65" Turbo Duster ARF

Instruction Manual



Copyright 2015 Extreme Flight RC

www.modellmarkt24.ch

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. 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 with the AMA safety code. It is highly recommended that you join the Academy of Model Aeronautics in order to be properly insured and 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 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.

Congratulations on your purchase of the Legacy Aviation 65" Turbo Duster ARF!

www.modellmarkt24.ch

We've all stopped on the side of the road to watch cropdusters at work. Practical aerobatics combined with real precision flying makes it very cool to see. The 65" Turbo Duster captures the spirit of the latest-technology full-scale dusters.

The Turbo Duster ARF is quick to build, strong, light, and is very high-performance. In addition to all of the low-level scale maneuvers, you can take the Duster to the extremes of high-energy tumbling aerobatics, or you can fly it as a gentle and predictable sport airplane – it's up to you!

The Duster uses the same simple, reliable equipment as the Extreme Flight 60" series of aerobatic aircraft, and adds two flap servos. The flaps can (and should!) be programmed for a variety of fun modes, to give an extra-wide flight envelope. The Duster is going to delight you with its many talents – so let's get started!

Items needed for completion:

- ✓ **Masking tape.**
- ✓ **Hobby knife with #11 blades.**
- ✓ **Thin and medium CA. We highly recommend Mercury M5T thin and M100XF medium formulas as well as the Mercury glue tips.**
- ✓ **30 minute epoxy. Mercury Adhesives Epoxies have worked very well for us.**
- ✓ **Blue Loctite.**
- ✓ **Electric drill with an assortment of small drill bits.**
- ✓ **Small flat head and Phillips head screw drivers.**
- ✓ **Standard and needle nose pliers.**
- ✓ **Side cutter.**
- ✓ **Metric ball driver or allen key set.**
- ✓ **Sanding block and sandpaper.**
- ✓ **6 x METAL GEARED servos with a minimum of 76oz of torque. All flight testing was performed with Hitec HS-5245MG.**
- ✓ **Dubro Long Super Strength servo arm set. (Dubro part #670 for Futaba, #671 for JR and #672 for Hitec).**
- ✓ **2 x 12” Servo Extensions for the Ailerons.**
- ✓ **2 x 24” Servo Extensions for the rudder and elevator servos**
- ✓ **1 x 12" Servo Extension for the ESC**
- ✓ **Torque 4016T/500 MKII Brushless Outrunner.**
- ✓ **Airboss Elite 80 Amp ESC.**
- ✓ **6S 3300-4000 mah LiPo battery.**
- ✓ **16 x 7 prop.**

www.modellmarkt24.ch

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. Also, due to climate changes, wrinkles may develop in the covering. These are easily removed with a little bit of heat. Use a 100% cotton tee-shirt and your heat gun and heat the covering while gently rubbing the covering onto the wood with the t-shirt. Be careful not to use too much heat as the covering may shrink too much and begin to lift at the edges. Take your time, and a beautiful, paint-like finish is attainable.**

3. **Apply a bead of Pacer Formula 560 Canopy Glue at the intersection of the plastic canopy and its wooden frame.**

4. **Take a few minutes and apply CA to high stress areas such as servo mounting trays, landing gear mounts, anti-rotation pins, and motor box joints.**

5. **By the time your aircraft arrives at your door step, it will have been handled by a lot of people. Occasionally, there are small dings or imperfections on some of the surfaces. An effective method to restore these imperfections to original condition is to use a very fine tipped hypodermic needle and inject a drop of water under the covering material and into the ding in the wood. Apply heat to the area with a sealing iron and the imperfection will disappear. Deeper marks may require that this process be repeated a couple of times to achieve the desired result, but you will be surprised at how well this technique works.**

6. **Use a high quality epoxy for installing the composite control horns. We highly recommend the new Mercury Adhesives 30 minute Epoxy or Pacer Z-poxy. We are very pleased with the results and ease of application and cleanup of these products.**

7. **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, and 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.**

8. **Take the time to properly balance and trim your aircraft and set up rates and exponential values. Your flying experience will be greatly enhanced once your plane is properly dialed in.**

www.modellmarkt24.ch

Let's begin!

1. **Locate the 2 wing panels as well as the composite aileron and flap control horns and linkage hardware.**



2. **Use a soldering iron or sharp hobby blade to remove the covering over the slots for the aileron and flap horns. Make sure you are doing this on the bottom of the wing! Test-fit the horns – NO GLUE YET.**

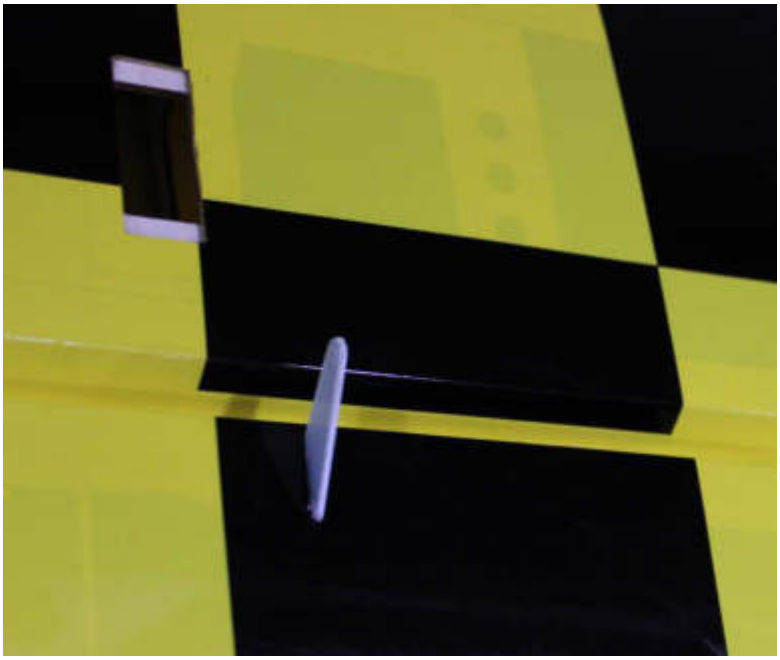


www.modellmarkt24.ch

3. Once you are satisfied with the fit of the horns, remove them. Use sandpaper to scuff the portion of the horn that will be inserted into the aileron or flap.



4. Apply 30 minute epoxy to the slot in the aileron and the scuffed potion of the control horn that will insert into the aileron or flap. Use a zip tie or toothpick to ensure the slot is completely filled with epoxy. Install the aileron horn into the aileron slot and wipe away any excess epoxy with a paper towel or cloth soaked with denatured alcohol. Allow to dry.



www.modellmarkt24.ch

5. Remove the aileron and flap from the wing to ensure all hinges are centered between the wing and aileron. One way to ensure the hinges are centered is to fold them in half and re-install into the aileron using the crease as a reference point.



