2 Meter Vanquish
F3A

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.

A few tips to ensure success

1. **We are very pleased with the level of craftsmanship displayed by the builders in our factory. Through hundreds of grueling test flights containing maneuvers that no aircraft should be subjected to, our prototypes have remained rigid and completely airworthy. However, it is impossible for us to inspect every glue joint in the aircraft. Take a few minutes and apply some medium CA to high stress areas such as servo mounting trays , landing gear blocks, anti rotation pins, etc.**
2. **Having survived the journey half way around the world while experiencing several climate changes, it is not uncommon for a few wrinkles to develop in the covering. Fear not! These are not manufacturing defects, and 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. Seal the edges of stripes with an iron. 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. **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 to 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.**
4. **DO NOT SKIMP ON SERVOS! Use the recommended servos or equivalent to ensure that you have enough power to adequately actuate the control surfaces.**
5. **Use a high quality epoxy for installing the composite control horns. We highly recommend the use of Pacer Z-Poxy 30 minute formula. We have used this glue for many years with zero failures.**
6. **Your aircraft is built using very modern construction techniques and is very light weight for its size. As with any high performance machine, regular inspection and maintenance is a must. While disassembling your aircraft after a flying session, pay close attention and inspect glue joints, linkages and loose covering to be sure the airframe is sound. A few minutes spent doing this will help maintain airframe longevity.**

Congratulations on your purchase of the Extreme Flight RC 2 meter Vanquish!

The Extreme Flight 2 meter Vanquish is our attempt to provide the pattern community with a very competitive, low cost alternative to the multi-thousand dollar composite airframes currently dominating the competition circuit. Properly assembled and set up the Vanquish can hold its own in any of the classes against the aforementioned high dollar ships.

The Vanquish is loaded with unique features, including first rate useable hardware and components and thorough instructions to ensure a trouble free assembly and set-up. Weight saving components are used throughout, such as carbon fiber wing and stab mounting tubes, carbon fiber landing gear, titanium pushrods and carbon fiber tail wheel assembly. Wing and stab adjusters are provided for precision incidence adjustment.

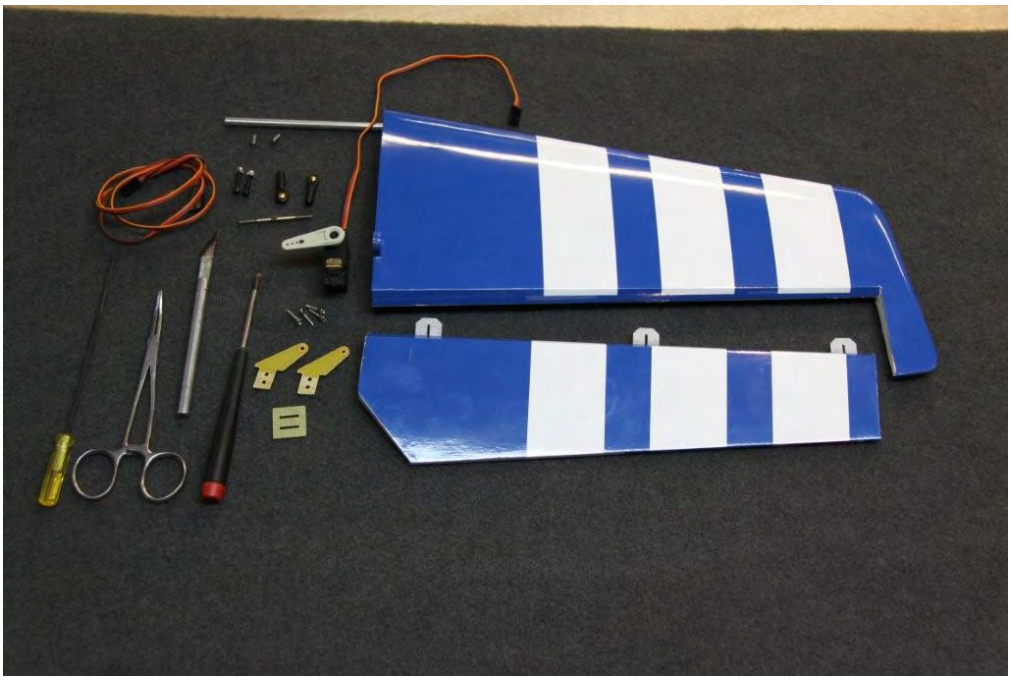
The Vanquish is intended to be powered by our Torque Silver Bullet F3A motor or an equivalent 2600-3000 Watt power system running a lightweight 10S LiPo battery set up.

We have spent a great deal of time and effort to provide you, the discriminating aerobatic enthusiast, with the highest quality, most complete package possible. We are very proud of the end result of our labor and wish you great success with the assembly and flying of your Extreme Flight RC Vanquish!

Let's begin!

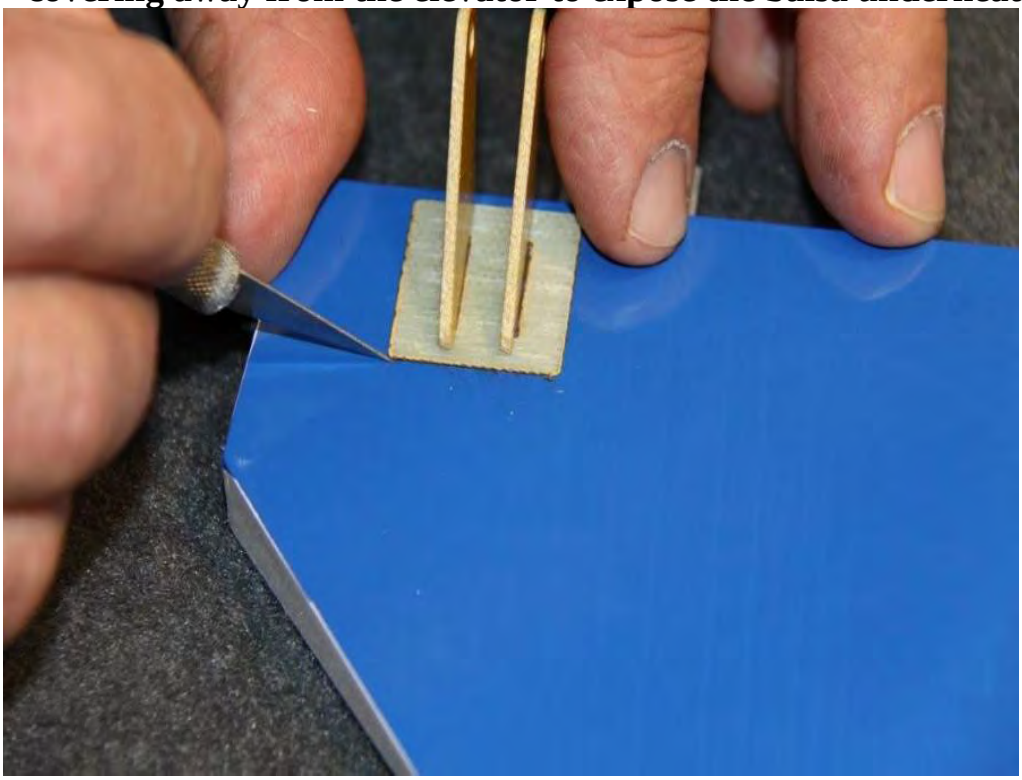
Stab and Elevator Assembly

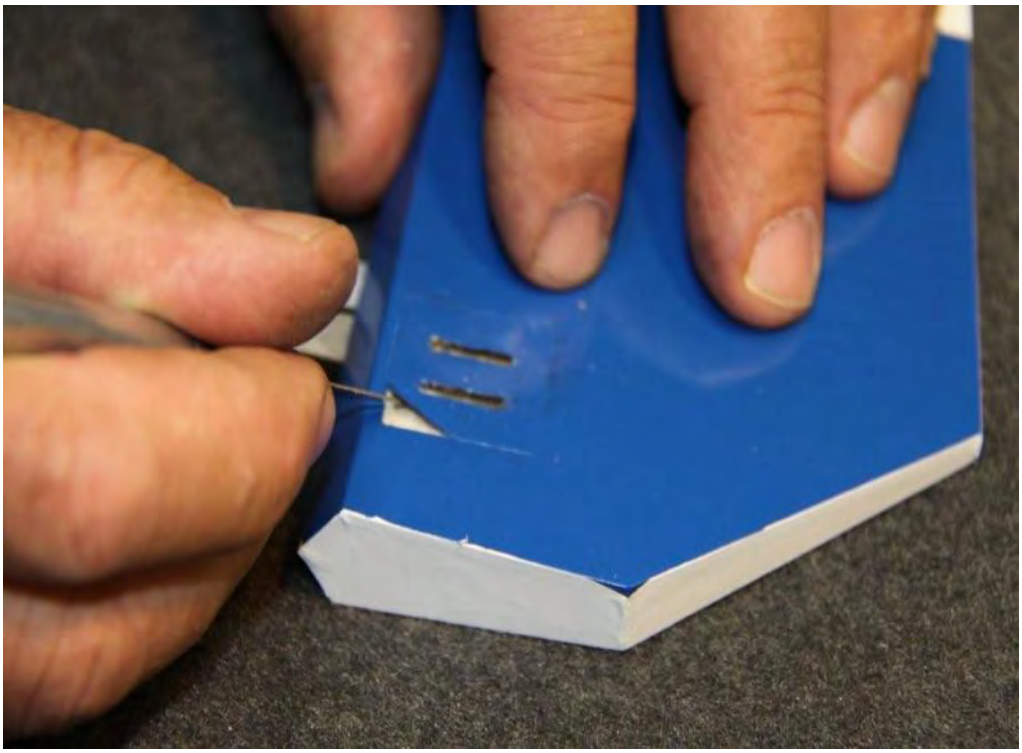
Parts and tools needed for this



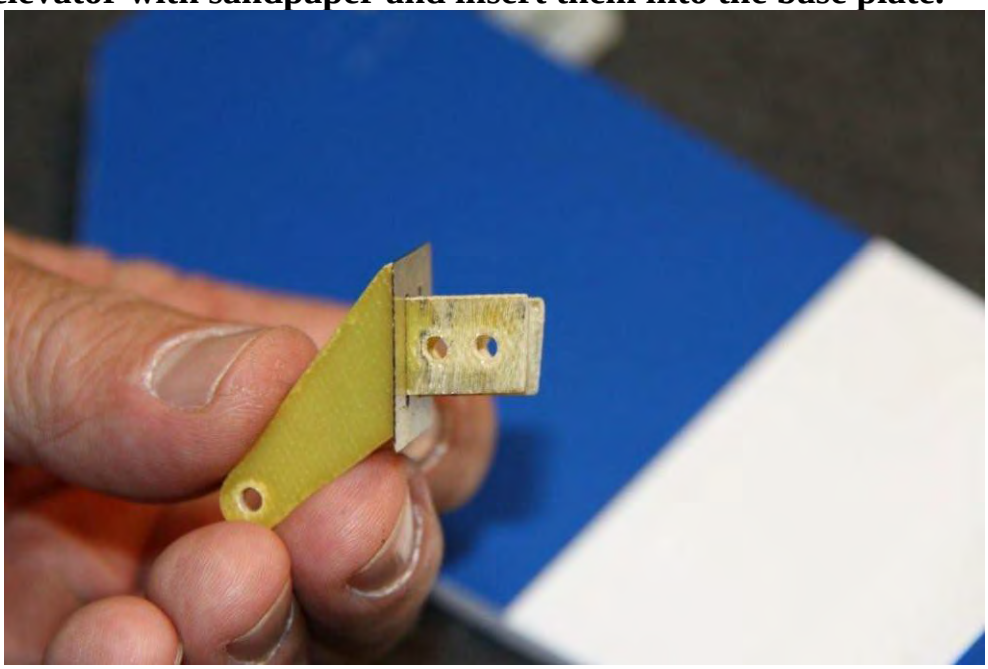
1. **Locate the horizontal stabilizer/elevator assemblies as well as the composite control horns and base plates from the elevator hardware package. Use a sharp #11 blade to make a cut in the covering over the 2 slots for the elevator control horns on the bottom of the elevator surface.**

2. Insert the 2 control horns into the base plate and trial fit the horns into the slot and make sure they seat properly against the base and elevator surface. Score covering around the base plate with X-acto knife and lift the covering away from the elevator to expose the balsa underneath.



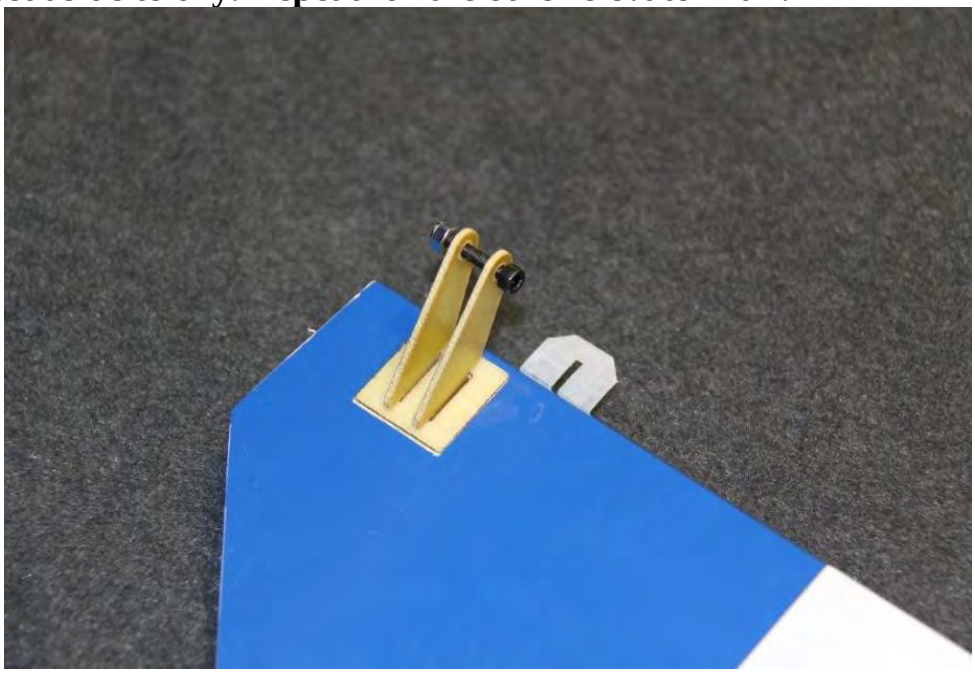


3. Scuff the portion of the G10 control horns that will be inserted into the elevator with sandpaper and insert them into the base plate.



