EXTREME FLIGHT

120cc SLICK 580 ARF

Assembly Manual



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Please take a few moments to read this instruction manual before beginning assembly. We have outlined a fast, clear and easy method to assemble this aircraft and familiarizing yourself with this process will aid in a quick, easy build.

Please read the following paragraph before beginning assembly of your aircraft! THIS IS NOT A TOY! Serious injury, destruction of property, or even death may result from the misuse of this product. Extreme Flight is providing you, the consumer, with a very high quality model aircraft component kit, from which you, the consumer, will assemble a flying model. It is beyond our control to monitor the finished aircraft you produce. Extreme Flight RC will in no way accept or assume responsibility or liability for damages resulting from the use of this user assembled product.

This aircraft should be flown in accordance with the AMA safety code. It is highly recommended that you join the Academy of Model Aeronautics in order to be properly insured and operate your model at AMA sanctioned flying fields only. If you are not willing to accept ALL liability for the use of this product, please return it to the place of purchase immediately.

Extreme Flight RC, Ltd. guarantees this kit to be free of defects in materials and workmanship for a period of 30 DAYS from the date of purchase. All warranty claims must be accompanied by the original dated receipt. This warranty is extended to the original purchaser of the aircraft kit only.

Extreme Flight RC in no way warranties its aircraft against flutter. We have put these aircraft through the most grueling flight tests imaginable and have not experienced any control surface flutter. Proper servo selection and linkage set-up is absolutely essential. Inadequate servos or improper linkage set up may result in flutter and possibly the complete destruction of your aircraft. If you are not experienced in this type of linkage set-up or have questions regarding servo choices, please contact us at info@extremeflightrc.com or 770-887-1794. It is YOUR responsibility to ensure the airworthiness of your model.

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Congratulations on your purchase of the Extreme Flight RC 120cc Slick 580 EXP! Designed by Extreme Flight and developed by Jase Dussia, the Slick 580 was conceived as a no holds barred, no excuses all out Freestyle competition machine. The first prototypes were sent directly to the Dussia's in Michigan in the Summer of 2016. The aircraft were assembled, setup and dialed in. A few short weeks later Jase won the 2016 Clover Creek Invitational Freestyle competition with his new Slick! After the contest further testing was conducted and minor tweaks were made to the airframe to improve strength while reducing weight. Extreme Flight returned to China in November 2016 to oversee the implementation of the final changes and tweaks. Now the Slicks are here, and ready to usher in a new era in 120cc Aerobatic performance!

The new Slick 580 is a masterpiece of integrated carbon and composite reinforced balsa airframe design. Strong, rigid and lightweight with a state of the art aerodynamic package, the Slick excels at XA, 3D and precision aerobatics and is probably the fastest rolling giant scale aerobatic plane in existence. Extreme Flight and Jase evaluated various airfoils, multiple wing planform details, several rudder designs, and more to maximize all these characteristics. Highly stylized with flowing lines and curves reminiscent of a composite airframe, the Slick 580 is simply gorgeous. Currently available in 2 Arron Bates designed ultra modern Ultracote color schemes, the Slick will also be available in Jase's printed competition scheme very soon.

The Slick ships with a complete hardware package that is competition proven and exactly what Jase uses in his models. It also includes a set of engine baffles that can be trimmed to accommodate most makes of 100-120cc engines. Rig out your model just like Jase's with our line of Xcessories including Flowmaster tanks, EF fuel dots, 20 AWG twisted servo extensions, high quality aluminum servo arms, MKS servos and DA engines.

If you are looking for the pinnacle of competition level ARF aircraft, here it is!

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Items needed for completion:
Hobby knife with #11 blades
30 minute epoxy. Pacer Z-Poxy has worked very well for us for many years
Blue and Red Loctite
Electric drill with an assortment of drill bits
Small flat head and Phillips head screw drivers
Standard and needle nose pliers
Side cutters
Metric ball driver or allen key set. (especially 2.5 and 4mm drivers)
Sanding block and sandpaper
Extreme Flight Servo Mounting Screws
7 500oz (min) torque metal gear servos (8 servos if you use 2 rudder servos) 1 x standard size servo for the throttle
4 x Extreme Flight 1.5" single aluminum Servo Arms for the ailerons
2 x Extreme Flight 2" single aluminum arms for the elevators
1 x Extreme Flight 1.5" single aluminum servo arm for rudder if using single rear mounted servo
1 x Extreme Flight 4" double offset aluminum arm for the rudder if using pull pull rudder setup.
2 x 6" Extreme Flight 20 AWG Servo Extensions for inboard aileron servo
3 X 24" Extreme Flight 20 AWG Servo Extensions (2 outboard ailerons 1 for throttle)
3 x 48" Extreme Flight 20 AWG Servo Extensions elevators and rear mounted rudder servo.
2 x Extreme Flight multi-plug sets (optional but a great convenience)
5" Spinner
85cc-120cc gas engine and recommended prop and mufflers/canisters/pipes
Blazing Star DA 120cc engine mount
EF Flowmaster 34 ounce fuel tank and tubing, EF FUEL DOT.
Receiver, batteries, switches

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Tips for Success:

1. Before starting assembly, take a few minutes to read the entire instruction manual to familiarize yourself with the assembly process.

2. Go over all the seams on the aircraft with a covering iron on a medium heat setting. Also, due to climate changes, wrinkles may develop in the covering. These are easily removed with a little bit of heat. Use a 100% cotton tee-shirt or microfiber cloth and your heat gun and heat the covering while gently rubbing the covering onto the wood with the cloth. Be careful not to use too much heat as the covering may shrink too much and begin to lift at the edges. Take your time, and a beautiful, paint-like finish is attainable.

3. Apply CA to high stress areas such as servo mounting trays, landing gear mounts, anti-rotation pins, wing and stab root ribs, wing mounting tabs and motor box joints etc.

4. By the time your aircraft arrives at your door step, it will have been handled by a lot of people. Occasionally there are small dings or imperfections on some of the surfaces. An effective method to restore these imperfections to original condition is to use a very fine tipped hypodermic needle and inject a drop of water under the covering material and into the ding in the wood. Apply heat to the area with a sealing iron and the imperfection will disappear. Deeper marks may require that this process be repeated a couple of times to achieve the desired result, but you will be surprised at how well this technique works.

5. Use high quality, fresh epoxy for installing the composite control horns and hinges. We highly recommend Pacer Z-Poxy 30 minute Epoxy. We are very pleased with the results and ease of application and cleanup of these products.

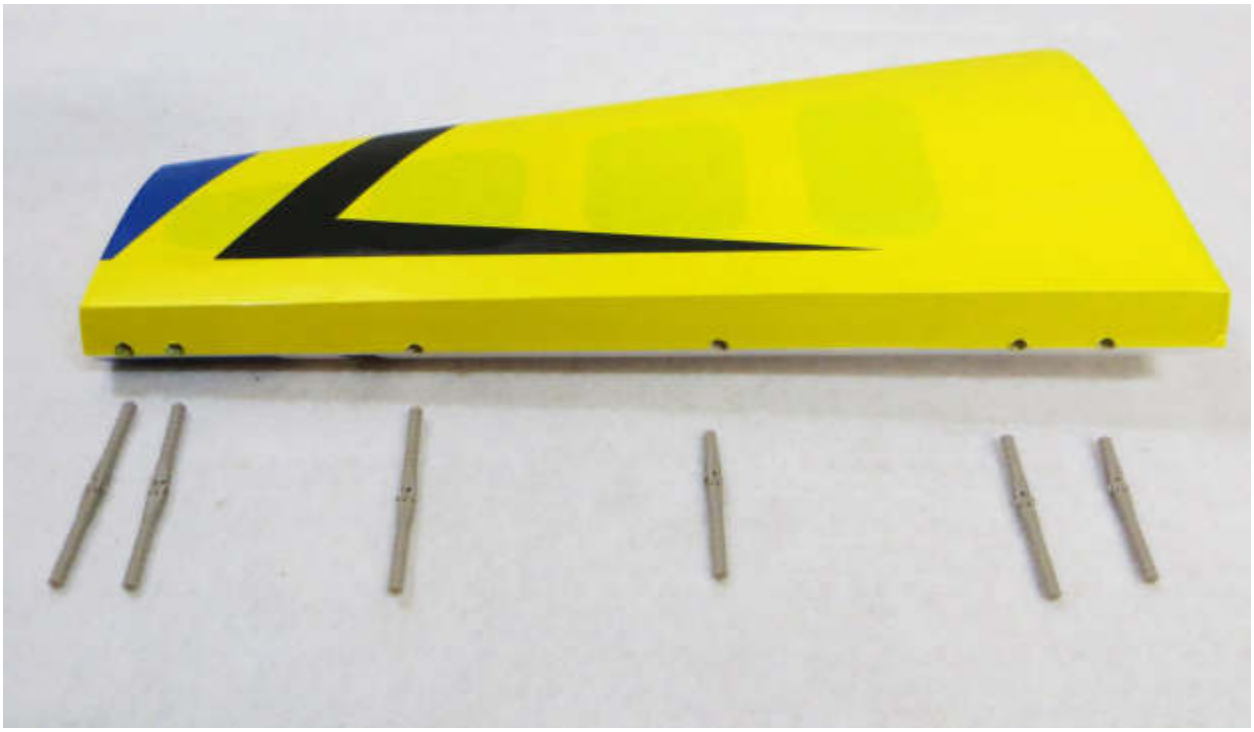
6. Take the time to properly balance and trim your aircraft and set up rates with exponential values. Your flying experience will be greatly enhanced once your plane is properly dialed in.

