60” Monoplane
Assembly Guide

EXTREME FLIGHT

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 (or alternate appropriate to your region) 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 (or the appropriate model aviation sanctioning body in your geographical region). 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.

If you need assistance with your aircraft, please contact the selling dealer. In the United States, please contact us at info@extremeflightrc.com or 770-887-1794. It is your responsibility to ensure the airworthiness of your model.

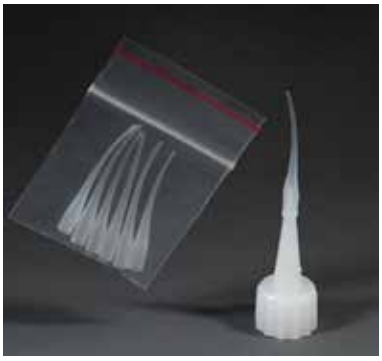
This build guide covers all of the 60-64" Extreme Flight monoplane ARFs. There are detail differences between these aircraft. Some have add-on wingtip extensions, some do not. Some use cutout-style horizontal stabililzer mounts, and some use slot-style. Some use landing-gear-to-fuselage fairings, some do not. But the overall assembly sequence is identical.

NOTES ON USING THIN CA GLUE IF YOU HAVE NOT BEFORE:

We recommend to glue the horizontal stabilizer in with thin CA glue. You will also use it to attach the rudder hinges, and we recommend it in addition to medium CA glue for the control horns. Thin CA dries nearly instantly and is very strong and is perfect for this very quick build. It requires only 8-10 drops of thin CA total around the horizontal stabilizer seam to fully attach it. If you have never used thin CA glue before, we recommend two things:

A.Thin CA glue can spill easily, because it is thinner than water and runs very freely. It can be difficult to precisely apply only one drop without practice. So, practice! Take your thin CA glue and some scrap material and practice applying one drop of glue, precisely. After four or five drops, you'll get the hang of it. Much better than practicing on your airplane.

B.The job is made easier by using a glue tip. This is a piece of tapering teflon tubing which attaches to the spout of your glue bottle. They are extremely inexpensive and can be changed frequently if clogged:



Required equipment:

Brushless electric power system - You'll need a motor and ESC which are correct for the airplane. For this series of aircraft you'll need a brushless motor in the range of 320-375 grams weight, so that the plane can balance properly without excessive added weight. The two power systems we recommend are the XPWR 22CC motor or the T-Motor AM600 motor. Both are the correct size and weight and Kv, they spin a 16" prop on 6S Lipo 3000-4000mah, and this is the type of system these planes are designed for. We use a T-Motor AM116S esc with either motor.

These aircraft are designed to use high-performance metal-gear mini servos. There are many, many choices for servos available and it can be confusing to choose appropriate ones. Because there are so many different servos which can be used, the servo cutouts in your aircraft are not likely to be exactly fit to your servos, so you may need to remove a bit of wood to clear the cases on your particular servos. We prefer to use a sharp hobby knife and then a small sanding board.

Our preferred servos are EF/Theta 988 or 989, or SAVOX 1261. These servos are in the 200-300 oz/in torque range and we recommend only servos in this class for high-perfomance flying. Many "HP Mini" servos on the market are in the 100 oz/in class or less. These are adequate for sport or slow flight, but you may experience blowback, low performance or even flutter if you use these with the most powerful electric power systems.

We recommend a Lipo battery in the 3000-4000mah range for mixed 3D, precision, XA and sport flying (how most of our aircraft are actually used). If you plan on ONLY sport/precision flying with no 3D, you can use a larger pack up to 4400mah, but note that a bad landing with a smaller pack might do no damage, but with a heavy pack onboard the chance of damage is greater.

Materials, Tools, Supplies:

For assembly, you will need to glue a few of the parts on your airplane. We use CA-glue only, it's quick, easy and strong. We recommend to have thin-CA, medium gap-filling CA, and a matching CA-accelerator.

If you wish, you can use epoxy glue instead on some joints. Epoxy can give you more time to work, but note that it adds weight quickly if you apply too much, so use it carefully.

For cleanup of dripped or spilled glue, use acetone for CA glue and use denatured alcohol for epoxy. Both are available at hardware/home improvement stores or online.

If your kit includes landing-gear-to-fuselage fairings, we recommend Gorilla Clear Bond glue for this joint.

You will need hex drivers in the 1.5mm, 2.0mm, 2.5mm and 3.0mm sizes. These are often sold together as a set for hobby use. You will need a hobby knife (commonly called an X-acto after a popular brand name) with spare blades and some sandpaper 120-180 grit.

We recommmend that you use threalocker on the metal-to-metal screwed connections on your acraft where called for. You want MEDIUM strength, which is usually denoted by the color BLUE. Red, high strength threadlocker is not required and can make maintenance or parts replacement very difficult.

Your power system may come pre-assembled with battery connector and motor-to-esc connenctions pre-finished, otherwise you will need to solder your connectors in place. For this you will need a soldering rig and solder. Selection of a soldering rig and how-to solder is beyond the scope of this guide, but there are many online resources including instructional videos on soldering connectors.

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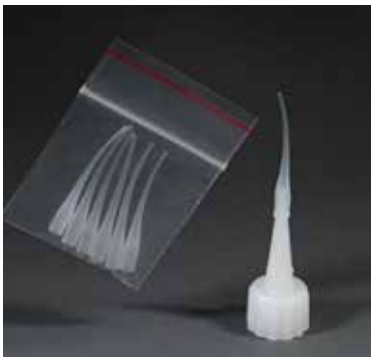


Working with covering material.

Your aircraft has been on a journey around the world since it left our factory. Although the covering material was perfectly smooth when it was boxed up, changes in weather and humidity may have wrinkled the covering material. For certain, wrinkles will appear in the covering once you have unpacked your aircraft and it adjusts to the atmospheric conditions in your region. Learning to remove wrinkles from covering is a necessary skill to maintain your wood aircraft.

Your Extreme-Flight produced aircraft is covered in Ultracote covering material (US market name), also called Oracover in global markets. If you need replacement covering to repair damage, Ultracote/Oracover is widely available from retail hobby suppliers. Also, each roll of Ultracote/Oracover includes excellent instructions which are also available online. Please refer to them for details about working with and/or repairing your covering.

The basic tools are a covering iron and a hobby heat gun. When you unpack your new aircraft, start by using the iron at 220F (104C) to seal all of the edges on the covering scheme. This is CRITICAL on the leading edges of wings and stabilizers. Then use the iron at 300F (149C) or a heat gun to shrink out any wrinkles in the covering. Remove the plastic canopy from the aircraft when using a heat gun to protect it from heat damage. GO SLOWLY AND CAREFULLY to avoid over-shrinking or burning the covering. This is a skill which takes a bit of practice. There are many tutorial videos online demonstrating shrinking wrinkles from Ultracote. BE CAREFUL when you first try using a heat gun to shrink covering! Heat guns are EXTREMELY powerful and even experienced modelers occasionally can over-shrink an area, lifting a seam or causing a stripe to become crooked, when using a heat gun.

