GB1 GAMEBIRD EXP

60 Inch Electric ARF

Assembly Manual



EXTREME FLIGHT

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Congratulations on your purchase of the Extreme Flight RC 60 inch GB1 Gamebird EXP ARF! The full scale Game Composites GB1 Gamebird was designed by Philipp Steinbach. It is an ultra-modern all carbon fiber composite construction aerobatic masterpiece with gorgeous flowing lines and truly amazing performance capabilities. We were given Philipp's blessings to model his Gamebird and allowed access to his CAD and 3D drawings of the GB1 which allowed us to recreate the unique styling of this aircraft while tweaking it ever so slightly to achieve the performance capabilities of our other current EXP models. The result is a beautiful model aircraft with outstanding 3D, Precision and XA flight capabilities that pays tribute to this modern aerobatic wonder. Thank you Philipp!

In addition to the industry leading composite laminated construction methods found in our current aircraft you will notice some interesting new tech incorporated into the Gamebird EXP; a unique wing retention system that provides a robust and very secure method of attaching or removing the wings from the fuselage in a matter of seconds. There is also a new carbon fiber canopy lock system that secures the canopy to the fuselage while providing virtually instant access to the interior of the plane. The high level of prefabrication in this airframe kit allows for a quick and easy assembly. An experienced modeler can easily assemble this model in a single evening of relaxed assembly steps.

If repairs become necessary, the Ultracote colors used on the Gamebird are as follows:
Green scheme: Apple Green #HANU903, White #HANU870, Black #HANU874, Silver #HANU881
Red scheme: True Red #HANU866, White #HANU870, Silver #HANU881, Black #HANU874

Extreme Flight R/C reserves the right to alter the assembly process at any time. While we do our best to update the manuals, sometimes there are minor changes in the process of the build. If you have any questions regarding assembly please check the webpage for any assembly manual addendums or contact us before moving forward.



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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. 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, 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 setup is absolutely essential. Inadequate servos or improper linkage setup may result in flutter and possibly the complete destruction of your aircraft. If you are not experienced in this type of linkage setup 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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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. Please take a few minutes and go over all the seams on the aircraft with a covering iron on a medium heat setting.
3. Use a fresh bottle of thin CA with a fine glue tip when attaching the CA hinges. This will ensure that the proper amount of CA wicks into the hinge and surrounding balsa wood and creates a proper bond between the wood and hinges. We are big fans of the Mercury line of adhesives as well as the glue tips provided by them.
4. Apply a couple drops of CA to high stress areas such as anti-rotation pins, landing gear mounts, servo trays and motor box joints .
5. When applying decals, first clean the area where the decal will be applied with alcohol. Mist the area lightly with Windex or Rapid Tack before applying the decal which will allow you to properly position it, then use a rubber squeegee to push all of the liquid from under the decal. This will result in very few air pockets trapped under the decal.
6. Take the time to properly balance and trim your aircraft and set up rates and exponential values. Your flying experience will be greatly enhanced by doing this.

Items needed for completion

-Hobby knife with #11 blades.

-Hobby sealing iron.

-Thin and medium CA. We highly recommend Mercury M5T thin and M100XF medium formulas as well as the Mercury glue tips.

-Blue Loctite.

-Small flat head and Phillip's head screw drivers.

-Standard and needle nose pliers.

-Metric balldriver or allen key set.

-Sanding block and sandpaper.

-4 mini metal geared servos. All flight testing was performed with Hitec HS-7245s, MKS 9767s and Savox 1260s. Please note that the MKS and Savox servos will require slight elongation of the servo slots.

-4 Extreme Flight Anodized 1.25" lightweight servo arms.

-Torque 4016T/500 Brushless Outrunner.

-Airboss Elite 80 Amp ESC or Castle Creations Talon 90 if using HV servos.

-6S 3300-4000 mah LiPo battery.

- 16x7 Xoar PJN Electric wood prop.

-2-24" extensions for the 2 rear servos, 2-6"extensions to go between the receiver and the aileron servo leads, 1-12" extension for the ESC lead.

-Extreme Flight Servo Safety Locks

-Adhesive backed Velcro and Velcro strap for battery retention.

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Let's begin!

1. Locate the 2 wing panels with ailerons as well as the 2 G10 aileron control horns and base plates. You will find 4 G10 control horns in the hardware package; 2 horns with longer shanks (the portion of the control horn that glues into the surface) and 2 horns with shorter shanks. For the ailerons you want to use the 2 horns with the longer shanks.