7. Extreme Flight now has their own Vimeo channel. There are many assembly videos providing extreme detail on certain aspects of the assembly. https://vimeo.com/extremeflightrc

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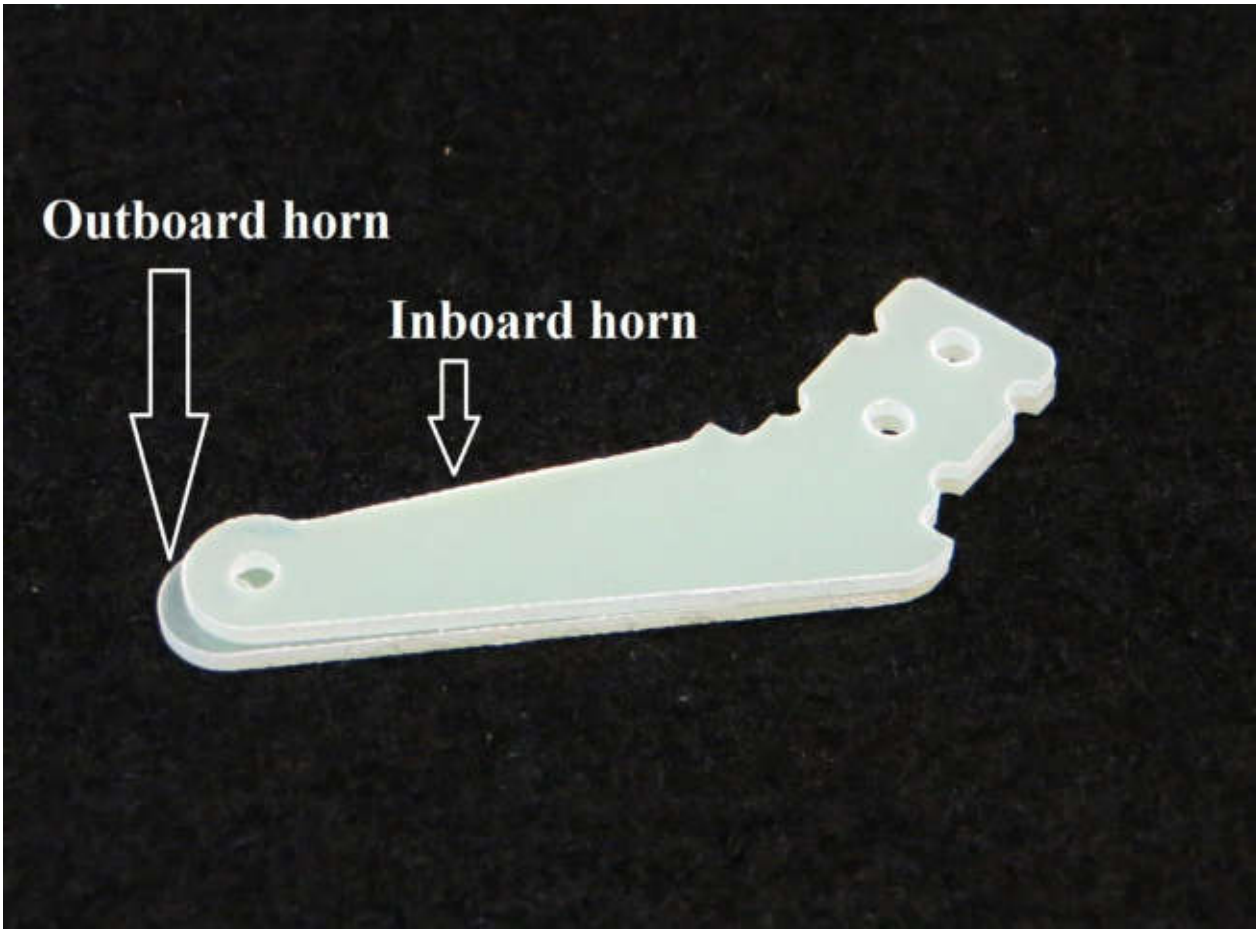
Let's Begin:

1. Locate the wing panels/ailerons and horizontal stabilizers/elevators and associated hardware bags. We will begin by hinging all of these at one time. I strongly recommend 30 minute (or slower curing) epoxy for installing hinges. I have found it easier to apply 3-5 drops of glue in the hinge hole and then using a toothpick, or similar, spread the glue around the sides of the hinge hole. Do this on just one side of the surface at a time. Before applying any glue to the hinge itself, I highly recommend you protect the hinge pin (pivot point) from glue. I use Vaseline. Tape will work however it is harder to remove later. In any case apply either protectant to the center of the hinge so glue cannot penetrate the pin. Once you have the holes lathered with glue, apply a small amount to the hinge barbs and insert into the hinge hole until the pin is even with the hinge line. Be sure your hinge pivots freely and is perpendicular to the hinge line. Allow to dry then mate to the appropriate surface (wing to aileron/horizontal stabilizer to elevator) and allow to dry. ***PLEASE NOTE* there are 3 hinges that have been shortened to clear the tube socket. They are glued into the 3 inboard positions as shown.**



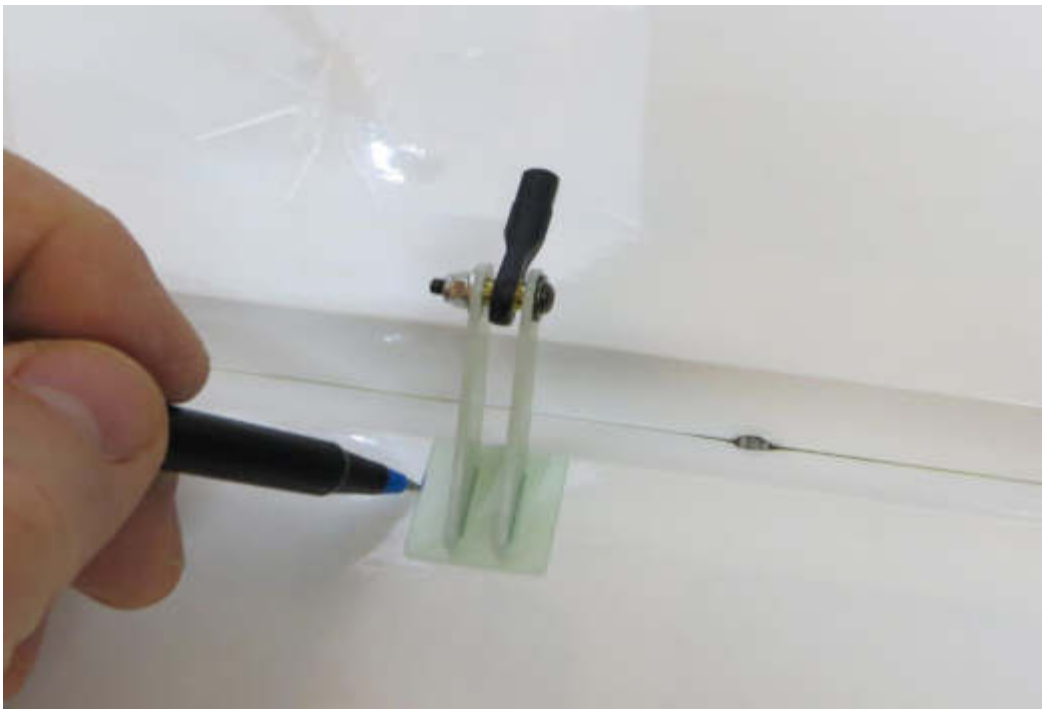
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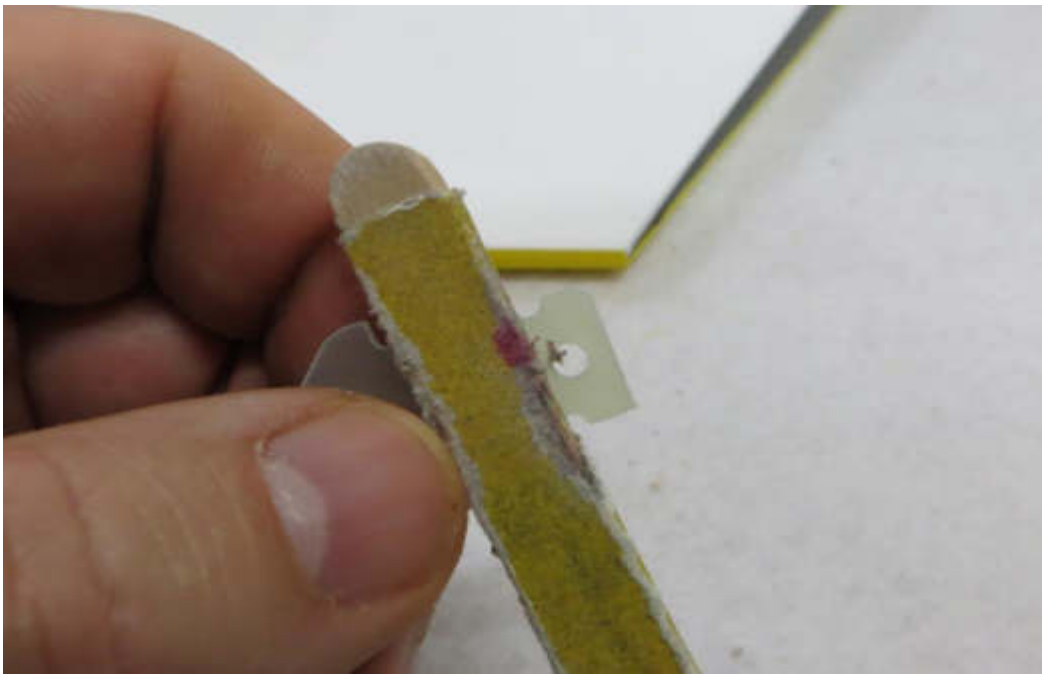
2. Install the control horns for the ailerons. *<u>PLEASE NOTE</u>*** <u>There are 2 different size control horns for the ailerons.</u> The 2 longer sets are for the outboard aileron servos, the 2 shorter sets are for the inboard locations. Pay very close attention when separating and grouping the horns to be sure you are gluing the correct horns in the correct location!**