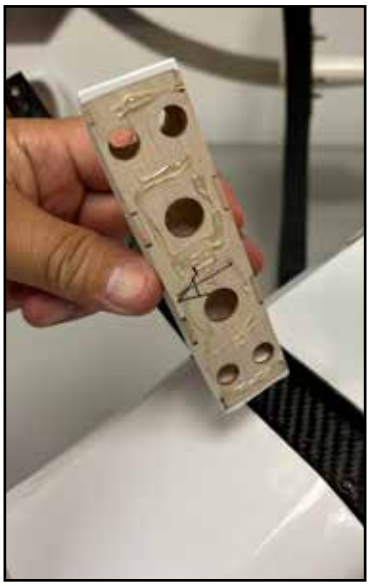
Periodically repeat the sealing and shrinking process to keep your aircraft in good condition.

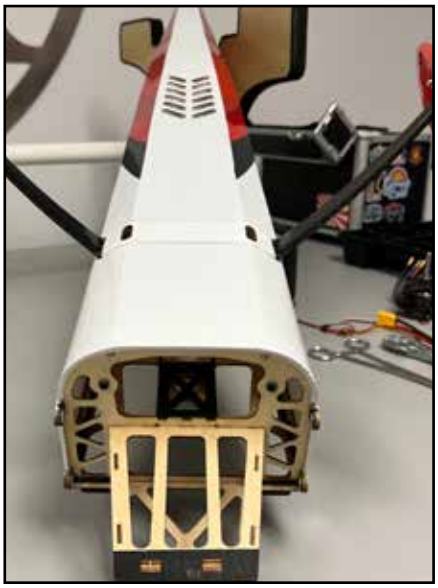
Small sections of repair covering are included in your kit box. If you need additional covering material to repair your aircraft, the color codes are are listed in the spec sheet for your aircraft, posted on the ExtremeFlightRC.com website.

ExtremeFlight RC also carries all of the spare parts you might need to repair your aircraft in the event of damage.

1 Unbox and unwrap all parts, check for any damage. If you need assistance, contact your dealer. In the United States, contact Extreme Flight RC at the email address posted on our website, www.ExtremeFlightRc.com. Carefully inspect the inside of the shipping box for ALL included parts and give it a close look for any screws. Do not dispose of the box until your build is finished, this may save you from a crisis if something was accidentally left inside. Follow the instruction in the "working with covering material" section above.

2 Attach the landing gear to the fuselage using bolts as shown, apply a drop of threadlocker to each bolt before screwing them in. These bolts may either included washers or have the washer integreated into the bolt head. Note that one most of the aircraft in the series, the landing gear sweeps slightly forward when installed. On the 60" Gamebird, it sweeps back. On some aircraft, a filler plate is included which glues on the bottom of the landing gear mount area, we recommend Gorilla Clear Bond glue, or an alternate such as Goop or clear silicone caulk.



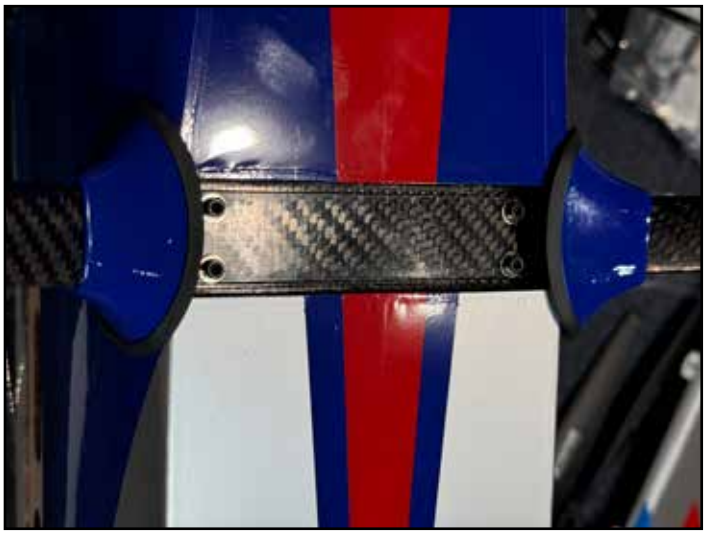


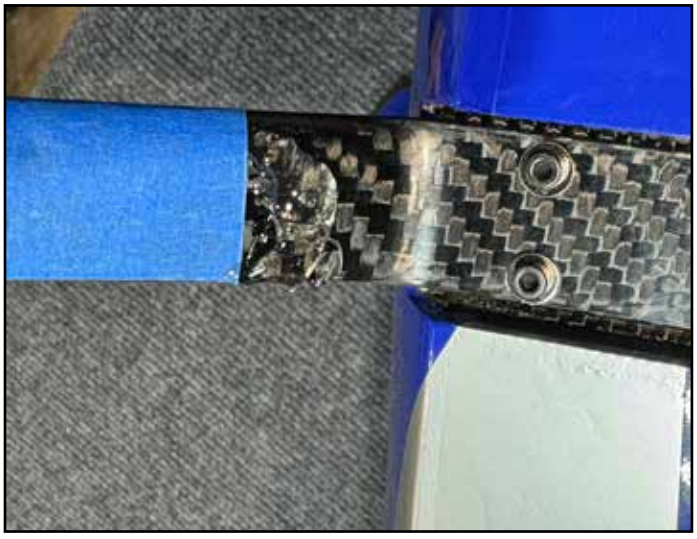
3

Your kit may include landing gear-to-fuselage fairings. If so, we recomend to glue these to the landing gear only. If you glue them to both the gear and the fuselage, they can't flex adequately with the landing gear. Dry-fit the fairings and make sure you have the correct sides in the correct location. You may need to fit the inside of the fairings to the gear legs by sanding a bit.

The 60" Yak 54 includes wooden fairings which are simply glued on. For other aircraft which include fiberglass fairings, you may need to fit the inside of the fairing to fit the gear perfectly, use sandpaper.

We recommend to use Gorilla Clear Bond rubberized glue. If this is not available, Goop type glues or clear silicone caulk are good substitutes. We like to use a piece of masking tape to mark where the glue will go, then remove the fairings, then apply a large dollop of glue as shown and tape the fairings in-place until dry.





4

Locate the wheels, axles, hardware and fiberglass wheel pants. Put the wheel on the axles and install the wheel collar as shown with blue loctite on the set screw. Put the wheel and axle into the wheels pants and attach to the landing gear with the self-locking nut as shown. Loctite is not necessary on self-locking fasteners. Your kit may include a self-drilling screw to lock the wheel pant as shown, drive it through the small hole in the carbon landing gear into the pant.