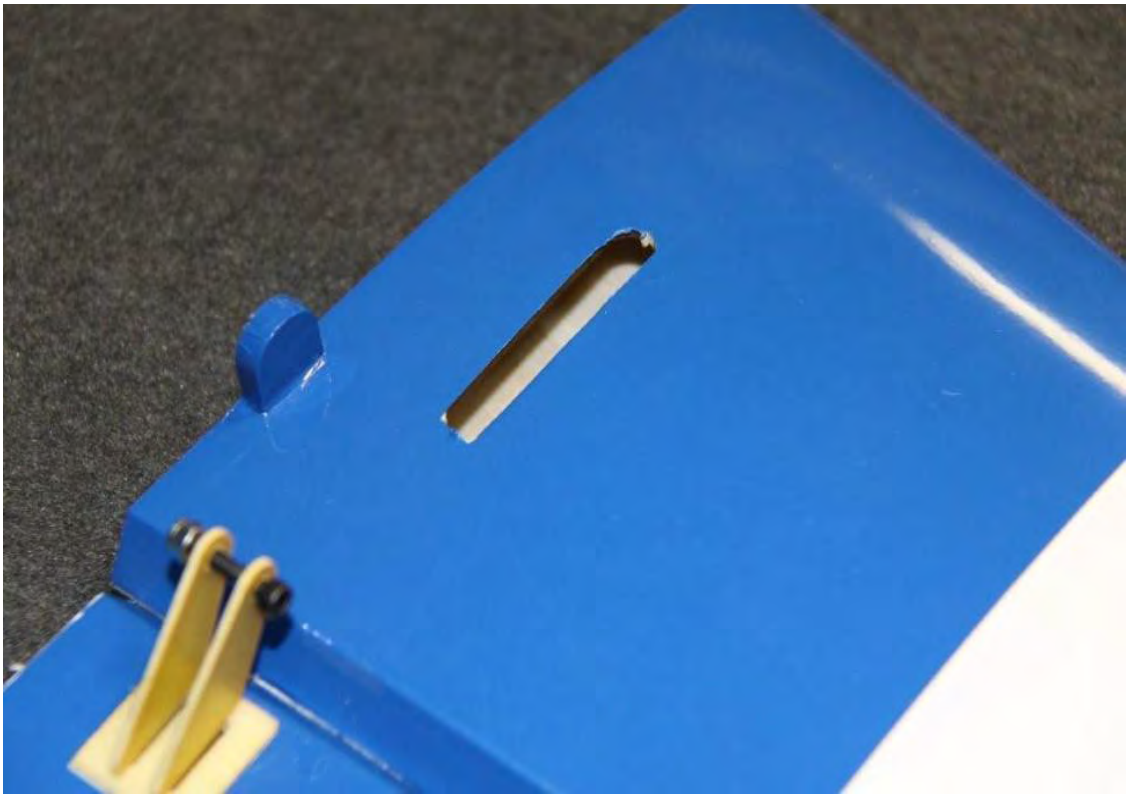
4. Apply 30 minute epoxy to the slots and thoroughly coat the horns and base plate bottom. Reinsert the assembly into the elevator and wipe away any excess epoxy with a paper towel and denatured alcohol.

5. Place a 3mm bolt through the horns to help insure proper alignment and set aside to dry. Repeat for the other elevator half.

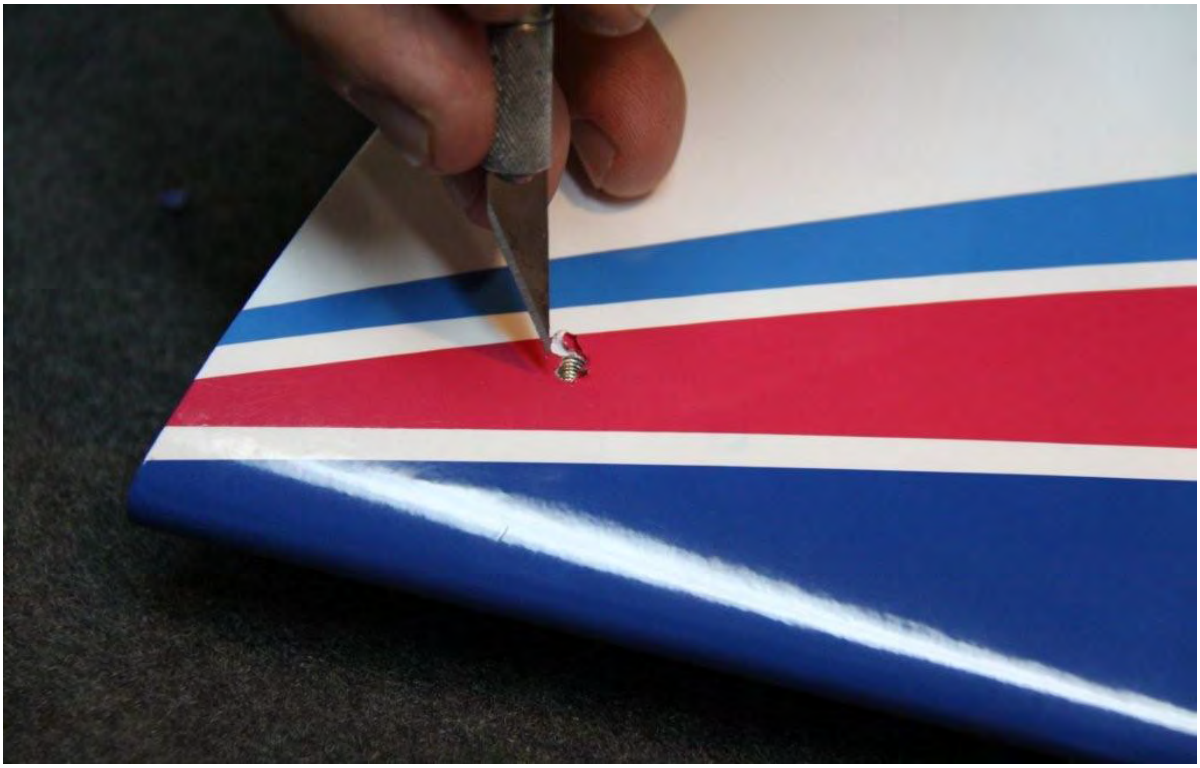


6. Place the elevator back on the stab, making sure the hinges are centered between the elevator and stab. Deflect the control surface to full deflection. Use a fresh bottle of thin CA and a fine tube applicator to apply a couple drops to each hinge. Flip elevator over and wick a few drops onto the other side of hinge. Ensure that both sides get a few drops of CA. Repeat this process for the other stab/elevator .

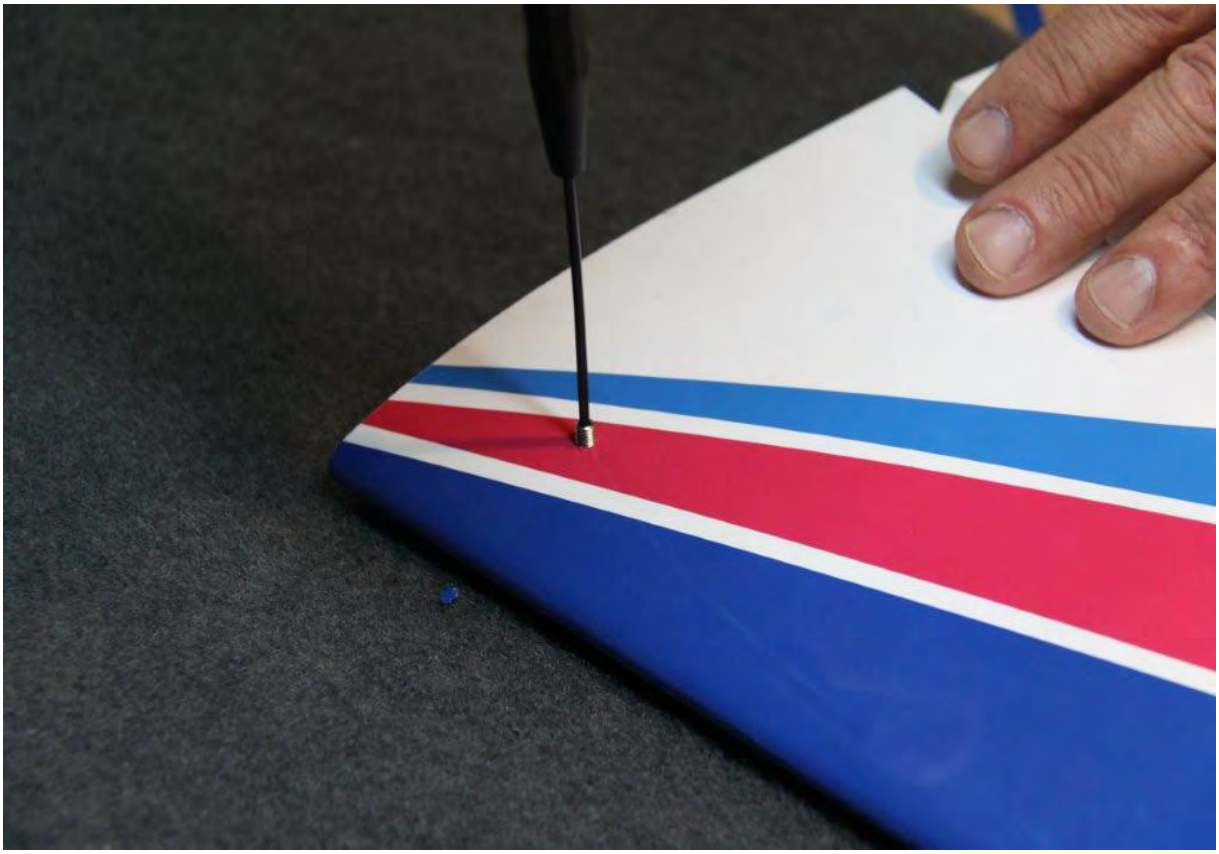
7. Cut away the covering around the servo horn opening on the bottom of the stab with a sharp #11 blade.



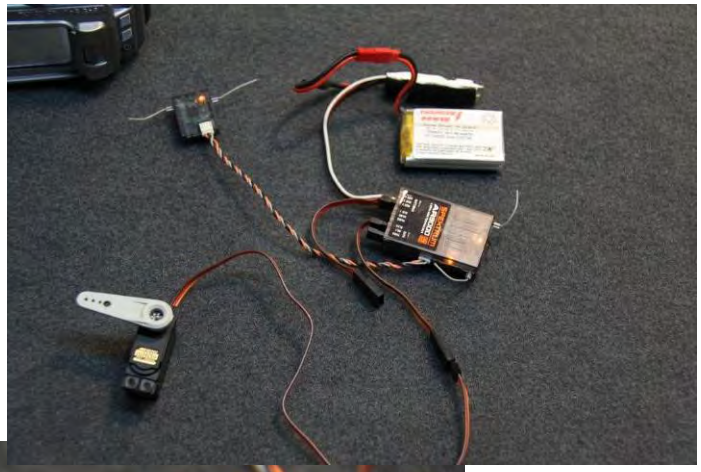
8. Locate and remove the covering for the Stab adjuster threads on top and bottom of the stab halves.



9. Locate the 2 set screws and install into holes about 5 or 6 threads.

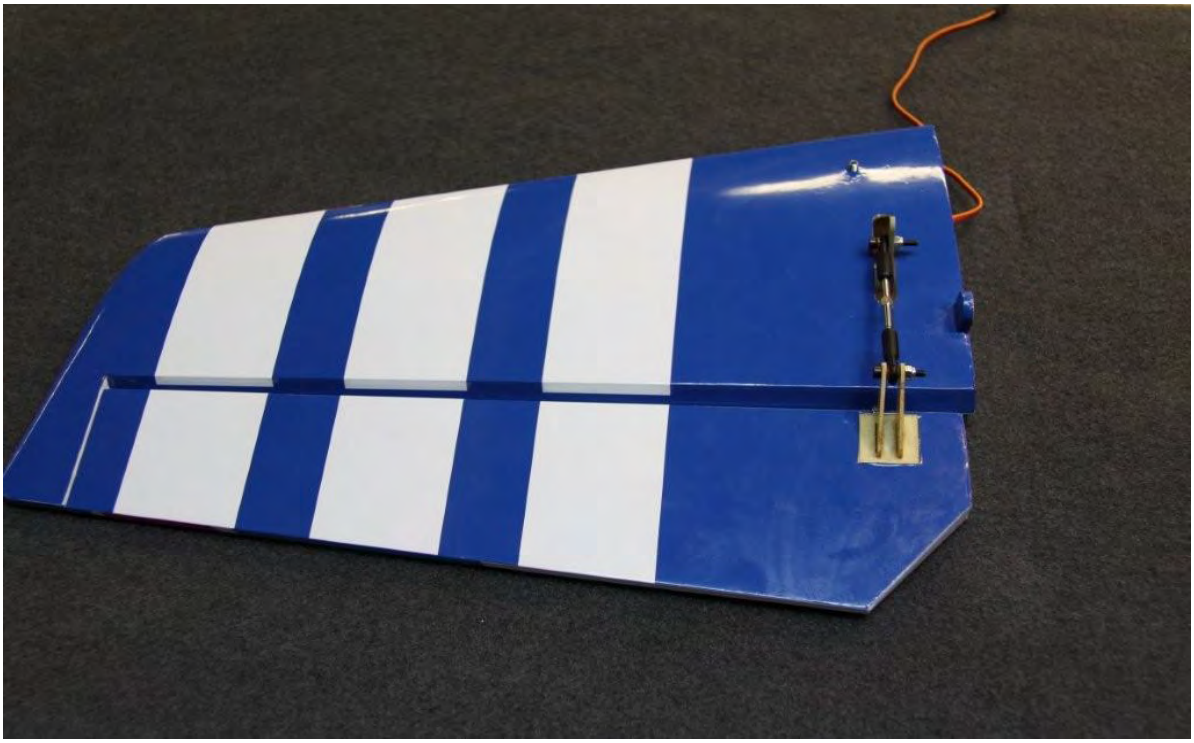


10. Now is a good time to electronically center the 2 Elevator servos, This will aid aligning the elevator horns when assembling the servos in the stab. We used the JR 3421 for the elevators with great results.

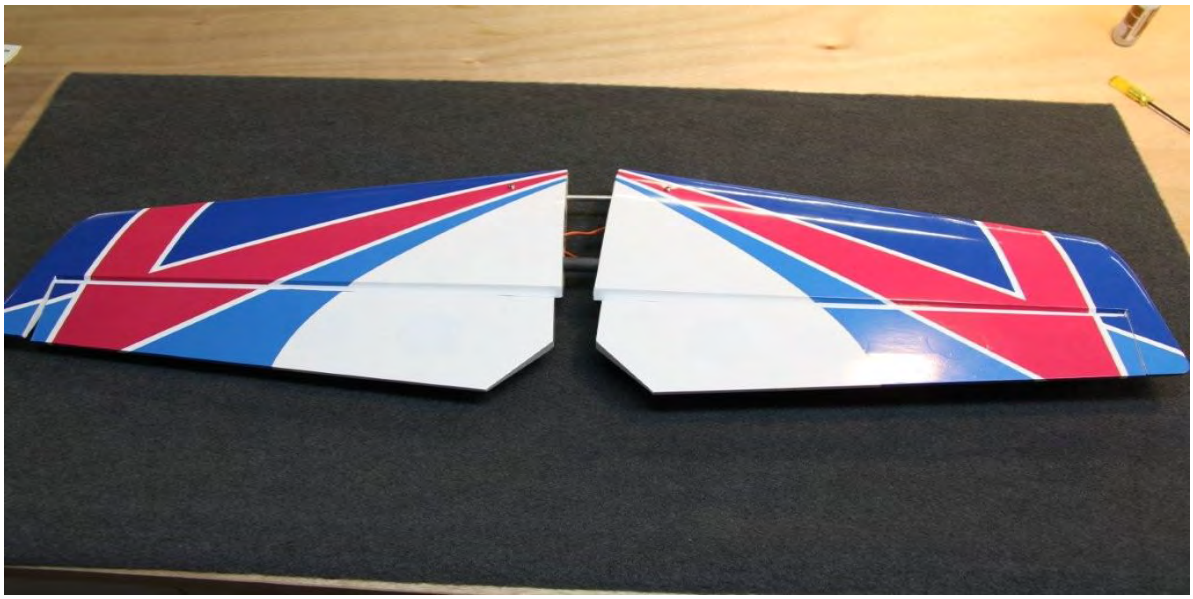


11. Install the servo into the servo bay using the manufacturers supplied hardware. Install servo with output shaft to rear of assembly. We highly recommend the Dubro Super Strength servo arms for all control surfaces. Although the long arm is pictured we recommend using the outside hole on the shortest supplied arm. 15 to 20 degrees of elevator throw is all the Vanquish will ever need for Box flying.

