

# EXTRA 300

*ELECTRIC ARF*

Instruction Manual



**EXTREME FLIGHT** ✓

**RADIO CONTROL™**

STATE-OF-THE-ART R/C AEROBATIC AIRCRAFT AND ACCESSORIES

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Thank you for your purchase of the Extreme Flight RC 45" Extra 300 Electric ARF. This aircraft was designed to provide maximum performance and fun in a realistic looking, lightweight, fully aerobatic park flyer. Using an inexpensive and efficient brushless outrunner motor and speed controller and a single high discharge 3S1P Lithium Polymer battery, the Extra 300 provides unlimited performance capability.

Great care was taken to design a light weight yet robust airframe. Expert engineering and modern laser cutting methods in conjunction with a carbon fiber wing tube and composite control horns keep weight to a minimum. Unique features such as the ram air equipped motor box, 2 piece plug in wings, and magnetically retained canopy/hatch make for quick easy assembly and instantaneous access to the interior of the plane and battery tray. The Extra 300 can truly be assembled in an evening-buy it one day, fly it the next!

As with all Extreme Flight RC airplanes, the proof is in the flying! Due to the close proximity of the wing and stab to the thrust line, the Extra 300 is a very neutral flying aircraft. It flies precision aerobatics remarkably well and allows you to practice your IMAC sequence almost anywhere. The slightly stretched fuselage makes for a plane that tracks like a pattern ship and the lightweight wings minimize over rotation in snaps. On a calm day you'll be amazed at how well this thing flies the sequences.

If 3D is your thing then strap in! The Extra 300 does it all with ease. Beautiful, slow high alpha knife edge passes. FLAT spins both upright and inverted, rock solid elevators and harriers. Tremendous aileron authority and insane roll rate from the massive ailerons. The Extra does beautiful waterfalls and is capable of performing large round knife edge loops. You won't believe how much fun this thing is to fly!

Sport flyers fear not! Just because you're not a 3D hot dogger or IMAC flyer doesn't mean you can't enjoy the Extra 300. With reduced rates the Extra 300 is a very easy plane to fly. Its super light wing loading allows it to land at a walk. It will instill confidence and allow you to improve your flying skills. When you're ready for more advanced aerobatics, flip the dual rate switch and hang on!

As with any high performance aerobatic aircraft, great care must be taken to avoid excess speed. Excess speed will lead to control surface flutter and quite possibly the complete destruction of your aircraft. Don't let this happen to you! Always have the motor at idle when the airplane is pointed down and reserve full throttle for vertical climbs. Make sure you have adequate mechanical advantage in your control linkage set-up. If you are unsure about this, have a more experienced flyer look over your set-up before flying. Extreme Flight RC, Ltd. in no way warrants its aircraft against flutter. As with all of our planes, we put the Extra through a rigorous flight testing regime and have not experienced any control surface flutter.

The Extra was designed around the Torque 2818T/900 Brushless Outrunner motor and Airboss 35 AMP ESC. This is the best choice for powering the Extra, providing plenty of power for any maneuver imaginable. Other outrunner motors in this class will work as well but may require slight modification to the motor mount.

The Extra is very easy to assemble. Take a few minutes to read this manual before beginning assembly to get familiar with the process.

**Let's get started!**

## Wing assembly

1. Locate a wing panel. Check to see that all hinges are centered between the wing and aileron. Hold the aileron fully deflected and apply a drop of thin CA to each hinge. Flip the wing over and repeat.



2. Use a #11 hobby blade to remove the covering over the servo bay. Install the aileron servo using the manufacturer supplied mounting screws. Route the servo lead out of the root of the wing.



3. Locate the composite aileron control horn, aileron pushrod with z-bend and ez-connector. Remove the covering over the mounting hole for the control horn with your #11 blade. Glue the control horn in place with medium CA. Electronically center your servo and mount the ez-connector to the servo arm. Place the z-bend in the aileron control horn and the other end of the wire into the hole in the ez-connector. Center the aileron and tighten the screw in the top of the ez-connector to retain the aileron pushrod wire. See picture.