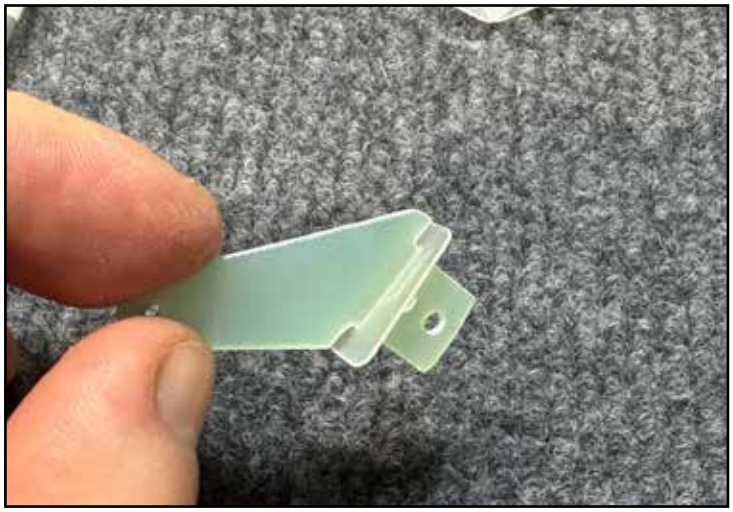
5

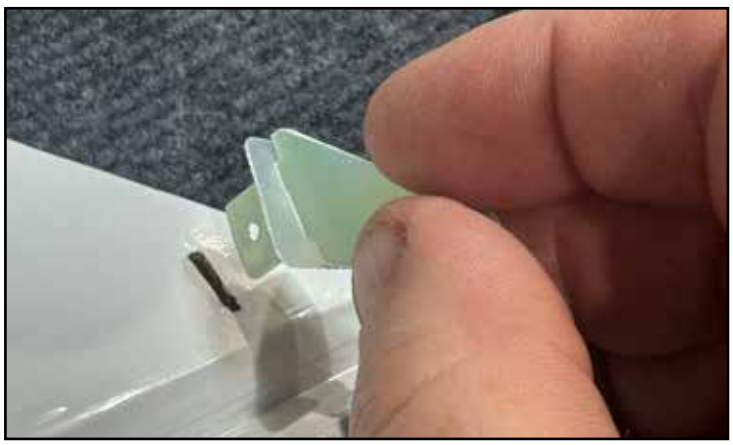
Your 60” aircraft uses 4 servos, and therefore you will install 4 control horns into your control surfaces. Note than on many of the aircraft in this series, the elevator is thinner than the other surfaces, so the end of the elevator control horn is shorter as shown.

Use sandpaper to scuff the end of your horns as shown to clean and prep the gluing area. Assemble with the cover plate as shown. Make sure the horn fits easily all the way into the slot, then remove.

If you wish to use CA glue as we do, apply several drops of medium to the slot and a drop to each side of the horn and insert firmly into the slot. Then after the horn is fully inserted, add a couple of small drops of thin on top as shown. Clean up any excess.

If you wish to use epoxy glue, apply into the slot and to each side of the horn, insert the horn firmly into the slot, and clean up any excess.

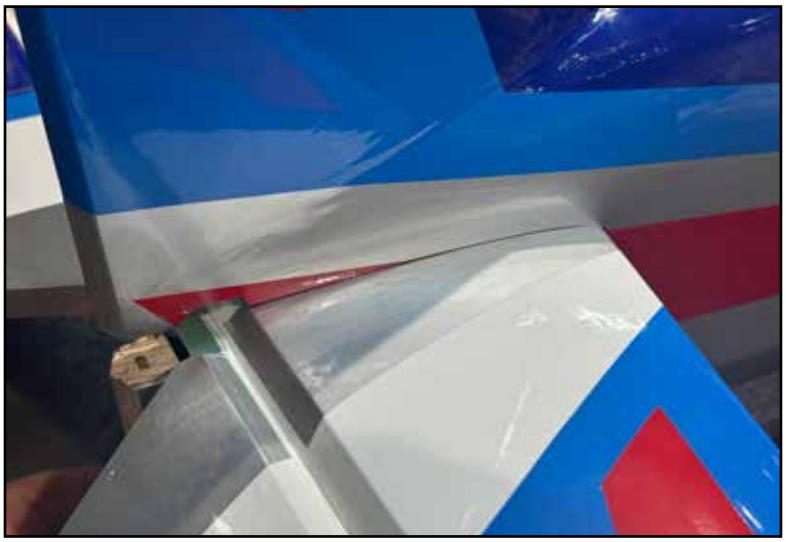




6

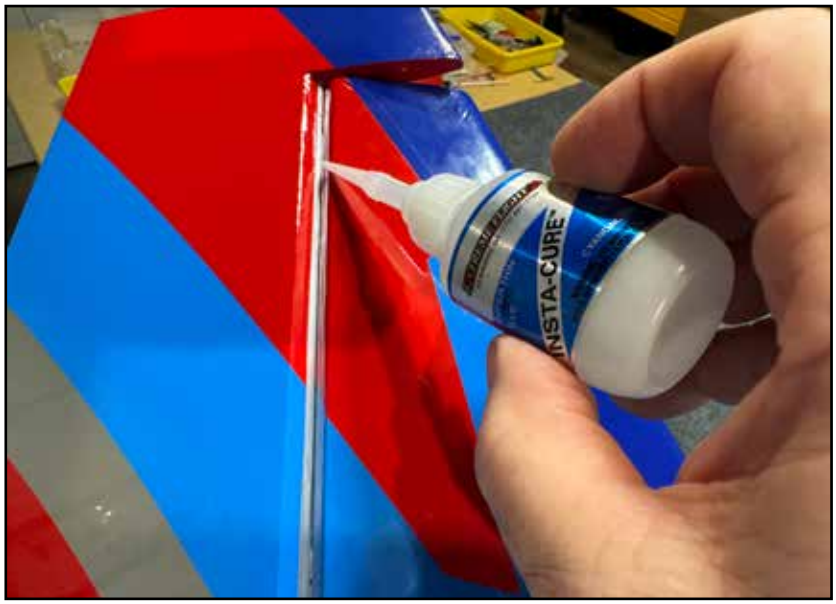
Your kit may include a spacer block in the horizontal stabilizer slot as shown. Remove any tape and remove the block. Slide the horizontal stab and elevator into the slot. Check the fit, slide the stabilizer as far foward as you can and make sure the spacer block can be installed without interfering with the elevators and the connector between. Make sure the stab is right side up!

When you are staisfied with the fit of the stab, you can either leave it in place and apply thin CA to the seams, and from the rear, and through the servo openings, or you can remove it to apply epoxy glue to the mounting areas and put it back in place. Re-install the spacer block with glue. Clean up any excess glue.



7

The only hinges you will need to assemble on your aircraft are the rudder hinges. These are made of Tyvek material. Slide the ruder hinges into the pre-made slots in the fin using a sawing motion. Once the rudder is in place and the hinges fully seated, swing the rudder back and forth to insure good motion and set the required gap in the hinge line (about 1mm is correct). Then apply a few drops of thin CA glue to each hinge. The glue will wick into the hinge slot, clean up any spilled glue with acetone.



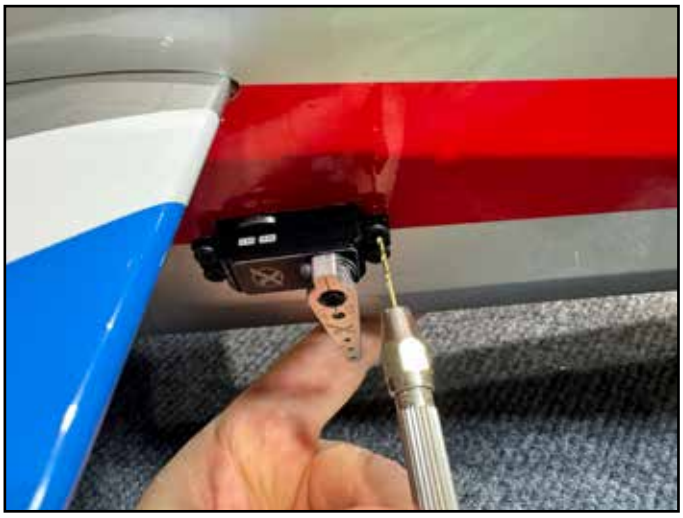
Once the rudder is glued in place, screw the tailwheel into the bottom rear of the fuselage as shown. Place the center of the steering axle of the tailwheel in-line with the hinge line of the rudder. Add one screw as shown into the rudder through the middle of the aluminum steering arm as shown. Do not tighten this screw completely down, it needs to be able to slide within the slot of the aluminum steering arm. Note the Extra NG (pictured) has a fairing the tailwheel carbon bracket fits into.