6. Slide the wings on to the fuselage and check the fit of the flaps. Make sure you can deflect the flaps up without contacting the fuselage. Slide the flaps and ailerons as necessary for clearance.

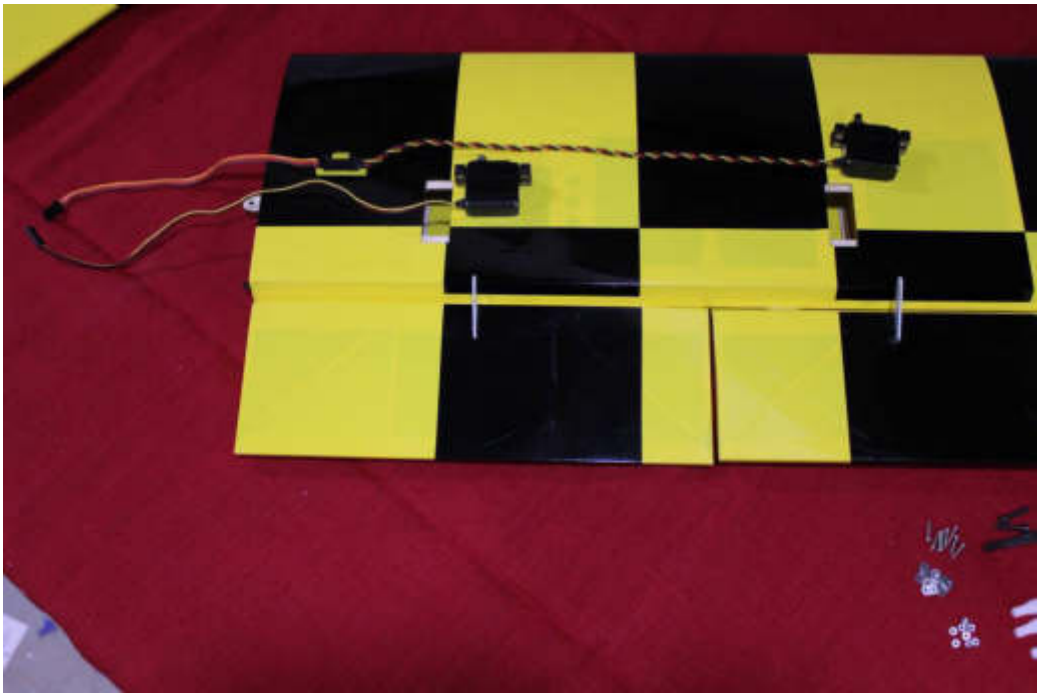


www.modellmarkt24.ch

7. Glue the hinges using several drops of thin CA on each hinge. Make sure your thin CA is reasonably fresh.

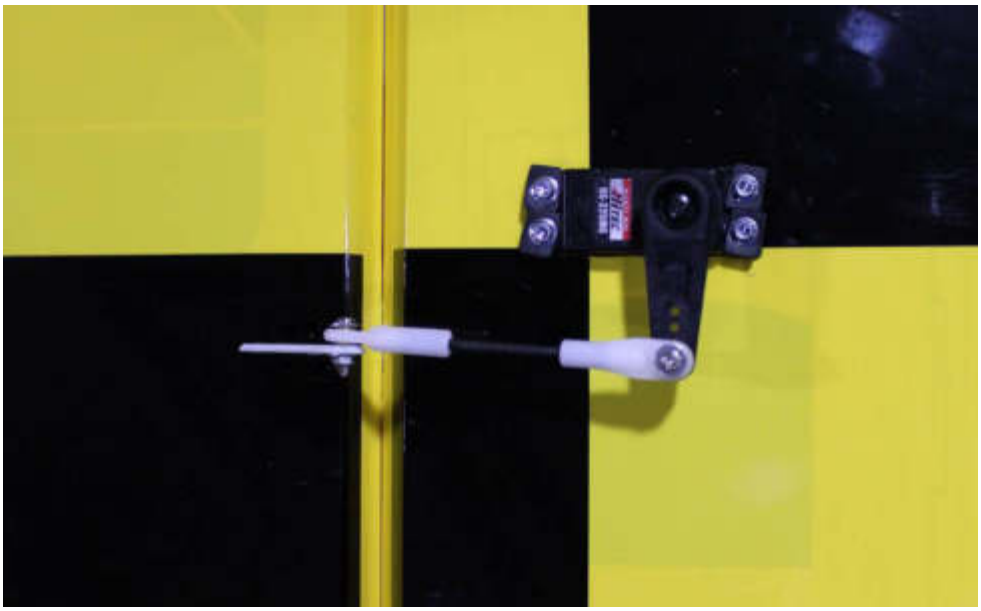


18. Attach an 8-12" servo extension to the aileron servo and secure with a lock or heat shrink tubing. Use the manufacturer supplied mounting hardware to install the servo with the output shaft toward the leading edge of the wing. Electronically center the servos. Use 4 identical length arms on the flaps and ailerons.



www.modellmarkt24.ch

12. Locate 4 of the short threaded metal pushrods and 8 ball links along with 8 x 2mm screws, nuts and washers. Thread the ball links onto each end of the pushrods and secure to the servo arm and to the control horn as shown in the picture below. Remember to use Loctite on all nuts. Repeat this process for the other wing half.





Fuselage Assembly

www.modellmarkt24.ch

13. Locate the carbon fiber landing gear and secure the landing gear to the fuselage by inserting the 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. Note the LG has a tapered edge and a straight edge; make sure the straight edge faces the front of the fuse.



