











120cc Build Guide

EXTREME FLIGHT

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Please read the following paragraphs 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 RC 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 to the AMA safety code (or code appropirate to your region). It is highly recommended that you join the Academy of Model Aeronautics in order to be properly insured, and to 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 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.

Special notes on120cc aerobatic monoplanes:

Extreme Flight 35%/120cc aerobatic monoplanes are a high-point in RC aerobatic capability and are champions of freestyle RC contests worldwide. Their performance is truly extreme. Choose your components wisely. Use only the best servos and arms to prevent flutter. Tie and wrap and fasten your equipment extremely well inside the airframe to prevent anything coming loose in flight.

It is assumed that anyone assembling and flying a 35% Extreme Flight aerobatic monoplane is an experienced assembler of RC aircraft. For this reason this assembly guide will not teach basic aspects such as how to shrink covering material. We will cover details specific to this series of aircraft. If this is your first aerobatic RC aircraft, it is highly recommended that you recruit an experienced giant scale RC enthusiast to inspect your work before you maiden. Please read through these instructions to familiarize yourself with tools, materials, and techniques before you begin assembly.

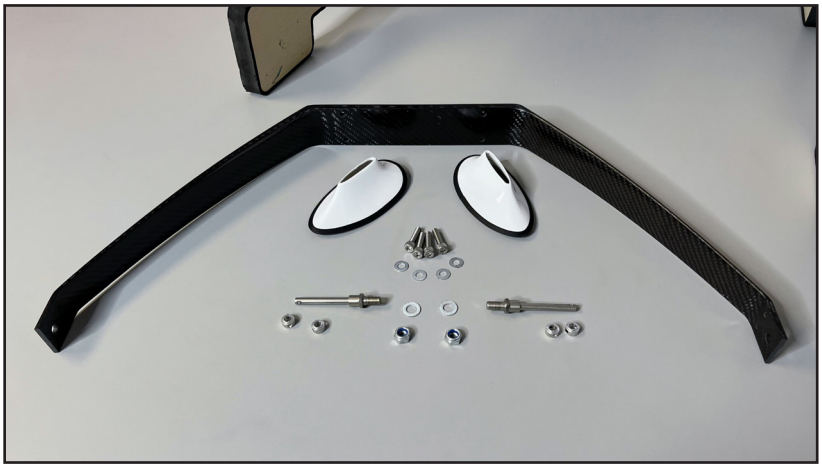


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1.

This assembly guide covers the entire series of 120cc aerobatic monoplanes. They all assemble in fundamentally the same way. There are detail differences between the aircraft, but they are slight in terms of assembly. Because these are large aircraft and can be difficult to move around, we will begin with assembly of the landing gear so that the aircraft will be up on its wheels for later steps.

Screw the landing gear to the fuselage, the gear sweep slightly forward when installed correctly. Use blue loctite or equivalent threadlocker on the gear attachment screws. Locate the gear-to-fuselage fairings. We recommend to glue the fairings to the landing gear *only* (not ot the fuselage) with a large dollop of rubberized glue such as “Goop”. Tape the fairings in place until the glue is dried.





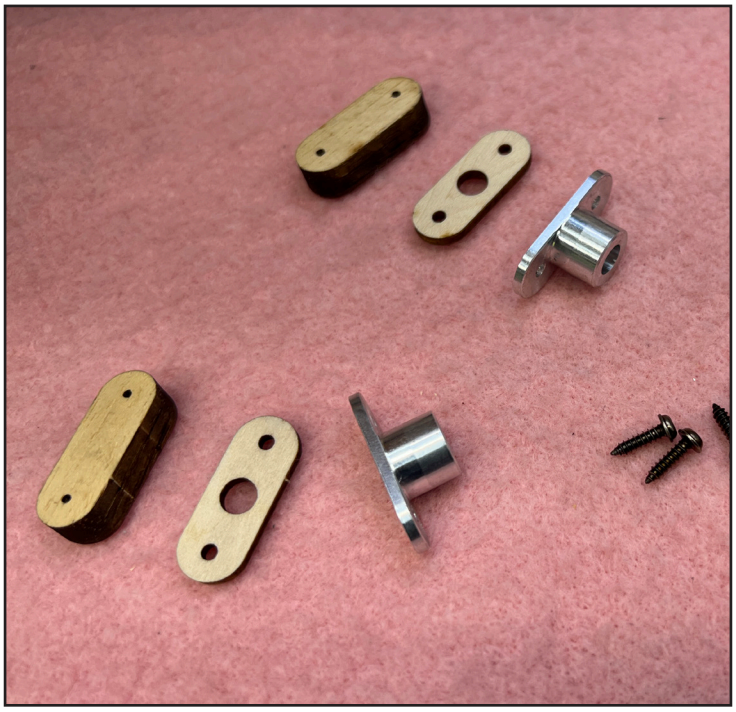


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2.

The axle system includes a wheel-pant-saver mechanism. Begin by attaching the axles to the landing gear with washers and self-locking nuts, find the flat spot on the outboard end of the axle and orient this flat spot *down* to face the runway. Assemble the “pant saver” as shown and install the wheels as shown with the pant saver as the outboard wheel retainer. In these photos, we show the installation of optional “Spot On” wheels, available from Extreme Flight RC.