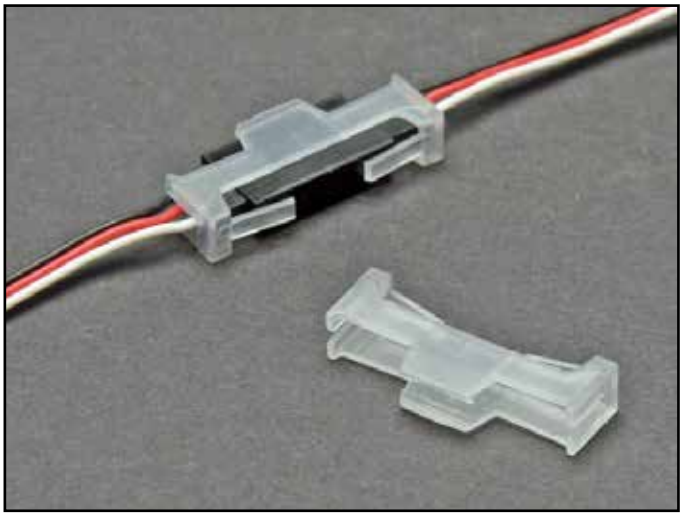
8

Your aircraft has four pushrods. These are made of threaded metal rods with a plastic/bronze ball link at each end. To install the ball links, we like to chuck the pushrods in a cordless drill and use it to spin the links on. The metal rod is right-hand threaded at both ends on this aircraft series.

Note that you will have two identical pushrods for the ailerons. Consult photos in this guide for push-rod locations for the tail pushrods, but in any case you should try the pushrods in their locations to determine the fore-aft orientation of each servo.

8 To install your rudder and elevator servos, note that there are many, many different types and brands of servos which are applicable to this size of aircraft, and their exact case sizes are not standardized. You may need to remove a bit of material to fit your servos. We recommend using a sharp hobby knife, and then finishing with sandpaper. Before installing servo screws, we recommend pre-drilling them with a small (1mm-1.5mm) drill bit as shown. Then remove the servo and add one drop of thin CA to each drilled hole, then install the servo with its extension wire (if applicable) permanently with the mounting screw. We recomend using a servo lock as shown on all servo extensions wire connections to prevent them coming loose in flight. You can also heat-shrink these connections if they are permanent.





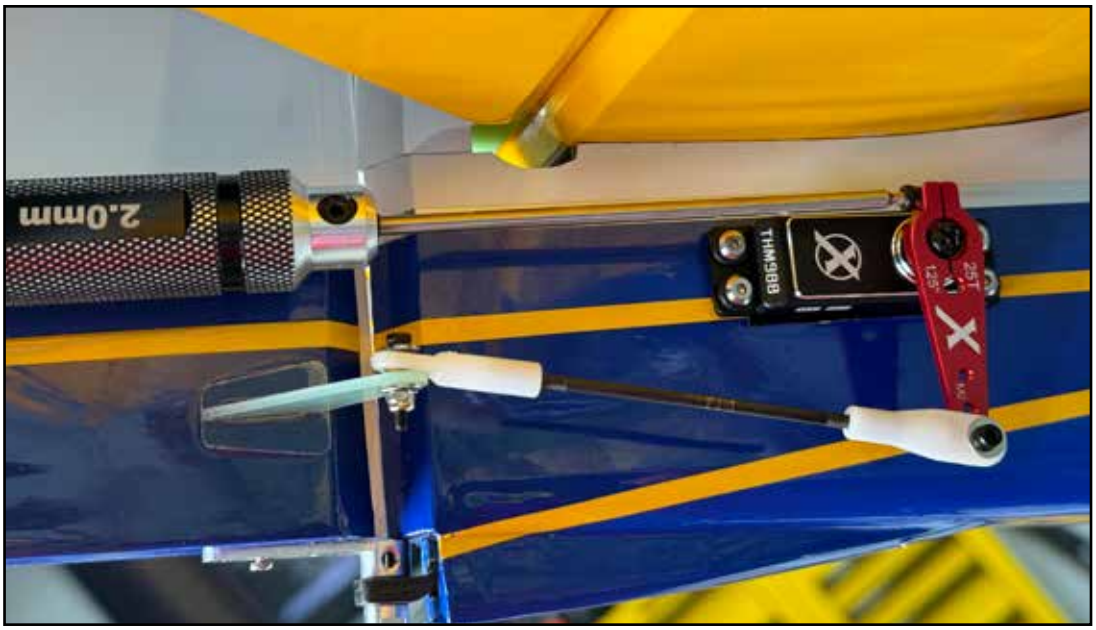
9

Now we attach the servo arms and pushrods to the rudder and elevator servos. Center your servos as necessary using your radio system or a servo tester. Remove the phillips screw on the servo output spline, push the servo arm onto the spline, add a small drop of threadlocker to the screw and screw it back in. Then tighten the pinch bolt on the servo arm as shown. This page shows the arms and pushrods for the Extra NG airplane. Some other aircraft's servos and pushrods are shown on subsequent pages for reference.

Attach the pushrods to the arms and horns with 2mm screws, washers, and locking nuts as shown. In the photos on the subsequent pages, you will see that some pushrods are installed on the outermost holes of the servo arms, and some on the second hole. During setup, choose the *innermost* hole (to make the shortest effective servo arm) with which you can achieve the desired throw. This will vary depending on your servos and radio gear.