12. Thread 2 of the supplied ball links on to one of the titanium pushrods. Remember that the ends of the pushrods are reverse threads so they can be adjusted as a turn buckle without removing the pushrod. Attach one end to the servo horn using a 3mm cap screw & locknut and the other to the composite elevator horn.



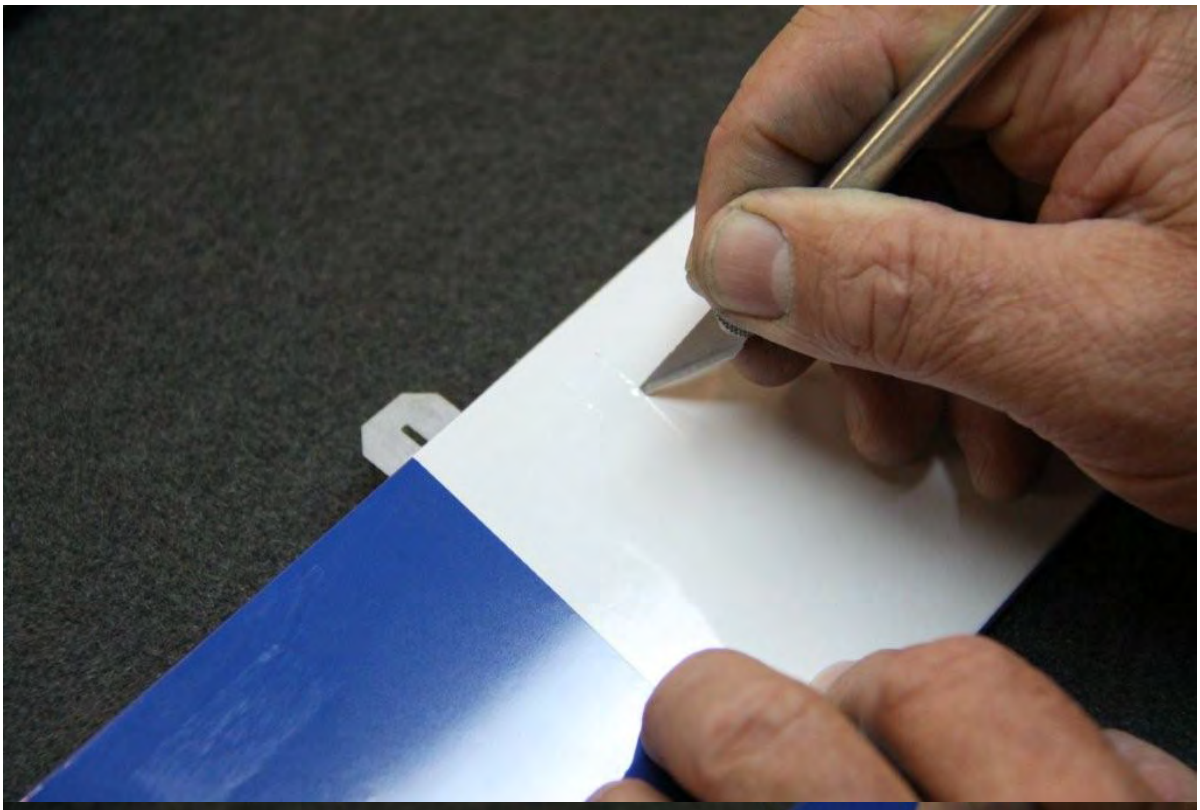
13. Seal the bottom of the hinge gap with a strip of Ultracote or Blenderm tape. Be sure to fully deflect the control surface when applying the tape or Ultracote to allow full deflection once the gap is sealed. Repeat this process for the other stab/elevator assembly. Before you set aside the stabs take a moment with your covering iron and go over all of the seams with a medium heat setting, paying special attention to the ends of thin trim stripes. At this point clean the 2 elevator/stab assemblies with Windex and set them aside.

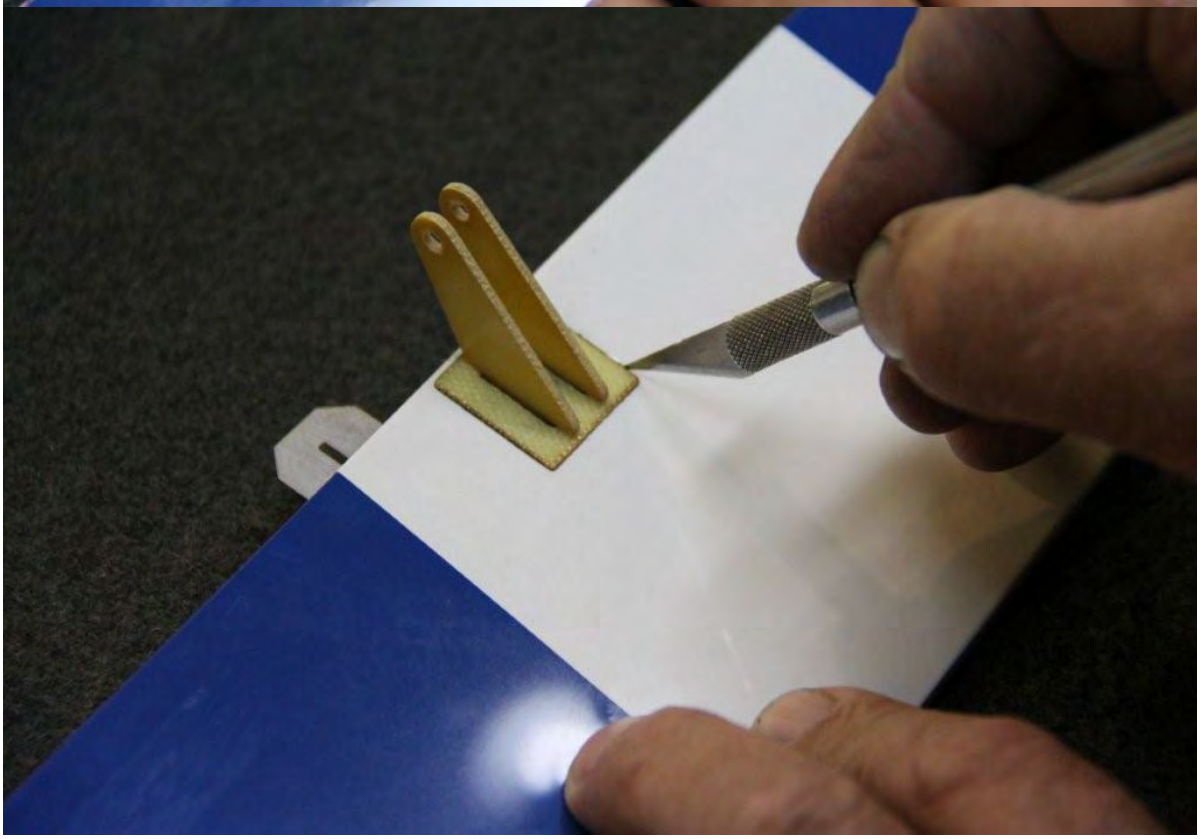


Wing Assembly

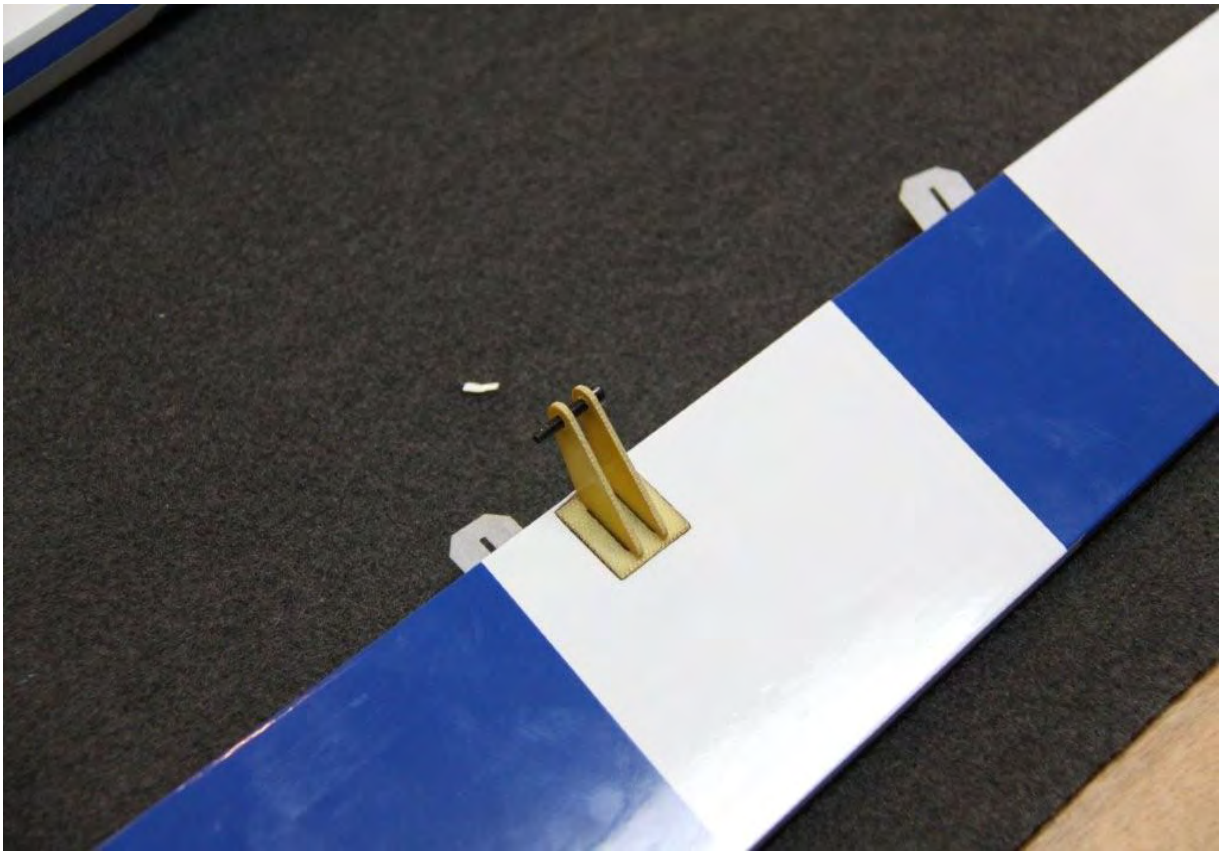
14. Parts and tools needed to assemble wing panels.

The wing panel assembly is very similar to the techniques used to assemble the horizontal stabs. Locate the 2 horn slots, trim back the covering under the horn plates and glue into place the composite horns just as you did on the stab. Once glued into place and all excess glue cleaned with alcohol keep your assembly aligned by installing 3mm cap screws until the assembly is dry. The following sequence of pictures probably explains this better.



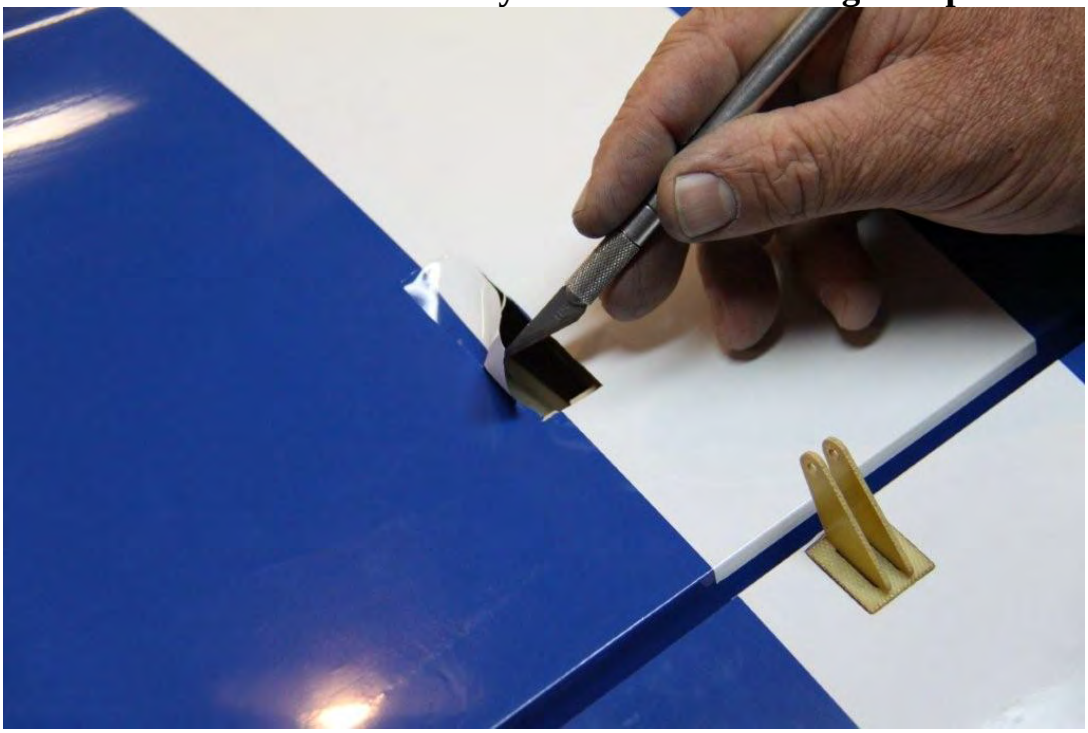



PACER
PACER...The total
• Clear formula
• Extra strength, permanent bond
• Excellent gap filling and shock resistant
• Great for sheeting foam wings
30-MINUTES
CAUTION: MAY CAUSE SENSITIZATION AND SKIN OR EYE IRRITATION. HARMFUL IF SWALLOWED.
See back panel.
TOTAL NET 8 FL. OZ. (237 mL)

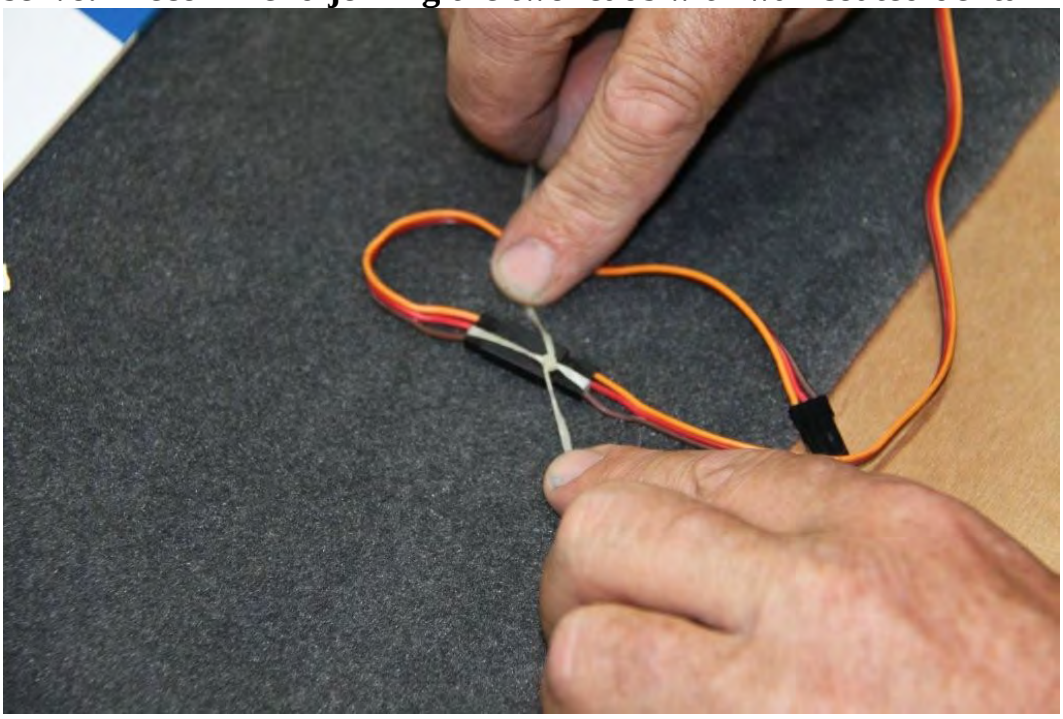


15. Install aileron hinges as previously done on the elevators. Deflect aileron back to full deflection and glue both sides of hinge using fresh thin CA glue. Once dry work back and forth to remove stiffness.