14. Locate the 2 axles, 2 locking nuts, 2 wheels, 2 wheel collars and 2 wheel pants. Place the wheel on the axel and secure with the wheel collar. Secure the axle to the carbon gear with the locking nut.



www.modellmarkt24.ch

15. Remove the covering over the cooling outlet in the bottom of the fuselage as shown.



16. Locate the rudder. Install, checking to be sure the hinges are centered as on the wings.

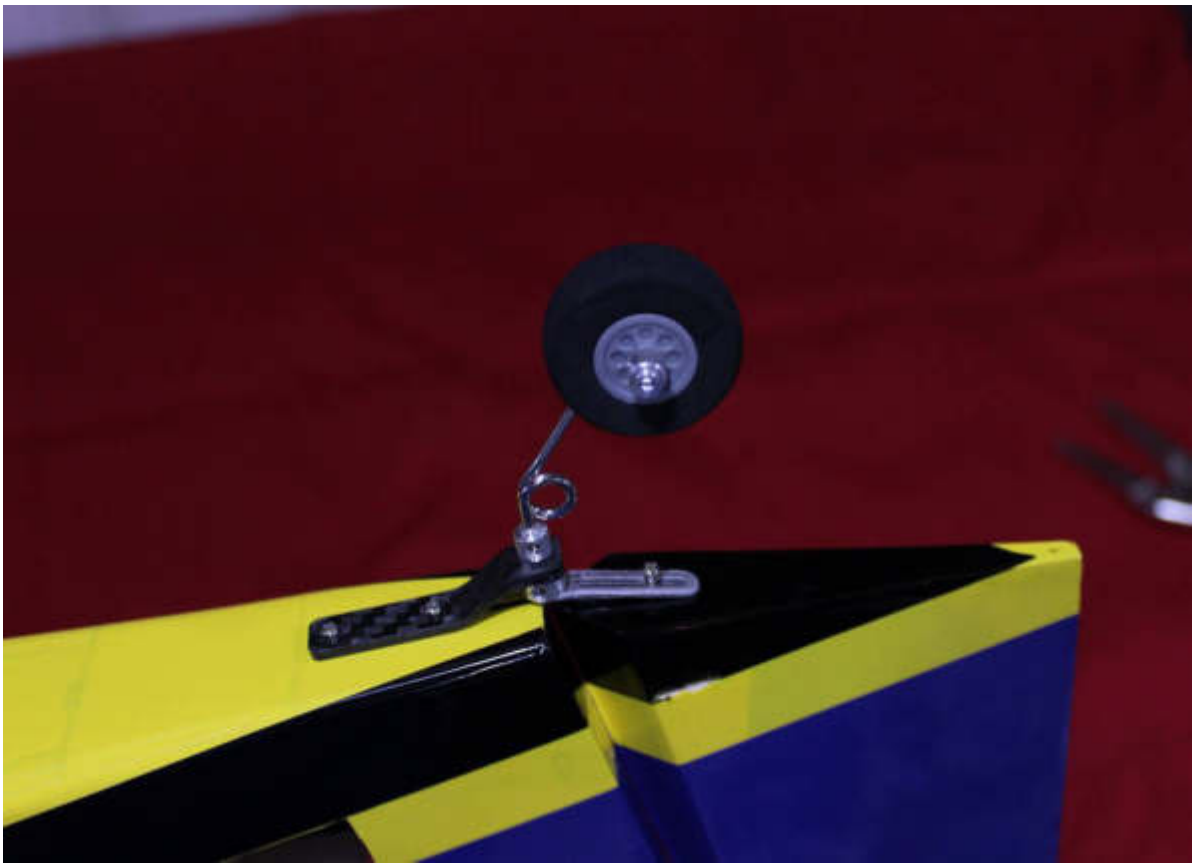


17. Use several drops of thin CA on each rudder hinge.

www.modellmarkt24.ch



18. Install the tailwheel as shown, bending the aluminum tiller arm to fit the rudder. The wood screw in the rudder is left slightly loose so the tiller arm can easily swing.

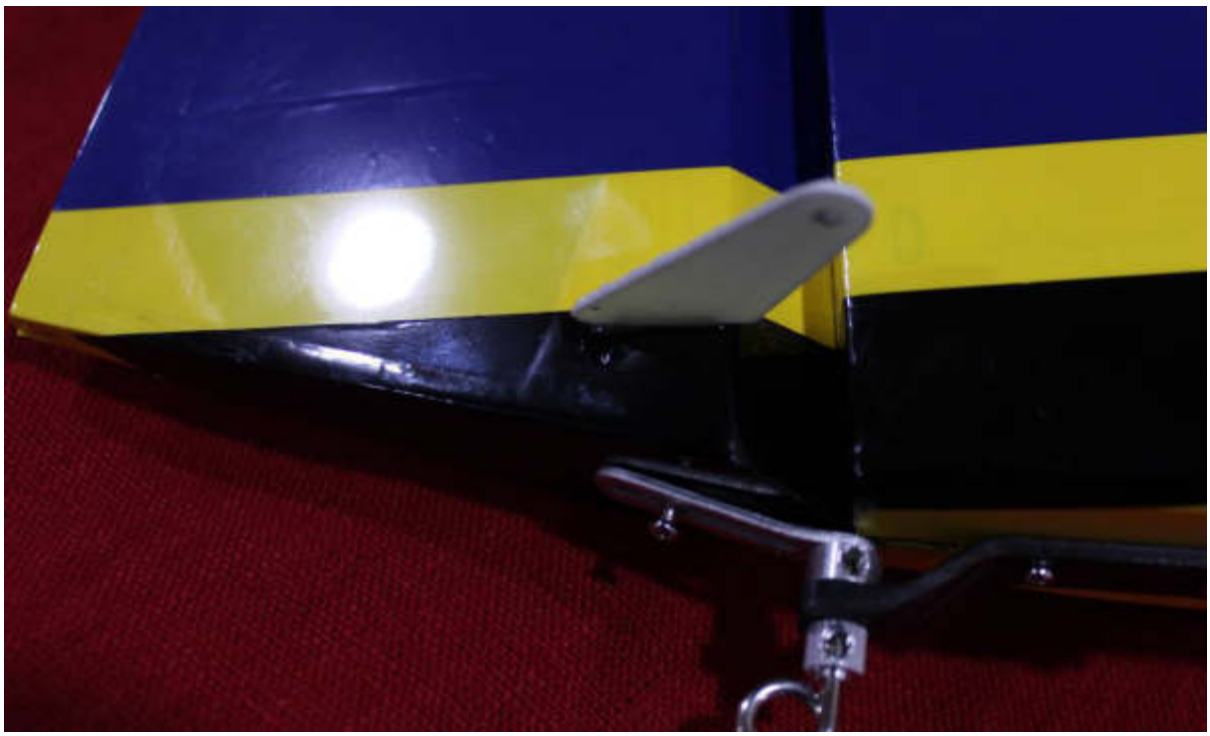


19. Locate the slot for the rudder horn as shown, remove the covering with a soldering iron or hobby knife.

www.modellmarkt24.ch



20. Prepare the horn with sandpaper as you did for the wing, and install the rudder horn with 30-minute epoxy as shown.



www.modellmarkt24.ch

21. Attach a 24" servo wire extension to your rudder servo, using a lock or heat-shrink tubing, route the wire through the fuselage, and install your rudder servo as shown.