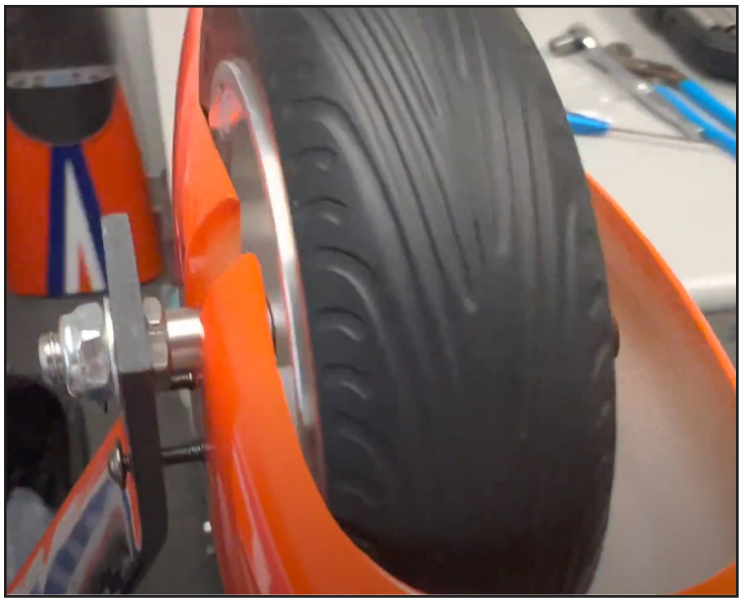


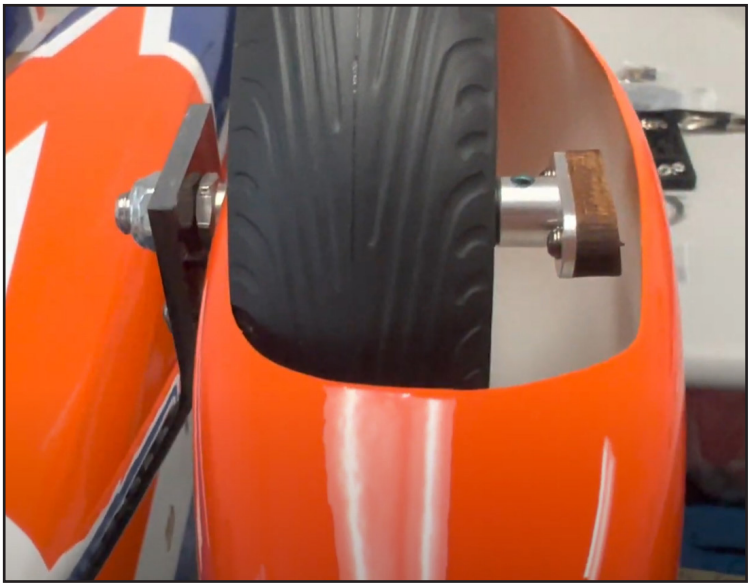


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3. Using loctite, start the screws which hold the wheelpant into the landing gear, but leave them loose. Please a dab of epoxy glue between the wooden pad of the “pant saver” and the wheelpant. Tighten the screws holding the wheelpant to the landing gear.