Insert the horns into the base plate and then temporarily install them in the aileron. Trace around the base plate with a fine tipped felt marker and then remove the horn and base plate. Use a sharp hobby knife to cut 2mm inside the line you marked and remove the covering. Scuff the bottom portion of the control horn that inserts into the hole in the control surface. Use epoxy to secure the control horns in place. Follow the same process to install the elevator control horns in the designated locations.

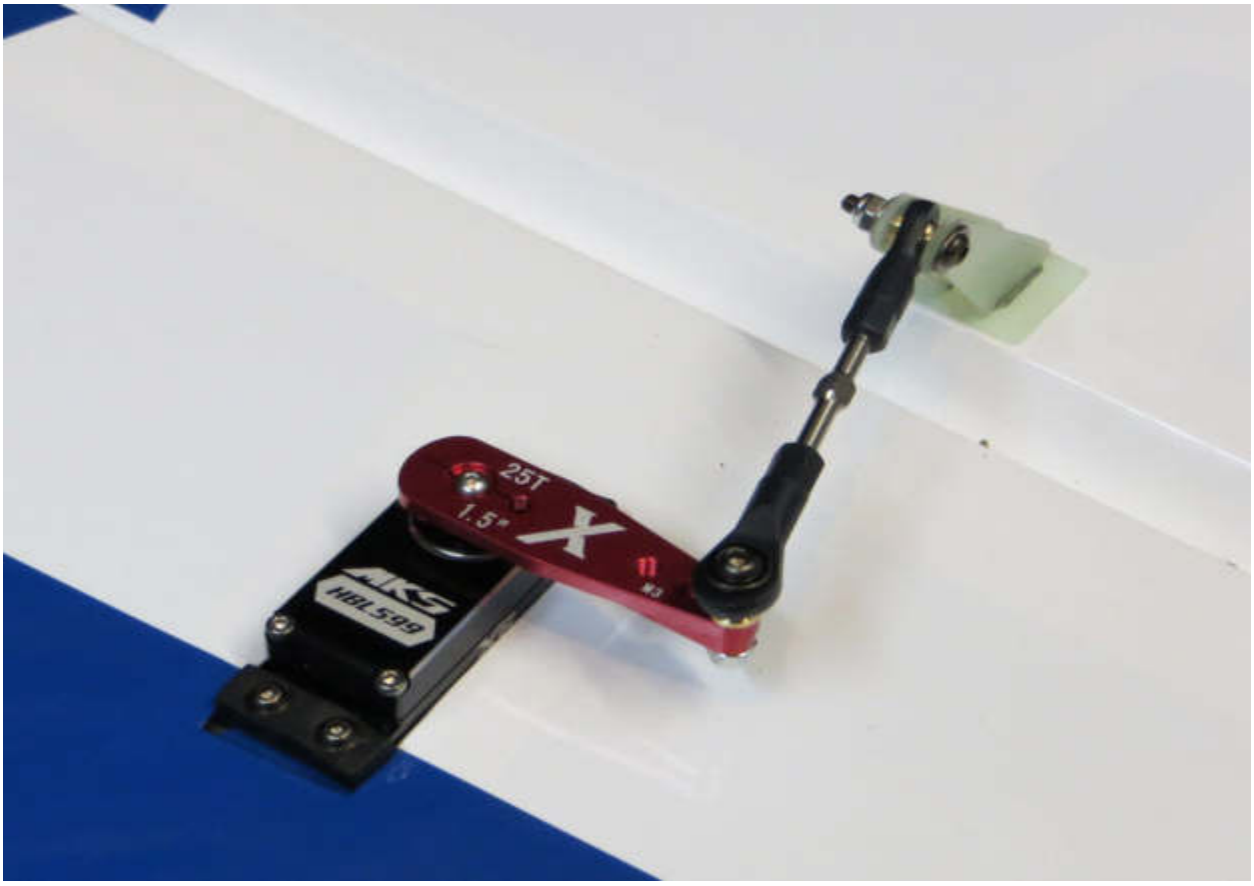
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3. Install the aileron servos and orient the output shaft of the servo towards the hinge line. You will notice there are 2 types of ball links included: one standard ball link and one with a built in riser. The standard ball link is sandwiched between the control horns, the ball link with the riser is secured to the aluminum servo arm. Thread the ball links onto each end of the turnbuckle pushrod. You may find it necessary to shorten the pushrods slightly (2mm) on each end with a pair of side cutters for best fit. To secure the ball link to the control horns insert the 3mm bolt with integrated washer thru the control horn, then the ball link in the middle, then thru the other control horn, then the washer and nylon insert nut onto the other side. Electronically center your servo and install the aluminum arm perpendicular to the servo case. Secure the ball link with the riser to the servo arm. Do the same for the other servo locations. You will need to use the servo matching function in your radio or an external device to make sure the 2 aileron servos are perfectly synchronized and causing no binding. Failure to do so can destroy your servos in short order.

