

MXS-EXP

64 Inch Electric ARF Assembly Manual



EXTREME FLIGHT ✓
RADIO CONTROL™
STATE-OF-THE-ART R/C AEROBATIC AIRCRAFT AND ACCESSORIES

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 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. However 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 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.

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. All of the G10 control horns are the same with the exception of the elevator horn. Its base has been shortened to fit the depth of the elevator.
6. 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.
7. 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.
8. If repairs become necessary, the Ultracote colors used on the 60 inch MXS are as follows:

Yellow/Black/White color scheme: Bright Yellow #HANU872, White #HANU870, Black #HANU874
Green/Black/White color scheme: Green #hanu880, White #HANU870, Black#HANU874

Please note: The MXS assembles in the same manner as the previous 60 inch airframes. As a result some of the photos in this manual may be of other aircraft if we determined they better illustrated the assembly step.

Items needed for completion

- Masking tape.
- Hobby knife with #11 blades.
- Razor saw.
- Hobby sealing iron.
- Thin and medium CA. We highly recommend Mercury M5T thin and M100XF medium formulas as well as the Mercury glue tips.
- 30 minute epoxy. The new Mercury Adhesives Epoxies have worked very well for us.



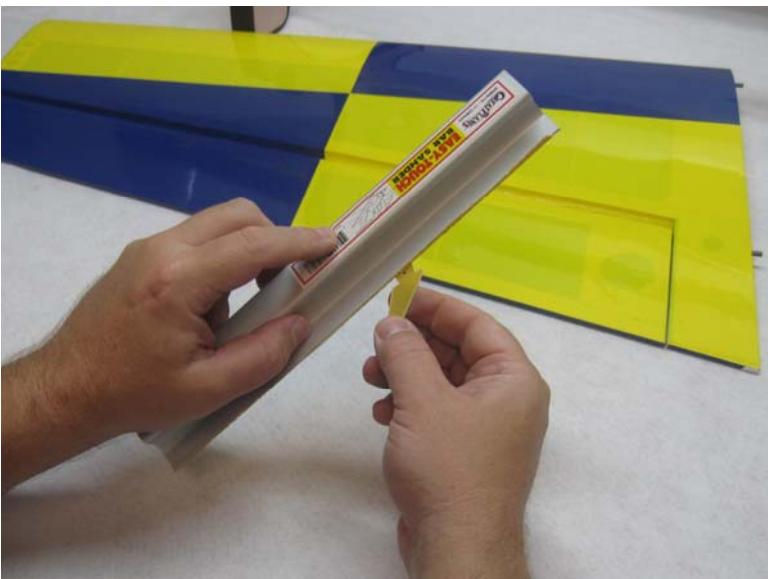
- Denatured alcohol.
- Paper towels.
- Blue Loctite.
- Electric drill with an assortment of small drill bits.
- Small flat head and Phillip's head screw drivers.
- Standard and needle nose pliers.
- Metric balldriver or allen key set.
- Sanding block and sandpaper.
- 4 mini metal geared servos. All flight testing was performed with Hitec HS-5245MGs and JR3711HVs.
- Dubro Long Super Strength servo arm set. (Dubro part #670 for Futaba, #671 for JR and #672 for Hitec).
- Torque 4016T/500 Brushless Outrunner or Hacker A50-14XS v2 Outrunner motor.
- Airboss Elite 80 Amp ESC.
- 5S-6S 3300-4000 mah LiPo battery.
- 2-24" extensions for the 2 rear servos and 2-6" extensions to go between the receiver and the aileron servo leads.
- Adhesive backed Velcro and Velcro strap for battery retention.

Let's begin!

1. Locate the 2 wing panels with ailerons as well as the 2 G10 aileron control horns and base plates. Remove the covering over the slot for the aileron horn on the bottom of the aileron with a sharp hobby blade. Make sure you are doing this on the bottom of the aileron! Insert the horn into the base plate and into the slot in the aileron. Use a fine tipped felt marker to trace the base plate.