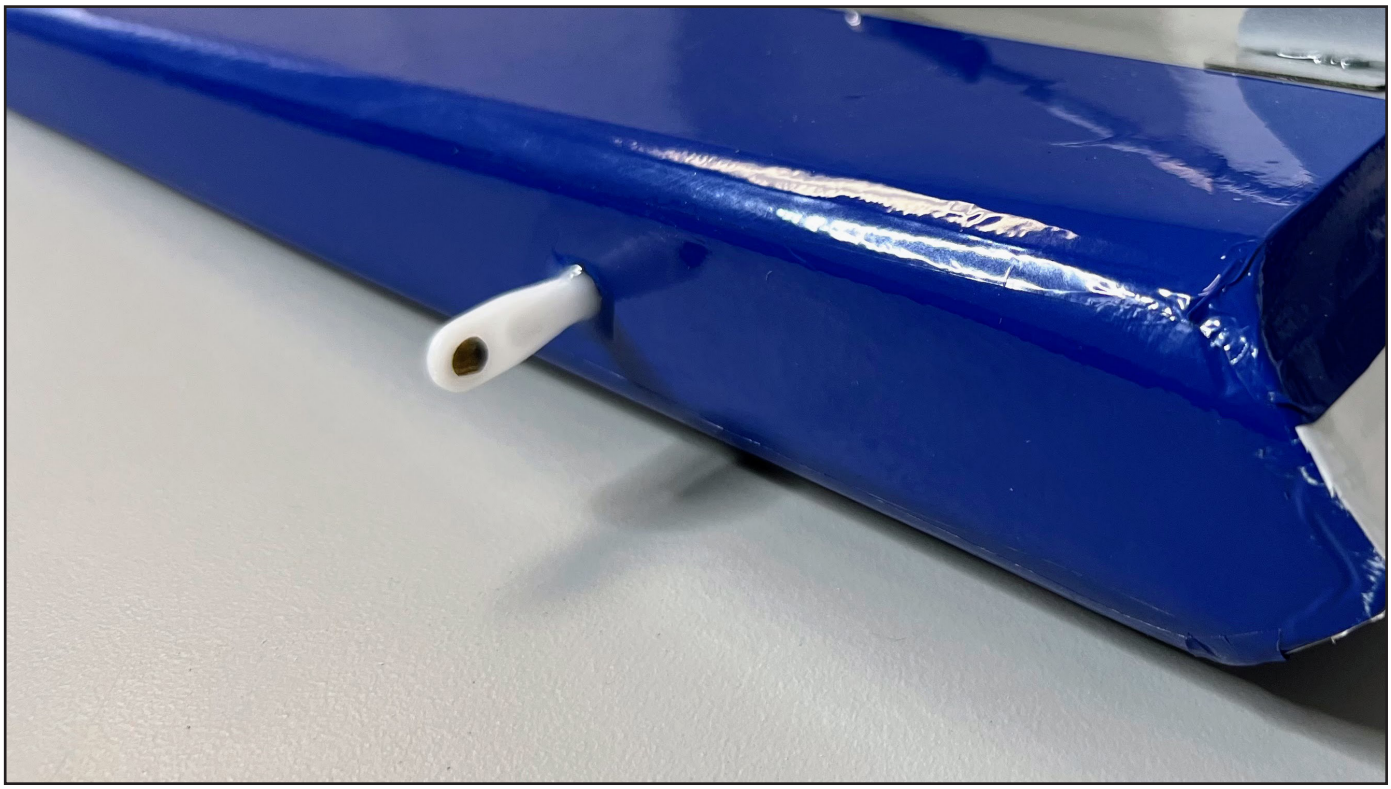


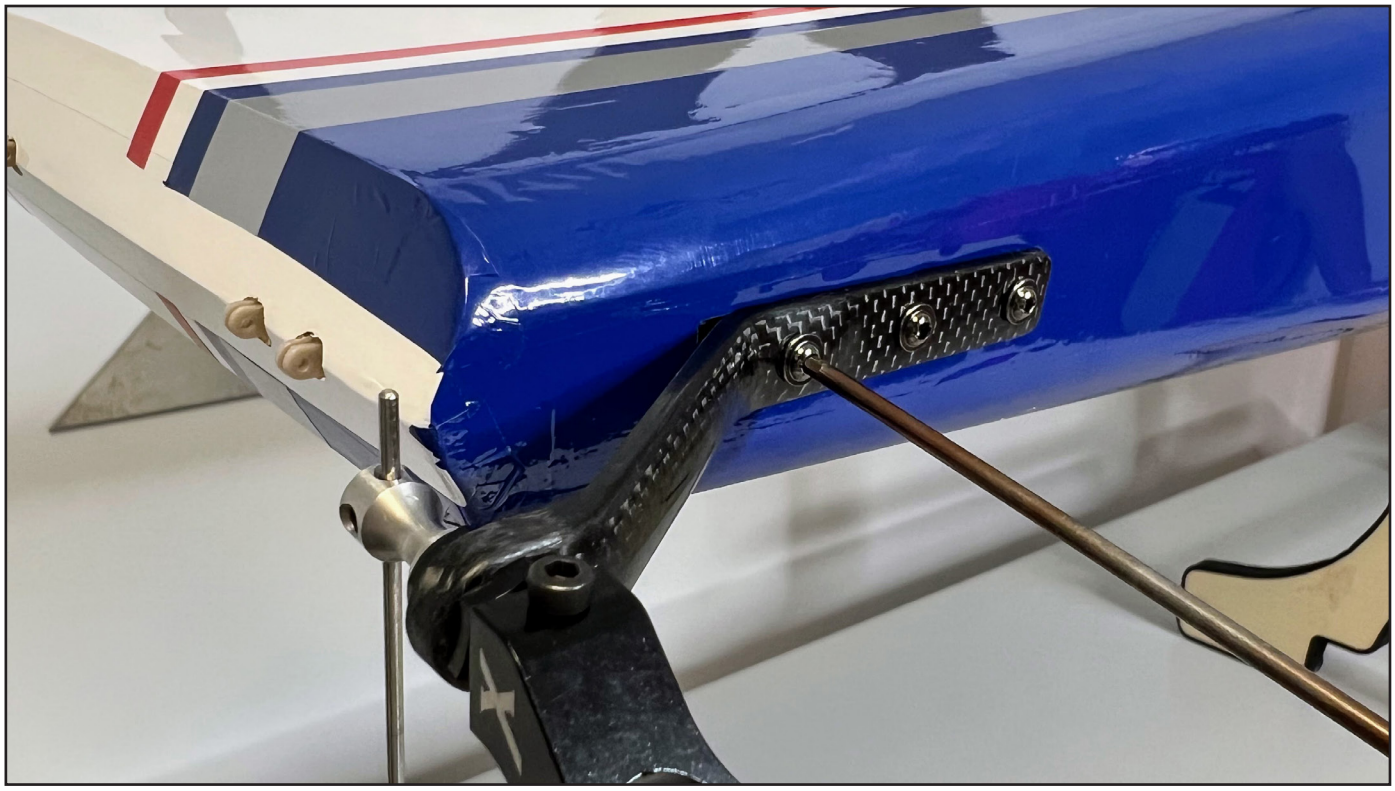


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4.

Locate the tailwheel, screws, and tiller keepter (nylon ball link). Glue the keeper into the hole in the bottom of the rudder with epoxy. Install the tailwheel onto the fuse using the screws and blue loctite threadlocker. Put the plane up on its landing gear.

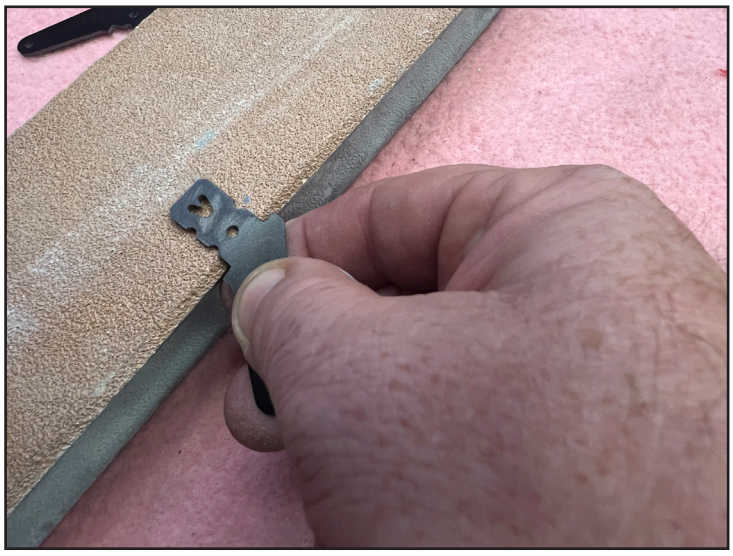


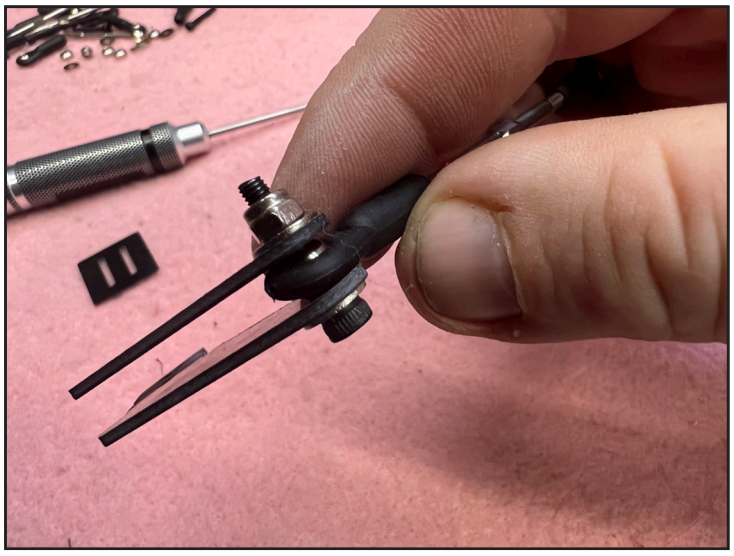


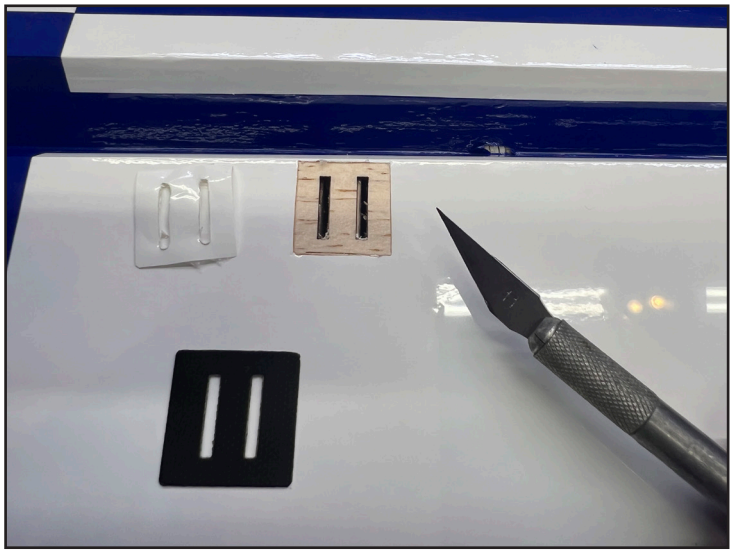
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5.

All the control horns on the aircraft install in the same way, in this step we will install the elevator and rudder horns ONLY. Scuff the gluing surface of the horns using 80-240 grit sandpaper. Assemble the horns with their ball link as shown. Remove the covering over the slots under the cover plate as shown. Assemble the cover plate onto the horns and test fit without glue, make sure the horn slides all the way into the surface. Remove the horn, apply epoxy into the slot and onto the horn, then install the horn and clean up any excess epoxy. Allow to cure.