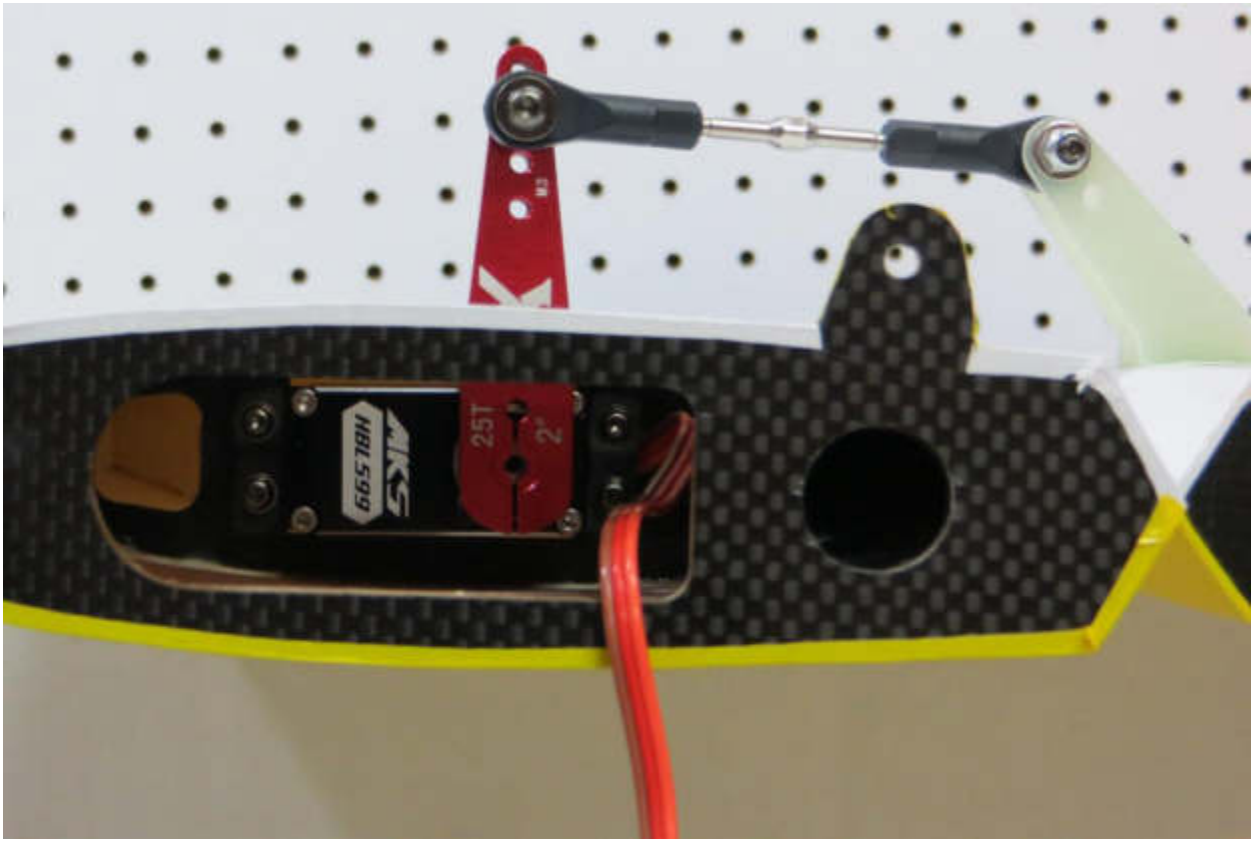


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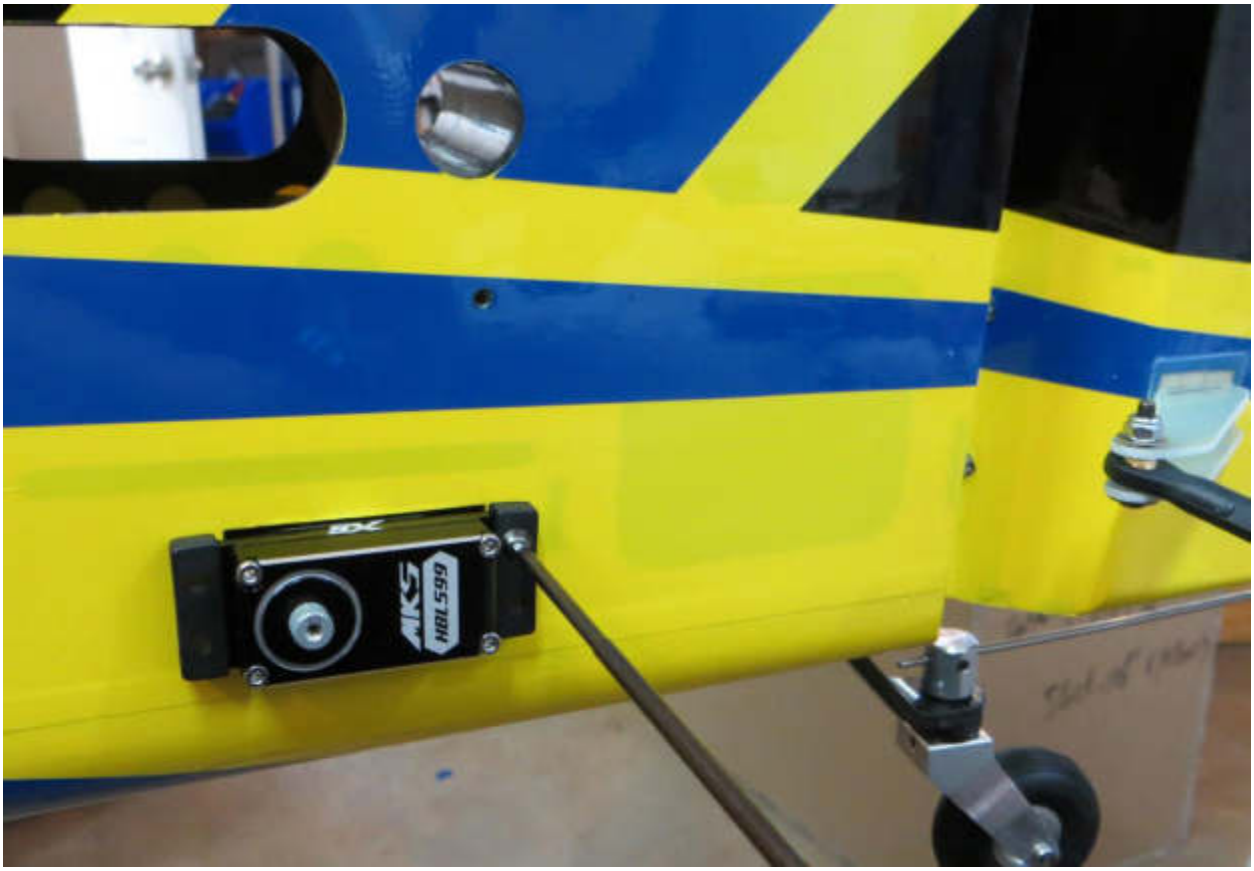
4. Install the elevator servos, orient the output shaft toward the hinge line of the horizontal stabilizer. It will be easier to install the servo arms after mounting the servo. Make all hookups for the pushrods/ball links as we did in the previous step. I recommend using the 1.75" location on the 2 inch servo arm to maximize mechanical advantage and minimize the chance of flutter.



5. Hinge the rudder and install the control horns using the same technique(s) as the wing. For most installations a single ultra high torque servo mounted in the rear of the plane will be the ideal way to power the rudder. We highly recommend the MKS HBL380 or 599 for this location. A single 1.5" aluminum servo arm will provide plenty of travel while maintaining the best mechanical advantage and servo resolution. Please see the following photo of this setup for detail. If using a pull-pull setup you will need to glue a horn set to each side of the rudder and use a 4" double arm on the servo mounted under the canopy.

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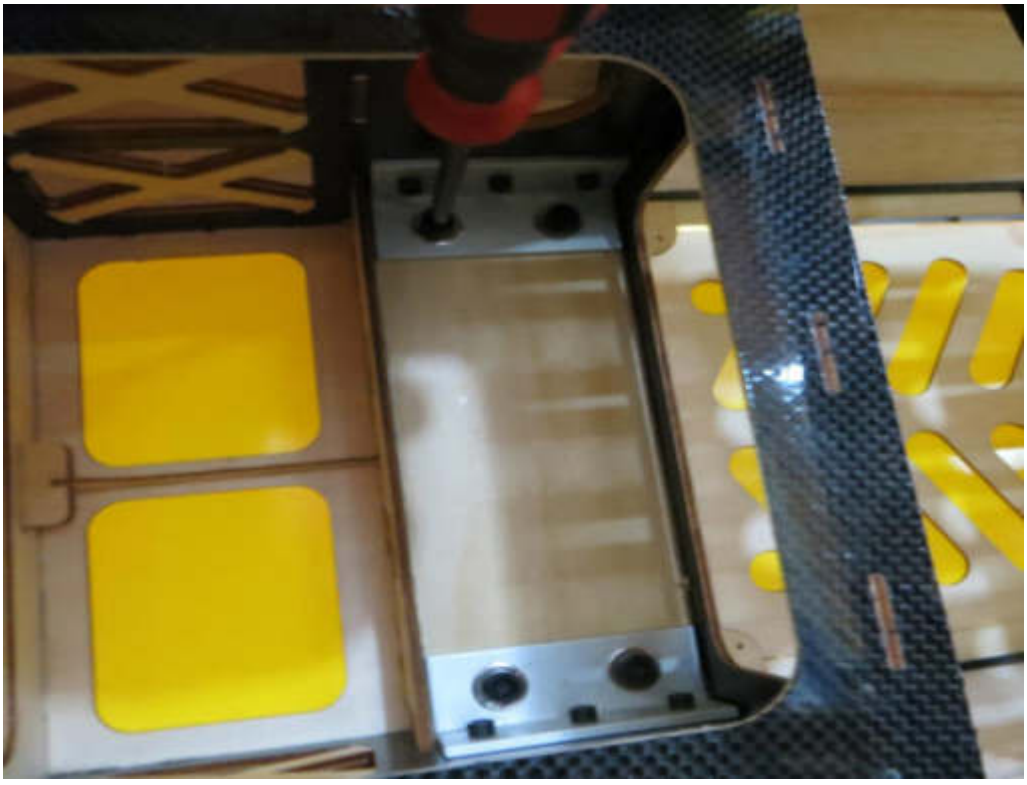
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6. Next we will install the main landing gear, axles, tires, wheel pants and wheel cuffs. Use the provided bolts, washers and nuts from the main landing gear hardware kit to mount the carbon gear to the fuselage.



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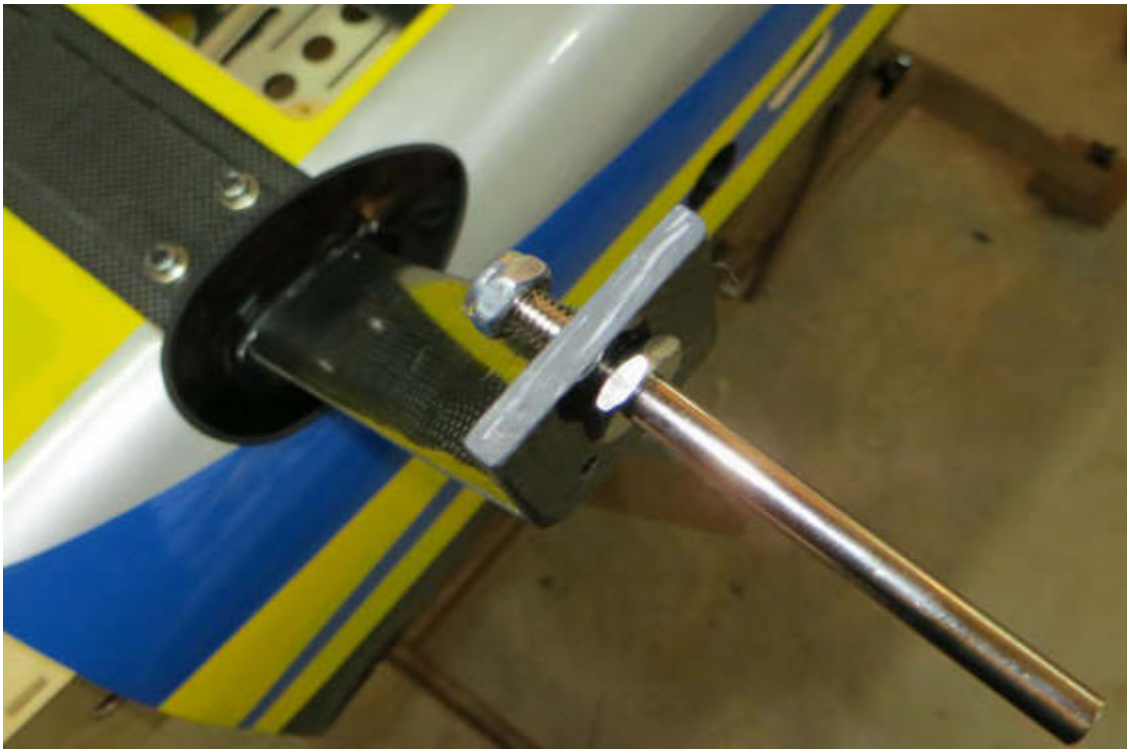
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7. Slide the landing gear cuffs into place against the fuselage and secure with Goop style silicon glue. Tape in place until glue is fully cured.