2. Remove the control horn and scuff the portion that will be glued into the aileron with sandpaper.

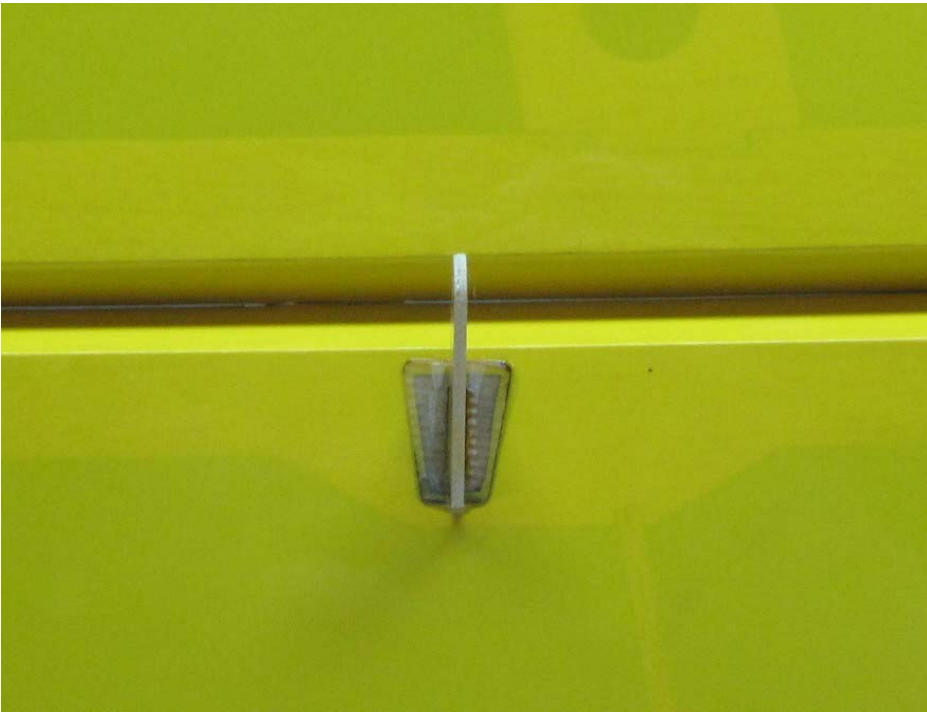


3. Use a sharp hobby blade to remove the covering 1/16 of an inch inside the line you traced around the control horn base.