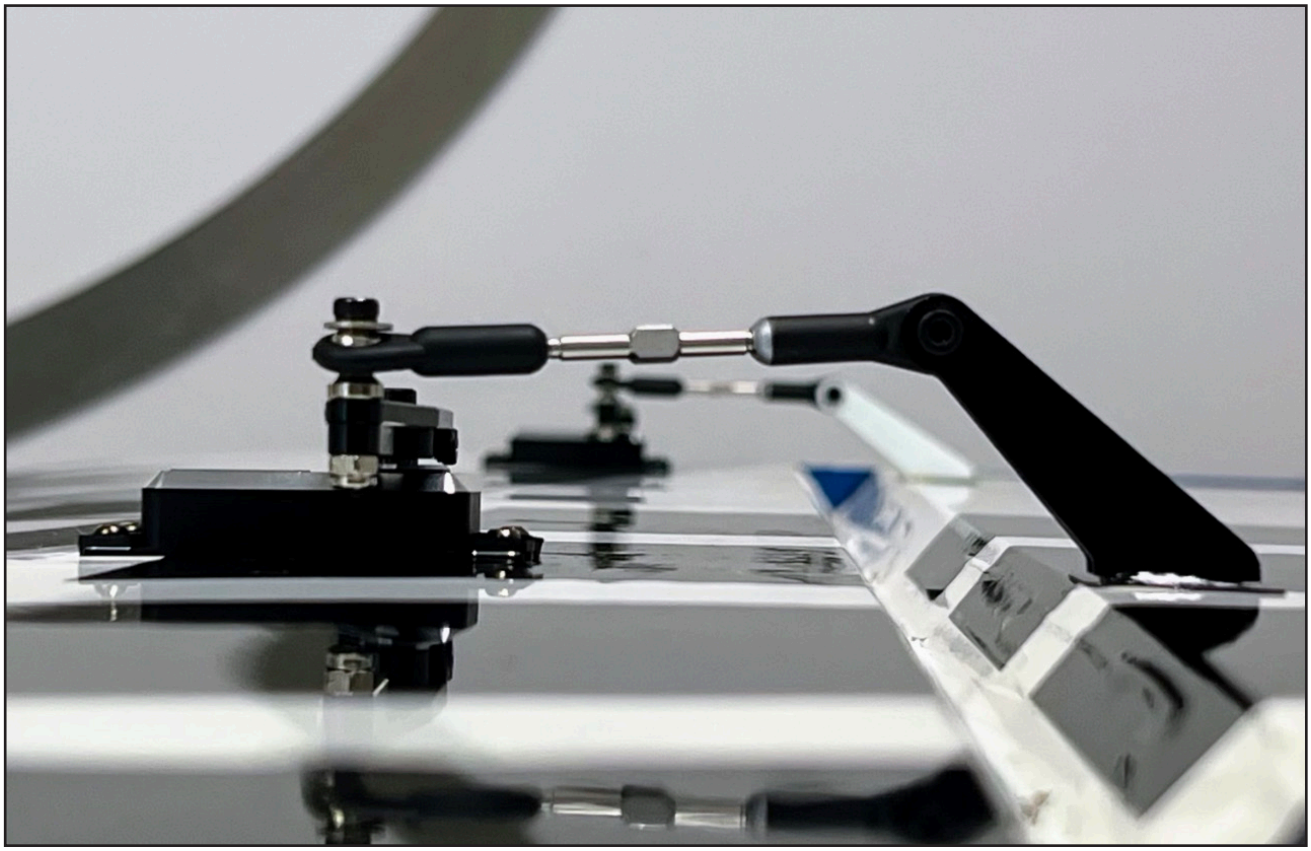






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6. For the aileron horns, note that each wing has two aileron servos and two horns. To correct for the tapering thickness of the wing, and keep the linkage geometry identical between the inner and outer servos, install the TALLER horn on the OUTBOARD location. The shorter horn goes into the thicker, inboard location.





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7.

Servos: You MUST use a top-quality digital, high-strength metal gear servo in these 120cc aerobatic monoplanes to avoid flutter and have the expected level of performance. Savox SG-2290, JR8911, and MKS599 are good choices. When installing servos, install the servo screws, then remove the screws and servo and put a small drop of thin CA glue into each screw hole to harden the area, allow to cure then re-install the servo permanently.

Attach the link to the servo arm using a tapered cone spacer between the ball link and the arm. Use washers and locking nuts as shown. Some of our 120cc kits include pull-pull rudder hardware, but so long as you are using a power system in the recommended range (120-125CC twin cylinder gasoline engine) you should mount your rudder servo in the rear using the simple, direct, push-pull linkage as pictured here. For every servo location, use the pushrod as a length gauge to determine the direction the servo should face.