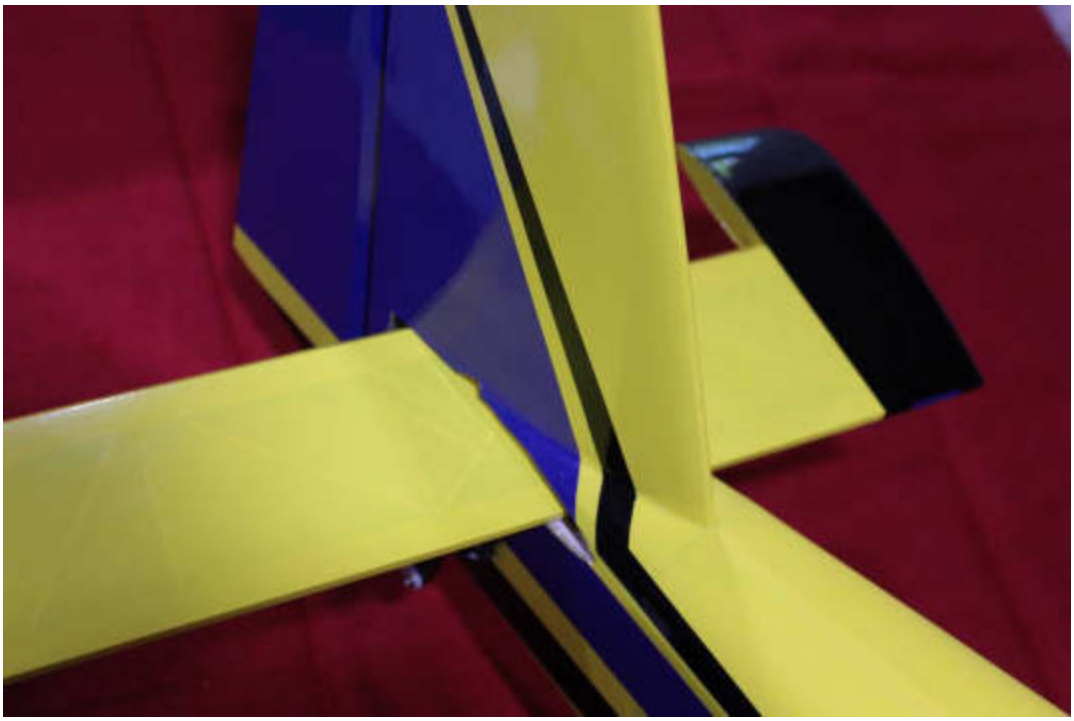
22. Install the rudder pushrod as shown. Use Loctite on the nuts.



www.modellmarkt24.ch

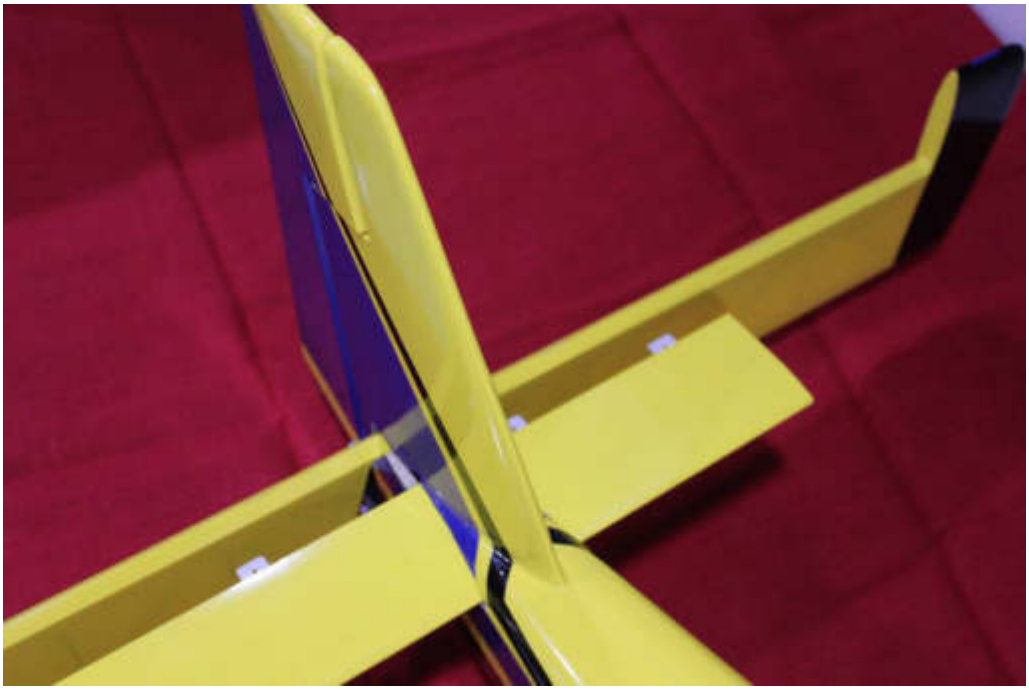
23. Turn the elevator upside down and backwards, and slide through the horizontal stab cutout in the fuselage as shown.