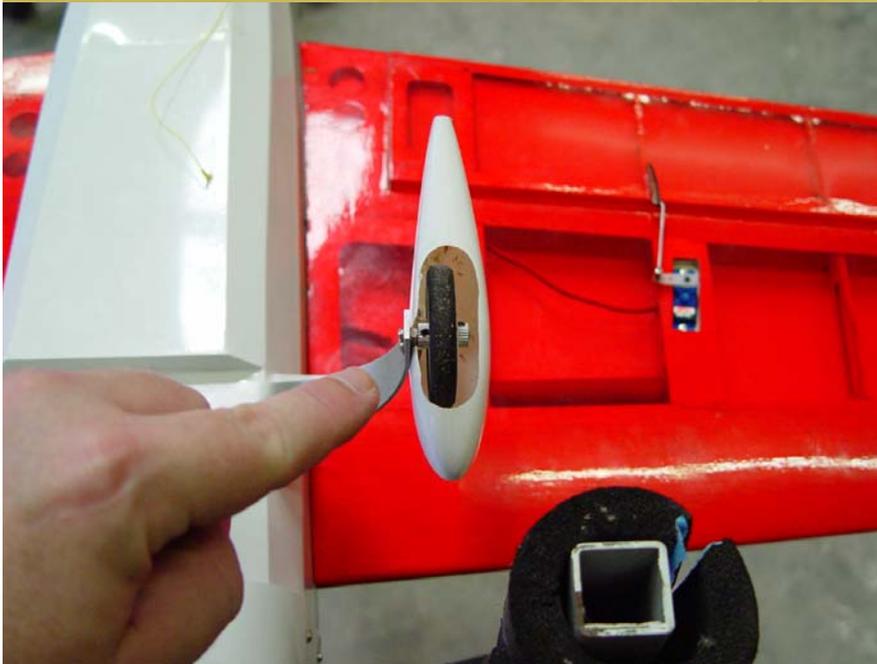
4. Repeat for the other wing.  
**That's it! You are done with the wings!**

## Fuselage Assembly

1. Lets mount the landing gear first. Locate the aluminum landing gear, (4) 3mm machine screws ( 2 long, 2 short), (4) wheel collars, the two wheel pants and wheels and the 2 small plywood squares. Use medium CA to glue the plywood square to the inside of each wheel pant, centered in the wheel pant opening. You may need to open the hole in the wheel pant slightly to allow plenty of clearance for the wheel. Use a drum sanding wheel for this with your moto-tool.



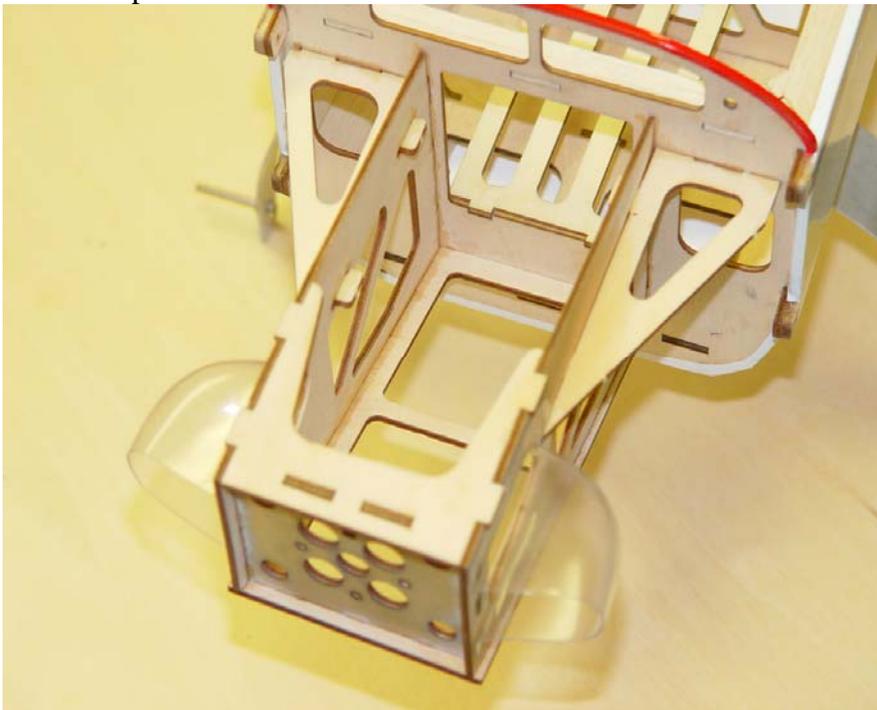
2. Locate the 2 longest 3mm screws and hex nuts. These are the wheel axles. Insert the screw through the pre-drilled hole in the landing gear and retain with the hex nut. It would be a good idea to use a drop of blue loc-tite here. Slide one of the wheel collars onto the axle, followed by the wheel, followed by another wheel collar. Slide the wheel pant over this assembly before tightening the set screws in the wheel collars to make sure the wheel is positioned so that it fits in the opening in the pants. When satisfied, tighten the setscrews in the wheel collars. Position the wheel pants over the wheels (you will need to slot the wheel pant so that it will slide down over the axle, again quick work with a moto-tool and proper attachment). Drill a small hole in the landing gear and into the ply square you glued into the wheel pants and use one of the small machine screws to secure. You may also want to put a drop of med CA between the wheel pant and aluminum gear. The picture below will make this much clearer.