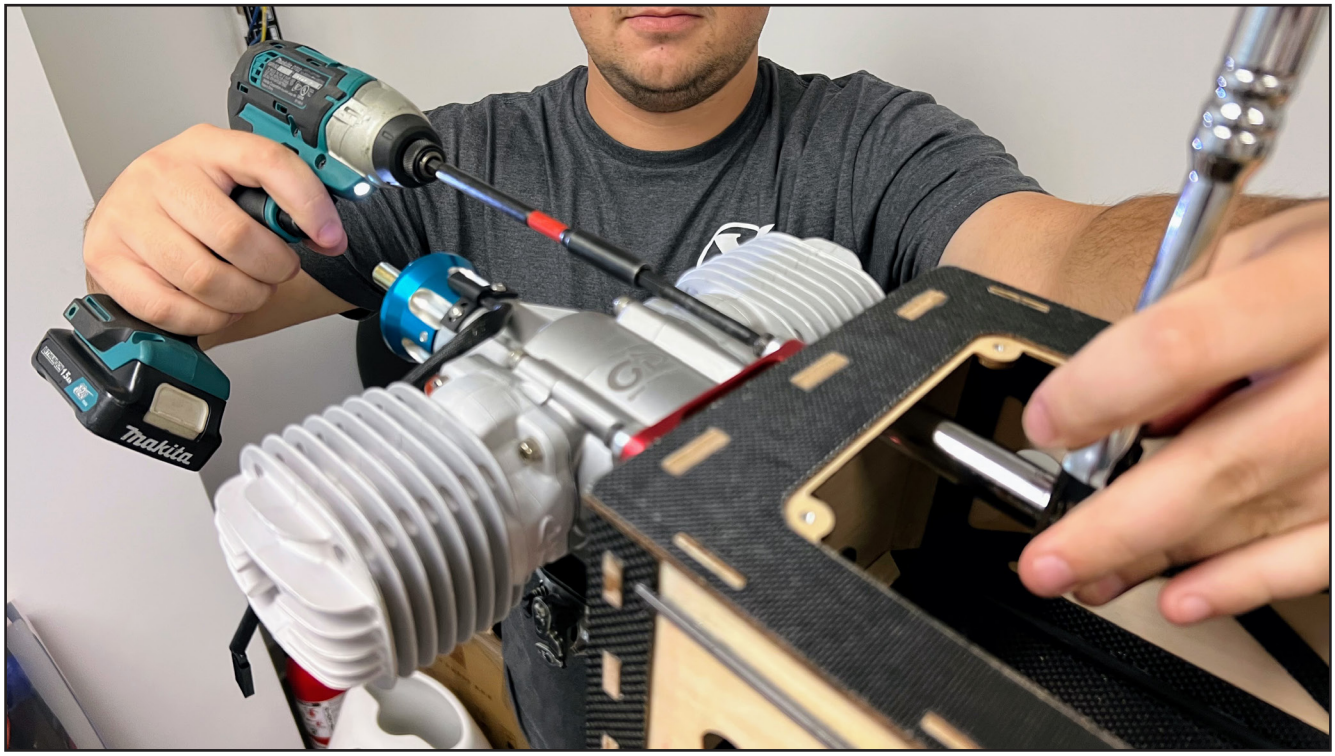




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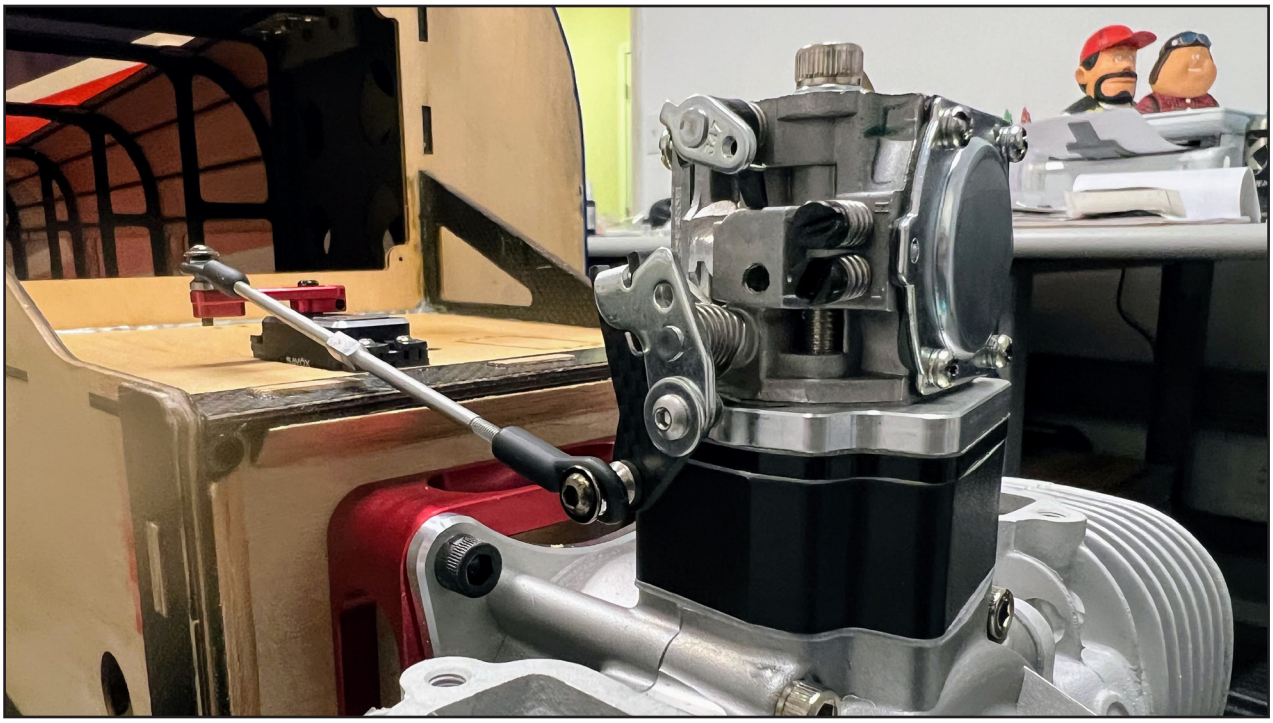
8. Drill the firewall as appropriate for your engine. The DA-120/GP-123 pattern is marked on the firewall for you. Use large washers and locking nuts on your engine mounting screws. For the DA-120 and GP-123, you will need the Blazing Star DA-120 mount, availble for Extreme Flight RC. Note that these engines are slightly different in overall length, and fiberglass cowls can vary slightly in length. So, the Blazing star mount, and some of our kits, include spacers so you can set the distance from your spinner backplate to the cowl perfectly. Place the spacers between the aluminum mount and the firewall as necessary. We recommend 2-3mm spacing. Note that we include 2.5-3 degrees of right thrust built into the firewall of our kits, and so on some cowls, such as the Extra 260 and 300, the clearance will be different on the right and left sides.