2. Insert a control horn into a baseplate and trial fit this assembly into the slot in the bottom of the aileron. Once satisfied with the fit, remove the control horn and scuff both sides of the shank with sandpaper to assure maximum glue adhesion. Use medium CA to glue the control horn into the slot as shown. Wipe away any excess glue. Once dry tug on the control horn to make sure it is glued securely in place.



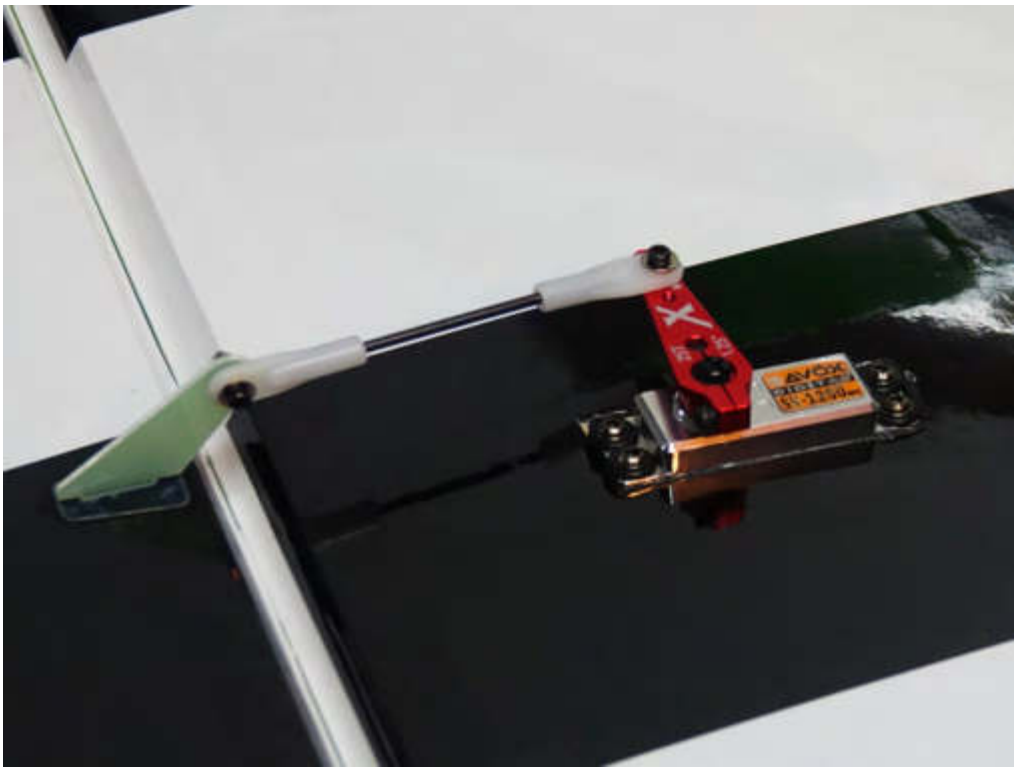
3. Center the hinges in their slots and slide the aileron into position making sure the outer tip of the aileron is flush with the wing tip and that there is no more than 1mm gap between the aileron and wing trailing edge. Apply a drop of CA at each hinge location on both the top and bottom side of the wing. Use a fresh bottle of thin CA and a fine glue tip for best results.



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4. Install your choice of servo with the output spline oriented toward the trailing edge of the wing. We recommend the use of the Extreme Flight Xcessories socket head servo screws for servo mounting. Please note that some of the newer mini servos are slightly longer than the industry standard and may require a slight modification to the servo mounting plate. This can be achieved quite easily with a sharp #11 blade and hobby knife. Take your time and remove a small amount of material at each end of the slot until the proper fit is achieved.

5. Locate the aileron pushrods, ball links and 2mm mounting hardware. Electronically center the servo and assemble the linkage as shown in the picture, paying careful attention to the orientation of the pushrod and ball link in relation to the G10 control horn. We highly recommend using the 2nd hole in from the end of the Extreme Flight lightweight 1.25" servo arm for maximum mechanical advantage while allowing you to run a high end point number for improved servo resolution. Repeat these steps for the other wing panel then do a final touch up of all the seams with your covering iron.



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Fuselage assembly

6. First lets assemble the landing gear unit and bolt it to the fuselage. Locate the main wheels, wheel pants, one piece carbon fiber landing gear, 2 axles, 2 wheel collars, 2 large washers to fit the threaded portion of the axles, and 2 nylon insert locknuts.