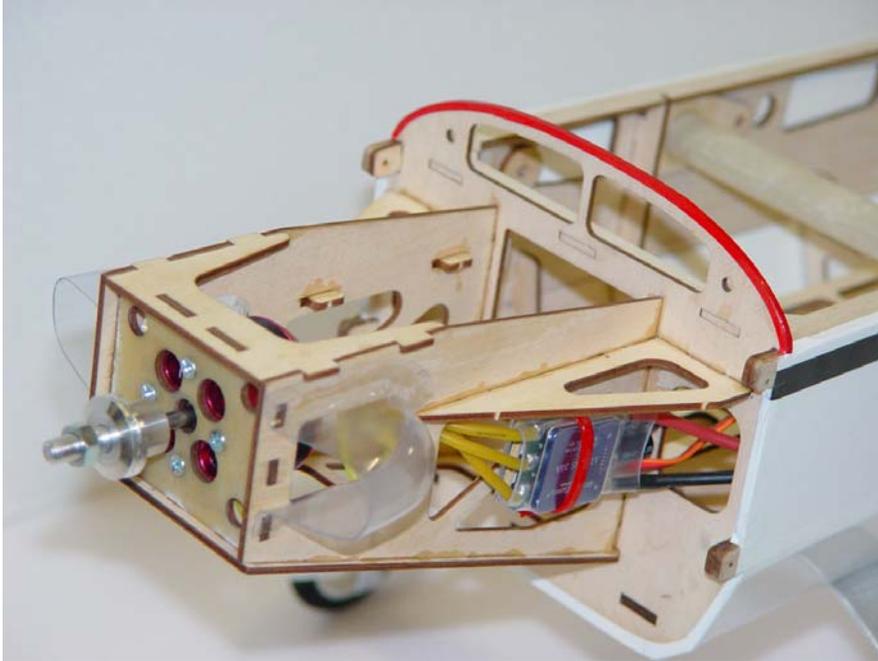
3. Apply a drop of loc-tite to each screw and insert it through the landing gear and into the pre-installed blind nut in the landing gear plate.



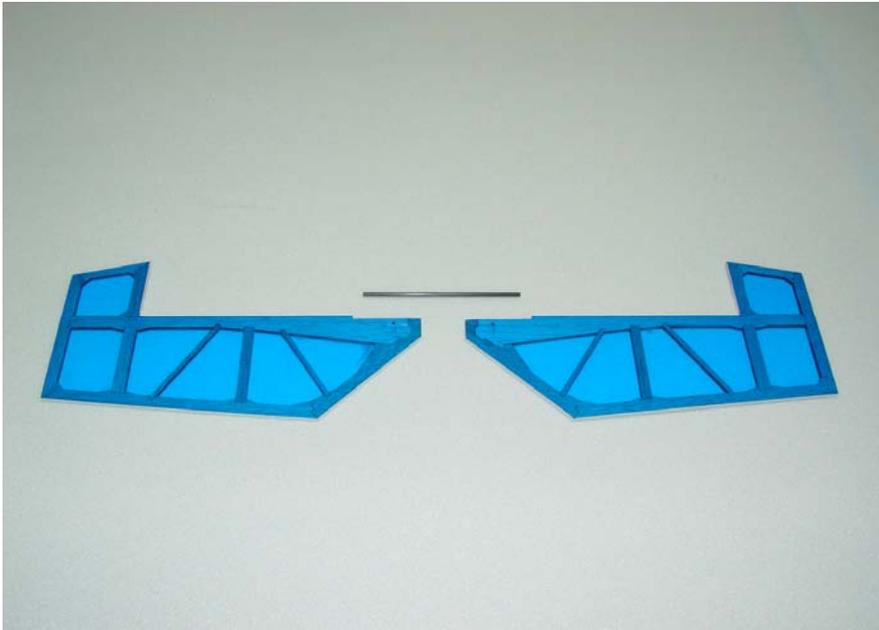
4. Locate the motor box assembly and the 2 laser cut triangular motor box supports. Place the tabs in the motor mount assembly into the firewall and push down so that they lock into place. Install the triangular supports as shown. Wick thin and medium CA into all joints and allow to cure. Locate the 2 clear plastic air scoops and glue them into place as shown.