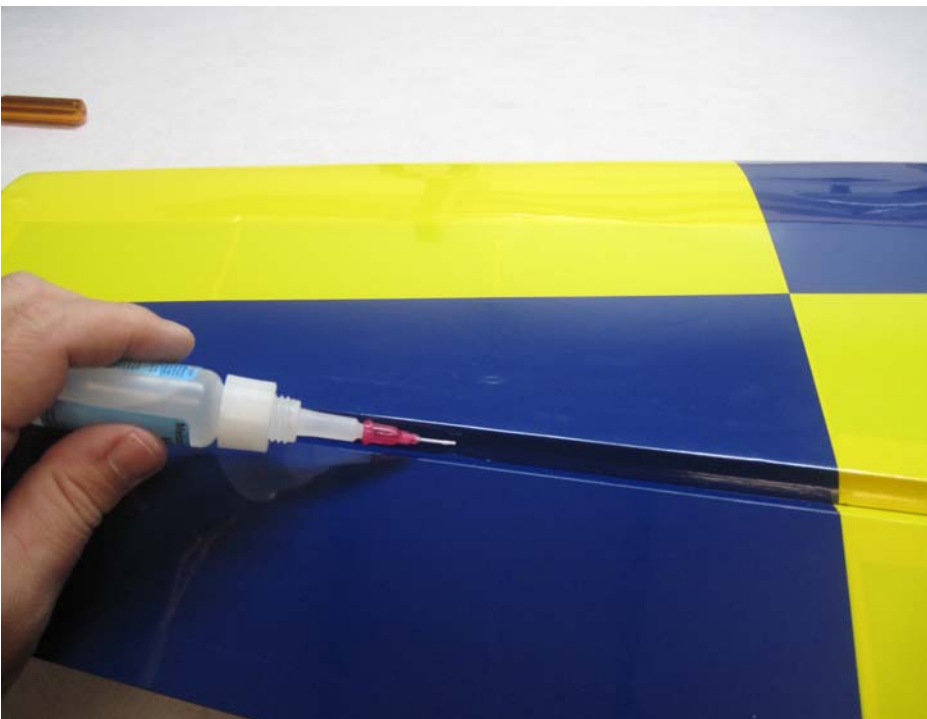


4. Mix up a batch of 30 minute epoxy and apply liberally to the slot in the aileron and to the scuffed portion of the control horn that will insert into the aileron. Install the aileron horn and base plate onto the aileron and wipe away any excess epoxy with a paper towel soaked in denatured alcohol.





5. Remove the covering from the aileron servo location and make sure the hinges are centered in their slots. Slide the aileron into position making sure the outer tip of the aileron is flush with the wing tip. 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.



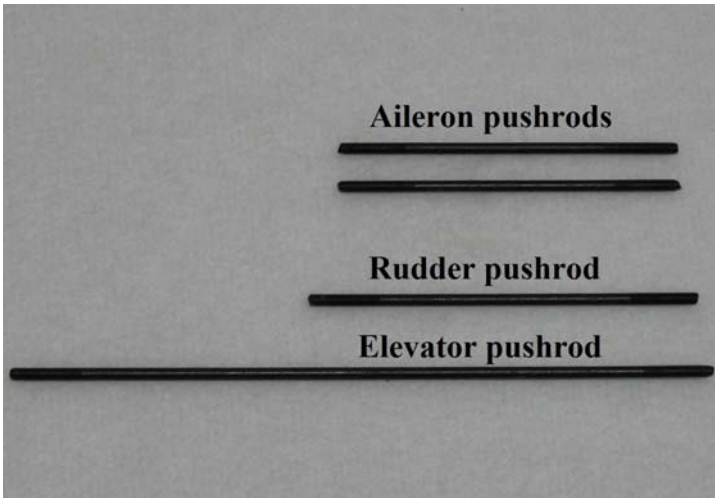
6. Before installing the aileron servo take a minute and apply some CA to the servo tray, root rib and the anti-rotation pins.



7. Use the screws provided by the servo manufacturer to secure the aileron servo in the designated location with the output shaft toward the leading edge of the wing.



8. Locate the 2 threaded metal pushrods that are the same length and 4 ball links along with 4-2mm screws, nuts and washers. Thread the ball links onto each end of the pushrods and secure to the servo arm and control horn using the supplied hardware as shown in the picture. Use the second longest set of servo arms included with the Dubro Long Super Strength servo arm kit for the aileron linkages. (Dubro part #670 for Futaba, #671 for JR and #672 for Hitec).



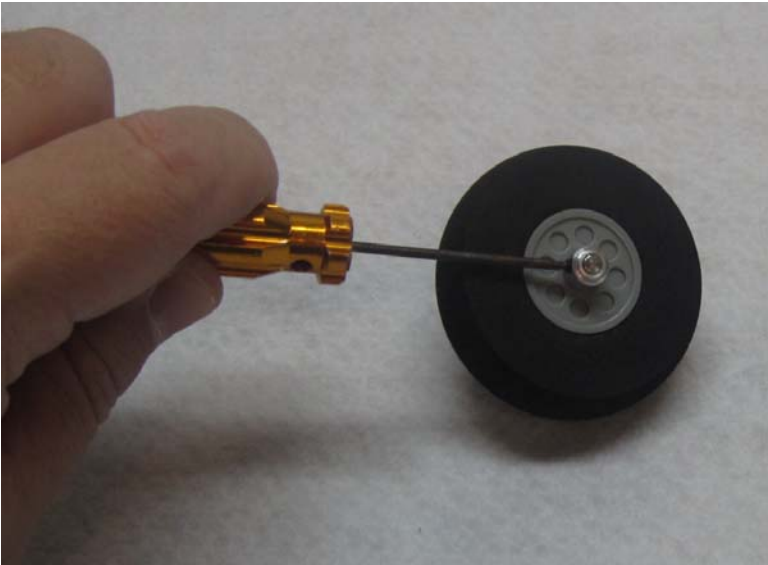
9. Repeat this process for the other wing half. When finished take a few minutes to go over all of the seams in the covering with a sealing iron on a medium heat setting paying special attention to stripe edges and ends. Clean the wing panels with a soft cloth and put them away in their wing bags.