www.modellmarkt24.ch

24. Slide the horizontal stabilizer into the slot, slide the elevator into position on its hinges, but do not glue yet.



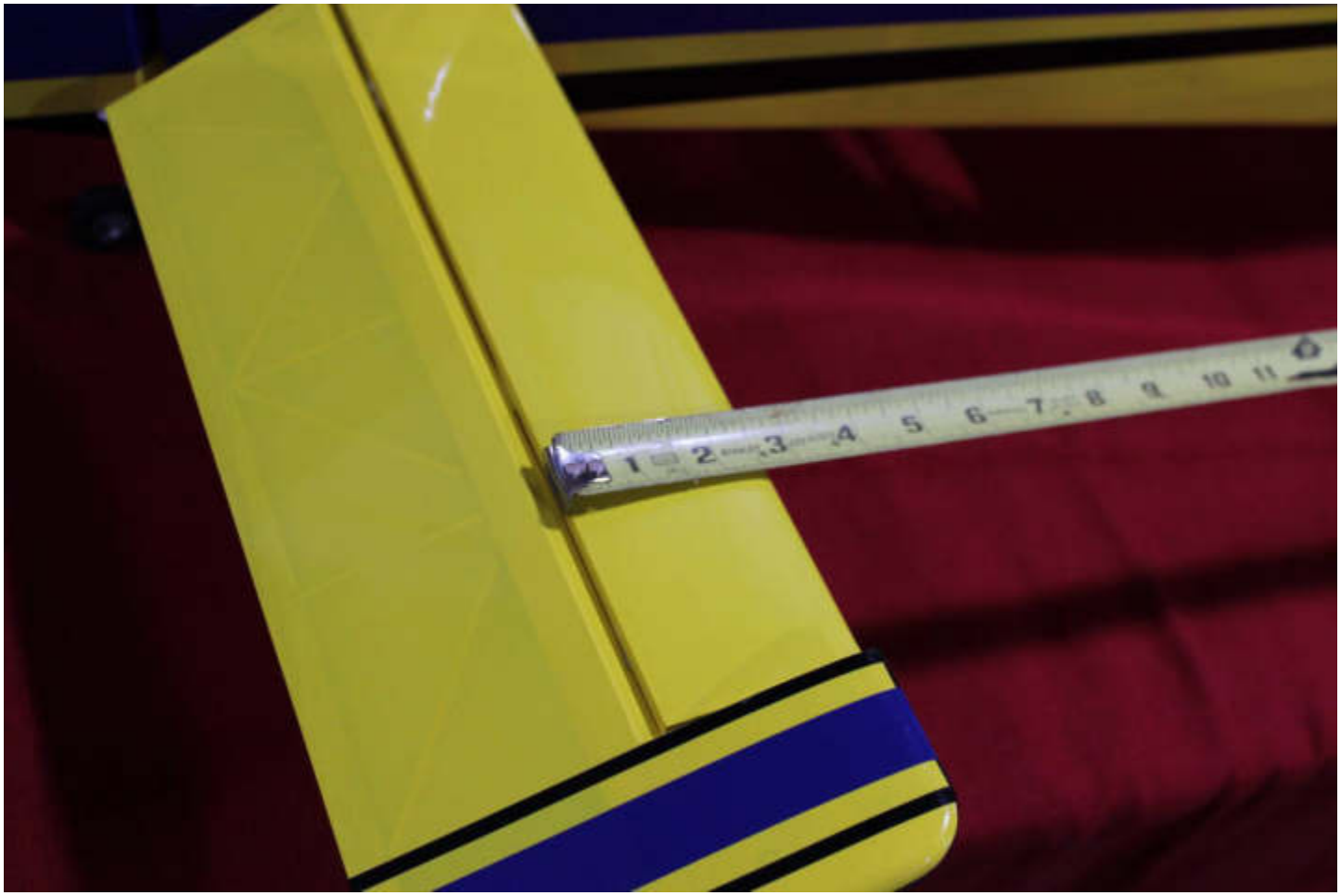


25. Install the carbon fiber wing tube into the fuselage and use a tape measure as shown to make sure the horizontal stabilizer is straight to the fuselage and perfectly

www.modellmarkt24.ch

equal side-to-side. Measure on each side form the elevator hinge line to the wing tube. The measurements should be exactly the same.





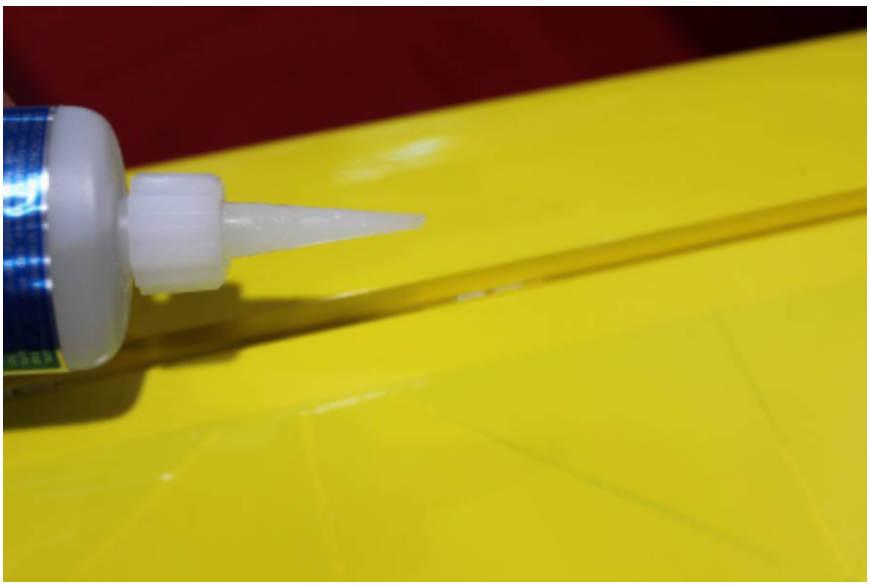
26. Once satisfied with the alignment, glue the horizontal stab in place by applying CA along the joint between the stab and fuse. Make sure to apply CA to the top and bottom

www.modellmarkt24.ch

of the stab, being careful not to get CA on the covering. NOTE: The stab on the Turbo Duster is long in span. The covering is an important part of the structure of the stab. DO NOT cut the covering. Thin CA will adhere to the covering material very well.



27. Align the elevator perfectly, flex it to make sure it moves easily 45 degrees up and 45 degrees down, and glue with several drops of thin CA per hinge.



28. Locate the slot for the elevator horn, remove the covering over the slot with a soldering iron or hobby knife as shown.

www.modellmarkt24.ch



29. Attach a 24" extension to the elevator servo, thread the wire through the aircraft, install the servo, horn, and pushrod as you have for the other control surfaces, as shown.



30. Next prepare the Torque outrunner motor for mounting.

www.modellmarkt24.ch



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.