7. Place the threaded portion of the axle through the hole in the carbon gear leg. Place a washer on the threaded portion of the axle and screw the lock nut onto the axle, but do not tighten completely. Slide the wheel onto the axle and secure with a wheel collar. Be sure to add some blue Loctite to the setscrew in the wheel collar before tightening it down. There is a slot pre-cut in the wheel pant along with a molded recess to allow it to fit over the axle and fit securely against the gear leg. Slide the wheel pant into position over the axle and tighten the nut on the axle, taking care to make sure the wheel pant is positioned properly. Repeat this process for the remaining wheel pant. This is probably better illustrated in the following series of pictures.

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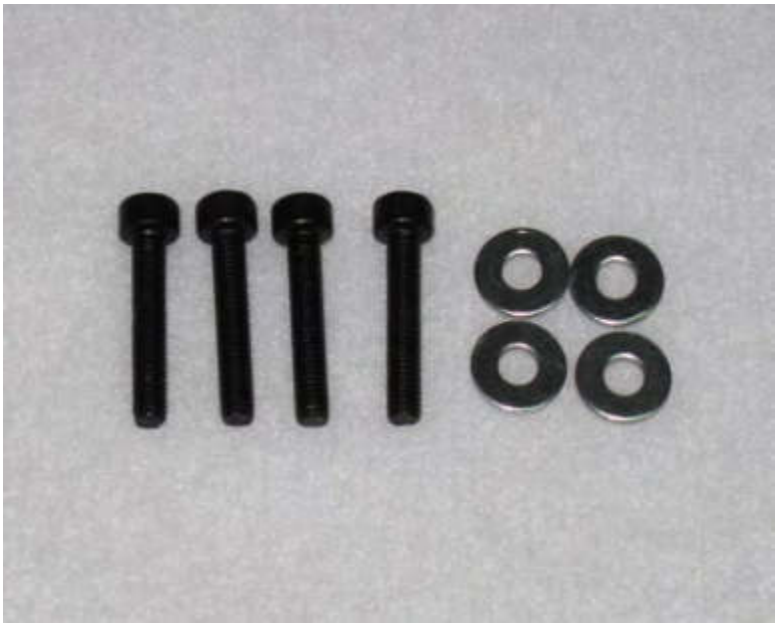






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8. Secure the landing gear to the fuselage by inserting a 3mm bolt into a washer, through the carbon fiber gear and into the pre-installed blind nuts in the fuselage. Make sure to use a drop of blue Loctite on each bolt to prevent them from backing out. <u>Please note the carbon gear should sweep back in relation to the fuselage.</u>

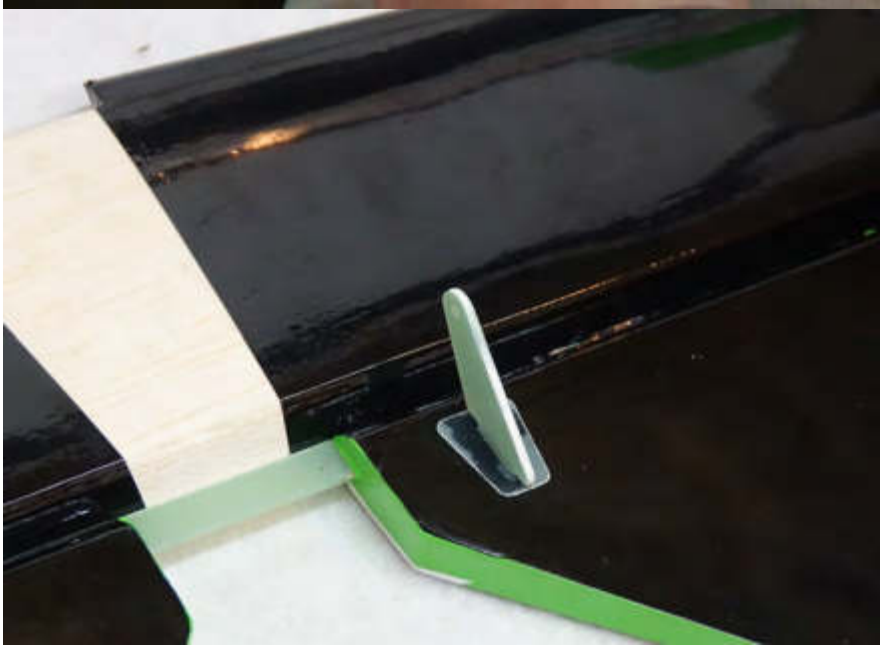




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9. Next lets mount the horizontal stab. In preparation to do this we need to remove the Ultracote covered filler block at the rear of the stab slot. I also find it easier to go ahead and hinge the elevator and install the control horn before gluing the stab into place. Locate one of the control horns with the shorter shanks. Scuff the area that will be glued into the surface, slide it into the baseplate and glue into the pre-cut slot with medium CA.