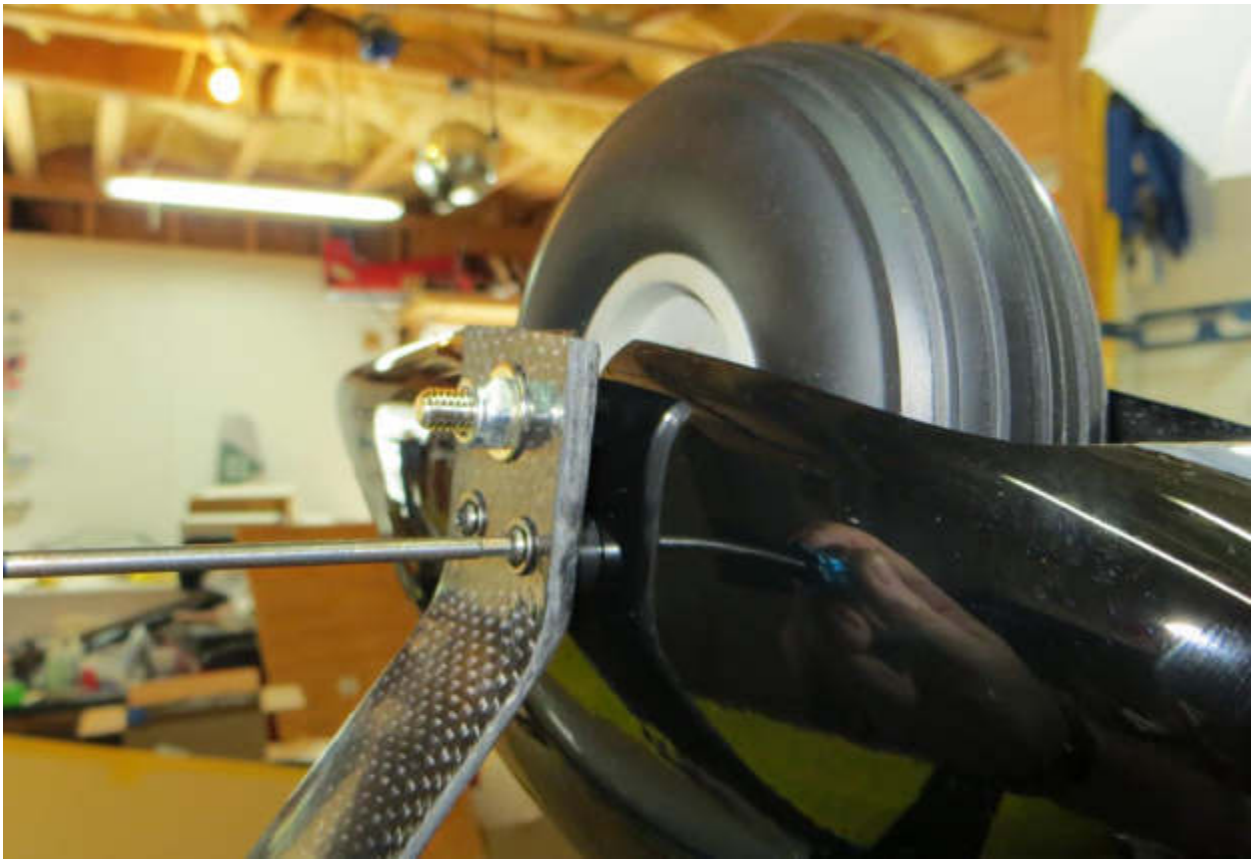
8. Insert the axles into the holes on the landing gear leg and secure with a washer and lock nut. Grind a flat spot on the axles to fasten the set screw against providing a better grip. Now install one wheel collar, the wheel then the other wheel collar but don't tighten. Position the wheel pant onto the axle and determine the exact position of the inner and outer wheel collars such that the tire will not rub against the wheel pant. Once you have this location add blue thread lock to the set screw and tighten the wheel collars. Now position the wheel pant(s) onto the axle/gear and secure with the 3mm bolts/washers and use blue thread lock on these as well.

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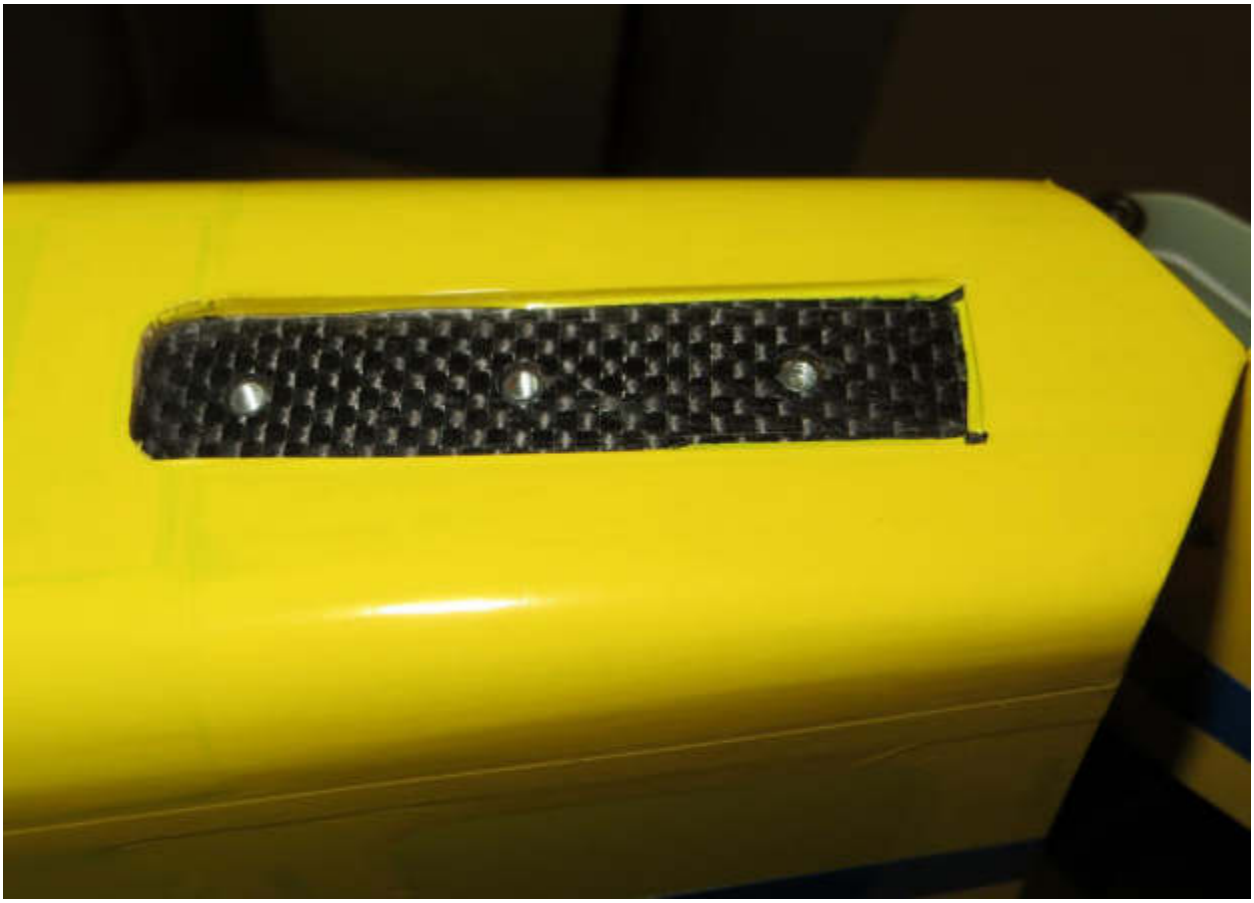


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9. Next we will install the tailwheel. Notice there is a 3mm hole in the bottom of the rudder about 3" inches from the hinge line. Remove the covering over this hole and then glue the included ball link into this hole with epoxy. You will also notice that the mounting plate for the tailwheel assembly is recessed. Remove the covering from this area to expose the mounting plate and 3 mounting holes. Use 3 of the included 3mm bolts to install the tailwheel assembly to the fuselage, using blue Loctite on each bolt. Before installing the tailwheel assembly we highly recommend that you remove all set screws in the unit and apply blue Loctite to each of them before reassembly.