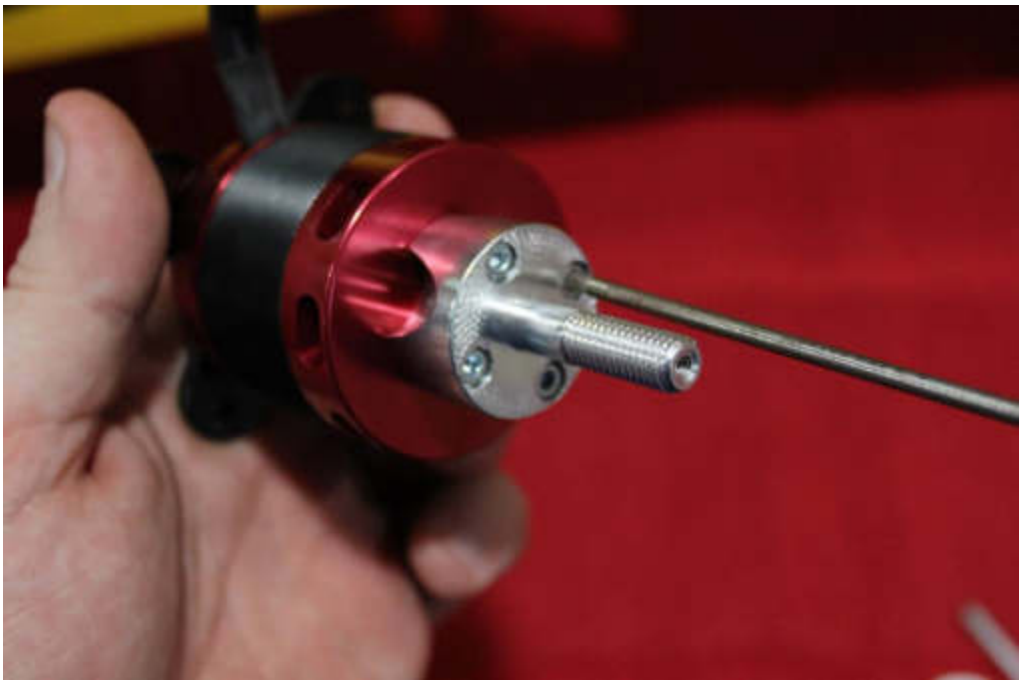


34. Next, secure the radial mount to the motor using the provided short Phillip's head machine screws. Again be sure to use a drop of blue Loctite on each screw.

www.modellmarkt24.ch

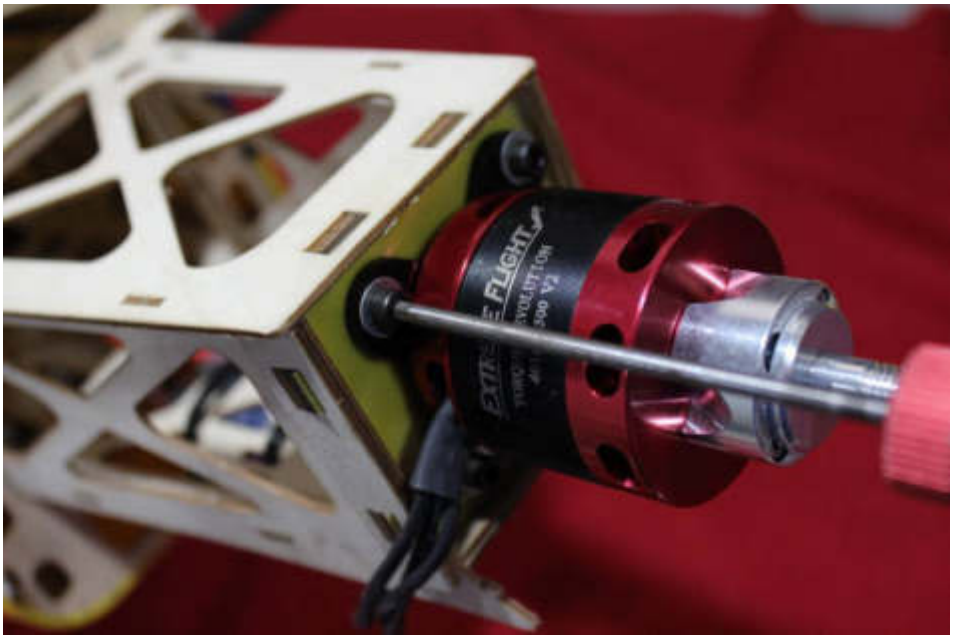


35. Secure the prop adapter using the 4 socket head cap bolts. Blue Loctite should be applied to each bolt.

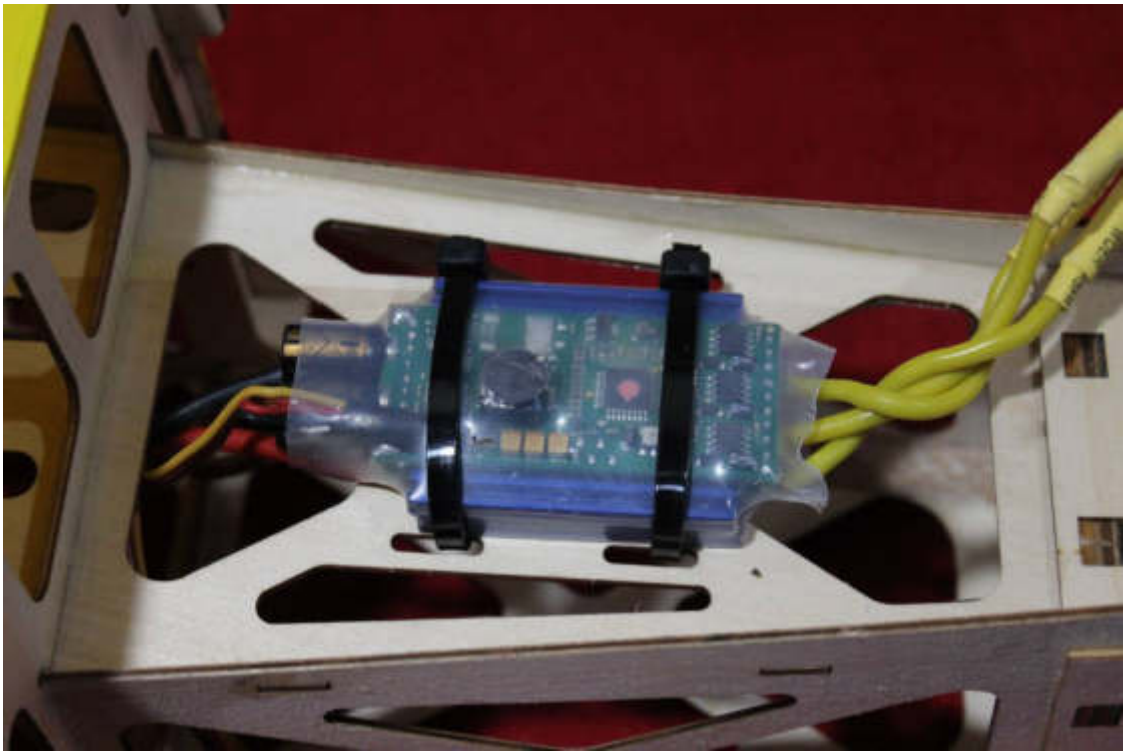


36. Mount the Torque motor using the supplied 4mm black socket head cap bolts and washers. The bolts are to be inserted into the blind nuts which are pre-installed in the motor mount plate. Be sure to put a drop of blue Loctite onto each bolt to prevent them from backing out. Also take time to add CA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

www.modellmarkt24.ch



37. Install the ESC to the bottom of the motor box using zip ties to secure the ESC.



Mounting the Cowl

37. Locate the turbine exhaust stacks.

www.modellmarkt24.ch



Scuff the mounting surface of the stack as shown, and the mounting area on the cowl, with sandpaper.