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10. Slide the elevator onto the hinges and secure to the horizontal stab with several drops of CA at each hinge location. Be sure to use a fresh bottle of thin CA to ensure maximum penetration and adhesion.

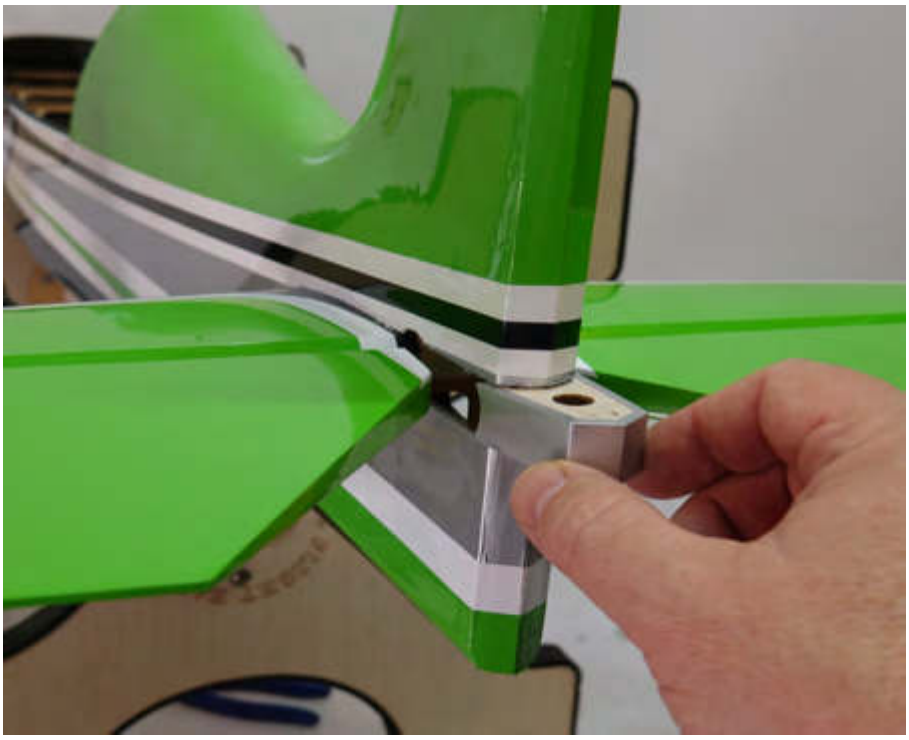


11. Slide the horizontal stab into position making sure to push it as far forward into the slot as possible. The alignment recess in the forward part of the stab will aid in proper positioning. Compare the stab with the vertical fin and make sure it is perfectly perpendicular. Adjust slot as necessary to achieve this and when satisfied with alignment secure the stab to the fuselage with a combination of thin and Medium CA.