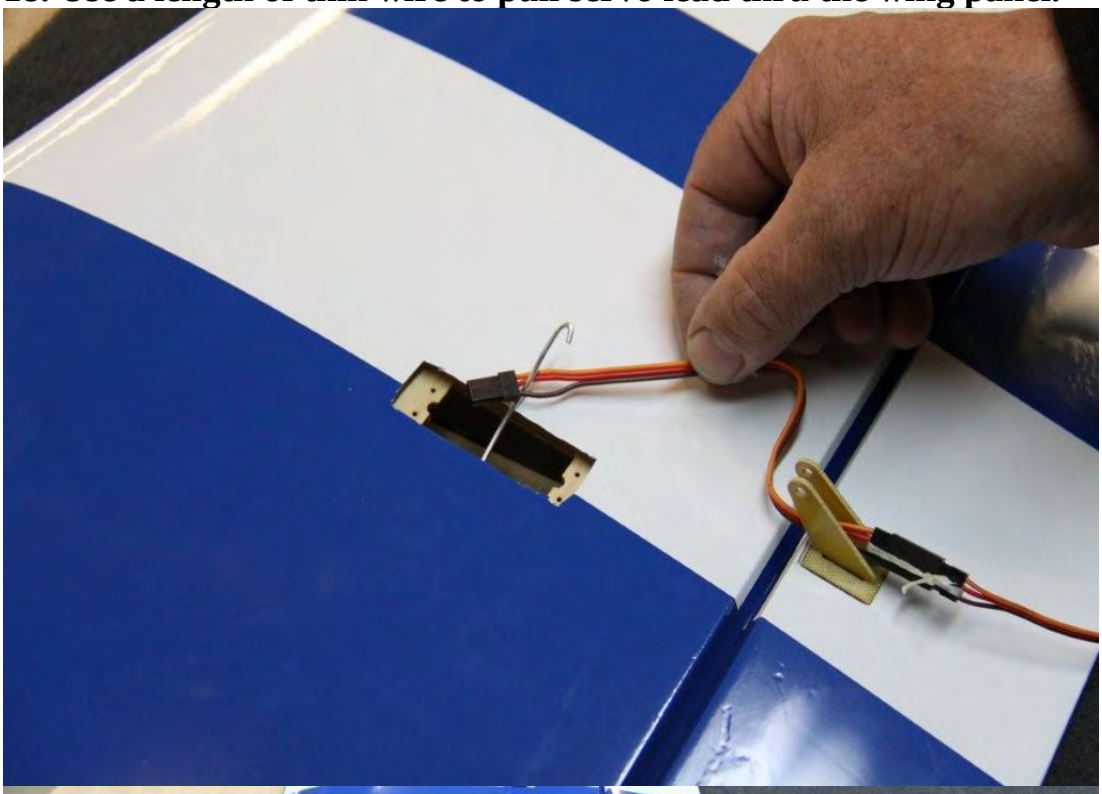
16. Locate the Aileron servo bay and remove covering to expose servo rails.

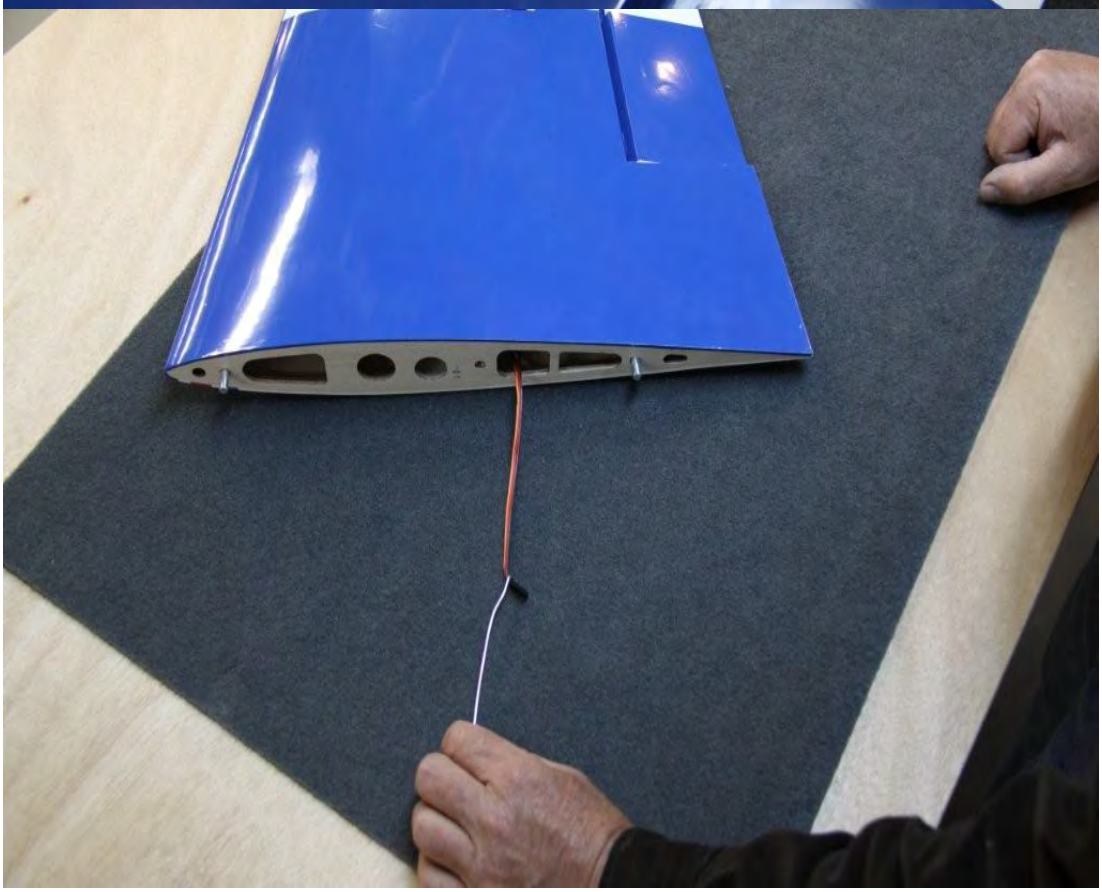


17. The Aileron servo will need a 6 inch extension added to the length of the servo. I recommend joining the two leads with wax coated dental floss.

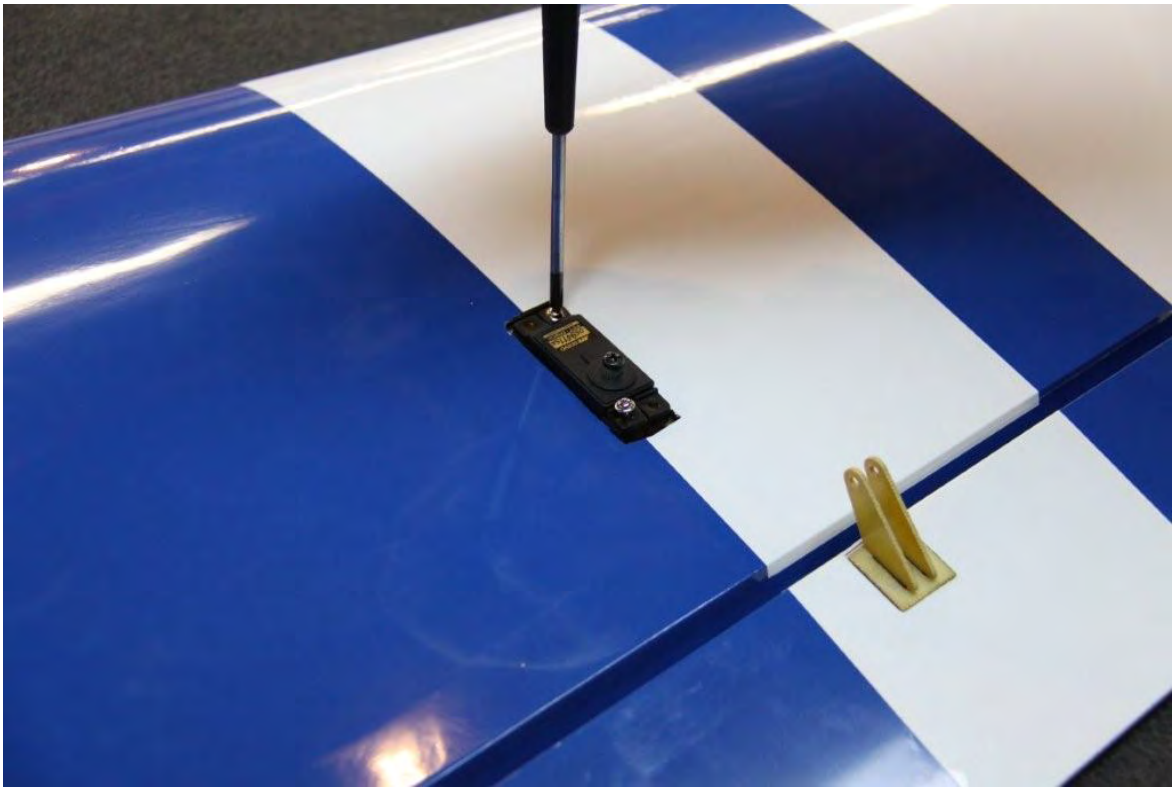


18. Use a length of thin wire to pull servo lead thru the wing panel.



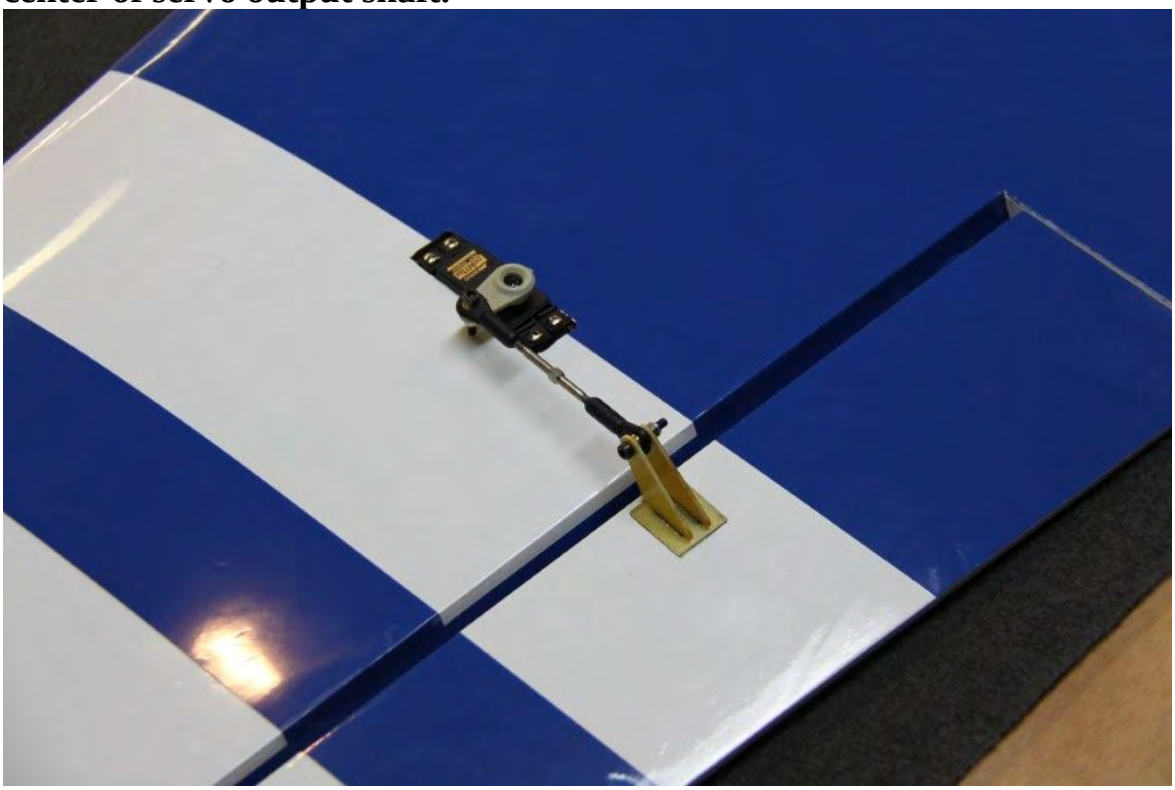


19. Install aileron servo using the manufacturers hardware. We used the JR 9411with great results. Electronically center servo and attach Du-bro servo horn.



20. Assemble ball links and pushrod as done previously.

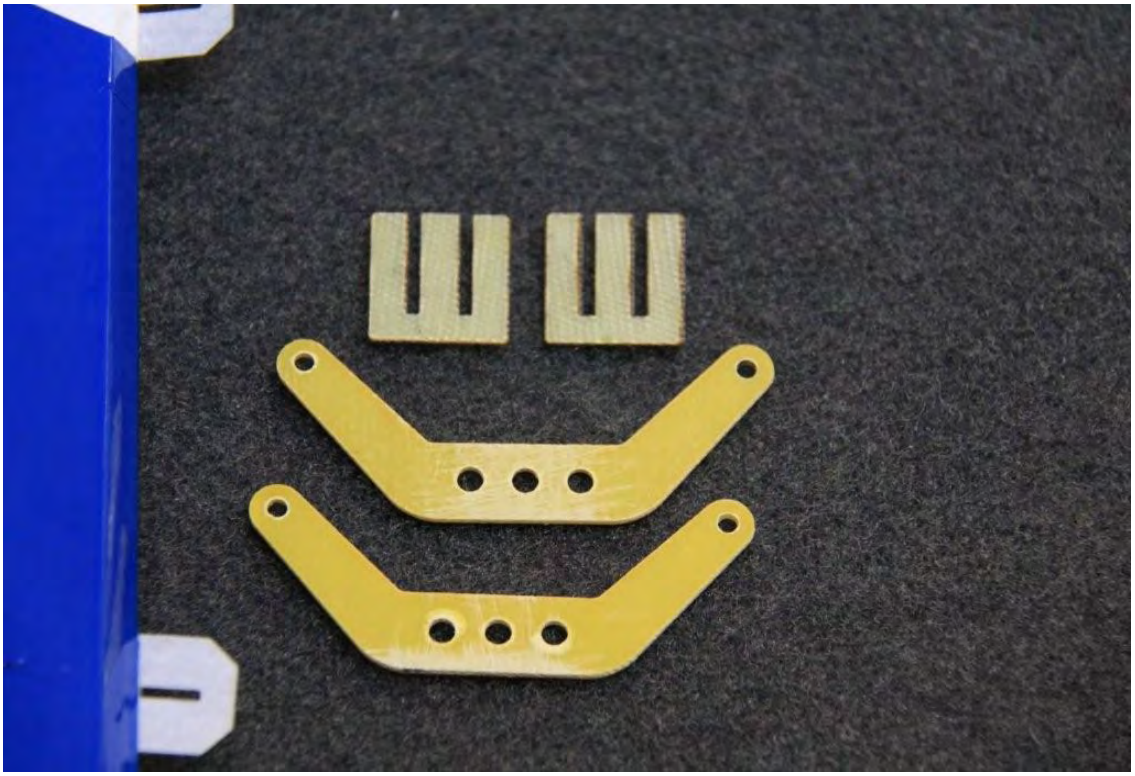
21. Using the Du-bro horn, install the linkage using the hole ¾ inch from center of servo output shaft.