60" Extra NG elevator

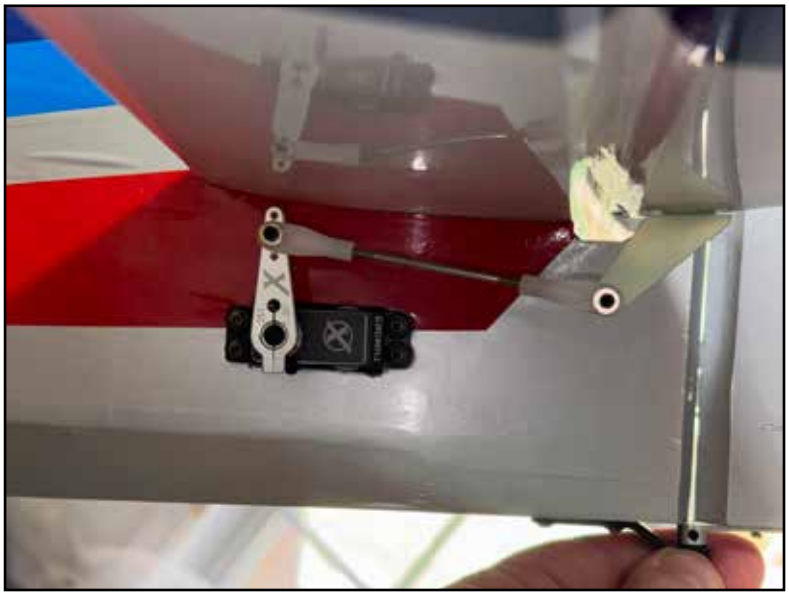
60" Extra NG rudder



60” Edge elevator

60” Slick elevator

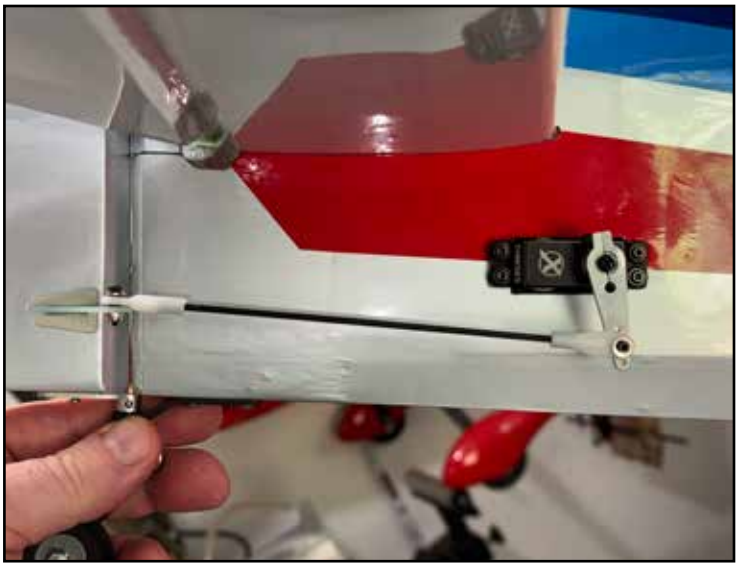
60” Laser elevator



60” Yak elevator

60” Slick rudder

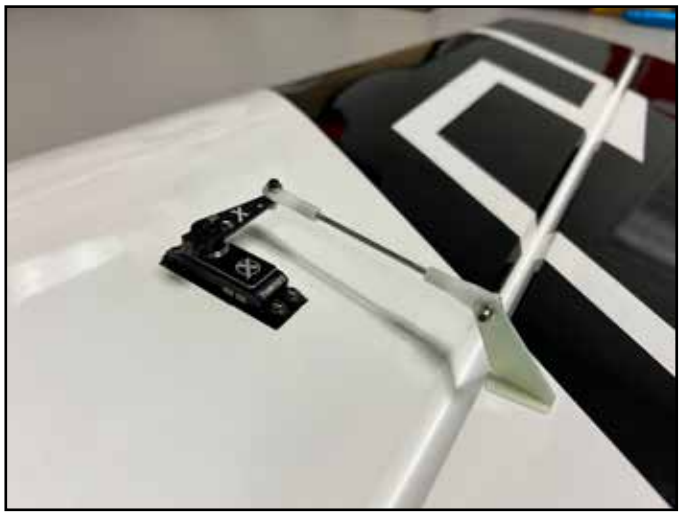
60” Laser rudder

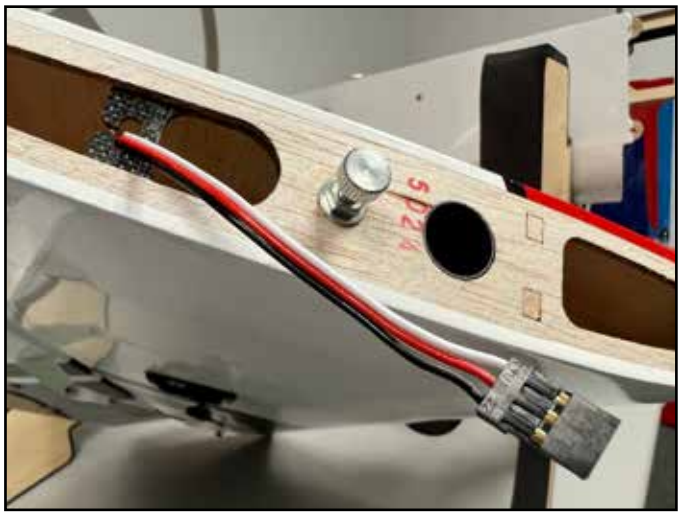


60” Yak rudder

10

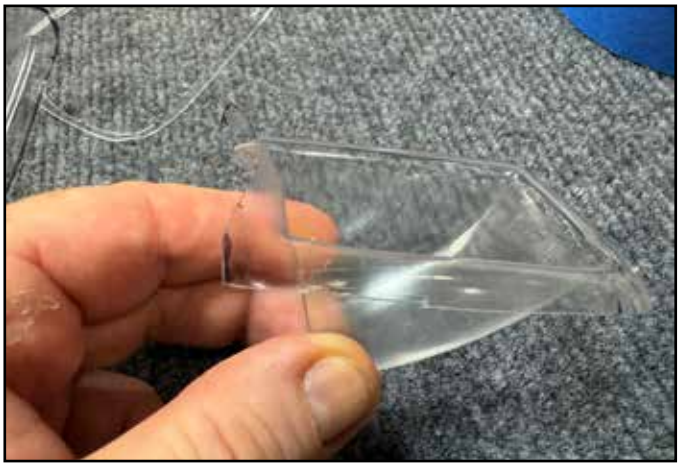
Installation of the aileron servos, arms, and pushrods is similar to the tail. Trim the opening as necessary for your servos, note that, as on the tail, the exact hole in the servo arms you will need to use is determined by your desired throw, and your equipment.

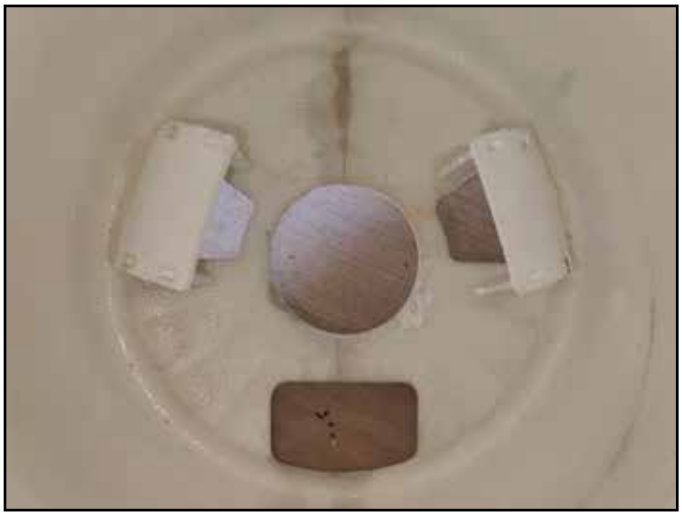




11

Some aircraft in this series use scoops to direct air over the brushless motor. These may be molded plastic, wood, or foam as shown. Glue in place as appropriate.