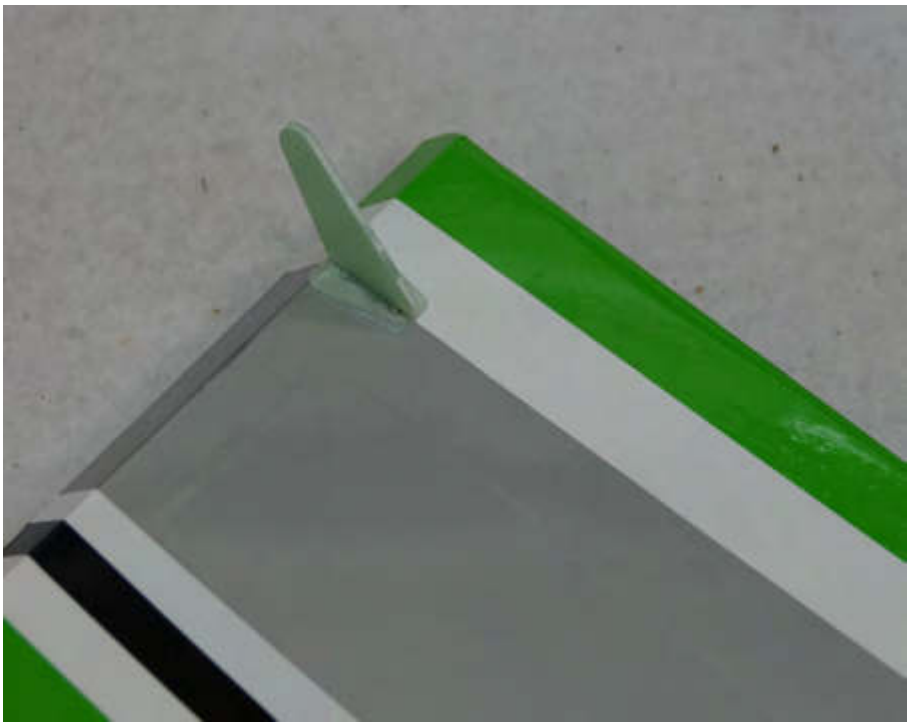


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12. Once the glue securing the stab is dry glue the filler block back into place behind the stab.



13. Scuff the shank on the rudder control horn and glue into position with medium CA as shown.



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14. Using the same process as with the ailerons and elevator, slide the rudder onto the hinges and secure to the vertical stabilizer with thin CA.



15. Locate the carbon fiber tailwheel assembly in the hardware package. Secure the tailwheel bracket to the bottom rear of the fuselage with the provided wood screws. Make sure the pivot point of the assembly is over the hinge line of the rudder for best results. Secure the tiller using the provided screw, but do not over tighten as the tiller should be able to move on the screw as the rudder is deflected.



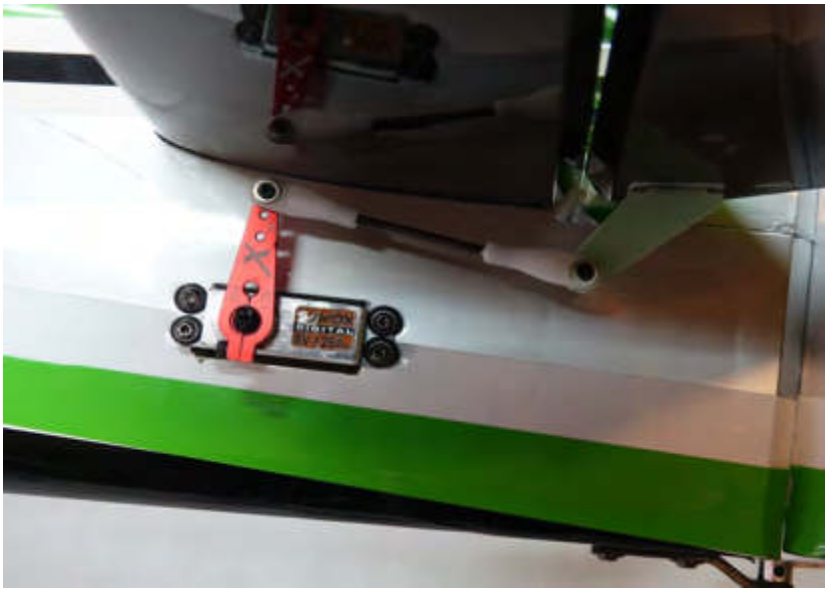


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16. Place the tailwheel wire in the proper position, aligned with the rudder and lock into place with the set screws.