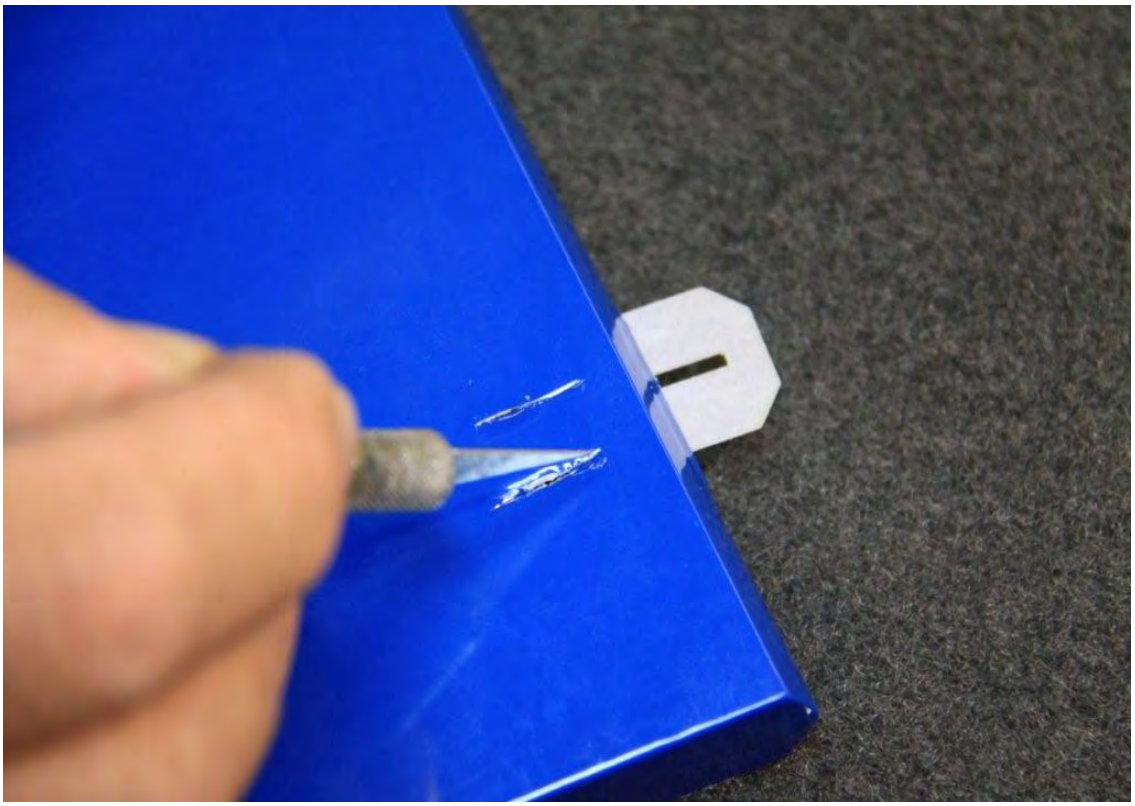


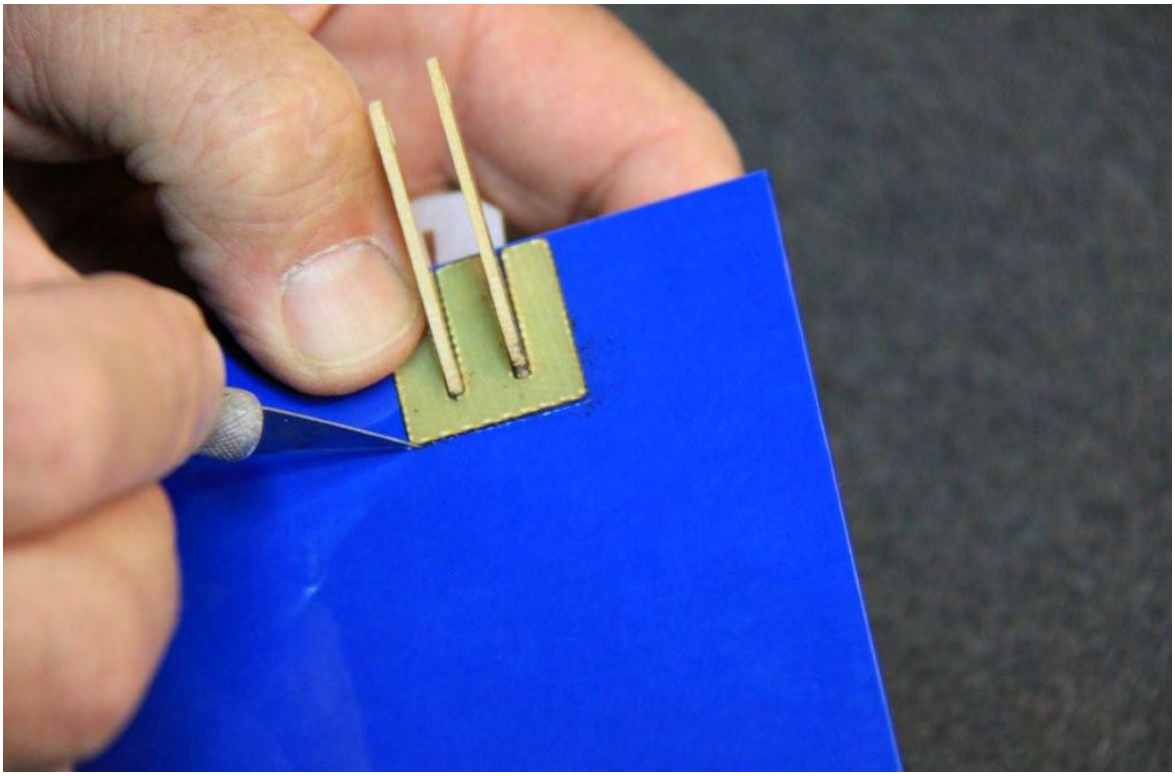
22. Repeat this procedure on the other wing. Seal hinges with tape or covering, clean and set aside.

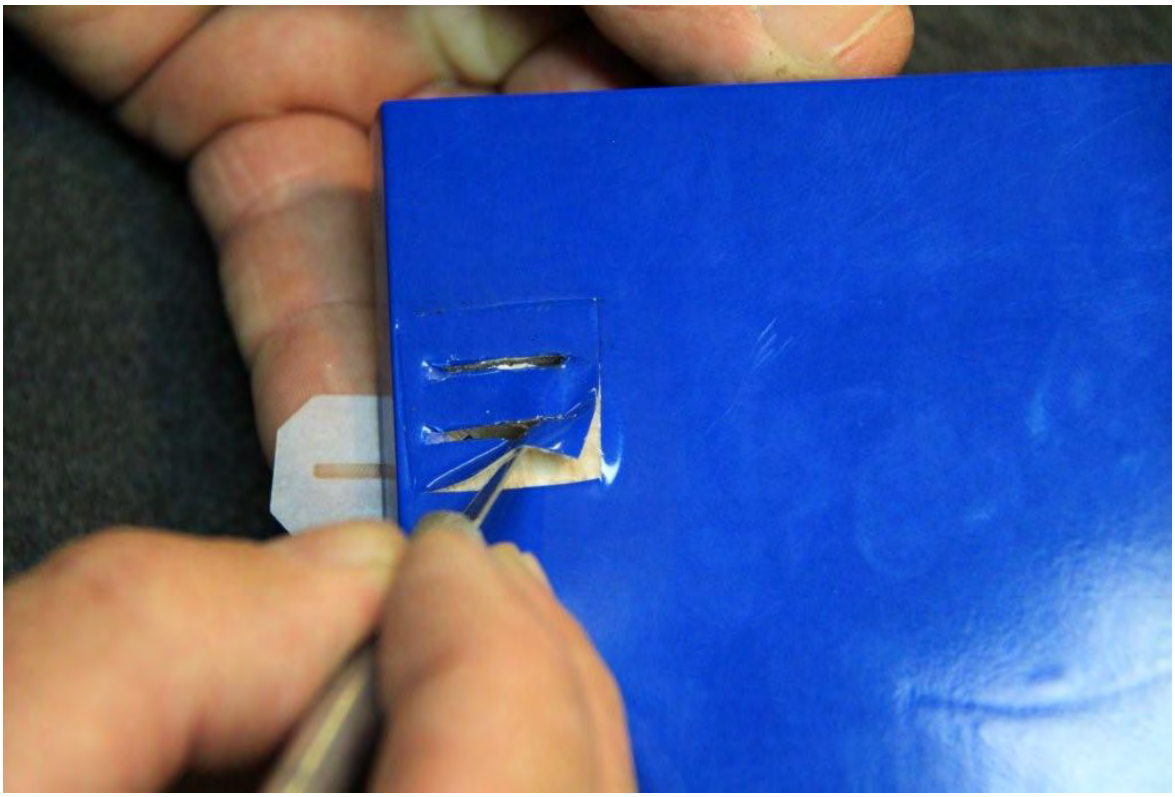
Rudder Preparation

23. Locate the rudder, the rudder control horns and the 2 slotted base plates. Use a sharp #11 blade to remove the covering from the 2 pre-cut slots in the rudder. Trial fit the 2 servo horns through the slots in the rudder and into their proper position. Remove the control horns and cut away the covering from the area where the base plates will go as done previously with the aileron and elevator. Mix up some 30 minute epoxy and use a small blade to fill the 2 slots with epoxy. Use plenty of epoxy and be sure to completely fill the two slots. Use an epoxy brush to completely cover the areas on the rudder horns and base plate that will glue into the rudder. Slide the rudder horns back into their proper position and immediately wipe the excess epoxy from the horns. Place 2 3mm screws through the outer holes in the horns to maintain alignment. Carefully check and re-check alignment to insure proper positioning. Use some denatured alcohol and a paper towel to remove any excess epoxy. Re-check the alignment one more time and set the assembly aside to dry.



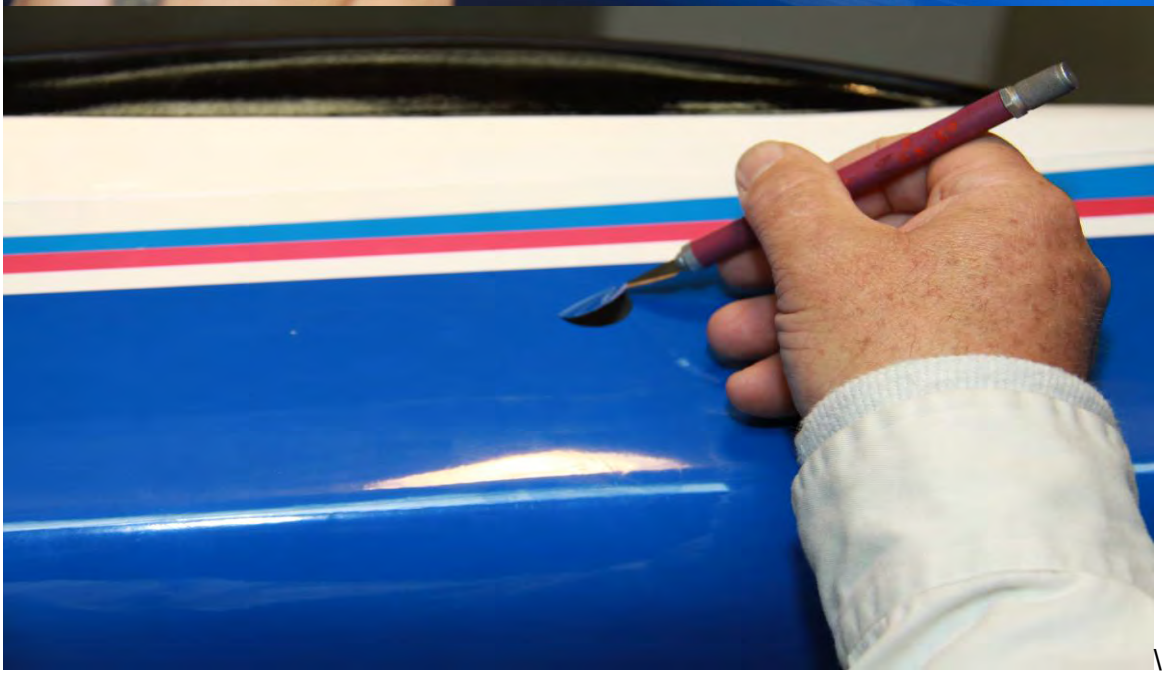






Fuselage Assembly

24. Prep the fuselage assembly by removing the covering over areas such as wing tubes, wing adjusters, servo wire exits, wing retainer screw holes, landing gear slots, stab tube socket and adjusters, fuselage air exits located on the bottom of fuselage and rudder cable exits with a new #11 blade.