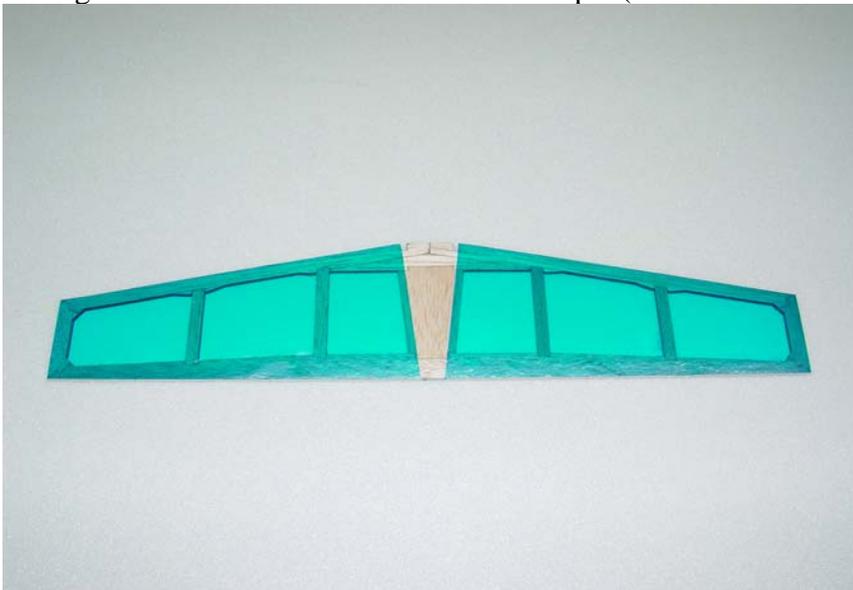
5. Use the manufacturer supplied mounting hardware and mount the motor and ESC as shown. The hole for the prop shaft may need to be reamed slightly to clear the C-clip on the motor.



6. Position the canopy/hatch in place and slide the cowl over the first former. Use your spinner (a 2" spinner is the proper size) on the prop shaft to make sure the cowl is aligned properly. View the cowl from the side and top view to insure it is positioned properly. When satisfied, secure the cowl in place with a few pieces of masking tape. Use a small drill bit to drill through the cowl and into the 4 mounting tabs. Secure the cowl with 4 small wood screws included in the hardware package. **I highly recommend that you soak the cowl mounting tabs with thin CA before drilling.**
7. Locate the horizontal stabilizer. Viewing the bottom of the stabilizer, use a #11 blade to remove the covering from the two notches at the leading edge of the stabilizer. Also remove the covering from the slot for the horizontal stabilizer in the fuselage. Slide the stabilizer into place and measure from several angles to insure that it is square to the fuselage and wing. Sand or shim the slot as needed to insure proper alignment. Use a fine felt tipped marker to make some reference marks and remove the stabilizer from the plane. Use a hobby knife to remove the covering from the stab where it will attach to the fuselage to insure a wood to wood bond. Be very careful not to score the wood which could potentially weaken the stabilizer. **DO NOT GLUE THE STABILIZER IN PLACE YET!!!!** Locate the elevator halves and the carbon fiber joiner tube. Place the elevator halves on a flat surface and tack glue the carbon tube in place. Check the alignment, then mix up some 30 minute epoxy and form a fillet between the carbon tube and elevator halves. This joint is crucial so take your time here.



8. After it is dry, flip the elevator over so that the counterbalances are facing the rear of the plane. Insert the elevator into the slot. Once it is in position, insert the horizontal stab into place. Re-check alignment and when satisfied, glue the stabilizer in place with CA or a small amount of epoxy. Once this is dry, slide the elevator into position and glue the hinges in place with thin CA. Be sure to leave enough space between the stab and elevator for maximum deflection. Seal the hinge line on the bottom with Blendederm tape. (DO NOT OMIT THIS STEP!!!)