Use 30min epoxy or 'goop' or 'welder' type adhesive to glue the stacks to the cowl.

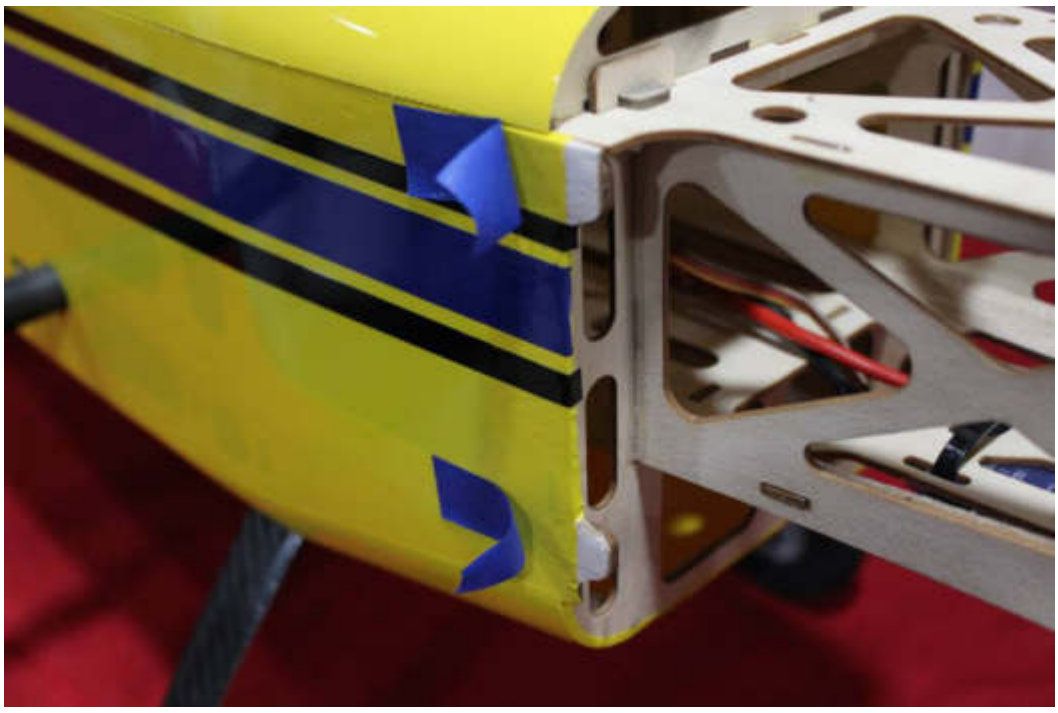


Use masking tape to hold the stacks in place while they dry.

www.modellmarkt24.ch



38. Cut 4 short pieces of blue painters 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.



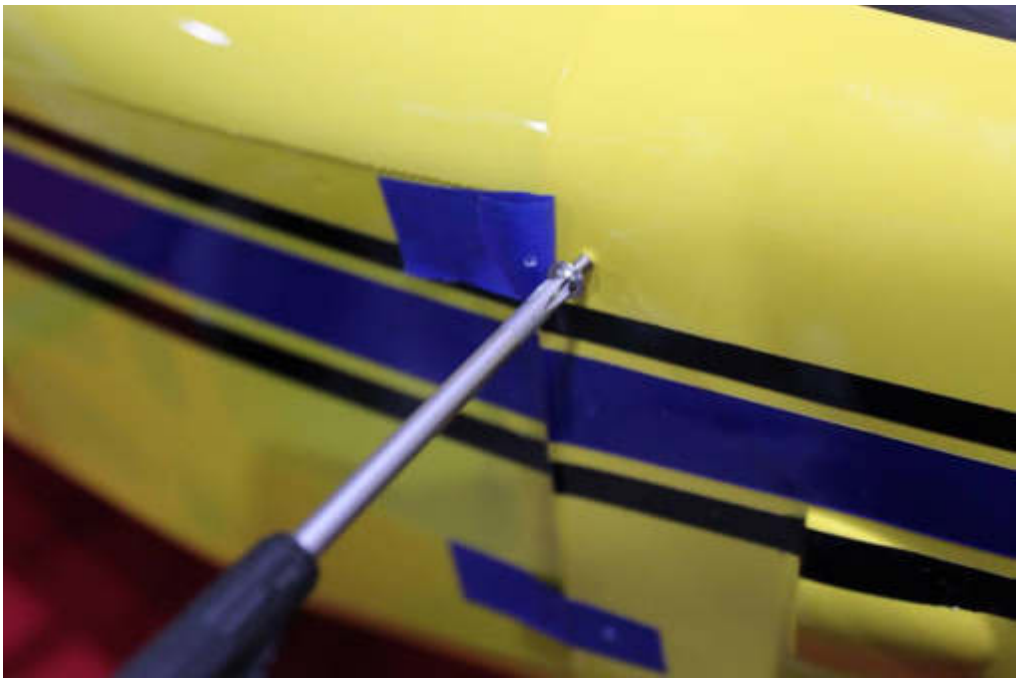
39. Roll the tape back and slide the cowl into position. Install the spinner onto the motor shaft for reference and once satisfied with the cowl position roll the tape back

www.modellmarkt24.ch

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.



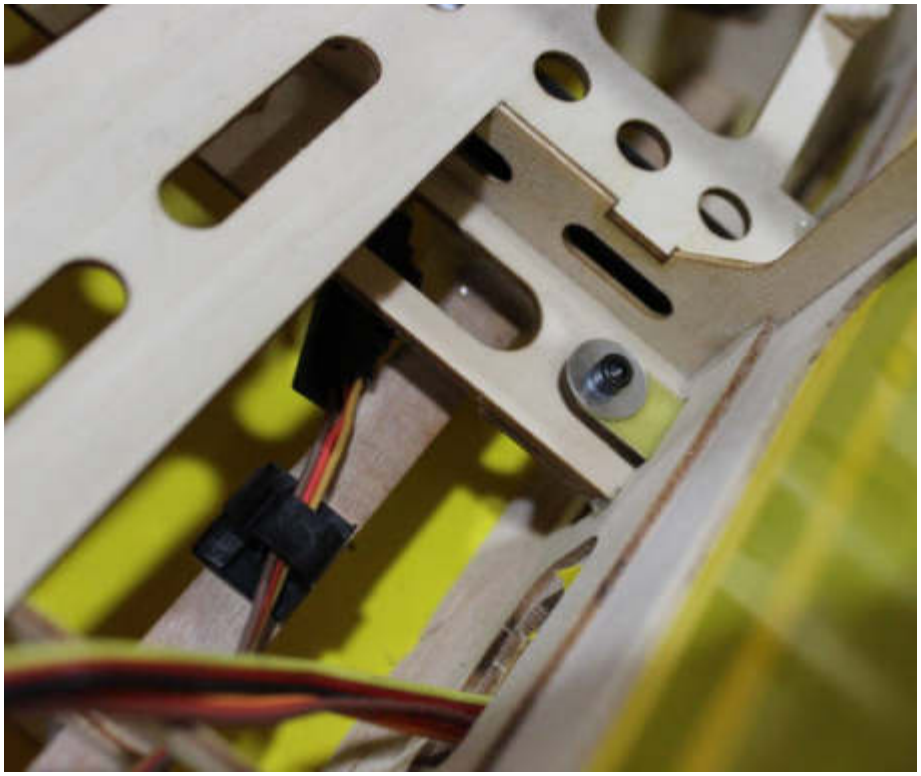
40. Remove the tape and secure the cowl with 4 of the included small wood screws that have the large heads.