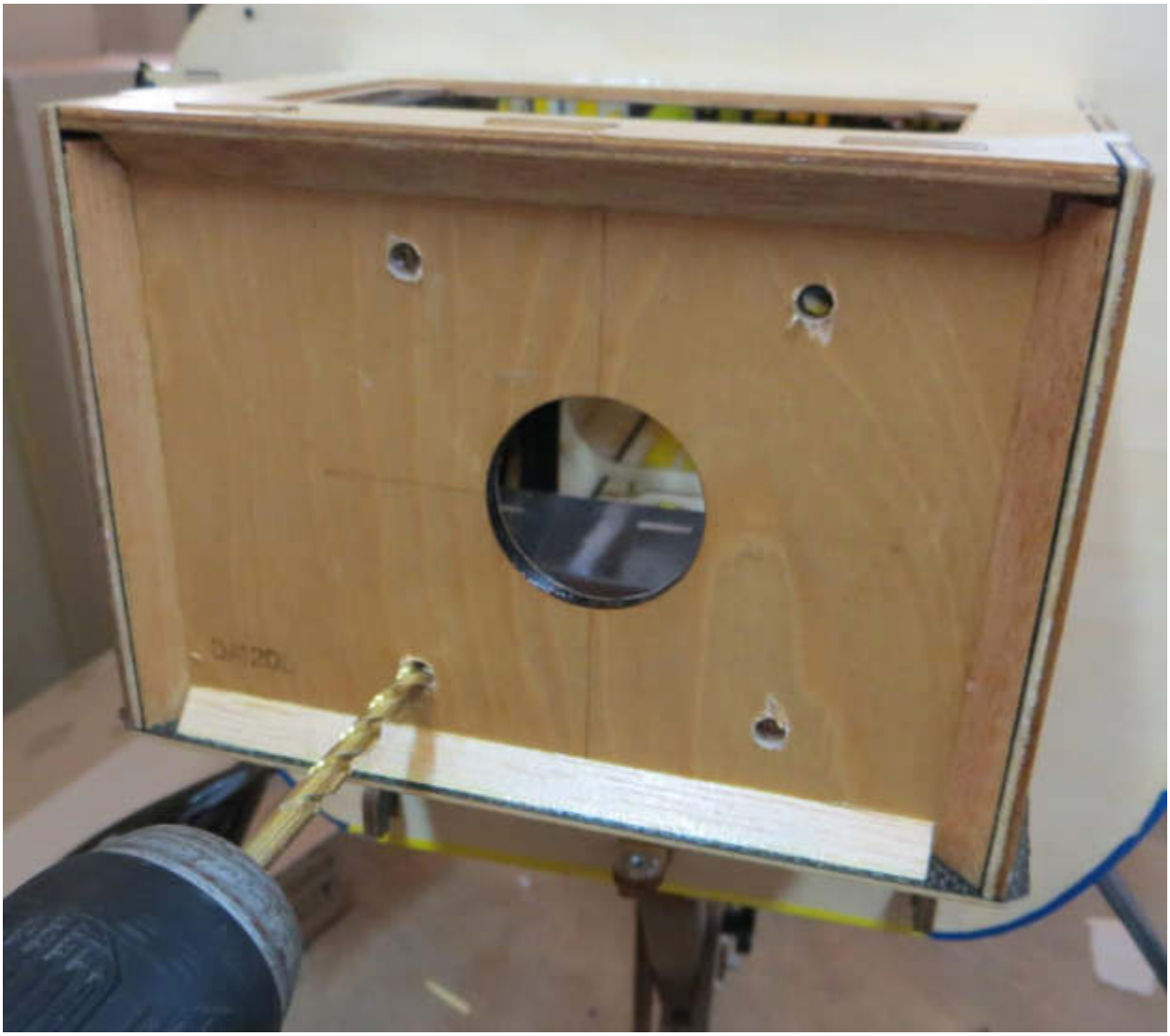
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10. Next we'll install the engine. There are laser marked locations to drill if using the DA-120. There is also a laser scribed cross to use a template for other engine makes. Drill for 1/4x20 mounting bolts at the proper locations.



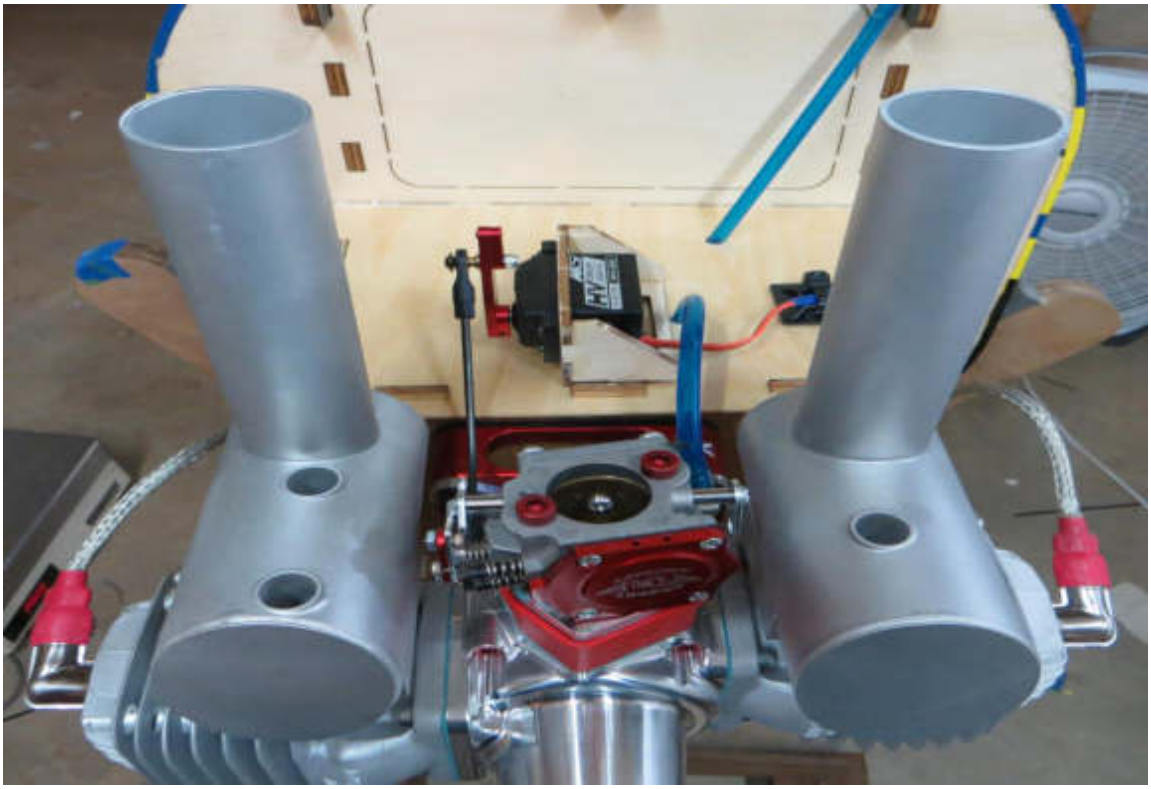
11. Install the DA-120 using the Blazing Star 1 inch mount and the single 3mm Delrin spacer provided with the mount. Be sure the spacer goes between the mount and plywood firewall, not against the engine. Secure using 1/4x20 bolts, washers and lock nuts (not included). Total distance from the front of the motor box to the rear of the spinner backplate is 7.35" or 187mm.