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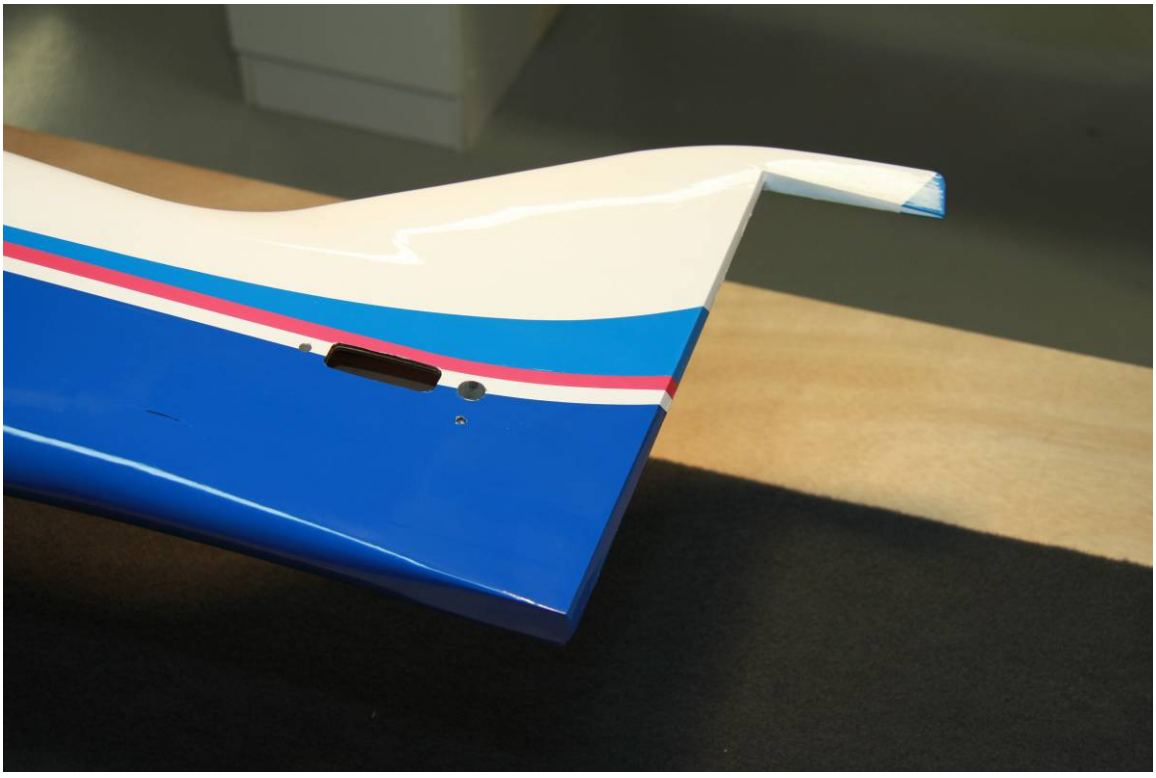
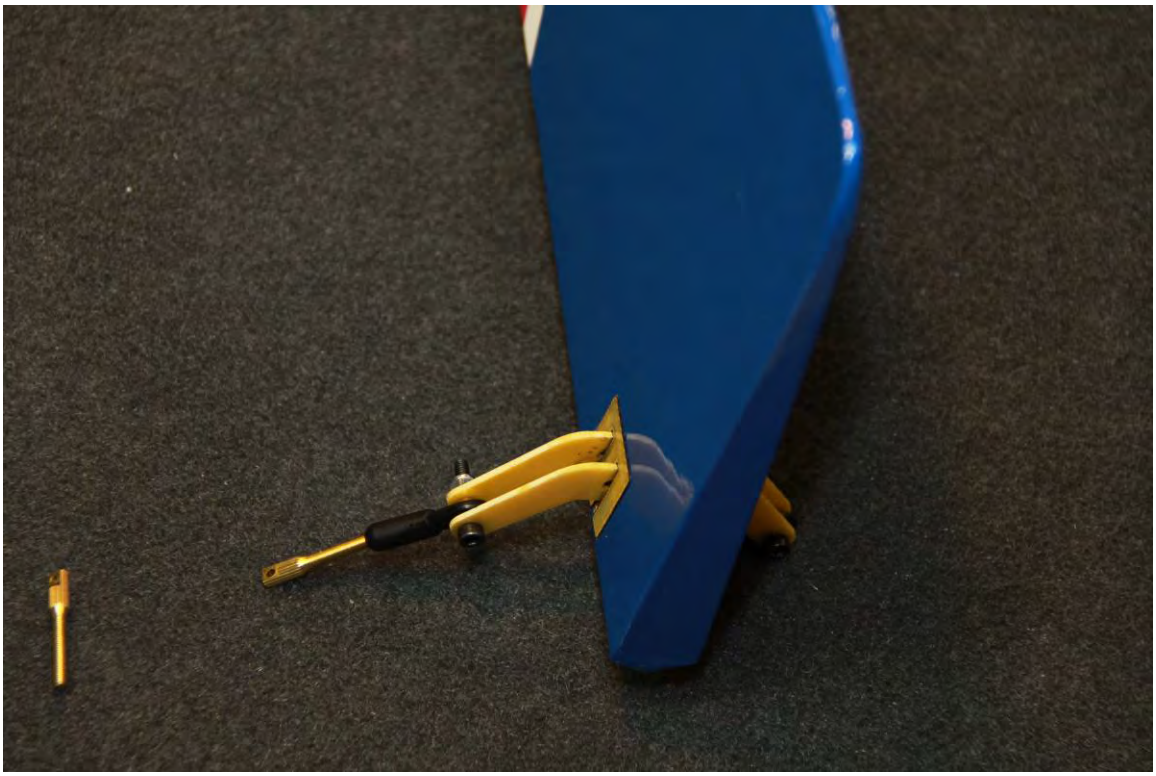
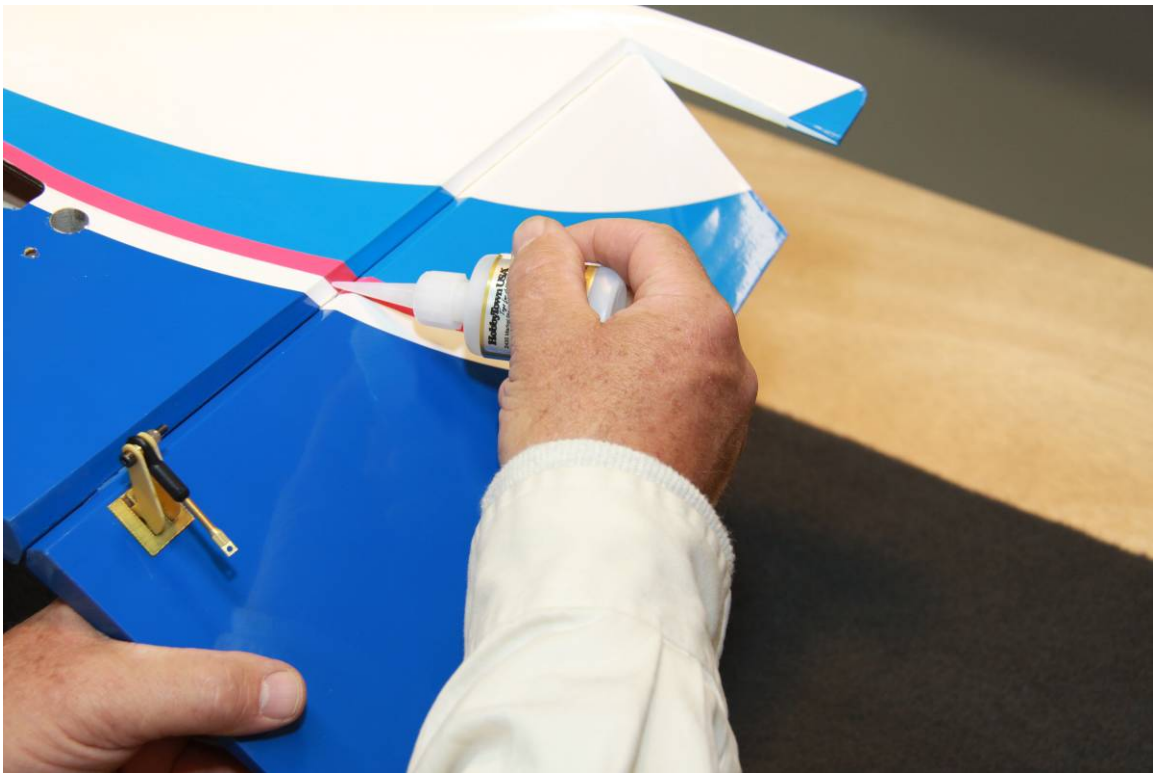
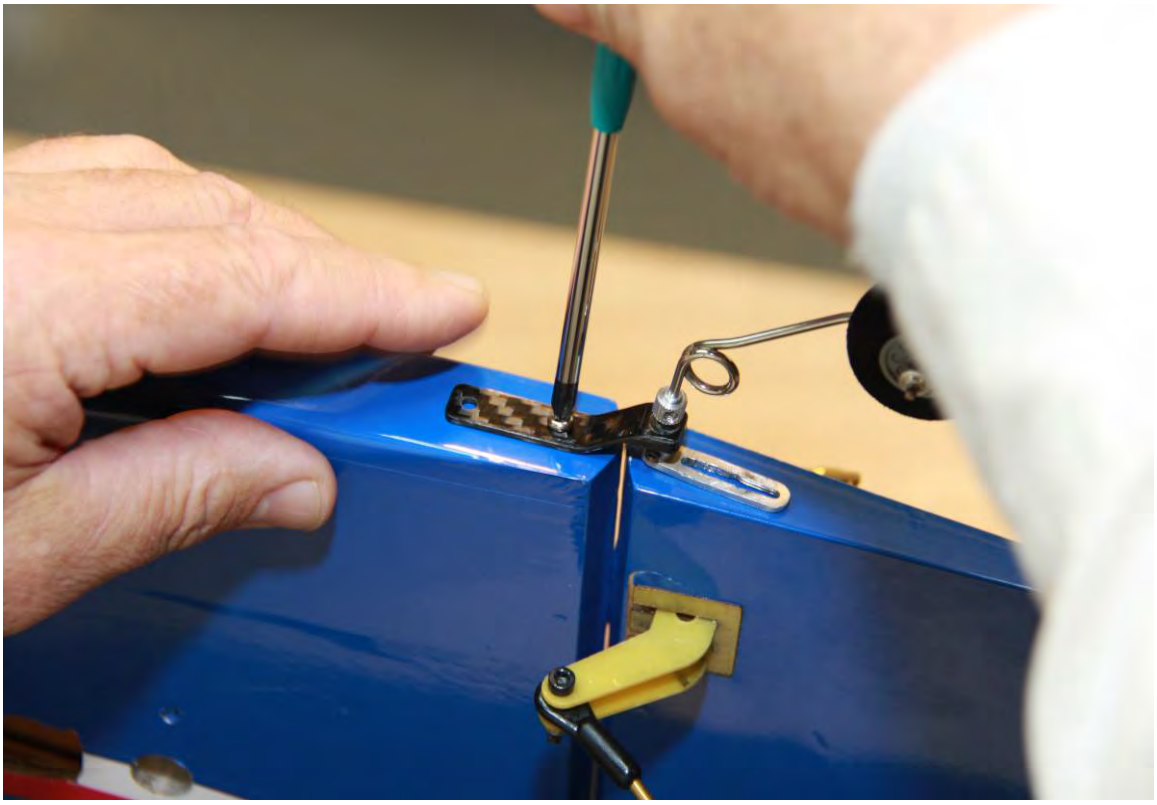


25. Trial fit rudder assembly onto fuse. Once satisfied with fit glue hinges with thin CA glue.





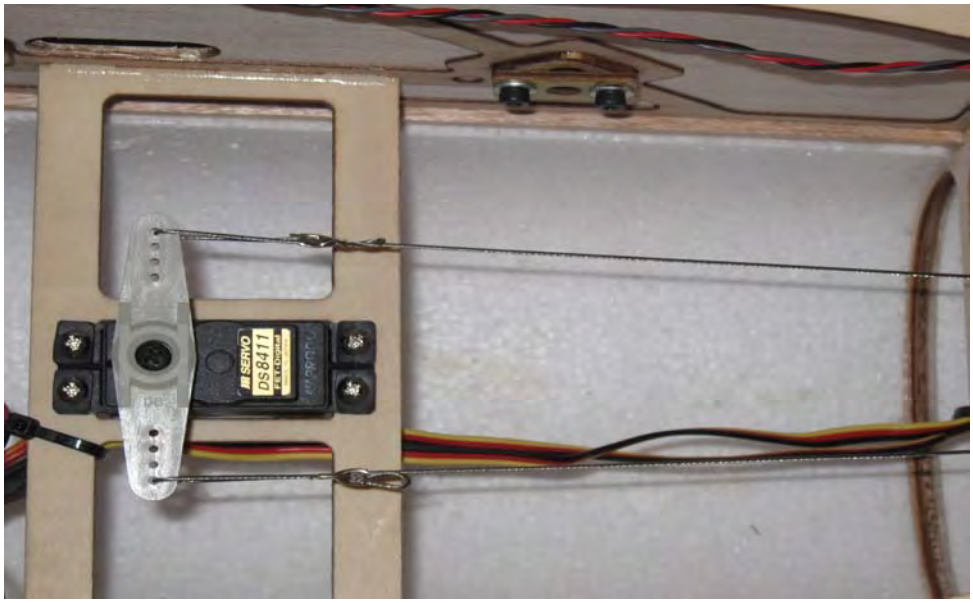
26. Locate tail wheel assembly and mount to fuselage as shown.



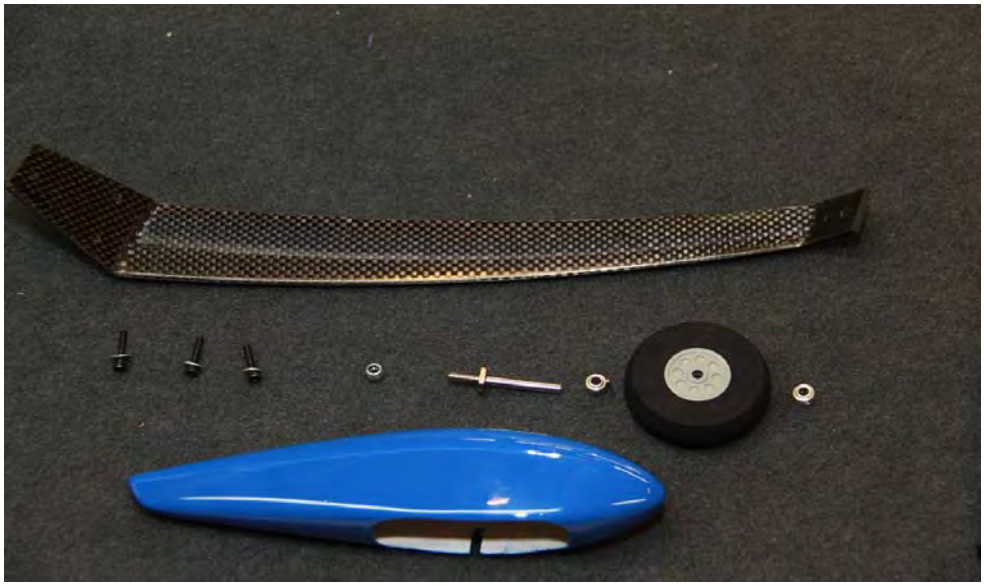
27. Locate the carbon stab tube & aluminum stab adjuster rod. Slide them into the stab socket and center them in the fuselage. Feed the elevator servo extensions thru the fuse & then slide stab assemblies onto the tubes. We will cover the stab incidence adjustment a little later.

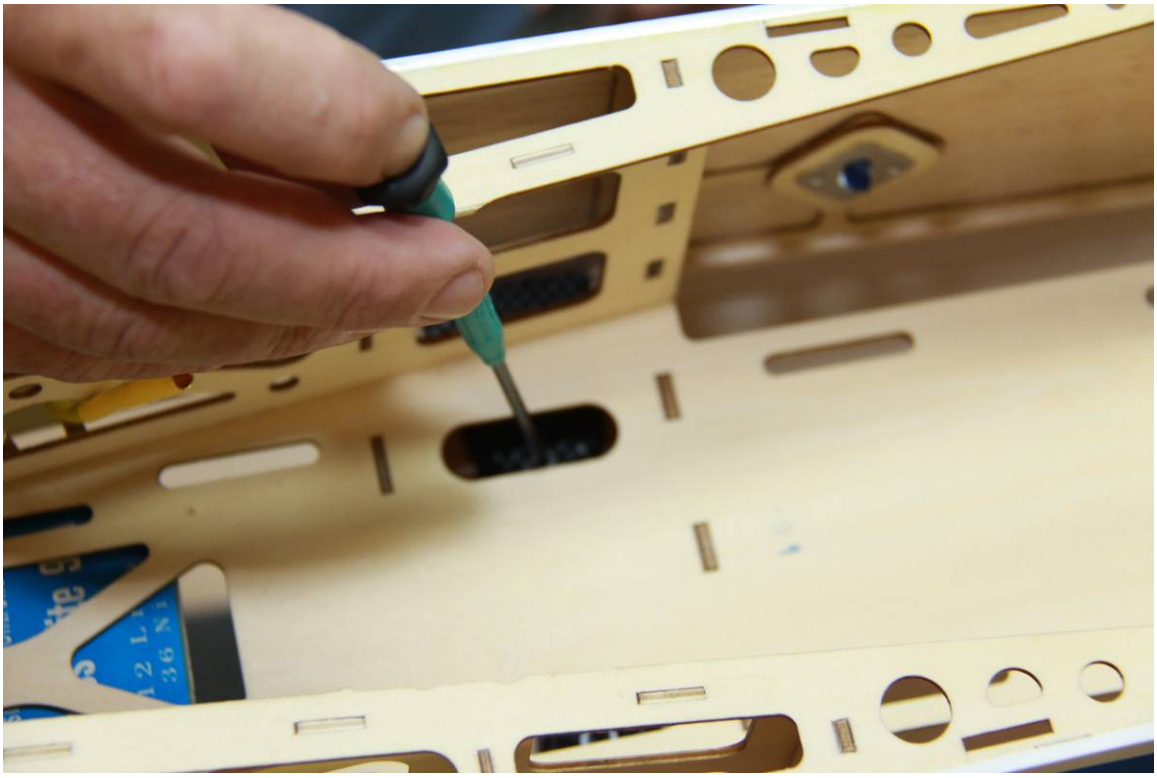
28. Install rudder servo on the servo rail under the canopy. The output shaft should be oriented toward the rear of fuse. We used the JR 8411 for the rudder with great results.