Fuselage assembly

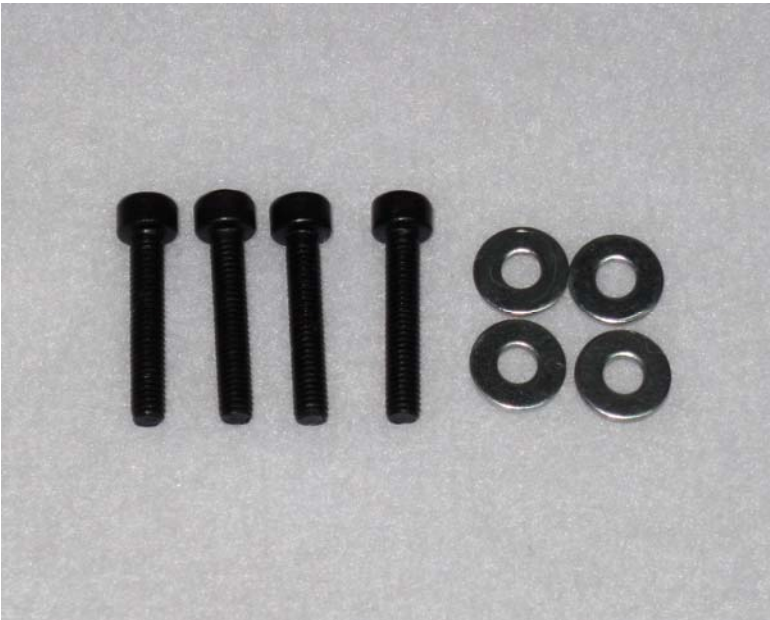
10. First lets assemble the landing gear unit and bolt it to the fuselage. Locate the main wheels, wheel pants, one piece carbon fiber landing gear, 4-3mm socket head cap bolts with 4 washers, 2 axles, 2 wheel collars, 2 large washers to fit the threaded portion of the axles, and 2 nylon insert locknuts.



11. Place the wheel onto the axle and secure with a wheel collar. 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. There is a slot pre-cut in the wheel pant to allow it to fit over the axle. 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. Again this is probably better explained in the following series of pictures.



12. 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.