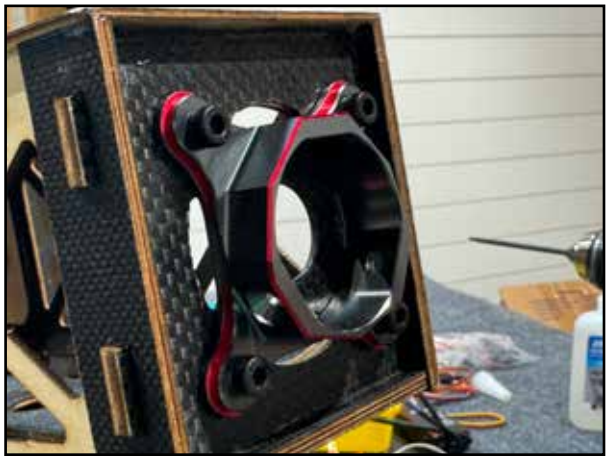


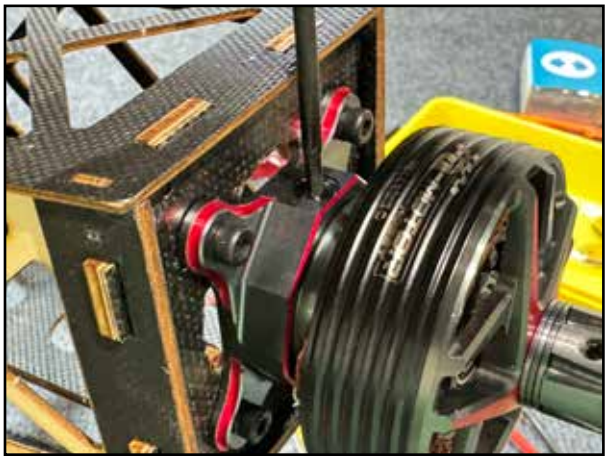


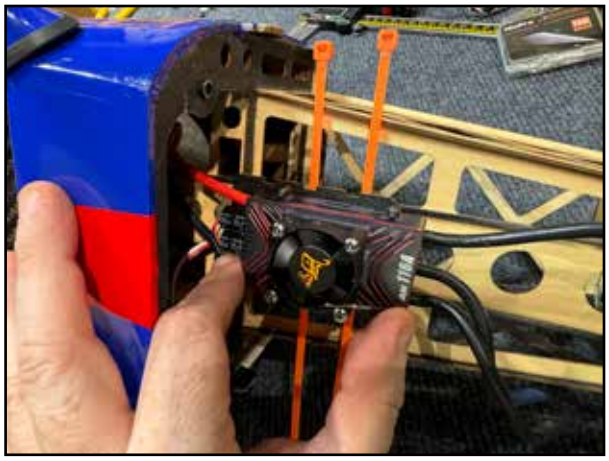
12

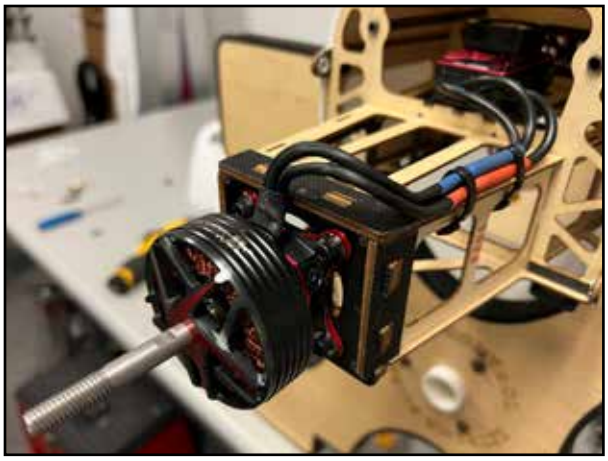
Install your brushless motor and ESC. Use blue loctite on all of the motor-mounting bolts. Tie down all wires so they can't move around inside the cowl. Many aircraft in this series have a dedicated ESC mounting pad area. Once your motor is installed, use the spinner back-plate as a guide to install your cowl perfectly and attach with 4 welf drilling/wood screws. Install the canopy hatch before tightening the coel in place to make sure the hatch will fit underneath the cowl lip. Your kit includes motor-mount spacers which you might need to use between the motor and airframe. Also some motors, such as the AM600, are length-adjustable via washers between the motor and prop mount. The correct gap between the cowl and spinner is 1.5-2mm.

Note: As you install your motor, you may notice that the motor mount on your kit points to the RIGHT 2.5-3 degrees, depending on the exact aircraft. This is called "Right Thrust" and corrects for prop and gyroscopic effects on the aircraft caused by the prop spinning in one direction.

