooling of the power system.



19. There are 4 nylon skids included in the hardware package. These are to be installed to help protect the bottom of the Outlaw during landing. Please see the photos below to show where they are to be installed. The smallest of the 3 skids is to be installed on the bottom of the fin just in front of the rudder hinge line, two at each wing tip and one just behind the motor compartment as shown. Drill two holes for each skid to accept the mounting prongs and secure with epoxy.







20. Apply a strip of adhesive backed Velcro to the battery tray and secure your battery with a Velcro strap. Make sure it is secured well!!

This completes the assembly process!

The CG range for the Outlaw is 11.75 inches to 12.25 inches measured forward from the rear edge of the center fixed portion of the trailing edge of the wing.
Control surface throws are as follows:

	Low rate	High rate	Exponential
Elevons:	**15 degrees**	**45+ degrees**	**30% low rate 80% high rate**
Rudder:	**20 degrees**	**45+ degrees**	**45% low rate 90% high rate**

I highly recommend starting on low rates for the first few flights until you get used to the aircraft. It is very responsive on high rates and may scare the heck out of you if you are not prepared! On high rates the roll rate is a blur so make sure you are several mistakes high when trying out high rates for the first time. To launch, have a friend hold the Outlaw with both hands at the wing tips and advance the throttle to wide open. Have your friend push the aircraft forward gently, releasing at about a 25 degree angle. When the battery is depleted, glide the Outlaw in for a smooth landing, preferably on soft grass. Thanks again for your purchase of the E-Outlaw ARF! See ya at the flying field!