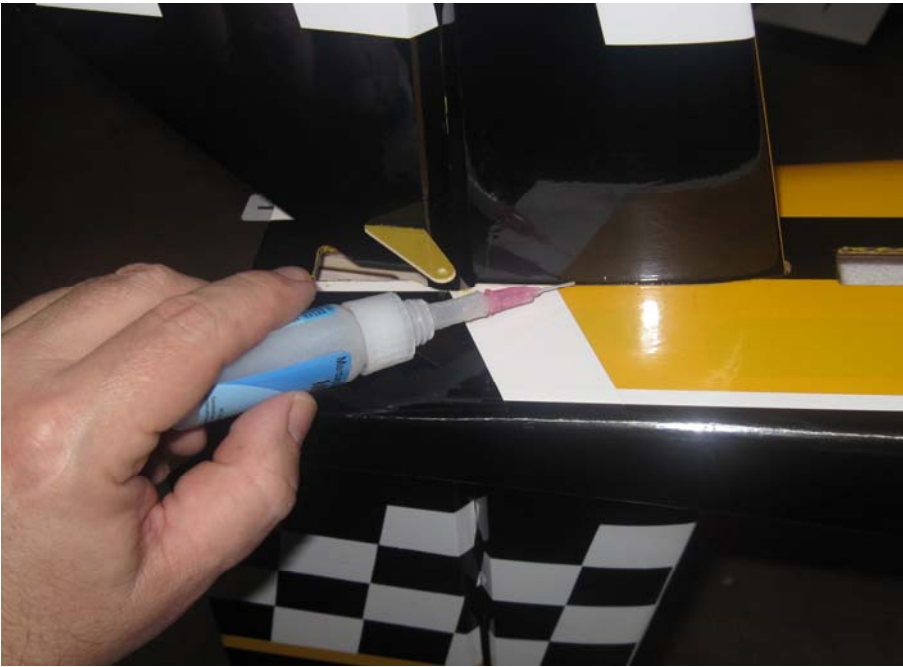


13. Next lets mount the horizontal stab and elevator. Please pay close attention to this step. **You MUST insert the elevator into the stab slot BEFORE inserting and gluing the horizontal stab in place!!!** You may also find it easier to glue the elevator control horn in place (using the same technique as you did with the aileron horns) before inserting the elevator into the fuselage. The elevator should be turned upside down with the counterbalances facing the rear of the fuselage, carefully inserted into the fuselage slot and then rotated 180 degrees into the proper position. Please see the following photo for details.



14. Slide the horizontal stabilizer into place. Slide the carbon fiber wing tube into place to use as a reference to ensure that the stab is properly aligned. Use a ruler to make sure the stab is centered in the slot. Sand or shim the slot as necessary to make sure the stab is parallel to the wing tube. Once satisfied glue the stab in place with CA.



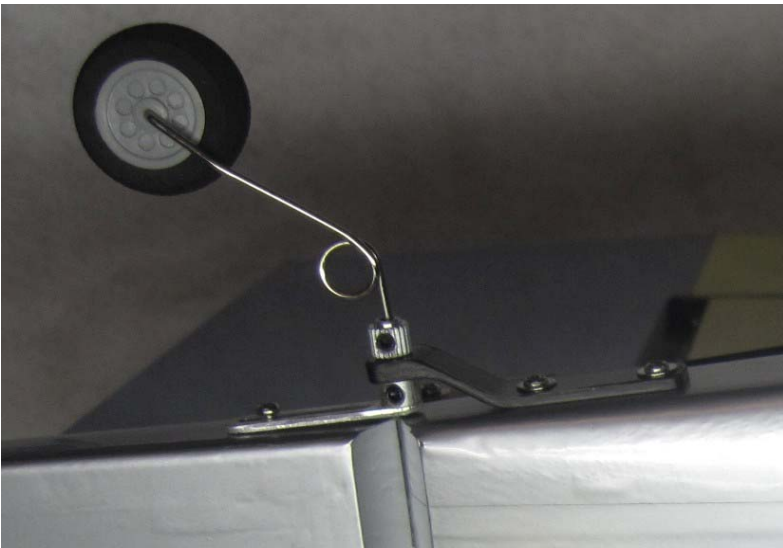


15. Slide the elevator onto the hinges in the stabilizer and secure with thin CA. Again a fresh bottle of CA and a fine glue tip work best here.

16. Glue the rudder control horn into place as you did with the aileron and elevator horns. Slide the rudder onto the hinges and into place and secure with thin CA.



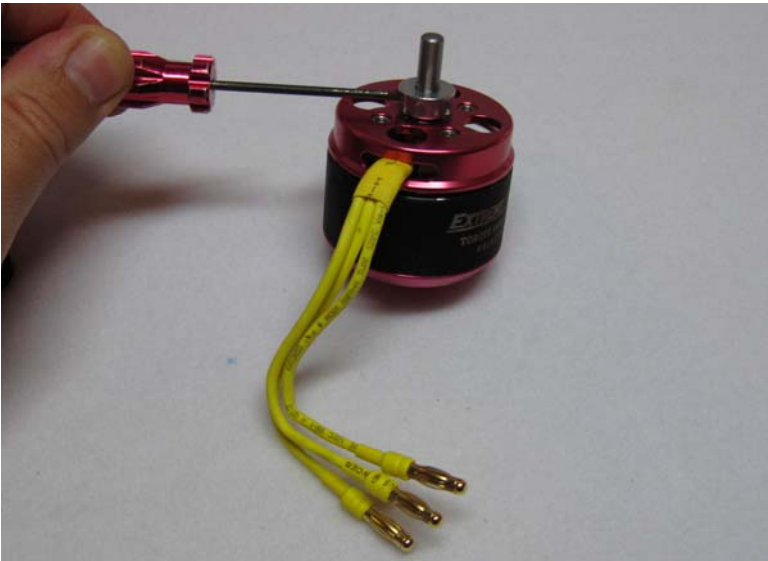
17. Locate the carbon fiber tailwheel assembly in the hardware package. Secure the tailwheel bracket to the bottom rear of the fuselage with the provided wood screws. Make sure the pivot point of the assembly is over the hinge line of the rudder for best results. Secure the tiller using the provided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