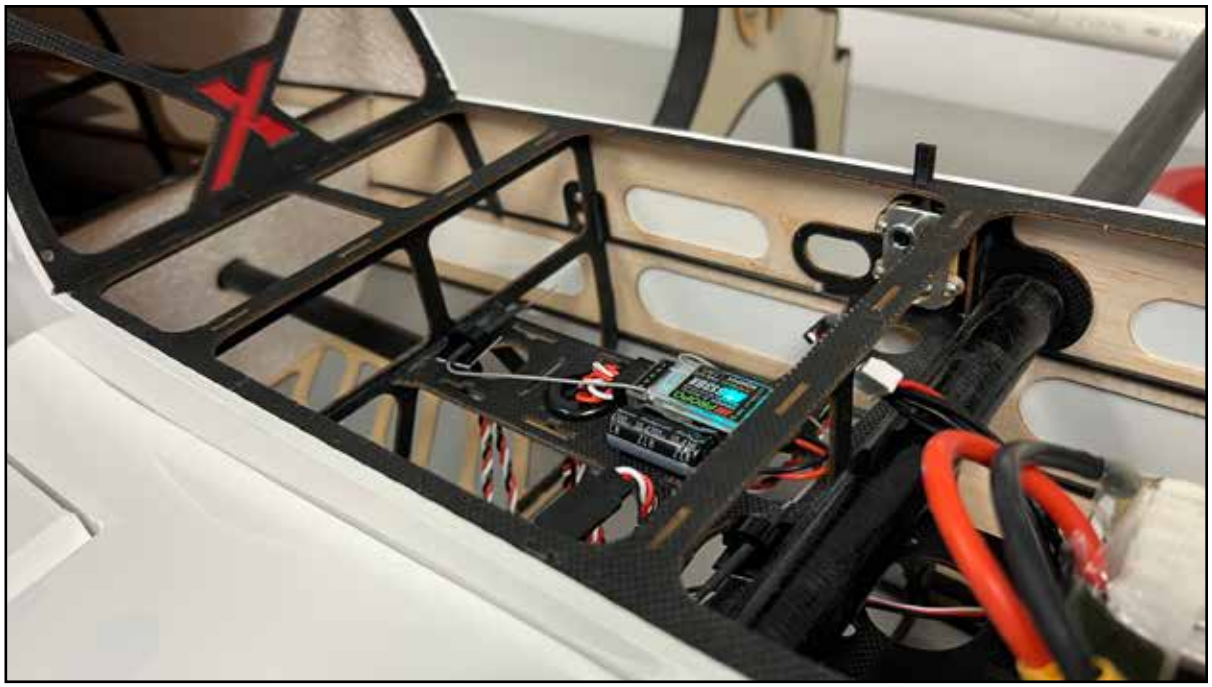


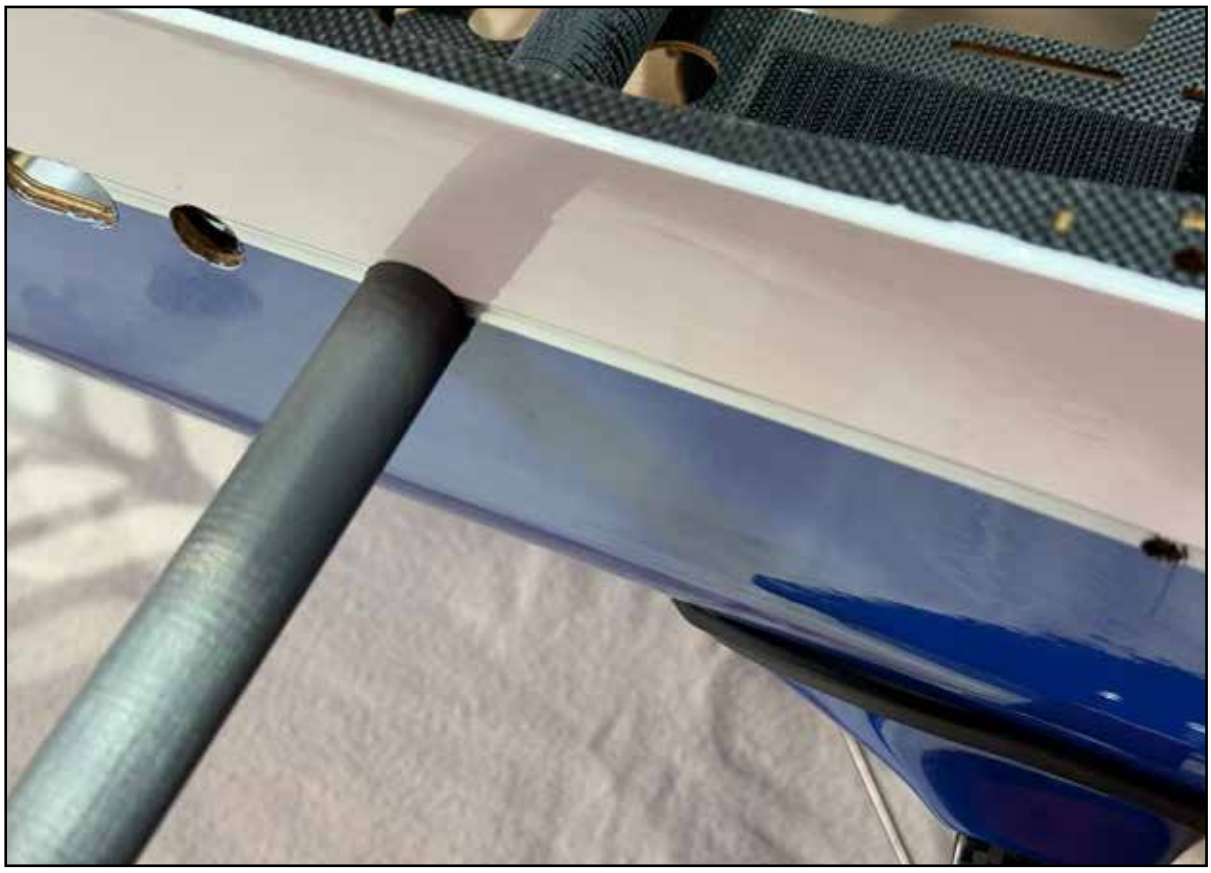






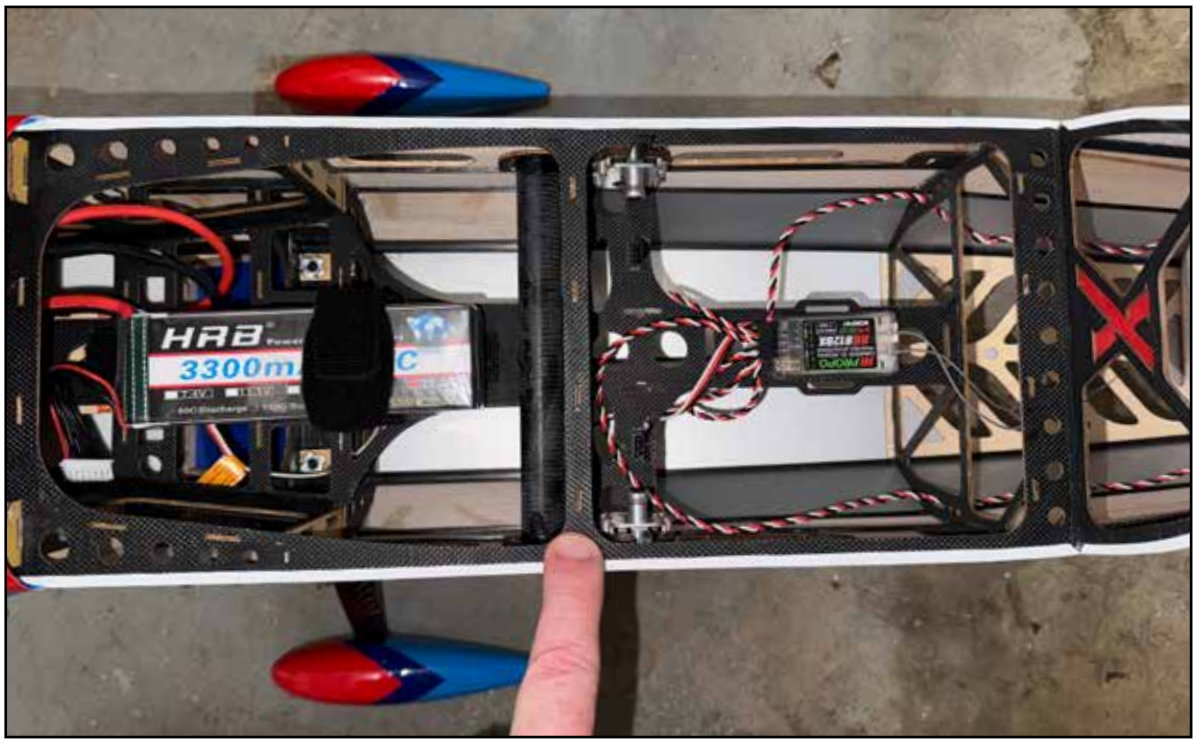
13 Install your receiver on the receiver tray behind the wing spar tube as shown. Install the wings onto the carbon wing tube, latch them in place and plug in the aileron leads, using any extension wires necessary. Install self-adhesive velcro on the battery tray ahead of the wing spar tube and install a strong velcro strap that completely encircles the lipo battery so that it cannot come loose even in harsh aerobatic flight.