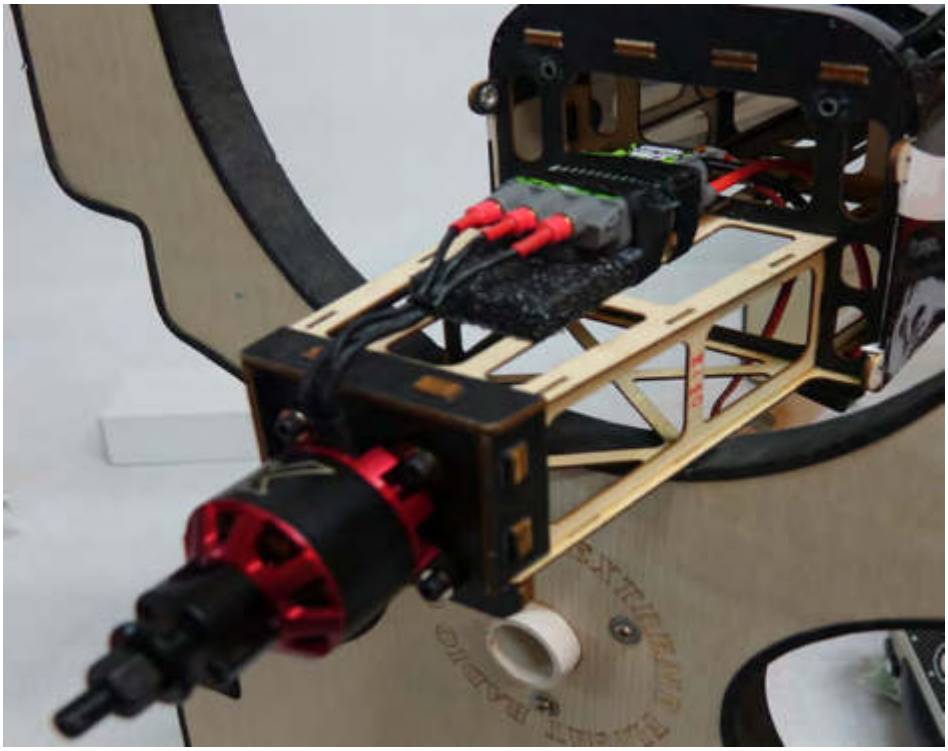
17. Attach a 24" Extreme Flight 28 AWG servo extension to the servo lead on your elevator and rudder servos and secure with an EF Servo Safety Clip or heat shrink tubing. Use the hardware provided with the servos to install the rudder and elevator servos in their respective location in the rear of the aircraft. From the pilot's perspective the rudder servo mounts on the right side of the fuselage and the elevator servo mounts on the left side. The elevator servo should have the output shaft toward the <u>front</u> of the aircraft while the rudder servo output shaft should be toward the <u>rear</u> of the aircraft. Assemble the linkages as shown in the photos. Please note you may need to snip 2-3 mm from the ends of the pushrod with a pair of side cutters for best fit.



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18. Attach the collar, radial mount and prop adapter to the Torque 4016T/500 and mount the motor using the supplied 4mm black socket head cap bolts and washers. The bolts are to be inserted into the blind nuts which are pre-installed in the motor mount plate. Be sure to put a drop of blue Loctite onto each bolt to prevent them from backing out. <u>Be sure to add some CA to all motor box joints!</u> Secure the ESC to the bottom of the motor box with Velcro straps or Nylon cable ties as shown.



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19. There is a set of clear plastic baffles included in your kit. We highly recommend installing these. We've found them to keep motor temperature very low, at times even below ambient temperature. Simply trim them along the etched trim lines and glue into position as shown behind the air inlets with medium CA or Goop style glue.

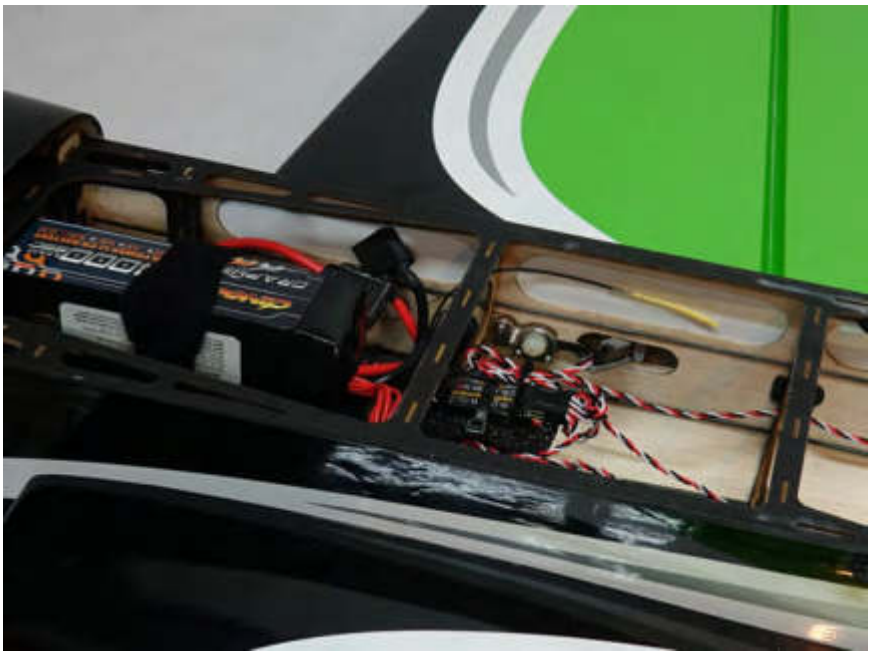


20. The holes for mounting the cowl are already pre-drilled at the factory. Place the canopy onto the fuselage and slide the cowl into position and secure with 4 3mm bolts and washers. In this picture we used the optional EF Xessories anodized black washers for an added touch of Bling. Be sure to use blue Loctite on each bolt!