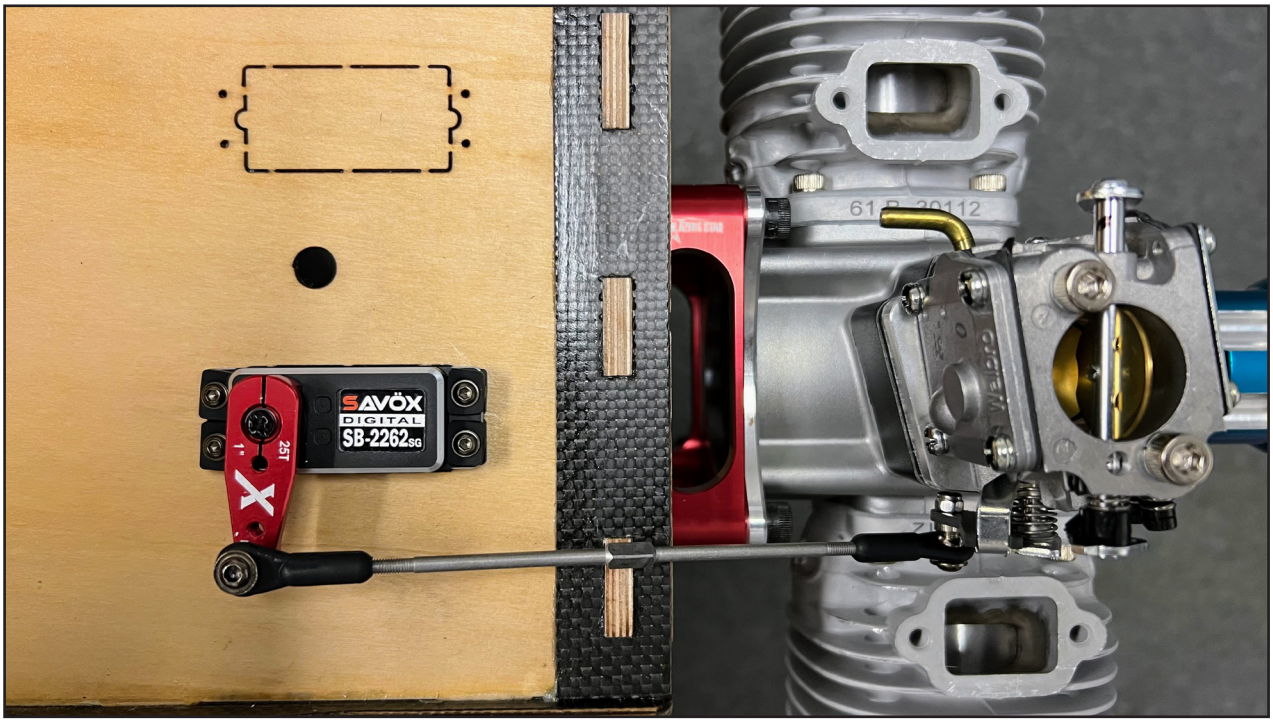




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9. Pictured is a typical throttle servo installation. Take care to ensure that the pushrod does not contact the motor box at any point in its travel.



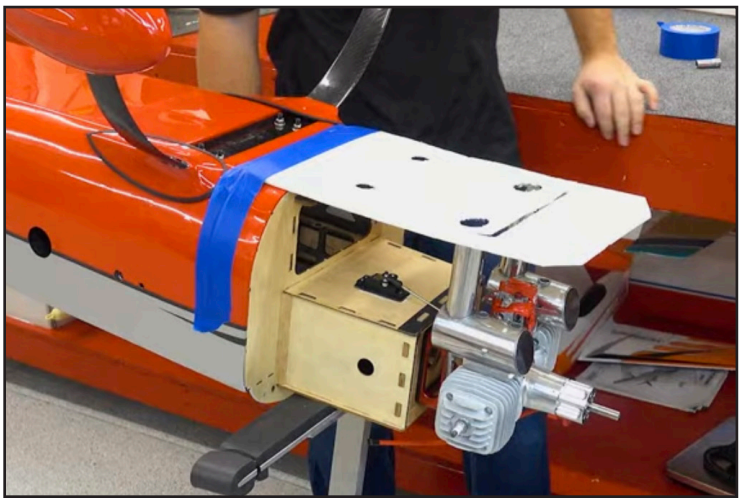


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10.

For stock mufflers you will need to cut the cowl for the muffler exits. One easy way to do this is to make a carboard or paper template as shown and use it to mark the cowl. Use a “dremel” type grinding tool with a sanding drum or stone attachment to make these openings in the cowl. Wear eye and breathing protection!

In our experience, if using stock mufflers, the best way to exit hot air from the cowling is through the bottom of the cowling. Large openings on the bottom of the cowling will exhaust hot air and, particularly if using smoke, the lack of holes in the bottom of the fuselage will prevent smoke oil or engine residue from migrating into the fuselage, lengthening the life of your airplane.









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11.

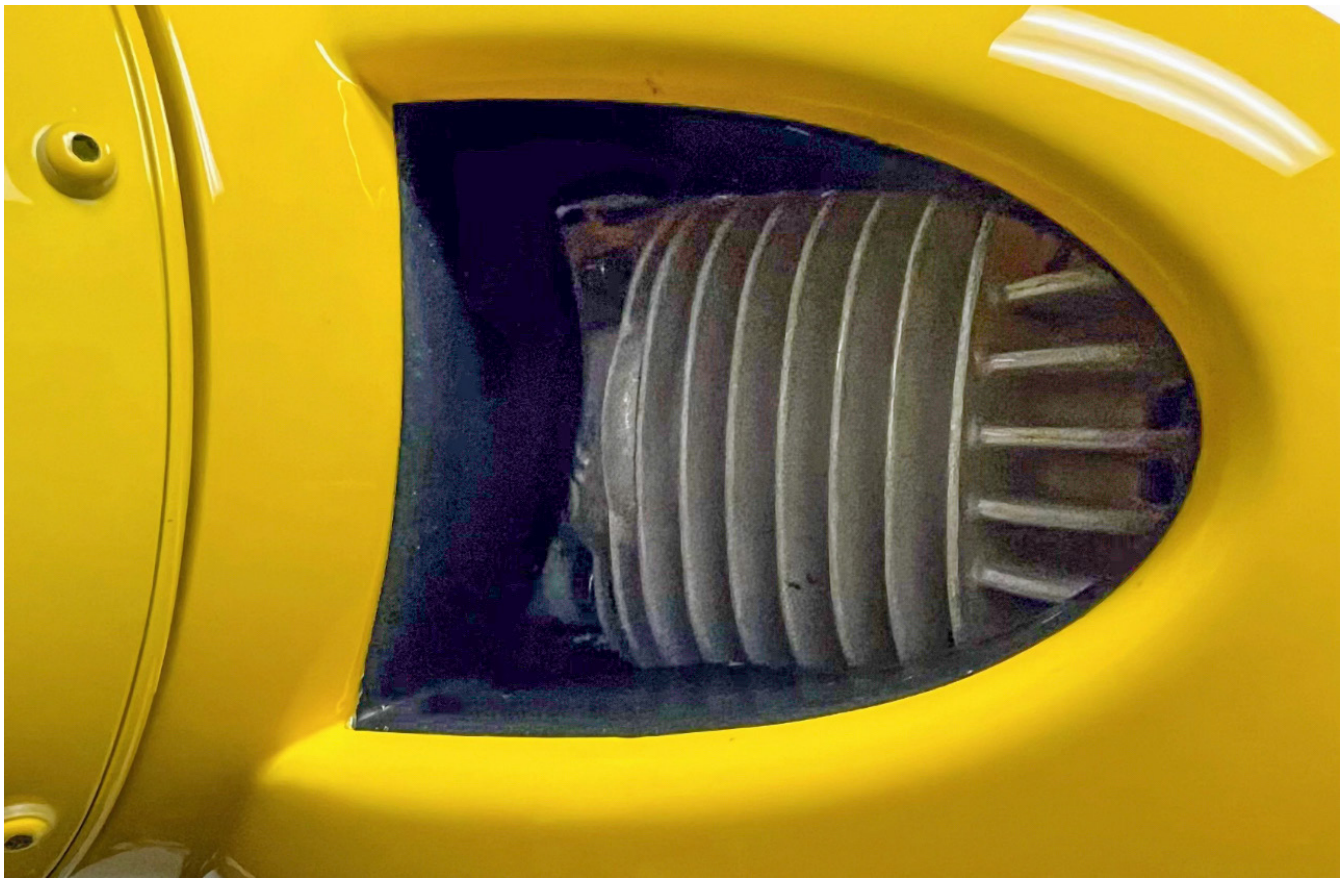
If using canister mufflers or tuned pipes, we provide outlet/vent plates for the bottom of the fuselage. Remove the covering over these locations on the bottom of the fuselage and install the plates with screws, using thin CA glue to hard the screw holes as you did your servo screw holes.