18. Use the hardware provided with the servos to install the rudder and elevator servos in their respective locations in the rear of the aircraft. The rudder and elevator servo linkages assemble and are installed just like the aileron linkages. For maximum control surface travel we highly recommend using the Long Dubro Super Strength servo arms. (Dubro part #670 for Futaba, #671 for JR and #672 for Hitec).



19. Lets prepare the Torque outrunner motor for mounting. First slide the provided collar over the motor shaft and secure in place with the set screw. Place a drop of blue Loctite on the threads of the set screw so that it will not back out.



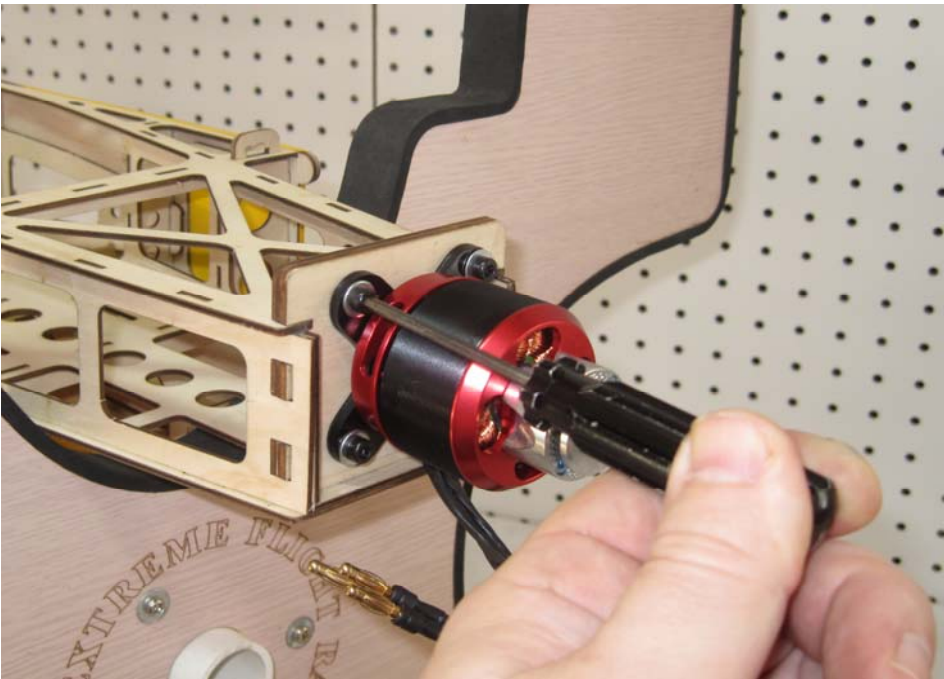
20. Next secure the radial mount to the motor using the provided short Phillip's head machine screws. Again be sure to use a drop of blue Loctite on each screw.