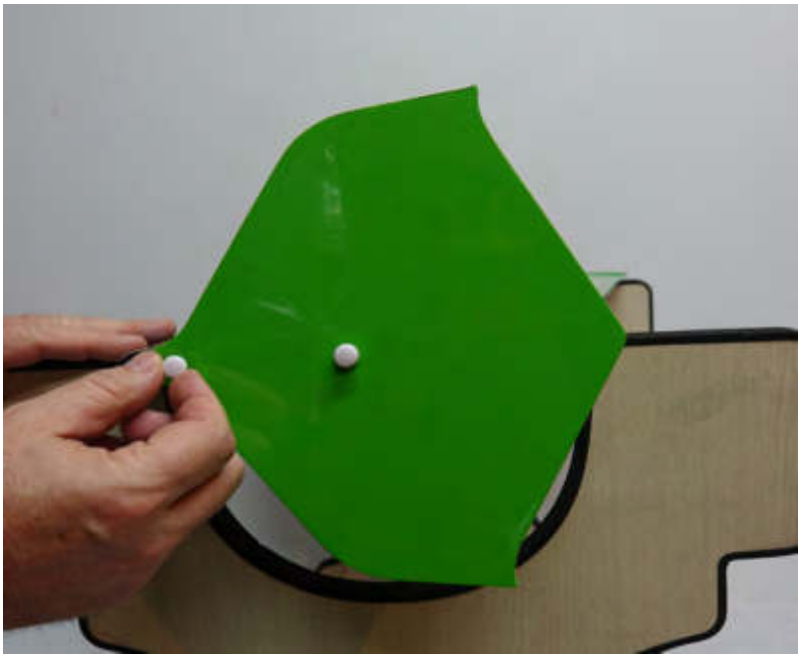


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21. Place a strip of Velcro onto the battery tray and onto your battery and use a Velcro strap around the battery and tray to prevent the battery from being ejected during high G maneuvers. Mount your receiver on the portion of the battery tray that extends behind the wing tube with Velcro.

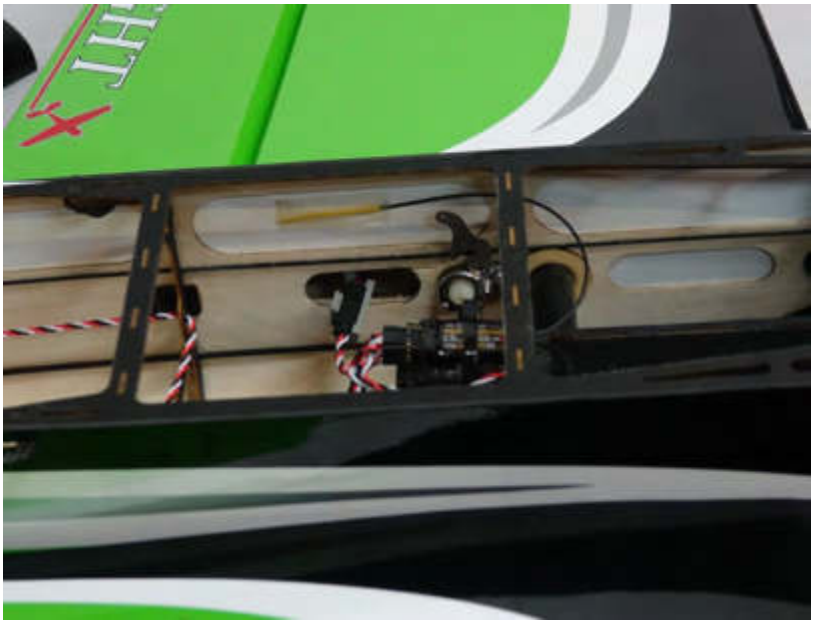


22. If using the included Side Force Generators now is the time to mount them. There are 2 clear spacers the shape of the wing tip that are to be placed between the wing tip and SFG to prevent them from rubbing against the aileron. Each SFG mounts using 2 3mm thumb screws. There are 2 laser cut holes in each SFG which correspond with 2 laser cut holes in the tip of each wing. Insert the bolts into the plastic washers and through the laser cut holes in the SFG and clear plastic spacer. Mount the SFG onto the wing tip by inserting the 2 bolts into the pre-installed blind nuts in the tip of the wing.