www.modellmarkt24.ch

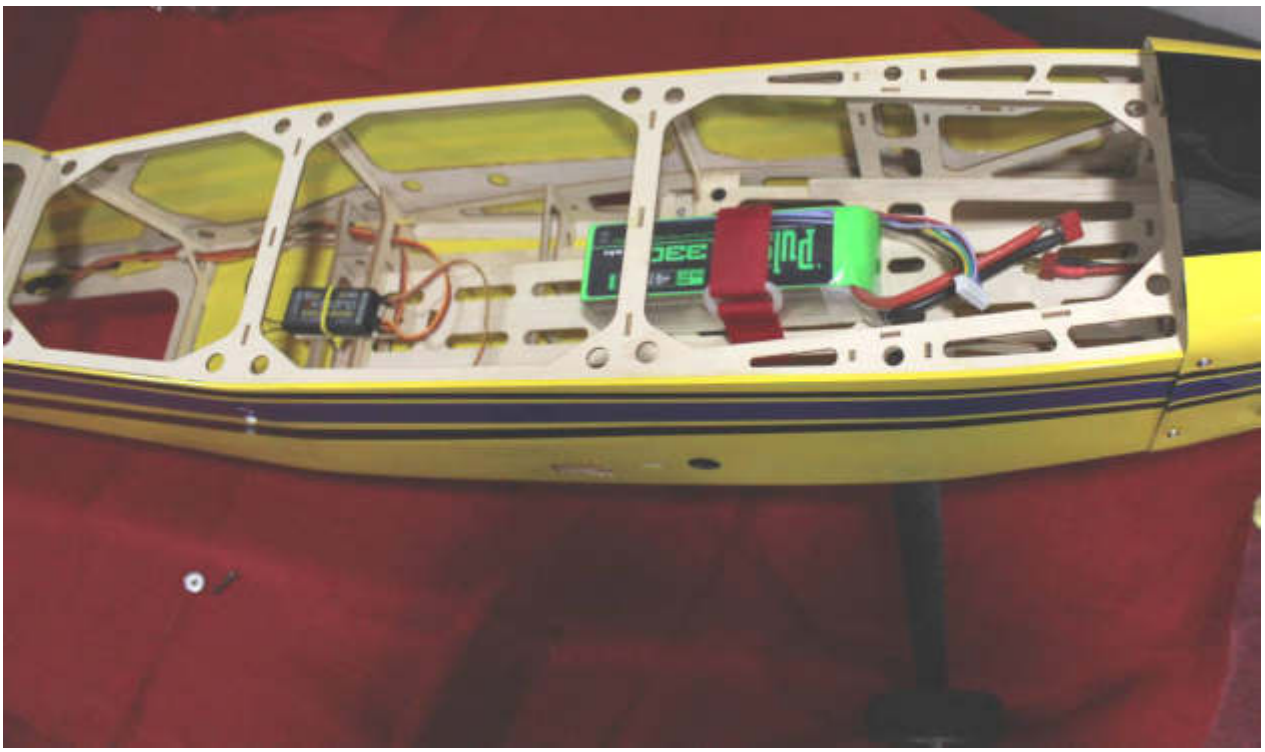


41. The wings are retained by inserting a 3MM bolt and washer through the tabs each wing at the side of the fuse just in front of the wing tube. Make sure the wings are pushed all the way in so the holes in the tab and fuse line up. Take care not to cross thread the bolts.



www.modellmarkt24.ch

42. Tie up all servo extensions inside the fuselage. Mount your reciver in a convenient place behind the battery area. The battery mounts in the area shown using Velcro.



www.modellmarkt24.ch

Set-up and Trimming

The CG range for the Turbo Duster starts at the front of the wing tube and extends to the rear of the wing tube. There is plenty of room on the battery tray to move your battery to achieve this CG location. Depending on your flying style you can adjust the position of the battery to alter the CG to accommodate your preferences.

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 aerobatic flight will allow you to experience the best attributes of the Turbo Duster or any aircraft for that matter. 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
Aerobatic rate-40-45 degrees; 40-50% Exponential

Rudder: Low rate-20 degrees; 45-50% Exponential
Aerobatic rate- As much as possible; 60-70% Exponential

Aileron: Low rate-15-20%; 40-45% Exponential
Aerobatic rate- As much as possible; 50-60% Exponential

Flaps: The flaps are designed to be mixed with ailerons for a variety of aerobatic capabilities. For simple flap use to slow the aircraft for landing, use 35-45 degrees of down flap. For best rolling performance, mix your flaps to perfectly match the motion of your ailerons, creating one large aileron surface.

The Duster responds very well to other flap mixes, such as crow mixing, and mixing flaps to elevators (down flap with up elevator, and up flap with down elevator) to increase pitch performance. Experiment, and see what you like!

www.modellmarkt24.ch

This completes the assembly of the 65 inch Turbo Duster. As a final step clean the entire aircraft with glass cleaner, then apply a coat of spray-on wax and buff the finish to a high gloss with a microfiber cloth. My favorite product for this is Eagle One Wet Wax AS-U-DRY, available in the automotive section of most Wal-Marts, K-marts, Sears, Targets, etc. People often ask me at trade shows how I get the planes to look so shiny, this is my secret. You may wish to apply all of your graphics before applying the coat of wax.
Thanks again for your purchase of the Legacy Aviation 65" Turbo Duster ARF. I hope you enjoy assembling and flying yours as much as I have mine.
See you at the flying field!

Chris Hinson
Extreme Flight RC



65" Turbo Duster optional float kit – available wherever Legacy Aircraft are sold!

www.modellmarkt24.ch