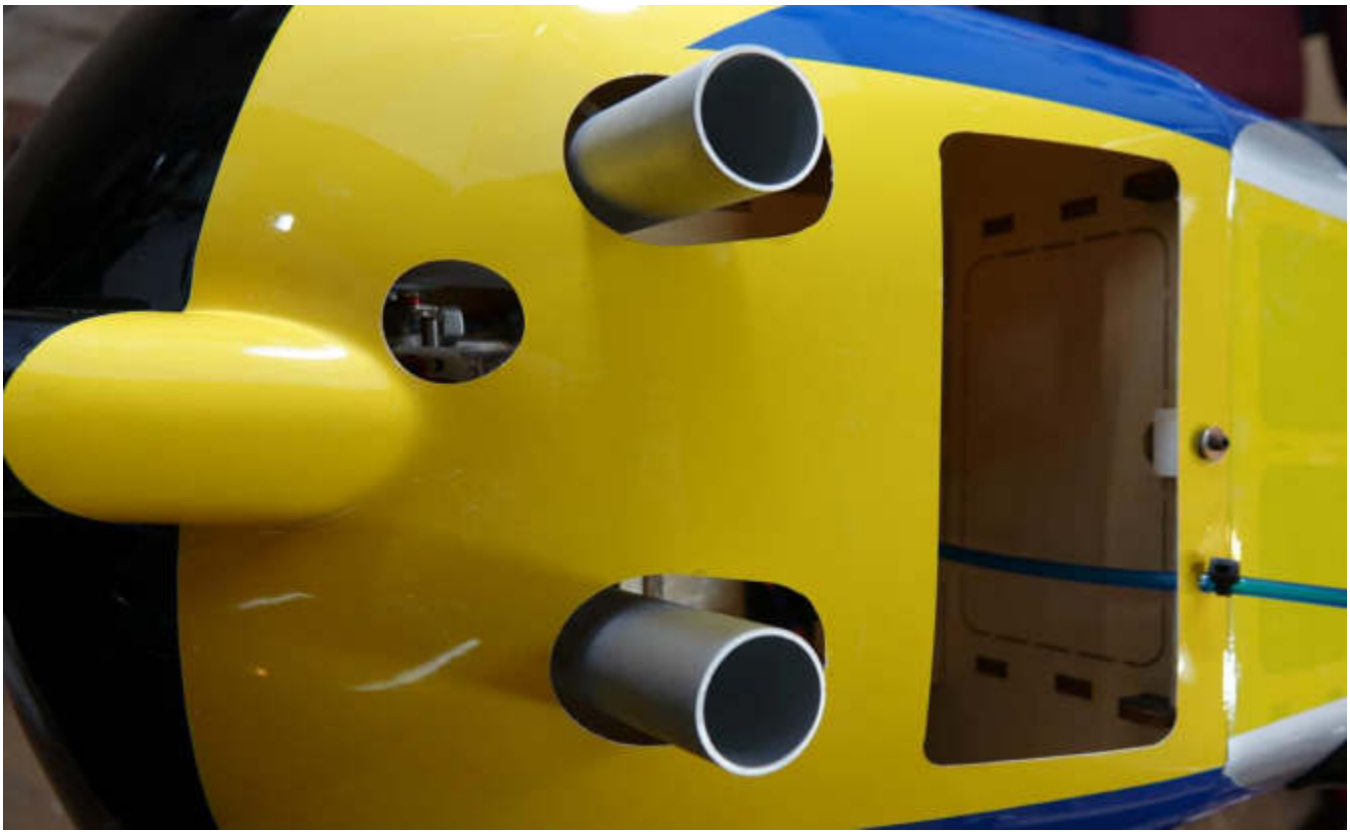
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12. The following picture shows the location I mounted my throttle servo as well as the mufflers installed. Use a rotary tool to open the bottom of the cowl to fit the mufflers and to provide an exit for air. Notice I've also made a hole so that I can reach the choke lever easily with my finger. I find this easier than a dedicated choke servo installation and you save the weight of the servo and linkage. Some folks prefer to use a choke servo and that works great as well.

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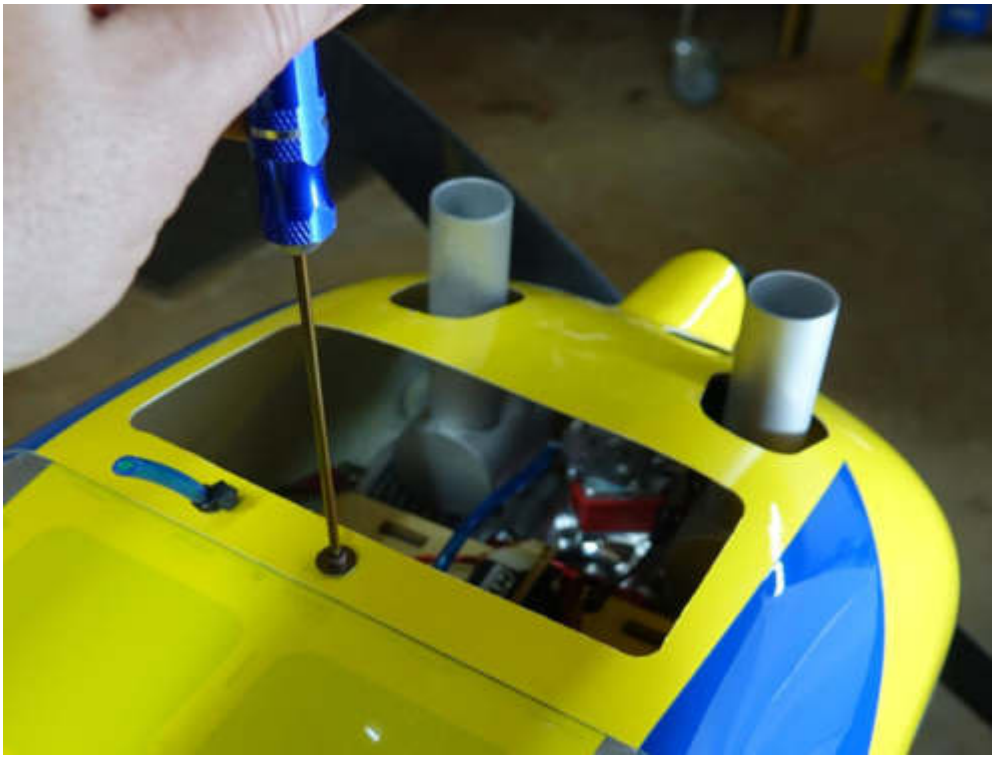


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13. A set of engine baffles has been provided to duct air over the engine cylinders. These will need to be trimmed to fit your chosen engine. Glue in place with Goop or epoxy.



14. Mount the cowl using the 3 3mm socket head cap screws and washers. The longest of the 3 bolts is used to secure the bottom of the cowl and the remaining bolts secure the top of the cowl as shown. Be sure to use blue Loctite on these bolts.



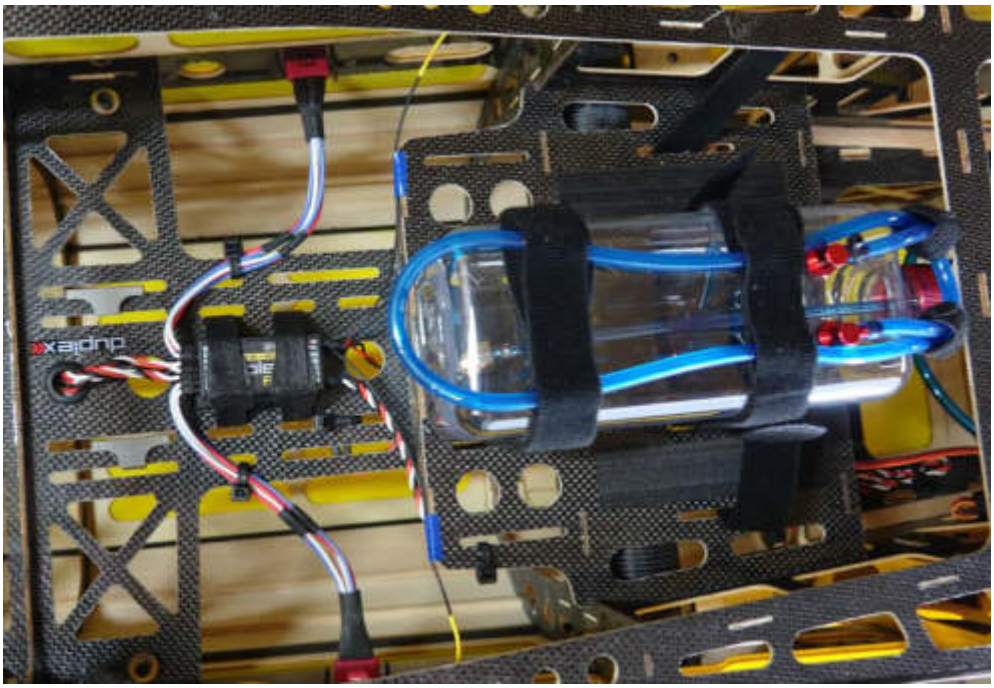
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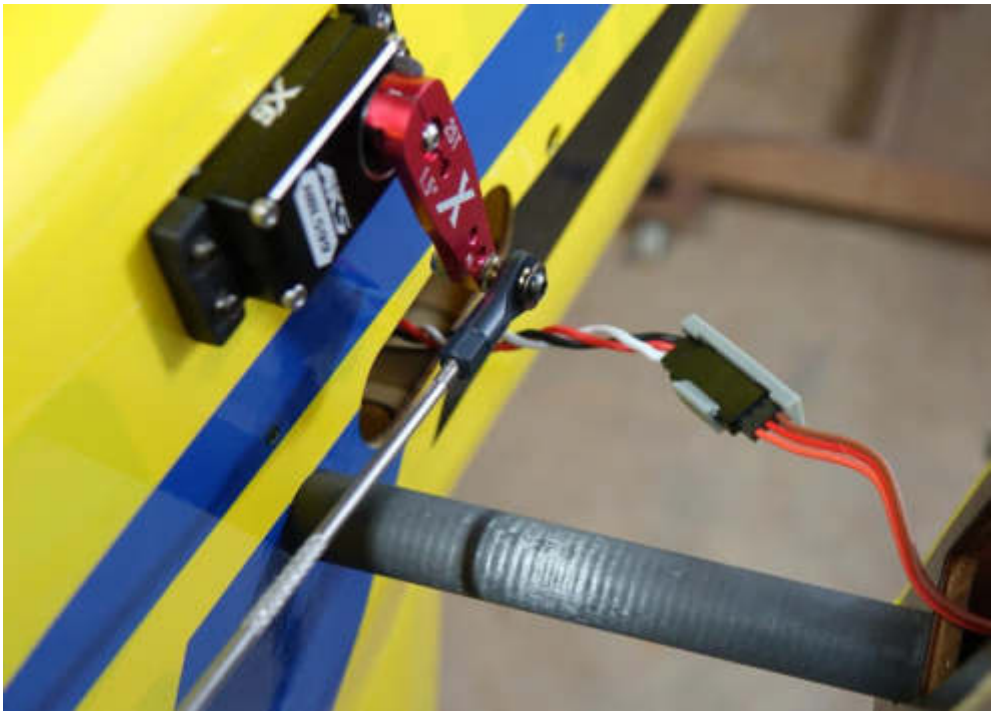
15. Secure your choice of tank to the tank tray over the carbon wing tube with Velcro or cable ties. We used the EF Flowmaster 34 ounce tank and fuel tubing along with an EF fuel dot. There is a laser cut hole in each side of the fuselage to install the EF fuel dot. You can also see the location of our receiver and the installation of the EF Multi-plugs in the sides of the fuselage in the following pictures.