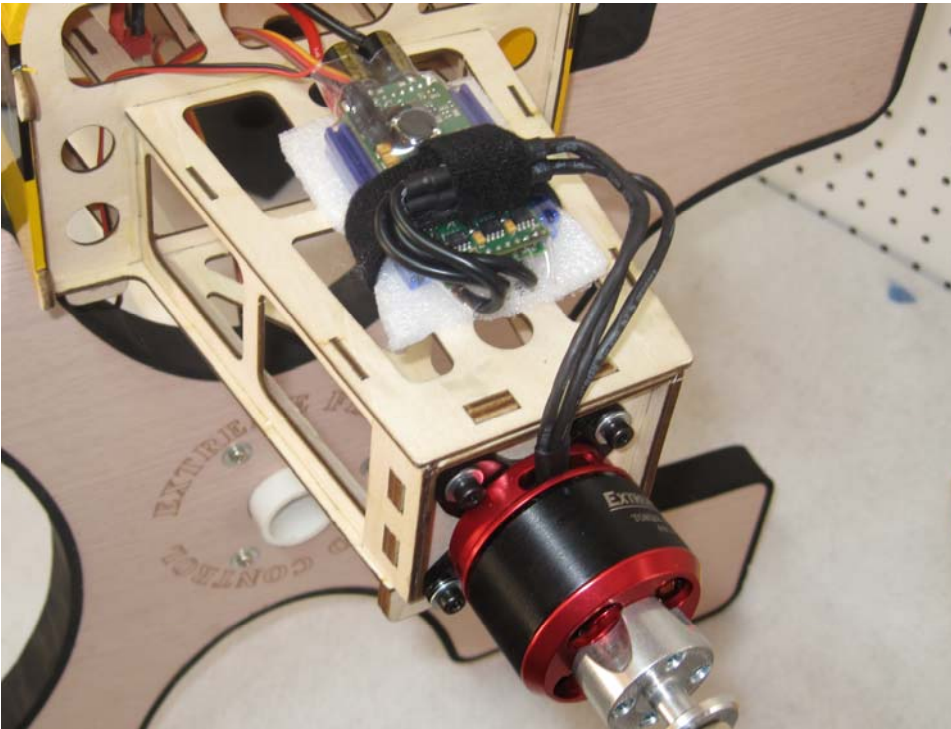
21. Secure the prop adapter using the 4 socket head cap bolts. Again blue Loctite should be applied to each bolt.



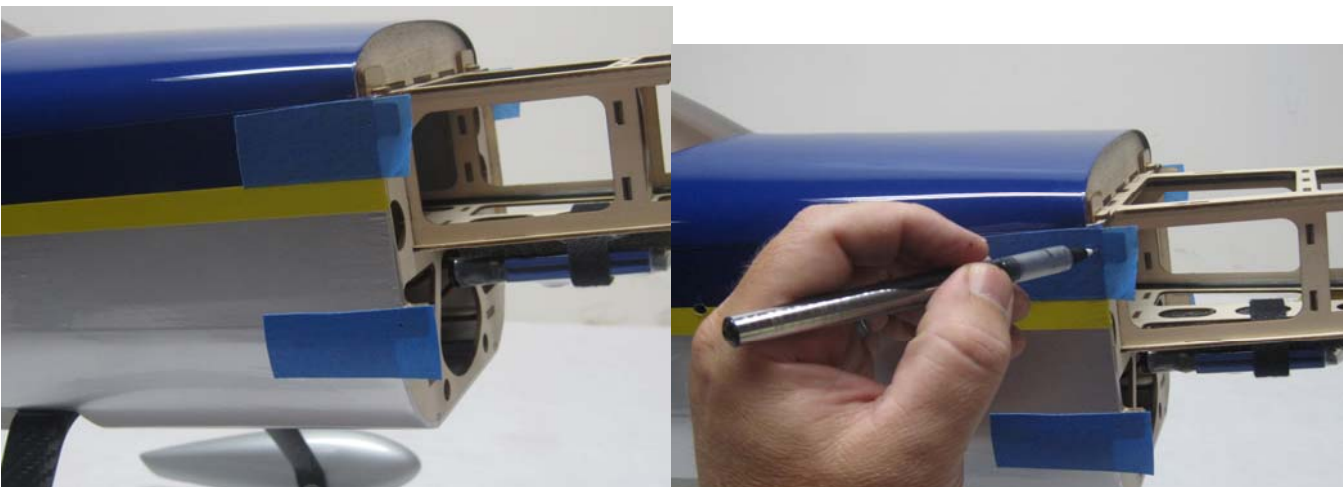
22. Mount the Torque motor using the supplied 4mm black socket head cap bolts and washers. The bolts are to be inserted into the blind nuts which are pre-installed in the motor mount plate. Be sure to put a drop of blue Loctite onto each bolt to prevent them from backing out. Be sure to add some CA to all motor box joints!