29. Locate the exit hole for the pull-pull cables in the lower rear portion of the fuselage. Insert the cables and run them forward to the rudder servo. Loop the cables through the servo arm and secure with a crimp as shown. Use the brass fittings and ball links at the rudder horn connection as pictured.

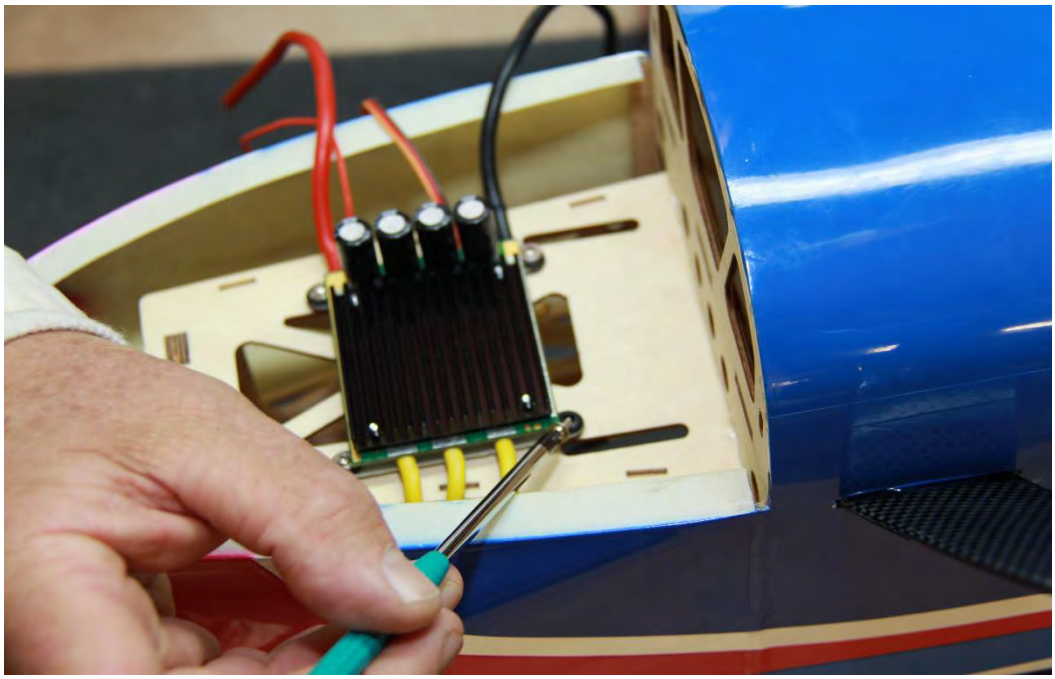


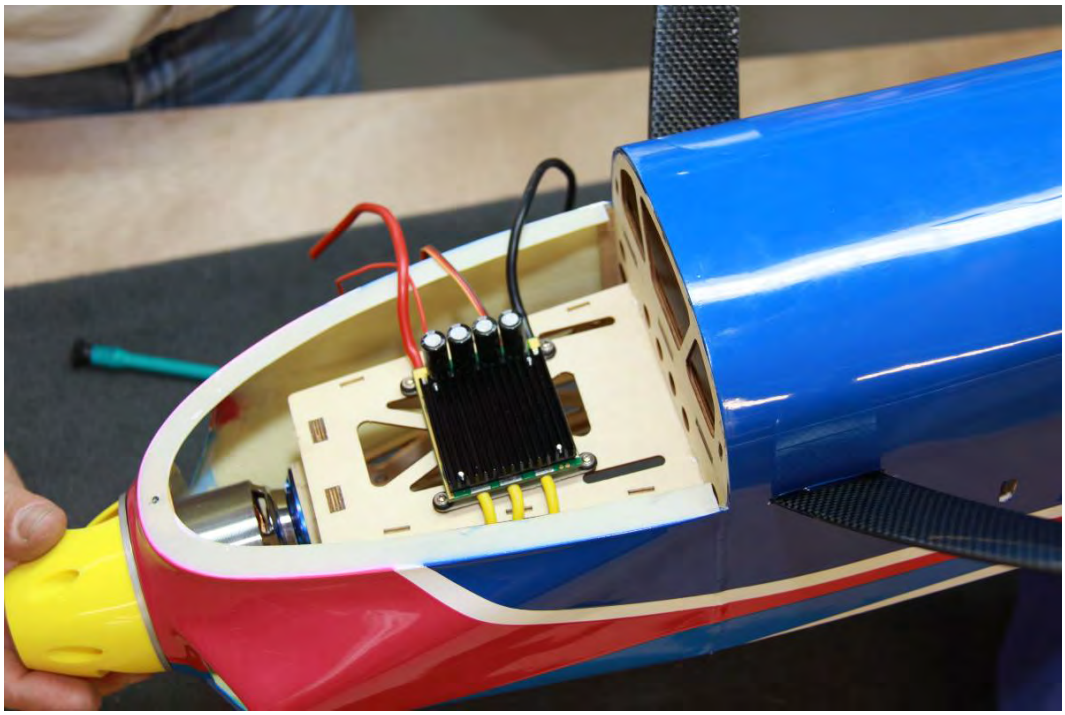
30. Locate the carbon fiber landing gear legs. Slide gear legs into slot with the sweep of the gear leg to the rear of the plane. The screws go in from the inside of the fuselage as shown. Once legs are secured to the fuselage assemble the wheel axles as shown & slide the wheel Pant slot over the axle and between axle flange and gear leg. Secure the wheel pant with a small wood screw inserted into the pre drilled hole in the gear leg.



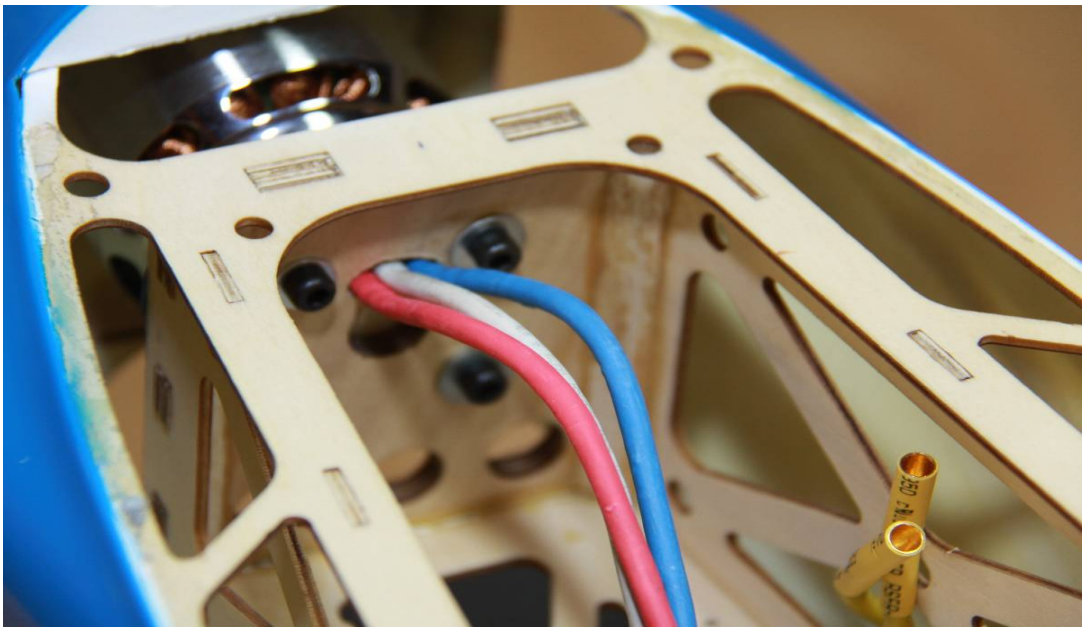


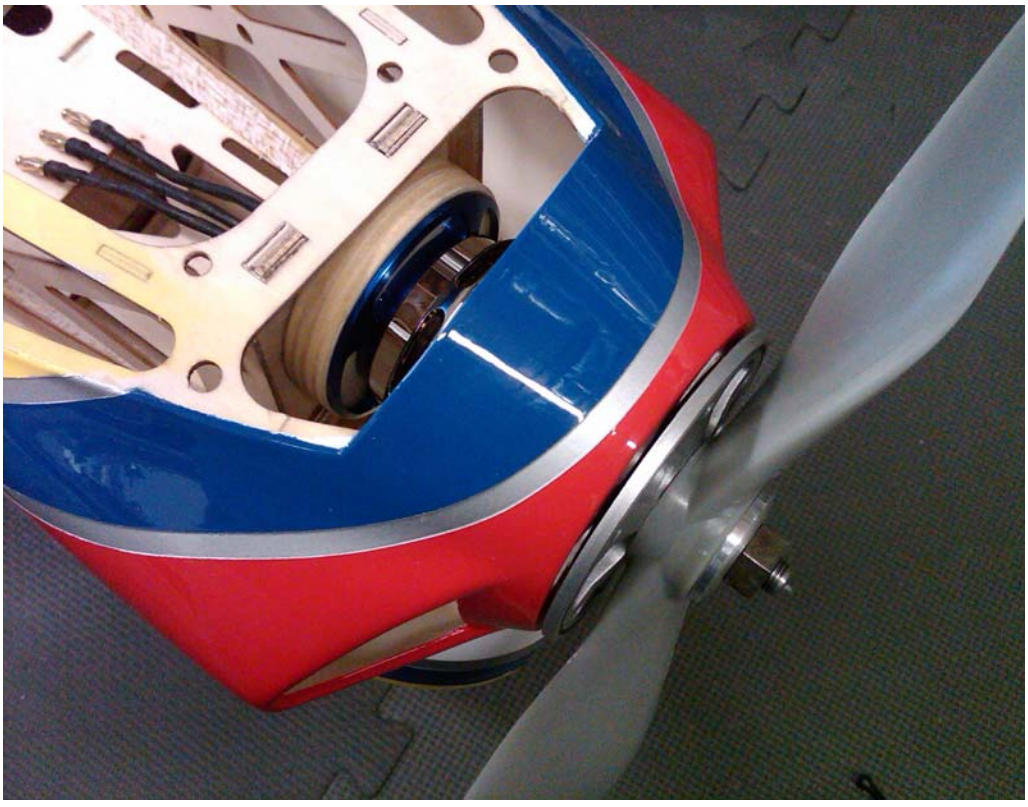
31. Mount your ESC as shown on the bottom of motor box with small wood screws or Velcro. It will be easier to do your soldering before installing it into airframe.





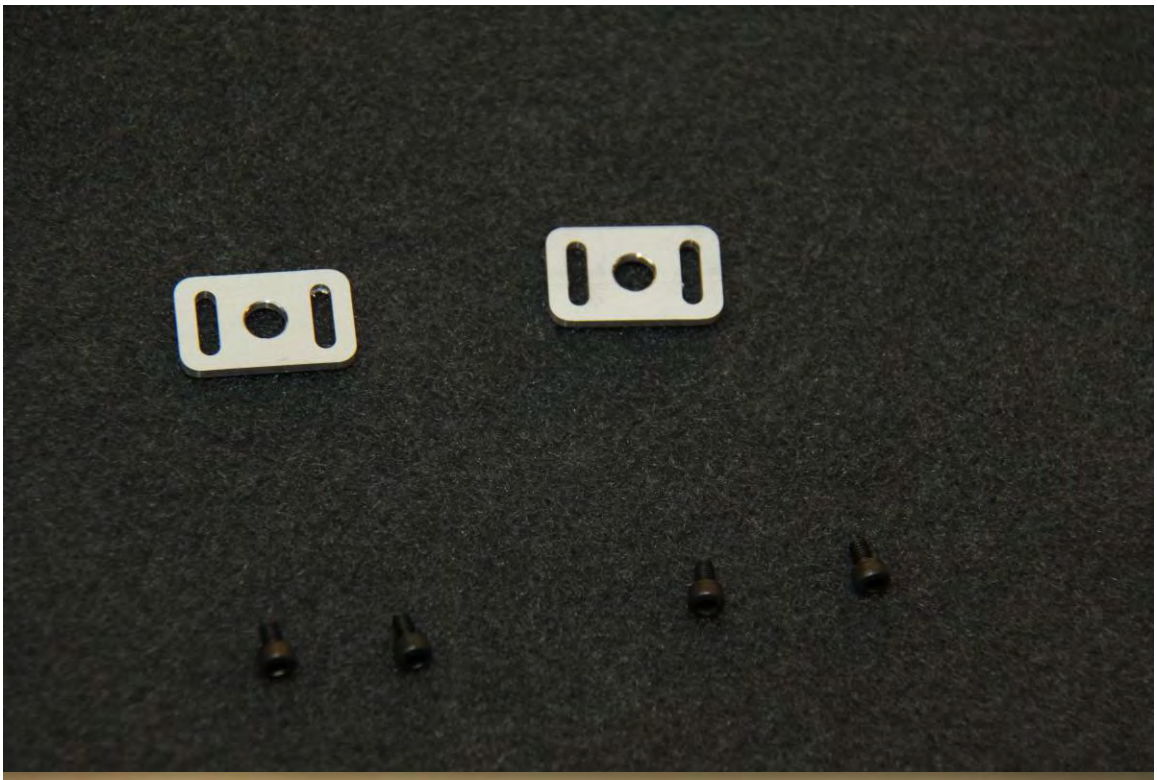
32. Mount your motor with the 4 supplied screws & washers. We have provided enough space to mount most makes of outrunner motors currently used in pattern/F3A flying. If using the recommended Torque motor we have supplied plywood spacers to provide the proper distance between the face of the motor box and the spinner back plate.