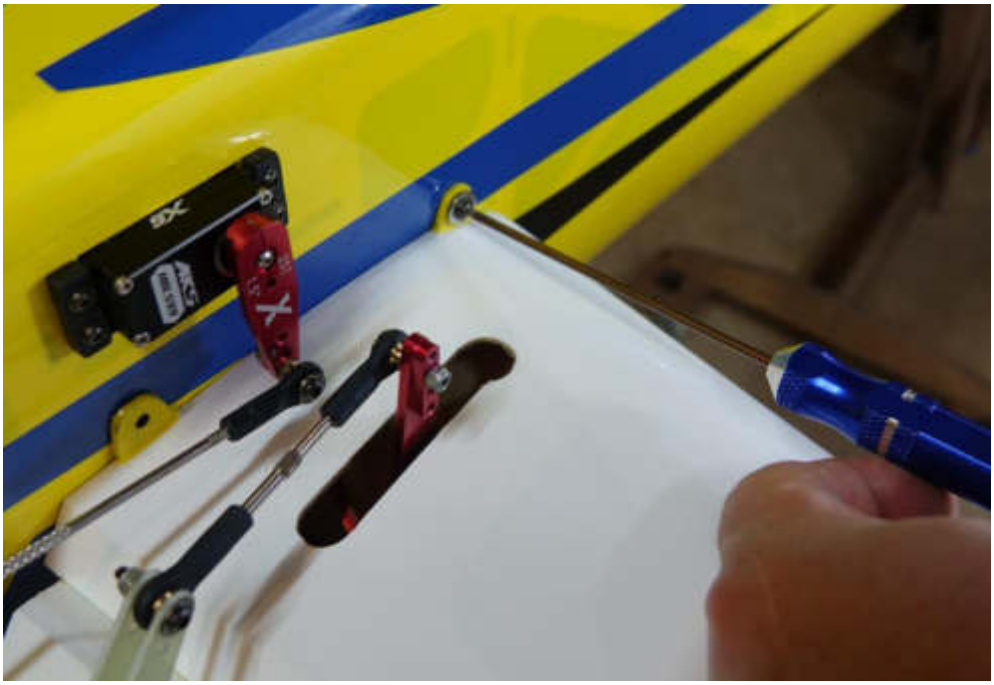
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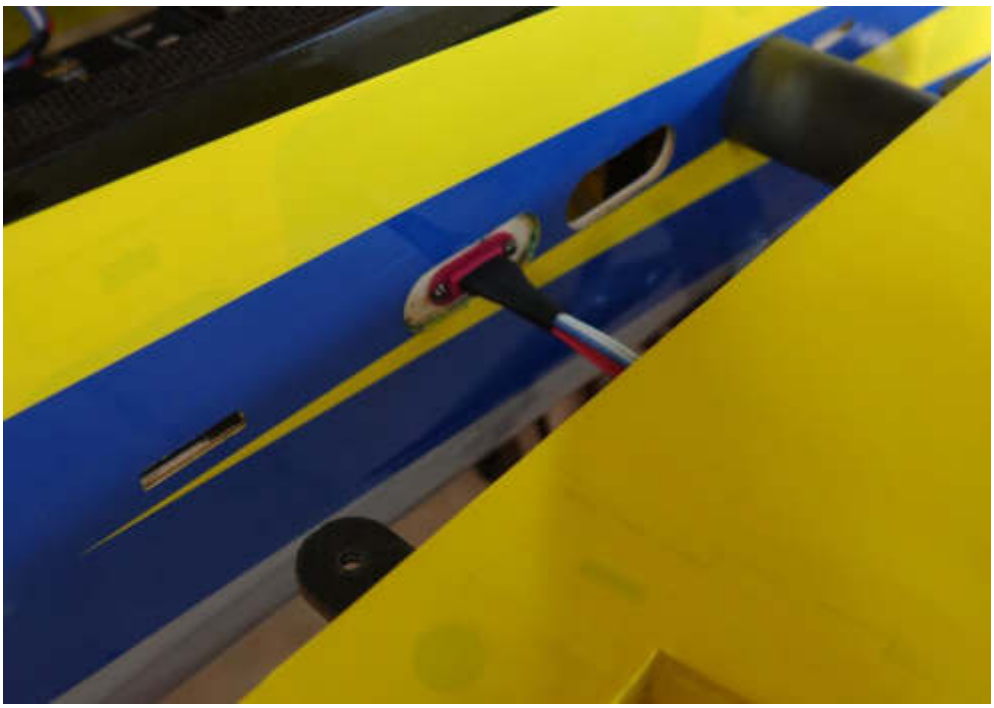
16. When preparing the Slick for flight, slide the stab tube into the socket in the rear of the model. Slide the stab onto the tube and secure the servo lead to the servo extension with heat shrink tubing (or an EF servo safety clip as shown if you plan to remove the stabs for transport). Secure the stab with 2 3mm bolts and washers as shown (be sure to put blue Loctite on the bolts!) Repeat for the other stab.



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17. Slide the wing tube into the fuselage socket and slide the wings onto the tube. Connect the aileron servo extensions to the receiver (this is where the EF mutli-plug is of great benefit, please see picture).



18. Secure the wing using 4 4mm bolts and washers inserted into the mounting tabs extending from the root of the wings. These bolts screw into the pre-installed blind nuts in the fuselage. Again use blue Loctite on all bolts!

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19. A set of SFGs and wing tips are included. They are secured with 3 mm bolts. We suggest you experiment with each configuration and decide which works best for your flying style. Attaching the racing wing tips will slow the roll rate slightly which some flyers may find beneficial. It will also add to the effective wing area of the model

20. Install your ignition and flight batteries where needed to help achieve proper CG.

Set-up and trimming

Besides basic assembly, this is the most important part of preparing your airplane for flight. It can also be the most time consuming, but once your plane is properly dialed in you will agree it was time well spent. The CG range basically extends over the width of the wing tube. One of the most practical ways to check the CG on an aircraft this size is to insert the carbon fiber wing tube into its sleeve in the fuselage and tie a length of rope around the tube on each side of the fuselage, forming a loop that you can pick the aircraft up with. Slide the wings into position, install the canopy and pick up the plane with the rope. The Slick should balance in a horizontal position. Move your batteries and radio equipment to achieve this condition. This will give you a safe starting place for the first flights. One of the best ways to fine tune the CG for your aircraft is the 45 degree line test. Fly the aircraft in front of you from left to right (or right to left if you prefer) at full throttle. Pull the aircraft into a 45 degree up line and establish this line. Roll the aircraft inverted, neutralize the elevator and pay close attention to what the plane does. Ideally the plane will continue on this line for several hundred feet before it starts to slowly level off. If the airplane immediately drops the nose and dives toward the ground it is nose heavy. If it begins to climb inverted toward the gear it is tail heavy. There is no need to have the Slick 580 excessively tail heavy to perform 3D maneuvers.

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Control surface throws

I highly recommend that you purchase a throw meter that measure in degrees. There are several units available commercially. These units are a great aid in set-up and definitely beat the "that looks about right" method. For any type of precision flying, surfaces that travel equal distances are a must. The following control surface travels are what I use on my own Slick. These are a good starting point, but are by no means the only way to set up the aircraft. Start here and then adjust to fit your own preferences and style of flying.

Elevator: 8-10 degrees low rate, 20% exponential; all you can get high rate, 60-65% exponential

Aileron: 20 degrees low rate, 30-40% exponential; 38-45 degrees high rate, 65-70% exponential

Rudder: 20 degrees low rate, 50% exponential; all you can get for high rate, 80-90% exponential.

This completes the assembly of the Slick 580 EXP. As a final step clean the entire aircraft with glass cleaner, then apply a coat of spray-on wax and buff the finish to a high gloss with a microfiber cloth. My favorite product for this is Eagle One Wet Wax AS-U-DRY, available in the automotive section of most Wal-Marts, K-marts, Sears, Targets, etc. People often ask me at trade shows how I get the planes to look so shiny, this is my secret. You may wish to apply all of your graphics before applying the coat of wax.

Thanks again for your purchase of the Extreme Flight RC 120cc Slick 580 EXP. I hope you enjoy assembling and flying yours as much as I have mine.

See you at the flying field!
Chris Hinson
EXTREME FLIGHT

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