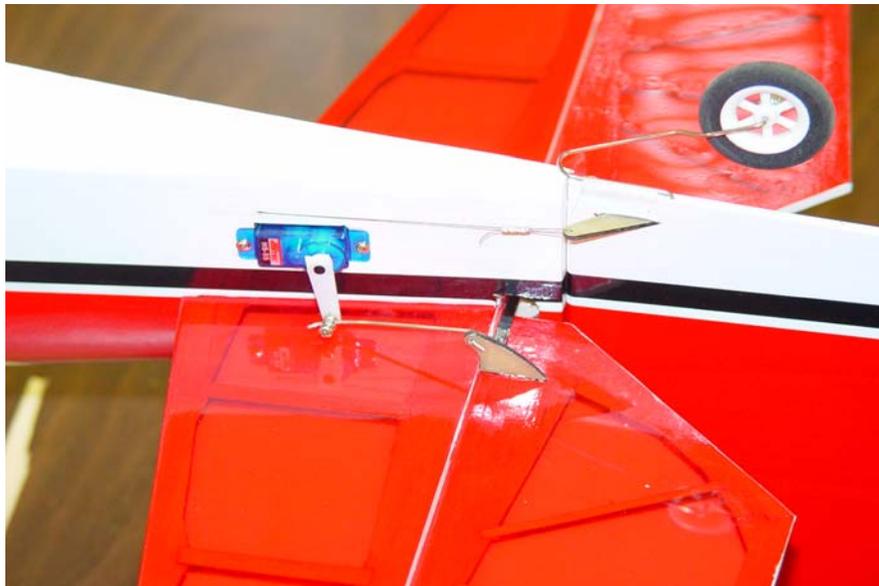


9. Locate the vertical fin and rudder. Remove the covering from the vertical fin where it will be glued into the fuselage. Glue the vertical fin in place, making sure that the trailing edge of the fin is aligned with the rear of the fuselage.
10. Locate the phenolic double rudder control horn. Remove the covering from the slot near the bottom of the rudder and insert the control horn into the slot. Glue in place with medium CA or epoxy. Attach the tailwheel assembly as shown in the

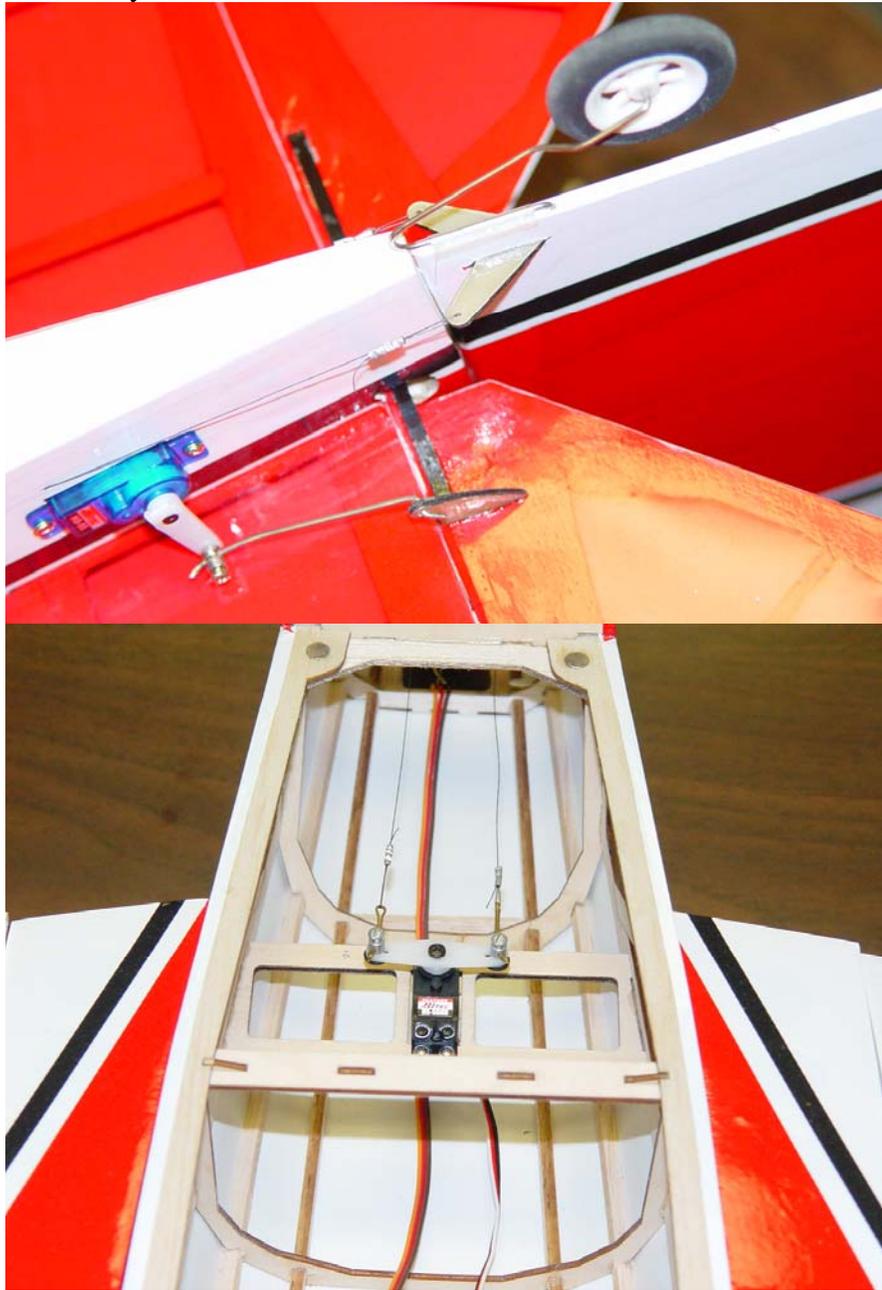
picture and secure with a small piece of strapping tape. Slide the rudder into position and glue the hinges in place with thin CA.