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23. Open the carbon fiber canopy locks and disengage the spring loaded hatch latch and remove the canopy. Lift the aluminum wing retention locks into the open position. Insert the wing tube into the receptacle in the fuselage and slide the wings onto the tube and up against the fuselage sides. Push the aluminum wing retention locks into place and plug the aileron servo leads into the receiver. Reinstall the canopy and secure the hatch latch and carbon fiber canopy locks. The Gamebird assembly is now complete and ready to fly, minus balancing and setup.





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Set-up and flying tips

We have found that the ideal location for the Gamebird to balance is 5 inches from the leading edge of the wing measured at the wing root. There is plenty of room on the battery tray to move your battery to achieve this CG location although we have found that placing the battery just in front of the wing tube is typically ideal for a wide range of flying styles. For this type of aircraft where I am going to predominantly fly aggressive 3D I typically set the airplane up with a neutral CG, meaning that when the aircraft is flown inverted straight and level it requires very little down elevator to maintain altitude. If your flying style leans more toward precision aerobatics then I recommend setting your CG using the 45 degree line test. Fly the aircraft from left to right or right to left, whichever direction you are more comfortable with at 3/4 to full throttle. Pull the aircraft to a 45 degree up line and establish this line and immediately roll the aircraft inverted. Establish this line and let go of the elevator stick. Ideally the aircraft will continue to track on that 45 degree line for several hundred feet before slowly starting to level off. Adjust the position of your battery to achieve this flight condition. Once satisfied with the location of your CG scribe a mark on the battery tray so that you can position the battery in the same location each flight and achieve the same feel and flight characteristics each flight.

I also highly recommend taking the time to properly set up your rates and exponential settings. Setting up low rates for precision maneuvers and high rates for aggressive aerobatics and 3D Here are some suggested rates to get started with. These are the rates and exponential values I feel comfortable with. They may feel awkward to you and if so please adjust to your taste.

Elevator: Low rate-8-10 degrees; 15-20% Exponential

3D rate-45-50 degrees; 60-65% Exponential

Insane tumble rate: As much as possible! 65-70% Exponential

Rudder: Low rate-20 degrees; 45-50% Exponential

3D rate- 45-50 degrees; 80-90% Exponential

Aileron: Low rate-15-20 degrees; 40-45% Exponential

3D rate- 38040 degrees; 70-75% Exponential

Again, these are my preferences, adjust to suit your flying style and preferred feel.

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The Gamebird EXP is capable of performing the full range of known 3D and precision maneuvers. It is also capable of performing all kinds of crazy aggressive maneuvers that have yet to be named. A great deal of fun and excitement can be had by just gaining some speed and pushing the sticks into new positions and seeing what happens! We've been able to coax all kind of crazy gyroscopic maneuvers out of this airframe. One of my favorites is to gain some speed and while on 3D rates and the "insane" elevator rate simultaneously chop the throttle while giving positive snap inputs (full up, full left aileron, full left rudder). Typically the Gamebird will perform 3 aggressive positive tumbles flipping over the wing tube before it runs of out inertia. Experiment with different inputs and vary the speed of your entry and see what happens. We can't wait to hear what you come up with! Be sure to get it on video!

The included SFGs can also act as "training wheels" when learning the harrier maneuver. They can help to stabilize the aircraft in high alpha flight and reduce pilot workload which certainly helps when you are learning a new maneuver.

Another neat set-up to try is to mix the ailerons to act as spoilerons which move in conjunction with your elevator. This mix commands both ailerons to raise as the elevator raises. I typically use this mix at 100% and put it on a switch so I can turn it on when needed and inhibit it when not needed. Some folks feel this type of mix is somehow taboo. To them I say "open your mind"! Anything that enhances flight characteristics or allows me to perform maneuvers that are otherwise not possible I am totally game to try! This mix allows the most straight down dropping elevators you will ever encounter, insane walls that gain no altitude where the tail of the aircraft is basically thrown under the fuselage and the tightest KE spins I've ever seen. This mix is also another good training tool for learning the harrier maneuver and by experimenting with the amount of spoileron to elevator mix you can actually determine the angle of attack that the EXP will harrier in. The best advice I can offer is to experiment, burn through lots of battery packs and above all have fun! You are in possession of a completely capable airframe whose flying abilities are only limited by your imagination. We have had a blast during the development and testing stages of this aircraft and I sincerely hope the Gamebird EXP provides you with as much joy and excitement as it has for me. See ya at the flying field!

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