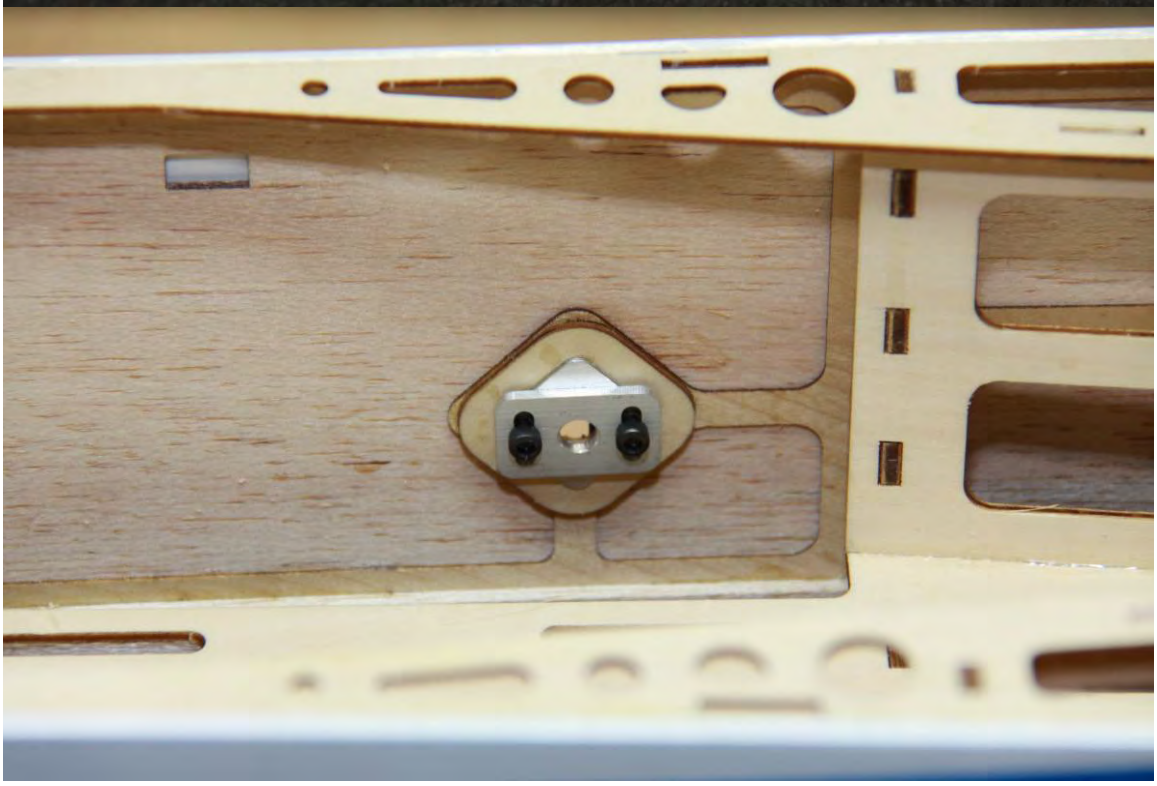




33. Secure the cowl chin by inserting the provided screw and washer into the pre-installed blind nut.

34. Locate the wing adjuster plates & 4 screws. Install onto adjuster base located on inside of fuse as shown. Do not tighten screws completely until later.





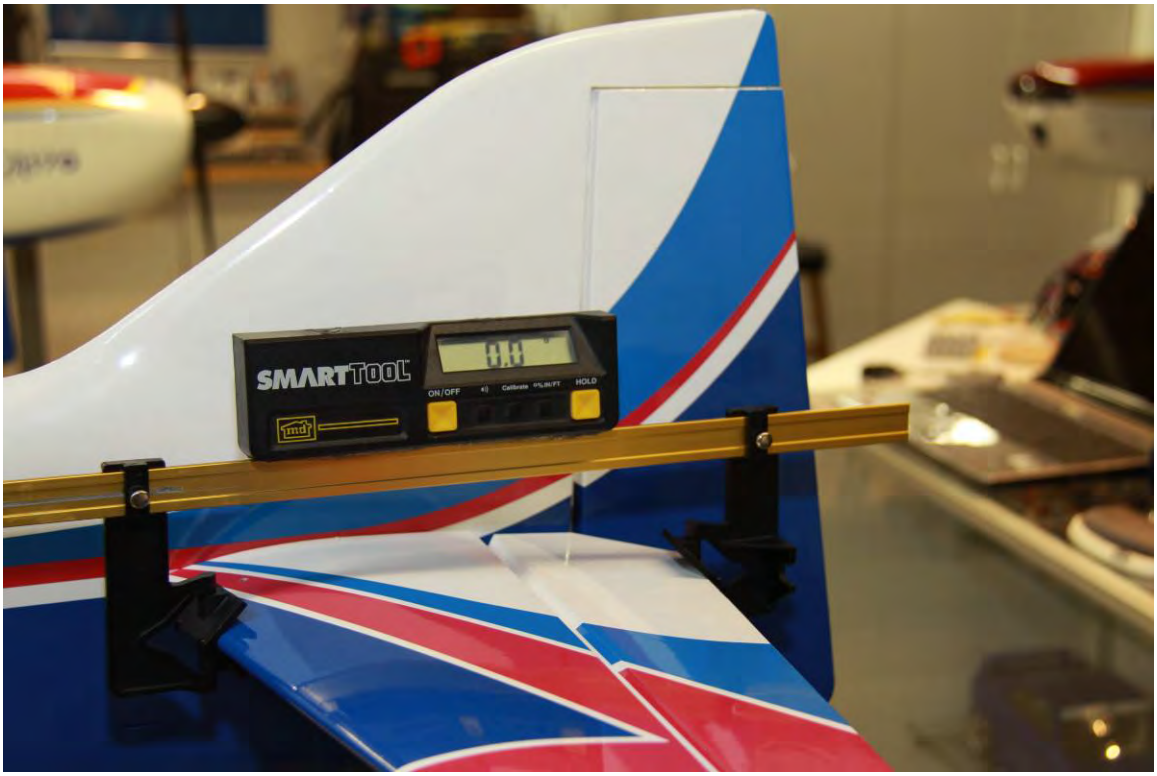
Wing and stab incidence adjustment

35. Items needed are a level & Incidence meter. Install wings onto fuselage with the carbon fiber tube. Do not use the wing hold down screws for this adjustment. Place level on the flat area of the canopy fuse base. Level your plane so that bubble is centered as shown.

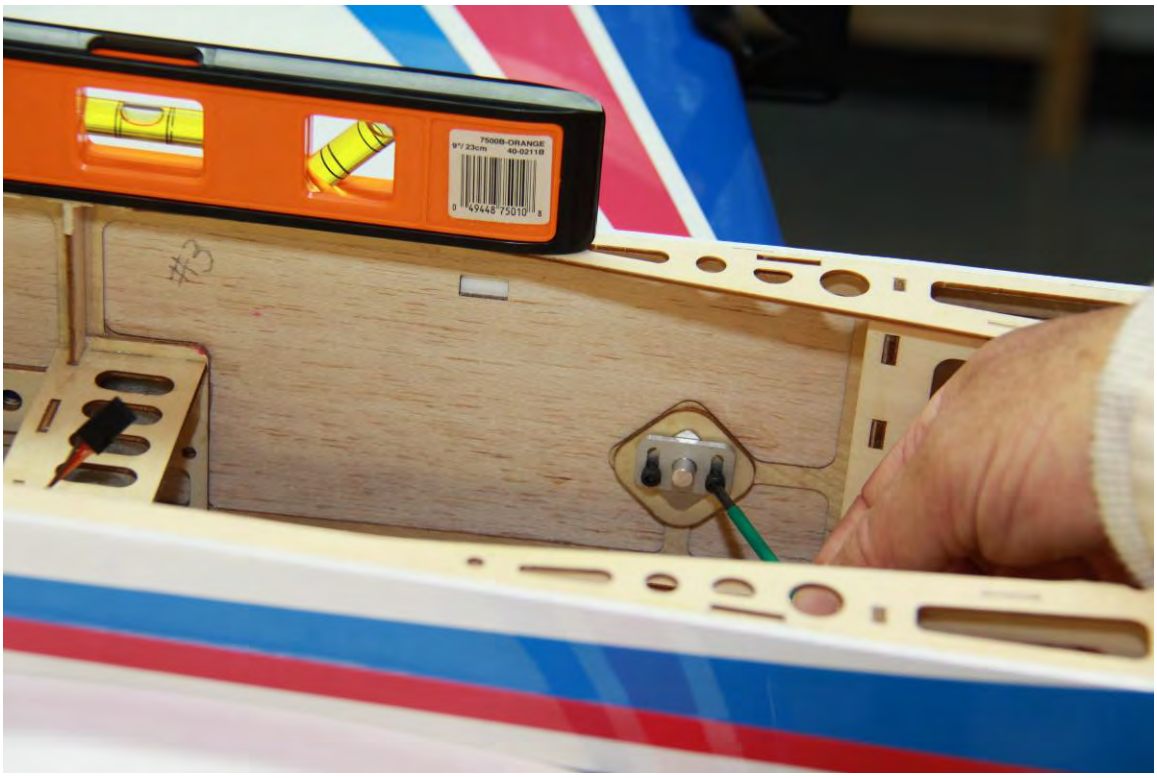
36. Place your incidence meter onto each stab half and using adjuster screws adjust each stab to read 0 (zero) degrees as shown. Remember the stab adjuster screws are set against the aluminum rod. These set screws do not require a lot of torque. Make sure to apply a drop of blue Loctite to these screws.

37. Now place your incidence meter on your each wing half. With level bubble still centered adjust wing incidence to read .3 (tenths of one degree) Positive. (Leading edge UP). Once you have one wing half adjusted tighten the screws on the wing adjuster plates & recheck your work. Repeat on other side.

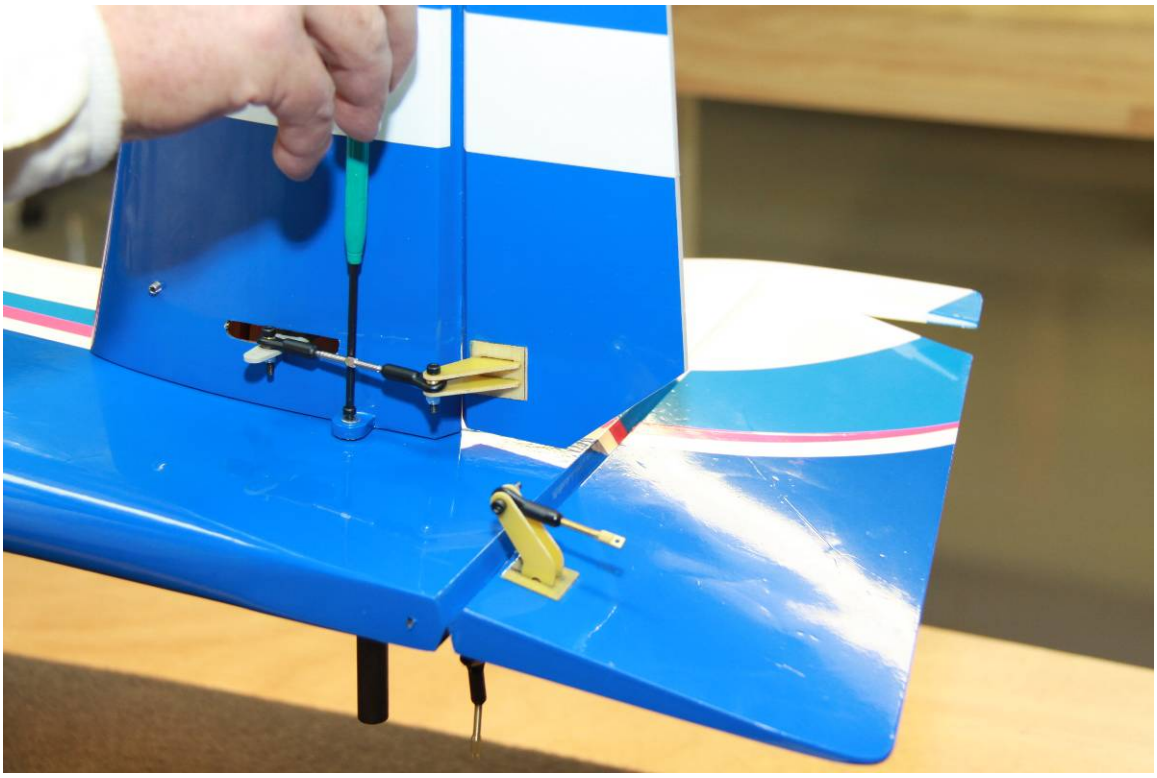
Remember to have the fuselage completely level (bubble centered) during all adjustments. This may take a few attempts to get correct but the reward is a true flying airplane.


SMARTTOOL
ON/OFF
HOLD


SMARTTOOL
0.3
ON/OFF
Calibrate
HOLD


#3

38. Once final adjustments are made secure stab halves to fuselage with a 3mm bolt as shown.



39. Wings are secured with nylon thumbscrews inserted from inside fuselage and threaded into pre-installed blind nuts in wing root.

40. Secure batteries with Velcro on the battery and battery tray as well as with a Velcro strap. Here is a photo of our equipment placement inside the Vanquish. There is plenty of room to work with to customize your set-up as you see fit.

41. Secure canopy with spring loaded hatch latch. Be sure hatch pin is fully engaged into canopy! Since this mechanism is manipulated each flight I had my local graphics shop cut a patch from carbon fiber vinyl to prevent the covering around the hatch pin from becoming frayed. You may wish to do the same.

Set-up and trimming

The Vanquish is purpose built for precision aerobatics. It is not intended for 3D flight and best performance will be obtained with moderate throws. If this is your first experience with a precision aerobatic aircraft I highly recommend downloading one of the aircraft trimming guides from the internet. Time spent trimming and dialing in your aircraft will reward you with a great flying experience and a highly competitive airframe. There is a wealth of information to be gleaned by visiting www.nsrca.us (the website for the National Society of Radio Controlled Aerobatics) and I highly recommend that you join this organization if precision aerobatics interests you. The monthly K-Factor magazine that you will receive as a member offers great useable information including product reviews, tips and tricks, contest reports and tips to help you fly better and get the most from your airplane.

The control surface throws recommended here are just a starting point and may need to be adjusted to suit your style or for the particular maneuvers flown in your chosen class. Don't be afraid to experiment with your center of gravity, control surface throws and exponential settings to find the set-up that works best for you.

	Low rate	High rate
Aileron:	**10-12 degrees**	**20-25 degrees**
Elevator:	**8-10 degrees**	**20 degrees**
Rudder:	**10-12 degrees**	**20-25 degrees**

Once again, thank you for your purchase of the Extreme Flight RC 2 meter Vanquish. I hope it brings you much joy!

See ya at the flying field!

Chris Hinson

Extreme Flight RC

Extreme Flight RC

2 Meter Vanquish Assembly Manual Addendum 1st Edition

Congratulations on your purchase of the Extreme Flight 2 meter Vanquish. We always welcome customer feedback and do our best to incorporate changes and revisions to make our aircraft the best they can be. We have made a couple of small changes in this latest production run that are not reflected in the original assembly manual.

1. Rather than having the cowl permanently mounted to the fuselage at the factory, we now supply the cowl as a one piece unit that is bolted to the fuselage which allows much better access to the motor and ESC . The canopy now extends all the way to the front of the fuselage and when removed, allows complete access to the forward interior of the aircraft.

2. After receiving several complaints of customers losing their canopy in flight, we have changed the canopy retention method to a 2 bolt system. We are supplying 2 metal bolts with integrated nylon thumb wheels which are very easy to install and remove without the need for a tool. You can also cut the metal portion of the screw down so that only a few turns of the screw are required to remove the bolts and canopy. This retention method has proven to be much more secure.

Thanks so much for your purchase of this Extreme Flight RC aircraft. We hope it provides you with many seasons of flying enjoyment.

F3A 2M Vanquish Tail wheel Assembly Addendum

In our effort to provide the lightest weight components for the 2 meter Vanquish we have included a newer tail wheel assembly design that is different from the one pictured in the manual.

To install simply drill a hole in the bottom rear of the fuselage and glue the aluminum insert in place with epoxy.

Install the 2mm ball link in the bottom of the rudder by drilling a hole to accept the ball link shaft and glue it in place with epoxy. Slide the tiller arm into the ball link and reassemble the unit.

Please see the photo of the finished installation.

Photo by Evan Chapkis/RC Accessories