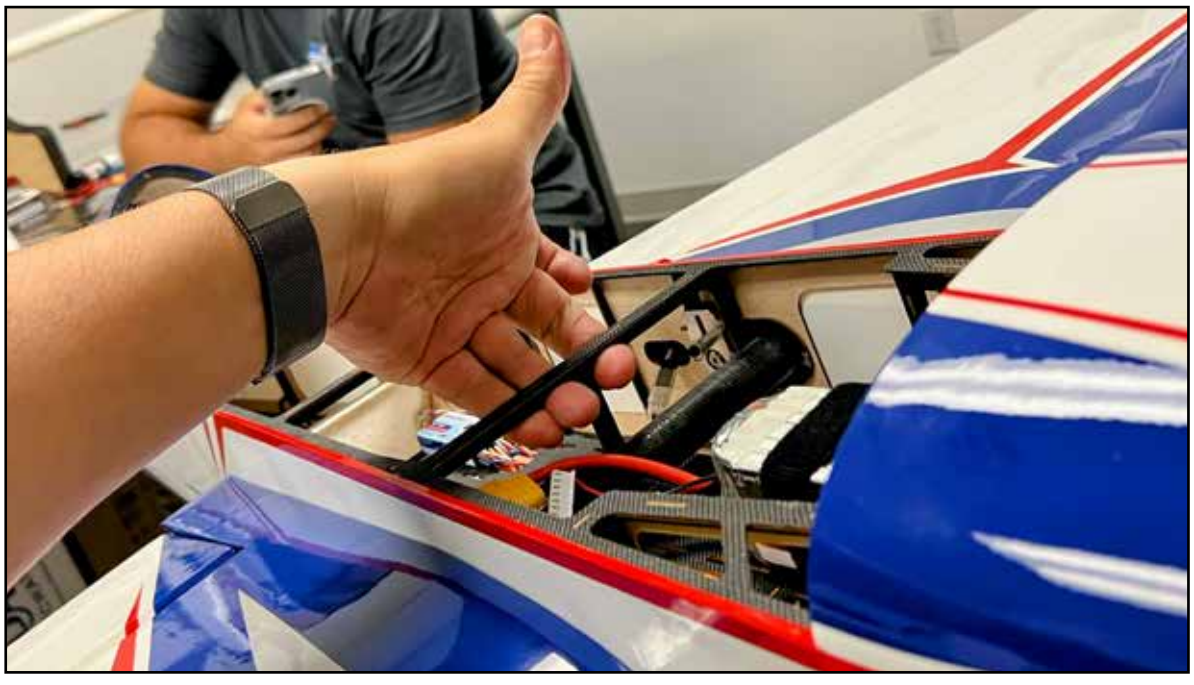




14

The correct CG location for initial flights is just behind the carbon wing tube. Measure this with the canopy OFF, but everything else installed for flight. On most of the aircraft in this series, there is a fuselage former piece just behind the wing tube, lift the aircraft by this former, it should hang approximately level. Shift your battery forward or backwards as needed to balance. On later flights you can move farther back for better 3D performance if desired. We prefer this initital location for all of our flying, but experiment to find your perfect spot. The more forward your balance, the more precise your plane will be - it will want to fly in straight lines. The farther back your CG, the more maneverable your plane will be - it will want to "bite its own tail". It will rotate better in maneuvers, but also be less stable and harder to land smoothly. For most Lipo battery sizes, moving the battery forwards and aft is all you will need to experience a wide range of CG's. If you do wish to experiment with CG's beyond what simply moving the battery will give you, we recommend a dab of plasticine modeling clay as ballast - it's dense, easy to add and subtract, and inexpensive.





15

Remove the prop (NEVER power up an airplane on the workbench with the prop installed). Power up your airplane and reverse any servos which need it.

Use a cell phone with an angle-finder app, or a throw gauge, to set your control throws in your transmitter. To use a phone, hold the phone against the control surface at the neutral point, zero the app, then move the surface to full travel and hold the phone against the surface again to read the throw.

We have recommended a high expo value for your first flights. Experienced pilots may want to start with lower expo.

Elevator: Low Rate 8-10 deg. 15-20% expo
3D Rate 45-50 deg. 60-65% expo
XA/Tumbling rate 55 deg. 65-70% expo

Aileron: Low Rate 15-20 deg. 40-45% expo
High Rate 38-40 deg. 70-75% expo

Rudder: Low Rate 20 deg 40-45% expo
High Rate 45-50 deg. 70-80% expo

If you find that you have excess travel available, move the pushrod on that servo to next innermost position on the arm. The goal is to have proper throw as you desire using maximum throw in the transmitter settings, and

If you are new to 3D flight and want to learn as quickly as possible, take note of two particular points of setup:

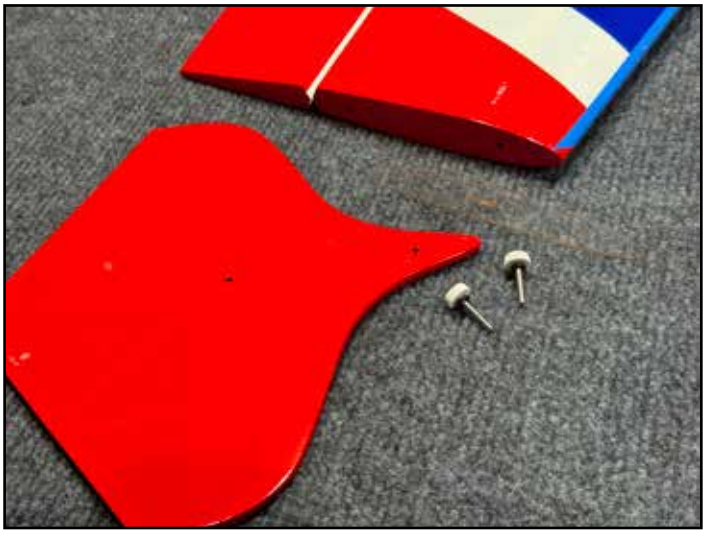
1.Instability in 3D flight is often caused by overuse of rudder in harrier flight. If you find your aircraft unstable and "rocking" back and forth in harrier, decrease rudder throw and concentrate on being smooth in rudder use. (Also be sure you have the SFG's installed!)

2.To be smooth in harrier, limit elevator to 45-50 degrees throw and concentrate on smooth inputs. Finding the "sweet spot" of nose-up attitude and throttle can be easier with less than maximum elevator throw.

16

For 3D flight, the Side-Force-Generators (aerodynamic plates mounted to the wingtips) can make flight smoother and easier by dampening out unwanted wing rocking in harrier flight. Be sure to try them! They attach to the wing tips with thumb screws. Note that some designs also place a clear plastic spacer in-between the wingtip and SFG. Small rubber washers are included, these go over the thumb-screw threads as shown to keep them tight in flight.

Note: As we continually improve our kits, we are gradually swtiching over to a “quick release” style of SFG. These allow you to leave the screws in the wingtip and only partially loosen them to remove the SFG. This style adds clear plastic washers to the outside of the SFG as shown. Glue these to the SFG with Gorilla Clear Bond or similar rubberized glue.



17 The decals included in your kit are “air release” type. The adhesive is applied to the material in a pattern to allow trapped air to better escape as you apply the decals. The texture will disappear as you burnish the decals down with a soft cloth.

Check the aircraft over before flight:

Battery fully charged - do a short flight the first time.

Prop rotating in correct direction.

Prop installed facing correct direction.

Prop nut(s) fully tightened.

Wing latches engaged correctly and fully.

Control surfaces moving in the correct direction.

Expo on controls correct and proper direction.

All bolts and nuts tight.

Battery strap secure.

Receiver antennas secure and installed according to manufacturer guidelines.

Locks or heat shrink (or at least tape!) on all servo wire connections.

ESC calibrated according to manufacturer instrcutions.

Safely test full throttle (make sure the plane is safely restrained).

We recommend to conduct your maiden flight on LOW control rates.

After flight:

Check all fasteners.

Check all wiring.

Check remaining battery capacity to determine how long you can fly on a charge.

Adjust CG location to suit your preference.

We hope your aircraft gives you many great flights! See you at the flying field!