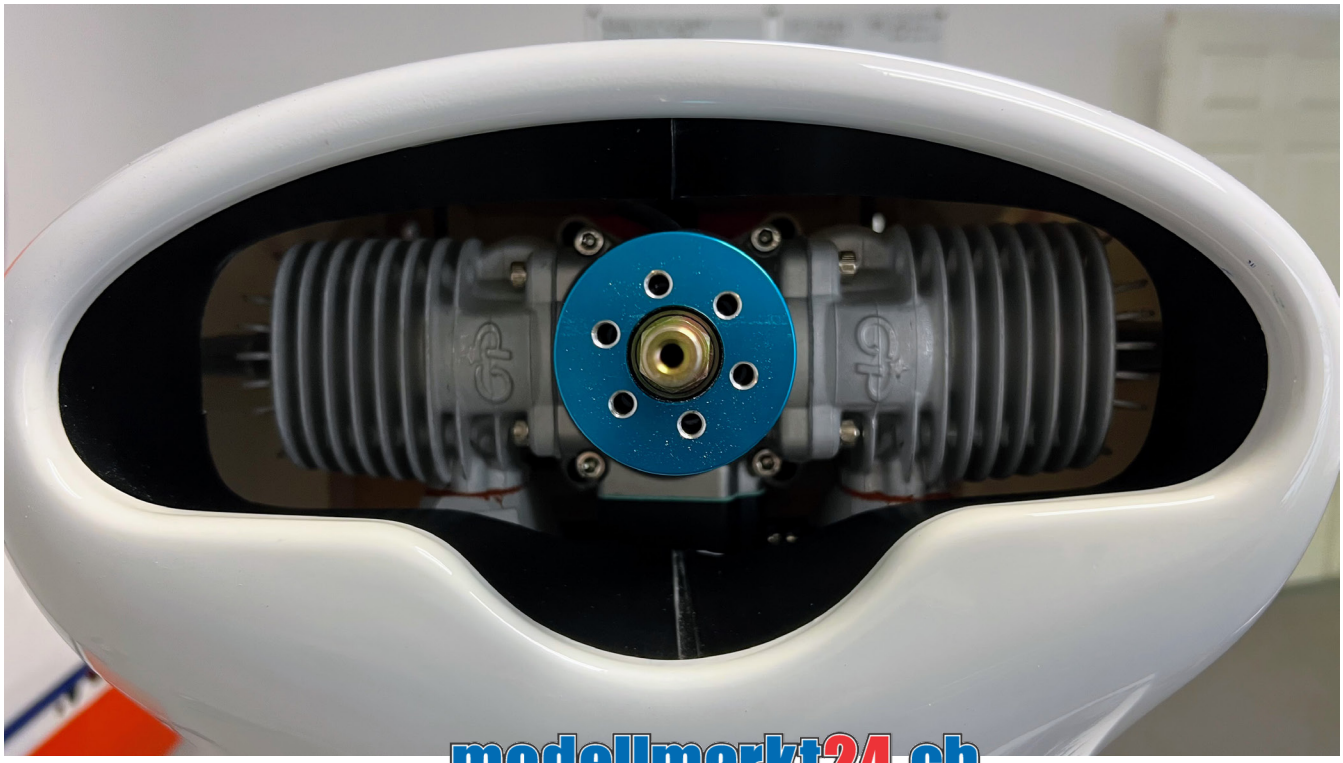


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12.

Many of our kits include cooling baffles (cooling ducts) which install into the cowl with epoxy glue. These ducts control the flow of air into the cowl and force the majority of the air to flow through the cooling fins of the cylinder heads. If cooling air is managed, and forced to flow though the fins, it may surprise you how little flow is actually needed to cool a well-tuned model aircraft engine. For kits which do not include baffles, they are easily made with craft foam.