23. Mount your ESC on the bottom of the motor box and secure all wires with Velcro or nylon cable ties.

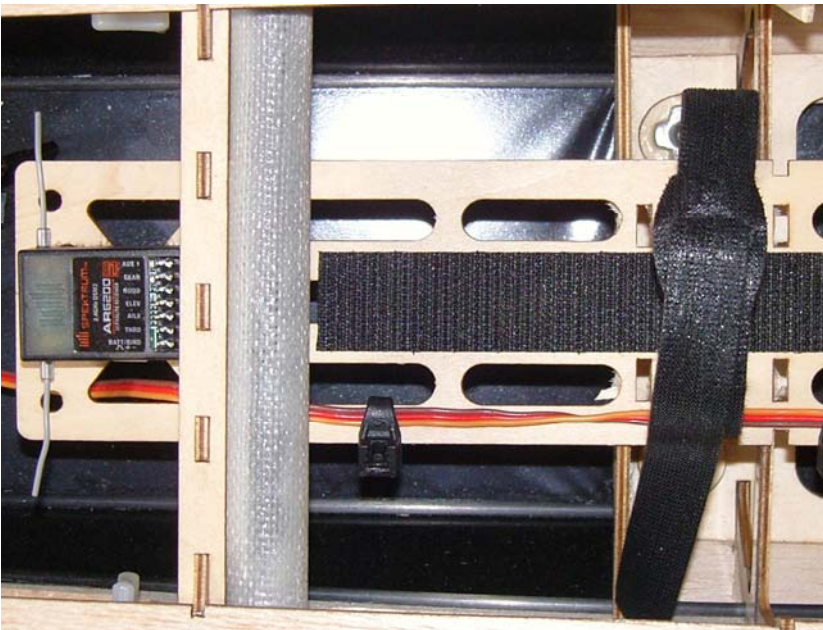


24. For quick, easy and accurate mounting of the cowl we recommend the following method. Tear 4 short pieces of masking tape from a roll. Place each piece of tape on the side of the fuselage so that each piece corresponds with one of the 4 cowl mounting tabs. Use a fine tipped marker to mark the location of the center of each mounting tab. Roll the tape back and slide the cowl into position. Install the Extreme Flight 63mm spinner onto the motor shaft for reference and once satisfied with the cowl position roll the tape back into place and secure the cowl. Use a 1/16" drill bit to drill a hole at the location of the dot on each piece of tape. Remove the tape and secure the cowl with 4 of the included small wood screws that have large heads. Very simple!





25. 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.



26. If using the included Side Force Generators or racing wing tips or both 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 or racing tip to prevent them from rubbing against the aileron. Each SFG or racing tip mounts using 2 3mm bolts (and 2 clear plastic washers for the SFGS). 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 SFGs or racing tips onto the wing tip by inserting the 2 bolts into the pre-installed blind nuts in the tip of the wing. Again apply a drop of blue Loctite to each bolt and be sure not to over tighten the bolts which may crush the wood in the SFG.



Set-up and flying tips

The CG range for the MXS starts at 4.5 inches from the leading edge of the wing and extends back to 5 inches, measured at the wing root. There is plenty of room on the battery tray to move your battery to achieve this CG location. This is a safe place to start and depending on your flying style you can adjust the position of the battery to alter the CG to accommodate your preferences. 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 no 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 flight will allow you to experience the best attributes of the MXS EXP or any aircraft for that matter. The recommended elevator set up will allow for close to 80 degrees of throw! While this is great for really aggressive tumbling maneuvers, positive and negative waterfalls and straight down dropping elevators, it can wreak havoc on stable harriers, especially if you are just learning the maneuver. If your radio will allow I suggest setting up 3 elevator rates or a flight condition that will allow you a rate for precision flying, another for harriers and the majority of 3D maneuvers and a final rate with as much travel as you can get for the crazy tumbles and flips.

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; 50-55% Exponential

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

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

3D rate- As much as possible; 50-60% Exponential

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

3D rate- As much as possible; 60-65% Exponential