11. Locate the elevator control horn and glue in place with medium CA or epoxy. Use a #11 blade to remove the covering from the elevator servo slot and install the servo using the manufacturer supplied mounting hardware. Place an ez-connector on the servo arm. Locate the elevator pushrod and insert the z-bend into the phenolic control horn and the other end into the ez connector. Electronically center the servo and then tighten the screw in the ez connector to clamp down on the pushrod, while making sure the elevator is in the neutral position. You may need to put a small bend in the pushrod. Pictured is the Hitec HS-55 sub-micro servo, however we strongly recommend using a stronger servo if you intend to set-up the Extra for 3D flying. We have had great success with the Hitec HS-56 and the JR 281.



12. Mount the rudder servo as shown inside the fuselage. We highly recommend using a more powerful servo for the rudder such as the Hitec HS-56, HS-65 or JR 281 to prevent control surface blow back. Use the supplied hardware to assemble the pull-pull cable system. At the rudder control horn end, the cable will be threaded through the control horn and secured with a small aluminum tube which is crimped around the cable. At the servo end, the cable is threaded through the hole in the connector as shown and then inserted into the ez connector. Center the servo electronically and make sure the rudder is in the neutral position. Tighten the screw in the ez connector. Make sure the cables are taut, but not overly tight, which may cause the servo to bind.



10. Install the receiver as shown using Velcro. Use Velcro to secure the battery to the battery tray and use a Velcro strap around the battery.



11. Use the supplied nylon bolts to secure the wings to the fuselage.  
**This concludes the assembly of the Extra 300.**

#### **Radio Set-up and flight tips.**

CG range for the Extra is from 3.50" - 4.00" from the leading edge of the wing measured at the wing root. CG should be easy to achieve by moving the battery along the length of the battery tray. Adjust to fit your flying style.

Control surface recommendations are as follows:

Elevator- 10 degrees low rates, 45+ degrees high rates.

Rudder- 20 degrees low rates, 45+ degrees high rates.

Aileron- 20 degrees low rates, 45+ degrees high rates.

Use exponential function to achieve the best "feel" for your particular flying style. I highly recommend that you take the time to set up rates for precision flying and separate rates for 3D. The Extra is capable of flying very precise maneuvers, and proper rates and CG will allow you to experience this to the fullest extent. Trying to fly precision aerobatics with 3D rates is an exercise in futility. Spend some time dialing in and trimming your plane and you will be rewarded with a great flying experience.

Thanks again for your business!

See you at the flying field!