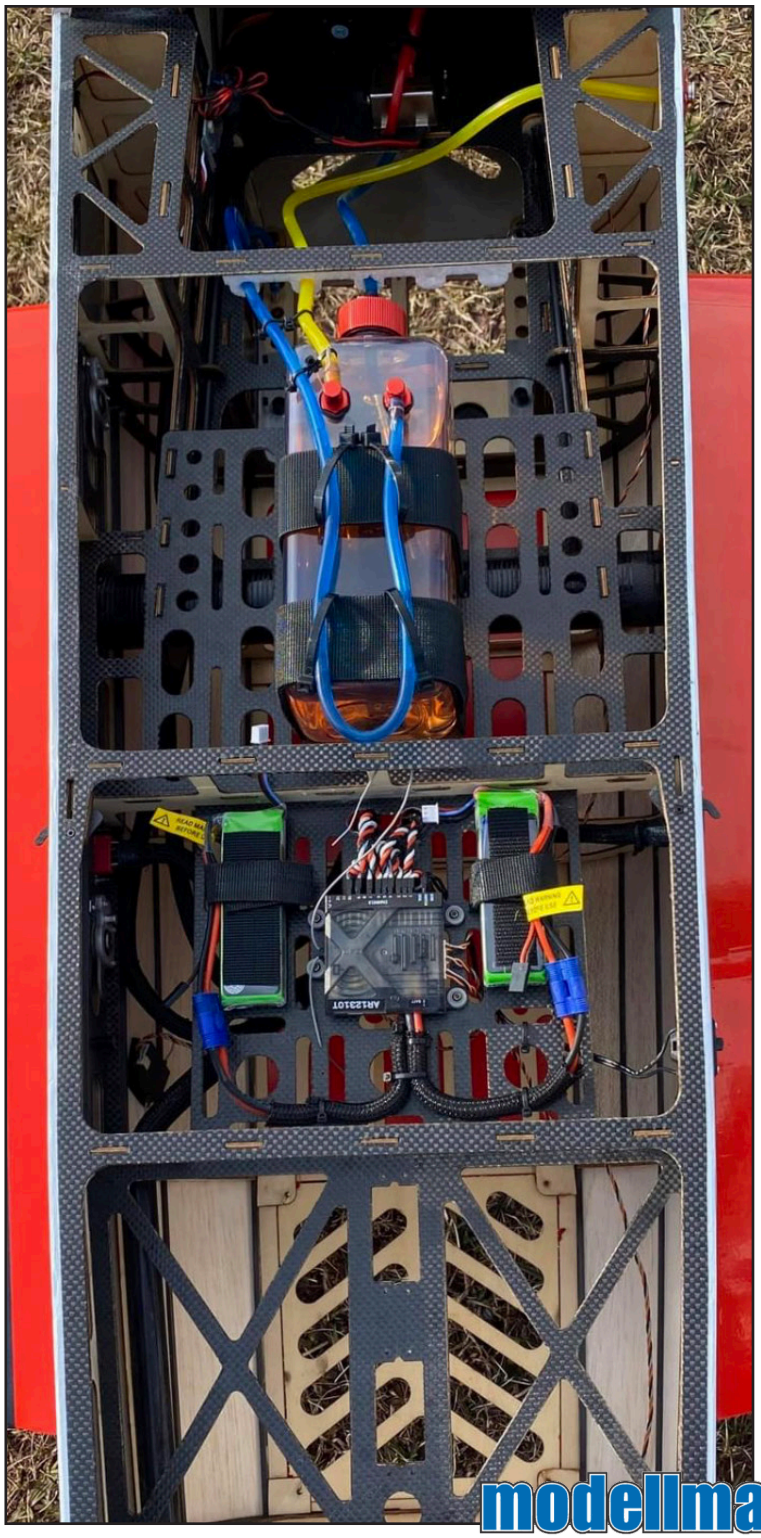


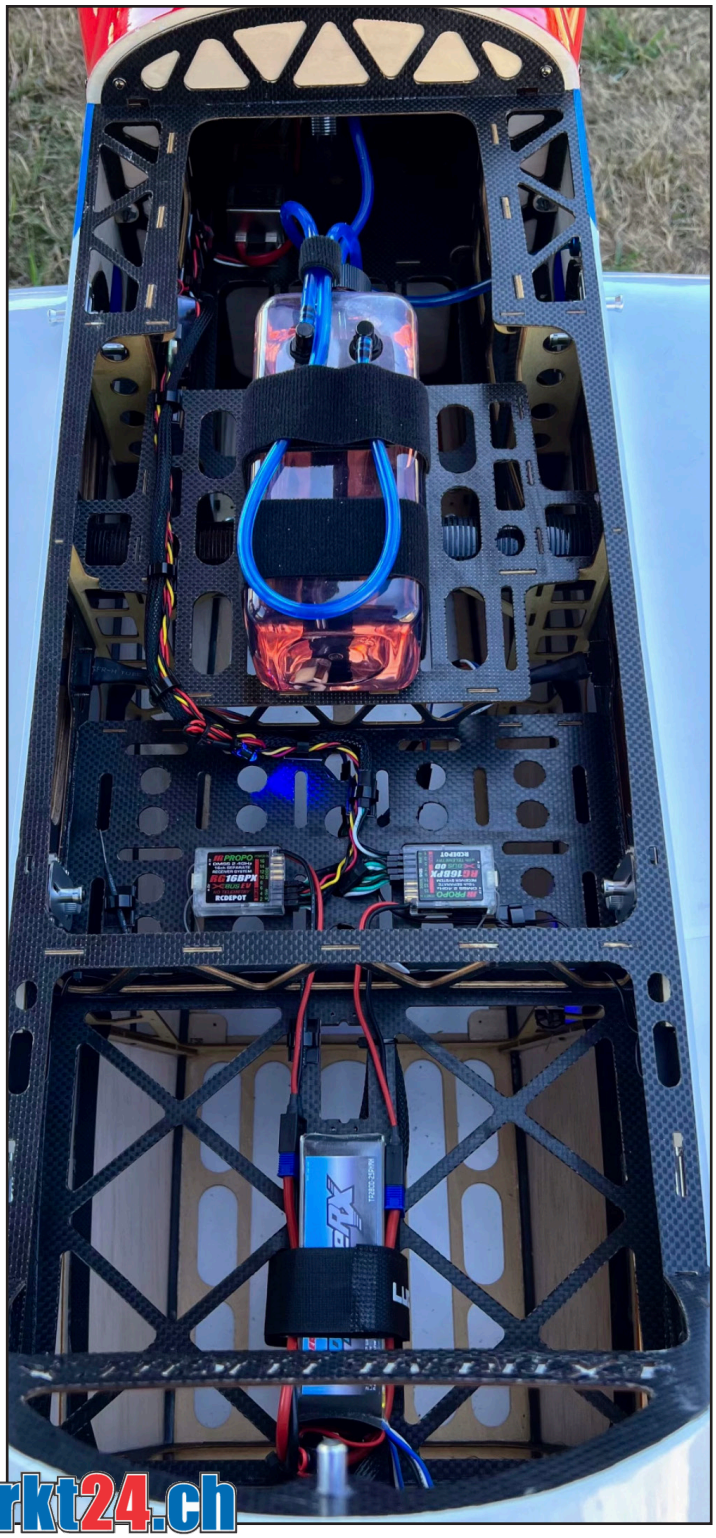
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13.

Here are typical equipment installation locations for this series of aircraft. For your maiden, you may wish to place your Rx batteries alongside your fuel tank. For the Extra 300, Extra NG, Slick, Extra 260 and Edge airframes, we prefer the batteries alongside the receiver for aerobatic flight. For the Laser, we prefer the batteries in the rear of the cockpit area.

For the Extra 300, Extra NG, Extra 260, Laser and Slick airframe, this results in a CG location just behind the wing tube for best aerobatic flight. For the Edge 540T, this results in a CG location on the center of the wing tube.





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14.

Recommended control settings are as follows:

Aileron Low:	20 deg up, 20 deg down 18-20% exponential
High:	38 deg up, 37 deg down 50-60% exponential
Elevator Low:	10-12 deg 18-20% exponential
High/3D:	45-50 deg 50-60% exponential
XA/Tumbling:	60+ deg 60-70% exponential
Rudder Low:	20 deg 50-60% exponential
High:	45+ deg 60-80% exponential

NOTE: This high rate aileron is an extreme setting and will result in a roll rate which is quite fast and may, for some pilots, be difficult to "keep up with" until you get used to it. If your transmitter has a mid rate for ailerons, set it to approx 32 degrees and 50% expo and this may help you get acquainted with this very high-performance aircraft.

Likewise, note that the "3D" elevator setting is optimized for smooth 3D performance in harrier, the "XA/Tumbling" rate may make it difficult to be extremely smooth down low until you are used to it.

We recommend only carbon-fiber props for maximum performance on this series of aircraft. 27x11, 28x9.5 and 28x10 are our favorites for our typical flying sites under 2,500 ft altitude.

We hope you enjoy your Extreme Flight 120cc aerobatic aircraft. This series of aircraft has collected trophies at top freestyle contests around the world. You now have that same level of world class performance in your hangar.



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